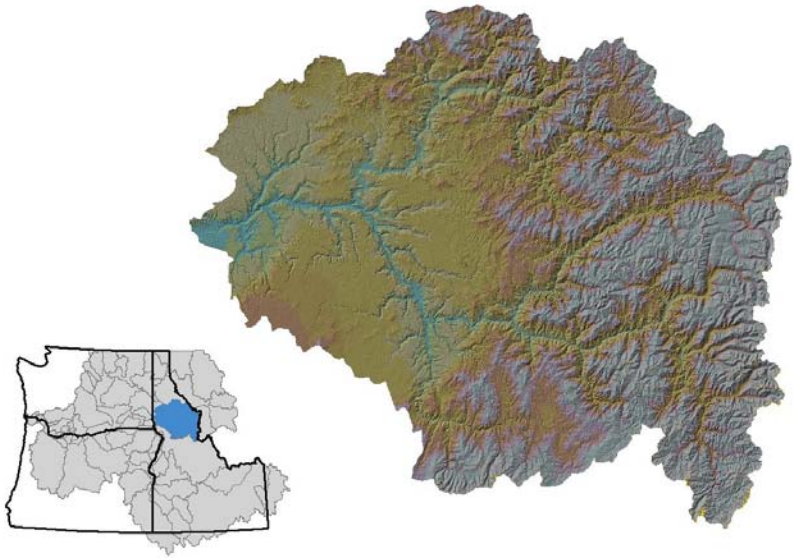
Final Draft
Clearwater Subbasin Management Plan

October 2002



Written by
Ecovista

Contracted by
Nez Perce Tribe Watershed Division

In Cooperation with
Clearwater Policy Advisory Committee

PREAMBLE

In early 2001, the excitement began. Over 147,000 adult spring chinook began to cross Lower Granite Dam, most of them on their way to Idaho from the Pacific Ocean. At least a quarter of these fish were honed in on the Clearwater River subbasin in Idaho. By the time the season ended in August, over 24,000 fish had been harvested by sportsmen and tribal fishers. Over 61,000 angler trips resulted in 24 million dollars of direct angler expenditures in the Clearwater River Subbasin. Large steelhead runs the following fall and winter provided additional opportunities and memories for recreational fishermen, in addition to important cultural and economic benefits in the subbasin.

Why so many fish following decades of so few? Above average spring flows in 1999 flushed juvenile fish to an ocean with better conditions for salmonid survival, including cooler water temperatures. In addition, hatcheries released full production capacity smolt numbers. Fisheries biologists predicted a large run, but even they could not have realized the memories and experiences that this run would provide the fortunate tribal fishers and sports anglers in the Clearwater subbasin.

The salmon and steelhead run of 2001/2002 provided us a glimpse of what runs were like historically, when thousands of self-sustaining wild fish returned to the Clearwater River every year. Unfortunately, wild fish continue to be much suppressed from historical numbers and the set of conditions that lead to the runs of mostly hatchery fish in 2001/2002 are not expected to persist in the future. In addition, a variety of in-basin and out-of-basin factors continue to negatively impact salmon and steelhead populations.

The future of salmon and steelhead in the Clearwater River will require the protection and expansion of wild fish populations, the continued production of hatchery fish for harvest and other purposes, and an openness by all parties to consider all factors which affect these important resources in the Clearwater. The members of the Clearwater PAC hope that implementation of the Clearwater Subbasin Plan will be a step in the right direction.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

The Clearwater Subbasin Plan has been developed as part of the rolling provincial review process developed by the Northwest Power Planning Council (Council)(See Table 1 for a complete list of acronyms used in this document) for each of 62 subbasins in the Columbia River Basin. Subbasin plans will be reviewed and eventually adopted into the Council's Columbia Basin Fish and Wildlife Program to help direct Bonneville Power Administration (Bonneville) funding of projects that protect, mitigate and enhance fish and wildlife habitats adversely impacted by the development and operation of the Columbia River hydropower system. The Council, Bonneville, National Marine Fisheries Service (NMFS, also referred to as NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) intend to use subbasin plans to help meet the requirements of the 2000 Federal Columbia River Power System Biological Opinion. The subbasin plan is also intended to provide a resource for use by NMFS and the USFWS as part of threatened and endangered species recovery planning (Council 2001).

The Clearwater Subbasin Plan is comprised of three main parts, each provided as a separate document. The three documents are interdependent, but each plays a unique role in understanding the characteristics, management history, and goals for the future of the Clearwater subbasin.

Assessment-- The assessment characterizes historic and current biophysical conditions in the Clearwater subbasin. It represents an interdisciplinary effort by multiple agencies to provide necessary technical information to guide actions to restore and conserve fish and wildlife species and habitat within the Clearwater subbasin. The Clearwater Subbasin Assessment provides the analysis and background information to support the recommendations made in the Clearwater Subbasin Management Plan.

Management plan-- The management plan includes a vision for the future of the Clearwater subbasin, biological objectives, and strategies for reaching management goals.

Inventory-- The inventory includes information on existing fish and wildlife protection, restoration and artificial production activities, and management plans within the subbasin. This information provides an overview of the management context, including existing resources for protection and restoration in the subbasin.

The initial planning and cooperation building efforts that culminated in the development of the Clearwater Subbasin Plan began with the designation of the Clearwater subbasin as a Council Focus Program in late 1996. The purpose of the Clearwater Focus Program is to coordinate projects to enhance and restore fish and wildlife habitats in the Clearwater River subbasin to meet the goals of the Council's program. Idaho Soil Conservation Commission (ISCC) and the Nez Perce Tribal Watershed Division (one of 6 divisions within the NPT Fisheries Department) co-coordinate the Focus Program on behalf of Idaho State and the Nez Perce Tribe (NPT).

To further the goal of a coordinated ecosystem-based approach to fish and wildlife protection and restoration efforts, the Clearwater Focus Program convened the Clearwater Policy Advisory Committee (PAC) to oversee the Clearwater subbasin planning process. PAC members include representatives from major resource management agencies, private landowners, and local governments in the Clearwater subbasin. Current PAC members include

George Enneking*, Idaho Association of Counties, Chairman
Cal Groen, IDFG, Vice Chairman
Bruce Bernhardt, Nez Perce National Forest
Dale Brege, U.S. National Marine Fisheries Service
Terry Cundy, Potlatch Corporation
Larry Dawson, Clearwater National Forests
Justin Gould*, Nez Perce Tribe Executive Committee
Kyle Hawley*, Idaho Assoc. of Soil Conservation Districts
Bob McKnight, Idaho Department of Lands
Bill Miller, U.S. Fish and Wildlife Service
*Elected officials of local or tribal government

Beginning in the fall of 1999, the NPT Watershed Division contracted with Washington State University, Center for Environmental Education (CEEd) to produce the Clearwater Subbasin Assessment. NPT provided funding for the assessment and planning via funding from contracts with the Bonneville Power Administration. Idaho Soil Conservation Commission provided supplemental funding and staff resources. Early assessment work focused on anadromous and resident fish populations, available habitat quantity and quality, and land management implications to fish populations. In response to the more complete ecosystem view of subbasin planning emerging in the Council, the NPT's Wildlife Department was contracted to produce the terrestrial portion of the assessment in early 2001. A terrestrial subcommittee of the PAC was formed to guide the development of the Clearwater Terrestrial Subbasin Assessment. Terrestrial subcommittee members included representatives from the NPT, Idaho Department of Fish and Game, U.S. Bureau of Land Management, Clearwater National Forest, U.S. Army Corps of Engineers and Potlatch Corporation.

Ecovista, a private company started by the original project staff from Washington State University, produced the Draft Clearwater Aquatic Assessment in September of 2001. The NPT Wildlife Department completed the Draft Clearwater Terrestrial Assessment in October of 2001. Ecovista integrated the two assessments into one document, addressed comments and integrated the collaborative efforts of subbasin resource managers into the Clearwater Subbasin Management Plan during 2002.

The aquatics portion of the assessment was first disseminated for public and technical review starting August 2001. Large portions of the aquatic assessment were also incorporated into the Clearwater Subbasin Summary, released May 2001 (Cichosz et al. 2001). The terrestrial portion of the assessment was first disseminated for review as a separate document in January 2002, and then again in the merged document in March of 2002. Through these review processes, dozens of comments, suggestions and clarifications were received. These have been integrated into the document to improve its accuracy and utility. Writing team members for these efforts include

Aquatic Assessment and
Subbasin Management Plan

Thomas Cichosz,	fisheries biologist
Craig Rabe,	aquatic ecologist
Anne Davidson,	spatial ecologist
Darin Saul, Ph.D.,	project manager/editor

Terrestrial Assessment

Angela Sondenaa, Ph.D	botanist, wildlife biologist
Gail Morgan,	wildlife biologist, GIS analyst
Shana Chandler,	wildlife ecologist
Blair McClarin,	field biologist
Jeff Cronce,	GIS Analyst
Marcie Carter,	wildlife biologist
Carl Hruska,	wildlife biologist

Please address comments to
Darin Saul sauld@pullman.com

The Nez Perce Tribe Executive Committee passed a resolution on October 8, 2002 approving the motion to forward the Clearwater Assessment and Plan to the Council for review. The members of the Clearwater PAC endorsed the Final Draft Clearwater Subbasin Plan on October 8, 2002.[1]

[1] The Clearwater PAC (referred to hereafter as the Parties)understand that this Plan shall be presented to the Northwest Power Planning Council (Council), as a proposed amendment to the Fish and Wildlife Program, for its review and appropriate action under the authority of the Northwest Power Planning Act. The Parties, except where specifically noted therein, support the Plan as an amendment to the Council's Fish and Wildlife Program, and its implementation if adopted as an amendment by the Council. The Parties believe that the Plan represents many areas of agreement, reached through a broadly collaborative process. However, the Parties recognize that the Plan does not resolve all differing legal, scientific and/or policy perspectives of the Parties, and that each Party may, at its own discretion, continue to advance their unique perspectives in the many fora dealing with the subject matter of the Plan. The Parties to this Plan specifically recognize that each Party reserves all legal rights, powers, and remedies now or hereafter existing in law or in equity, by statute, treaty, or otherwise. Nothing in this Plan is nor shall be construed to be a waiver, denial, or admission of any current or future legal claim or defense.

Table 1. List of acronyms used in the Clearwater Subbasin Plan

Acronym	Definition
Agencies or Groups	
BAG	Clearwater Basin Advisory Group
BLM	U.S. Bureau of Land Management
BPA	Bonneville Power Administration (Bonneville)
Council	Northwest Power Planning Council
EDT	Ecosystem Diagnosis and Treatment Method
EPA	U.S. Environmental Protection Agency
HUC	Hydrologic Unit Code
IASCD	Idaho Association of Soil Conservation Districts
IDFG	Idaho Department of Fish and Game
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
IFIM	Instream Flow Incremental Methodology
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPT	Nez Perce Tribe
NRCS	USDA Natural Resources Conservation Service
PAC	Clearwater Policy Advisory Committee
SCC	Soil Conservation Commission
TU	Trout Unlimited
USFWS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USACE	U.S. Army Corps of Engineers
WAG	Watershed Advisory Group (Associated with BAG)
Terms	
BiOp	Biological Opinion
BMP	Best Management Practice
BURP	Beneficial Use Reconnaissance Program
CCRP	Continuous Conservation Reserve Program (FSA)
CRFMP	Columbia River Fish Management Plan
CRP	Conservation Reserve Program (FSA)
CWA	Clean Water Act
FCRPS	Federal Columbia River Power System
GAP	Gap Analysis Program
HGMP	Hatchery Genetic Management Plan
IDAPA	Idaho Administrative Procedures Act
INFISH	Interim strategies for managing fish-producing watersheds in Eastern Oregon and Washington, Idaho, Western Montana and portions of Nevada
LSRCP	Lower Snake River Compensation Program
PACFISH	Interim Strategies for managing anadromous fish-producing watersheds in Eastern Oregon and Washington, Idaho, and parts of California.
PMU	Potential Management Unit
TMDL	Total Maximum Daily Load
WAG	Watershed Advisory Group (IDAPA 39-3615)
WBAG	Water Body Assessment Guidance

2 Subbasin Assessment

Although considered a component of the Clearwater Subbasin Plan, the Clearwater Subbasin Assessment is provided under separate cover as Volume 1. The assessment represents a combined effort of local resource managers and specialists from multiple disciplines and agencies over three years, and lays the foundation for the management plan contained within this volume. The assessment provides the technical information, interpretation, and synthesis on which the vision and goal statements, and the hypotheses, objectives and strategies developed in this document are based. The assessment has six main components.

- **Subbasin Description**. This section describes the physical features of the subbasin including the climate, geology, topography, and hydrology. It also discusses land uses, water uses and the demographics of the subbasin.
- **Vegetative Resources**. This section identifies current vegetative cover types in the subbasin and describes how the composition and distribution cover types has changed in response to alterations in the historic disturbance regime. It describes the current distribution of each major cover type in the subbasin, its value to wildlife, and the natural factors and human influences that have shaped its distribution. This section also describes the ecology and factors limiting, and in some cases threatening, the persistence of focal, threatened and endangered, and culturally important plant species
- **Wildlife Resources**-This section identifies the wildlife species and their habitats in the subbasin. It identifies focal species that characterize broader types of habitat use and describes the ecology and factors limiting, and in some cases threatening, the persistence of focal, threatened and endangered, and culturally important wildlife species. The dependence of many wildlife species on salmon or salmon derived nutrients is explored in this section.
- **Aquatic Resources**. This section identifies the location, quality, and productivity of habitat for focal anadromous and resident fishes in the subbasin.
- **Fishery Resources**. This section discusses the current distribution and population status of focal anadromous and resident fish species in the subbasin, and changes from historic distribution and population status. It identifies the factors thought to limit these populations, and it discusses the artificial production operations and supplementation efforts in the subbasin.
- **Synthesis of Potential Management Units**- This section describes the development of Potential Management Units (PMUs) for the subbasin. PMUs are groups of 6^{th} field HUCs (either contiguous or noncontiguous) differentiated to characterize areas with similar themes regarding species distributions, disturbance regimes, and other characteristics that will influence future subbasin scale restoration or recovery planning. In order to emphasize major differences in planning concerns, PMUs are presented and discussed individually within three distinct areas of the subbasin: those dominated by private ownership (excluding corporate ownership), mixed ownership (including corporate ownership), or federal ownership.

3 Clearwater Subbasin Management Plan

3.1 Vision Statement[2]

The vision for the Clearwater Subbasin is a healthy ecosystem with abundant, productive, and diverse aquatic and terrestrial species, which will support sustainable resource-based activities.

3.2 Goals

Respect, recognize, and honor the legal authority, jurisdiction, treaty-reserved rights, and all legal rights of all parties.

Protect, enhance, and restore habitats in a way that will sustain and recover aquatic and terrestrial species diversity with emphasis on the recovery of Endangered Species Act listed and native species.

Foster ecosystem protection, enhancement, and restoration that result in ridgetop-to-ridgetop stewardship of natural resources, recognizing all components of the ecosystem, including the human component.

Provide information to residents of the Clearwater subbasin to promote understanding and appreciation of the need to protect, enhance, and restore a healthy and properly functioning ecosystem.

Provide opportunities for natural resource-based economies to recover in concert with aquatic and terrestrial species.

Promote and enhance local participation in, and contribution to, natural resource problem solving and subbasin-wide conservation efforts.

Coordinate efforts to implement the Pacific Northwest Electric Power Planning and Conservation Act, the Endangered Species Act, the Clean Water Act, tribal treaties, and other local, state, federal, and tribal programs, obligations, and authorities.

Develop a scientific foundation for prioritizing projects and for monitoring and evaluation.

Enhance species populations to a level of healthy and harvestable abundance to support tribal treaty and public harvest goals.

3.3 Hypotheses, Objectives and Strategies

Information presented in this section is complimentary to that presented in the two subsequent sections ('Research Monitoring & Evaluation' and 'Prioritization of Efforts'), and is generally directed towards addressing broad scale (subbasin wide or population level) concerns. Subsequent sections address more specific and finer scale restoration concerns and recommended actions.

[2] Clearwater Policy Advisory Committee adopted final draft of Vision Statement and Goals February 21, 2002

The various components (working hypothesis, component hypotheses, objectives and strategies) of the Clearwater Subbasin Management Plan described in this section have been developed from information presented in the Clearwater Subbasin Assessment. To avoid redundancy, the readers are referred to the Clearwater Subbasin Assessment for supporting data and information used to develop the following components. Only in cases where information is considered critical to the immediate understanding of the stated hypothesis, objective, or strategy is that information reiterated in this section.

Although the Hypotheses, Objectives, and Strategies are commonly related to individual species or communities, none of these ecosystem components function independently. Any actions, which benefit or harm one species within the subbasin will also impact other species (aquatic or terrestrial, including humans) which utilize or rely on that species, and will also have social, political, and economic implications.

Social, economic, and political factors in the Clearwater subbasin are important considerations in determining the success of the implementation phase of this management plan. These factors are referenced in the vision and goal statements for the Clearwater subbasin and need to be adequately addressed at all levels of the planning process, including development of appropriate hypotheses, objectives, and strategies. Accounting for the human component will increase the probability that this plan will be successfully implemented and viewed as a necessary, socially acceptable, and reasonable step in the protection and recovery of aquatic and terrestrial species in the subbasin.

Working Hypothesis

Ecosystems within the Clearwater subbasin have been substantially impacted by human activities both in and outside of the subbasin, most commonly with negative impacts to aquatic and terrestrial species. Many aquatic and terrestrial species are currently at risk within the subbasin, and without appropriate management planning and implementation, may be further compromised. Humans are themselves an ecosystem component, and this management plan relies on the ability of human and nonhuman components to interact and coexist.

Anadromous fish species in the Clearwater subbasin are limited by out-of-subbasin factors impacting migration success and oceanic survival, and by in-subbasin factors related to habitat quantity, quality, complexity and connectivity. Fish management issues center around fish production and releases from four hatcheries within the basin and fish transported into the basin from hatcheries in the upper Snake River Basin. These hatchery releases are primarily for mitigation of hydropower development. Hatchery production of anadromous fish is not thought to limit persistence of existing stocks within the Clearwater subbasin, and is viewed in this management plan as a valuable tool to assist in achieving subbasin goals. Resident fish species are limited or threatened by reduced habitat quantity, quality, and connectivity, as well as through genetic introgression and the loss of fluvial population components and associated genetic interchange. Impacts of Dworshak Dam operations to both resident and anadromous fish species can be lessened through better understanding and combined consideration of economic, biologic, and flood control needs.

Terrestrial species within the Clearwater subbasin have been impacted by habitat alterations including loss of prairie grasslands, ponderosa pine, wetland and riparian habitats, and early and late seral habitats. Increased urban and rural development and the introduction of noxious weeds

and nonnative plants have negatively impacted both plant and wildlife populations within the subbasin. Changes in habitat complexity due to road construction, timber harvest, livestock grazing and fire suppression have reduced overall habitat condition for various plant and animal species. Due to strong ecological relationships between aquatic and terrestrial species, reductions of anadromous fish runs (loss in the North Fork Clearwater drainage) throughout the subbasin have resulted in reduced nutrient cycling, with impacts to both plant and animal species. Operational and secondary impacts of Dworshak Dam continue to impact wildlife resources in the subbasin.

Integration of this plan with existing programs and initiatives will provide benefits beyond those associated with individual plans or programs. Coordinated federal, tribal, state, and local policies are essential to achieve the goals and objectives of this management plan. Implementation of ecosystem restoration or protection strategies will have economic ramifications (positive or negative), which can be effectively balanced with the restoration objectives and strategies defined in this management plan.

Component Hypothesis, Objectives, and Strategies

The following is a list of component hypotheses derived from the above working hypothesis. Component hypotheses, objectives and strategies are grouped for organizational purposes as "Biological" "Environmental" or "Socioeconomic", although the three groups are intrinsically linked. "Biological" hypotheses, objectives and strategies are generally directed toward fish populations where sufficient data regarding population sizes, trends, and so on is available to establish biological criteria. Given a lesser amount of available biological information, component hypotheses, objectives, and strategies aimed at improving plant and wildlife populations are addressed through habitat management, and are therefore addressed as "Environmental." The "Socioeconomic" hypothesis acknowledges the importance of the human component in successfully implementing the Clearwater Subbasin Management Plan. Addressing the "Socioeconomic" hypothesis will increase the probability that the plan will be successfully implemented and viewed as a necessary, socially acceptable and reasonable step in the protection and the recovery of endangered fish and wildlife.

Consistent with Council guidance for development of subbasin plans, objectives have been formulated in a quantifiable manner whenever sufficient data or information was available. Quantifiable criteria were derived by technical working groups comprised of PAC member agencies, and may reflect predefined or newly defined goals, or be a best estimate of realistically achievable efforts. In the absence of sufficient information or data, timelines (rather than quantifiable criteria) for gathering necessary information or accomplishing objectives have been established as part of this management plan.

Biological
Anadromous Fish Species

I. Component Hypothesis 1: Out-of-subbasin factors including estuarine and ocean conditions, hydropower project impacts such as water quality and fish passage, mainstem Snake/Columbia River water quality and quantity conditions, and downriver and oceanic fisheries are the primary factors limiting recruitment of anadromous spawners to the Clearwater subbasin.

A. Objective: Increase the number of naturally spawning adults to achieve goals in Table 1 within 25 years (timeline is consistent with the Council's Fish and Wildlife Program) by ameliorating or mitigating the manageable limiting factors, or provide data key to out-of-basin efforts to improve limiting factors. Progress toward goals will be assessed at least every 2 generations.

1. Strategy: Participate in province and basin-wide coordinated studies designed to examine mainstem and ocean mortality associated with differential migration timing and life histories of anadromous salmonids and lamprey. Conduct research within the context of identifying management versus basinwide environmental effects.

2. Strategy: Define and establish anadromous index stocks within the Clearwater subbasin (comparable to existing Snake River index stocks) to evaluate Clearwater specific life history characteristics and spawn-recruit relationships as a measure of productivity. Develop appropriate historic (e.g. run reconstruction) data and long term evaluation protocols for comparison between Clearwater, other Snake River, and comparable downriver stocks.

3. Strategy: Improve flows and temperatures for increasing out-of-subbasin migration conditions and survival for anadromous salmonids through application of integrated rule curves and modified operational criteria at Dworshak Dam consistent with actions outlined in the Dworshak Operation Plan (IDWR 2000) and monitor and evaluate effects of implementation.

Table 2 Anadromous adult return objectives for the Clearwater subbasin. Goals are derived from various management plans and do not imply consensus of all management agencies.

Species[1]	Long-term Return	Natural Spawning Component	Hatchery Spawning Component	Harvest Component
Spring chinook	60,000	≥10,000	5,000	45,000[2]
Fall chinook	50,000	Up to 10,000	5,000	Up to 35,000
Coho	14,000	Undefined[3]	Undefined[3]	Undefined[3]
B-run steelhead	91,000	≥12,000	5,000	74,000[2]
A-run steelhead	2,000	1,000	0	1,000
Lamprey[4]	10,000-20,000	Undefined	Undefined	Undefined
Sturgeon[5]	Undefined	Undefined	Undefined	Undefined

1 See Appendix Table 1 for more detailed information on plans reviewed and methods used to derive these values.
2 The harvest component was derived from utilization objectives developed for the 1990 Clearwater River Subbasin Plan wherein planners worked with a Public Advisory Committee to derive long-term objectives for nontribal utilization, with an equal share subsequently added for tribal utilization.
3 Nez Perce Tribe's Clearwater Coho Restoration Management Plan is currently being developed, and will scope ranges to allow management development of this population.
4 Lamprey populations are not yet determined; further research to establish a program to restore and monitor a recovered population is needed; some historical counts at Snake River dams documented up to 30,000 adults.
5 Sturgeon once played a role in the anadromous system of the Clearwater but no history exists; research has been ongoing since 1996 and a BRAT will be convened in 2003 to assess and recommend management actions from the current population research program that studied sturgeon upstream of Lower Granite Dam since 1996.

II. Component Hypothesis 2: Anadromous fish production is limited by habitat quantity and quality in portions of the subbasin.

A. Objective: Improve anadromous fish survival through the following strategies and through quantifiable improvements outlined for individual habitat components under Environmental Objectives (defined below).

1. Strategy: Establish a set of index streams for monitoring purposes, using PMUs as stratifiers. These streams should be representative of the area in which they occur and should not be confused with reference streams.
2. Strategy: Develop indices to evaluate biological response(s) to habitat improvement projects over relatively short timeframes, using appropriate fish production models or empirical data to link the developed index to fish production potential.
3. Strategy: Utilize appropriate indices to monitor the effectiveness of habitat improvement efforts in providing biological benefits.
4. Strategy: Improve habitat conditions in the lower North Fork Clearwater and Clearwater rivers through application of integrated rule curves and modified operational criteria at Dworshak Dam consistent with actions outlined in the Dworshak Operation Plan (IDWR 2000).
5. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

III. Component Hypothesis 3: Management of hatchery and natural production can be coordinated to meet subbasin goals.

A. Objective: Develop an integrated management plan to optimize the use of hatchery fish to meet recovery and harvest objectives within 5 years of completion of relevant HGMPs.

1. Strategy: Continue to develop stock specific knowledge of interactions between hatchery and wild fish.
2. Strategy: Develop hatchery fish stocking guidelines for all life stages to optimize the use of hatchery fish.
3. Strategy: Organize a subbasin hatchery production committee of fisheries managers to enhance communication and coordination.

B. Objective: Utilize a mix of hatchery and natural production strategies for native, localized, and reintroduced populations to meet subbasin goals and timelines delineated in Table 2.

1. Strategy: Continue existing and/or implement innovative hatchery production strategies in appropriate areas that include hatchery production to support fisheries, natural production augmentation and rebuilding, reintroduction, and research (e.g. egg boxes in key habitat, use of acclimation facilities, etc).
2. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

C. Objective: Restore a naturally reproducing population of coho salmon within the Clearwater subbasin.

1. Strategy: Continue coho restoration efforts.
2. Strategy: Review and evaluate impacts of coho reintroduction and/or expanding coho population on habitats and other species within the Clearwater subbasin.
3. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

Resident Fish Species

IV. Component Hypothesis 4: Long-term persistence of resident fish species within the Clearwater subbasin may be threatened by genetic introgression and the loss of fluvial population components, genetic interchange, population connectivity, and habitat quality and quantity.

A. Objective: Evaluate needs and opportunities to increase fluvial populations of westslope cutthroat and bull trout throughout the subbasin by 2005.

Strategy: Conduct subbasin-wide assessment of fluvial fish populations to delineate areas of probable impacts and opportunities for restoration or enhancement.

B. Objective: Increase fluvial populations of westslope cutthroat trout and bull trout where they are extirpated or low by 2017.

   1. Strategy: Adjust harvest regulations as needed to improve fluvial fish populations
   2. Strategy: Improve habitat conditions for fluvial populations consistent with environmental objectives and strategies outlined in this management plan.
   3. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

C. Objective: Reduce potential and extent of rainbow x cutthroat trout hybridization in the North Fork Clearwater drainage within 10 years.

   1. Strategy: Develop a genetics monitoring plan that integrates past genetics work and includes documentation and interpretation of natural or hatchery influenced genetic interaction between rainbow and cutthroat trout.
   2. Strategy: Evaluate ongoing management practices of planting only sterile rainbow trout in the upper and lower North Fork Clearwater assessment units (especially Dworshak Reservoir).
   3. Strategy: Evaluate the management option of using westslope cutthroat trout progeny from local native broodstock for fisheries mitigation and genetic conservation.
   4. Strategy: Conduct public education to increase angler ability to identify hybrids.

D. Objective: In the next 10 years, establish the degree of bull x brook trout hybridization and determine the potential to diminish future brook x bull trout hybridization

   1. Strategy: Continue and expand ongoing distribution surveys including standardized genetic sampling to determine levels of hybridization
   2. Strategy: Continue and evaluate the effectiveness of ongoing brook trout removal efforts, including harvest regulations/incentives and mountain lake and tributary elimination approaches in areas where both species currently or potentially occur.
   3. Strategy: Investigate alternative measures to eliminate or reduce brook trout populations where they compete or potentially compete with bull trout. Include short and long-term effectiveness measures.
   4. Strategy: In areas where brook trout provide a desirable fishery and do not compete with bull trout, promote the continued existence of brook trout.
   5. Strategy: Develop and test methods to prevent the spread of brook trout.

V. Component Hypothesis 5: Dworshak reservoir operations impact important resident fisheries within the reservoir including kokanee, smallmouth bass, bull trout and rainbow trout.

A. Objective: Minimize average annual entrainment rates of kokanee salmon and bull trout from Dworshak Reservoir to achieve a minimum target of 50% annual survival.

1. Strategy: Utilize current knowledge of dam operations and kokanee distribution and behavior in conjunction with current experimental techniques (e.g. strobe lights) to minimize entrainment of kokanee through Dworshak Reservoir.

2. Strategy: Implement monitoring and evaluation studies designed to collect information on bull trout entrainment and distribution, timing, and usage of Dworshak Reservoir so that necessary modification to facilities and/or operations can be made.

3. Strategy: Estimate annual population size of bull trout migrating to and from Dworshak Reservoir, and develop abundance trends over time.

B. Objective: Evaluate the need to trap and hatchery rear kokanee for use in maintaining kokanee densities in Dworshak Reservoir between 30 and 50 harvestable (age 2-3) fish/hectare, providing a catch rate of at least 0.7 kokanee/hour.

1. Strategy: Assess the feasibility of trapping and hatchery rearing kokanee spawners migrating from Dworshak Reservoir.

2. Strategy: If these activities prove feasible, conduct studies to compare entrainment, harvest, and recruitment rates of kokanee produced from current hatchery stock(s) and that developed from spawners migrating from Dworshak Reservoir.

C. Objective: Evaluate the viability of using hatchery outplants to maintain harvestable sterile rainbow trout densities in Dworshak Reservoir.

1. Strategy: Evaluate existing stocking and creel survey records to assess the relative costs and value of maintaining a rainbow trout fishery in Dworshak Reservoir.

2. Strategy: Conduct annual creel surveys on Dworshak Reservoir to determine angler use, harvest, catch, and ability to meet goals of resident fishery.

3. Strategy: Estimate entrainment rates of stocked rainbow trout from Dworshak Reservoir.

D. Objective: Maintain and improve in-reservoir resident fish habitat and fisheries.

1. Strategy: Improve habitat conditions in Dworshak Reservoir through application of integrated rule curves and modified operational criteria at Dworshak Dam consistent with actions outlined in the Dworshak Operation Plan (IDWR 2000).

Terrestrial Species

VI. Component Hypothesis 6: Limited understanding of the composition, population trends, and habitat requirements of the wildlife and plant (terrestrial) communities of the Clearwater subbasin, limits the ability to effectively manage or conserve these species.

A. Objective: Increase understanding of the composition, population trends, and habitat requirements of the terrestrial communities of the Clearwater.

1. Strategy: Develop a subbasin-wide survey program for terrestrial focal, ESA listed, neotropical migrant, and culturally important species.

2. Strategy: Support the efforts of the Idaho Conservation Data Center (CDC) to document the occurrence of rare species and work toward increased reporting of sightings.

3. Strategy: Continue to research the habitat requirements of the terrestrial species of the Clearwater, focus efforts on focal, ESA listed and culturally important species.

B. Objective: Evaluate and quantify wildlife losses associated with continued operation and secondary impacts of Dworshak Dam and reservoir.

1. Strategy: Develop a methodology to assess wildlife impacts associated with Dworshak Dam including literature reviews, modeling, and/or data analysis.

2. Strategy: Quantify the ecological process and population impacts associated with the loss of anadromous fish species in the North Fork Clearwater above Dworshak reservoir.

3. Strategy: Develop a program to mitigate for operational and secondary wildlife losses in the Clearwater subbasin.

Environmental

VII. Component Hypothesis 7: Water quantity and quality, connectivity, and habitat complexity are key environmental factors that limit the production of anadromous and resident fish species.

A. Objective: Evaluate the need for minimum flow requirements for all anadromous fish bearing waterways by 2010, and complete designation of minimum flow requirements where appropriate by 2017.

1. Strategy: Where hydrographs have been altered, continue and expand efforts aimed at increasing base flows and restoring natural flow timing through riparian enhancement, definition and establishment of minimum flow levels, and implementation of forest and agricultural BMPs.

2. Strategy: Where hydrographs have been altered by high surface water withdrawls, work with user groups to decrease withdrawl.

3. Strategy: Conduct appropriate consultation with local, state, tribal, federal, and other relevant agencies/entities to evaluate the need and justification for minimum flow requirements by 2010.
4. Strategy: Coordinate efforts with the Idaho Department of Water Resources to secure water rights designated to meet minimum flow requirements where necessary by 2017.

B. Objective: Compile and evaluate a comprehensive database of existing and potential barriers to fish migration throughout the Clearwater subbasin by 2010, and achieve at least a 20 percent reduction in the number of blocked stream miles by 2017.

1. Strategy: Emphasize alteration/removal of unnatural barriers over natural barriers.
2. Strategy: Maximizing the number of barriers which can be altered based on available funds.
3. Strategy: Where elimination of barriers may pose a high risk to the genetic make-up of upstream fish stocks, deemphasize barrier removal or elimination until the risk of introgression is minimized or eliminated.

~~A.~~C. Objective: Reduce water temperatures to levels meeting water quality standards, with an established upward trend in the number of stream miles meeting standards by 2017.

Formatted: Bullets and Numbering

1. Strategy: Inventory and prioritize areas where temperature amelioration would most benefit various target species.
2. Strategy: Identify and rehabilitate wetland and floodplain areas.
3. Strategy: Continue efforts aimed at increasing streamside shading, through implementation of forest and agricultural BMPs.
4. Strategy: Conduct appropriate shade restoration activities where streamside shading has been reduced by anthropogenic activities to levels <50%.
5. Strategy: Continue efforts to examine the need and/or feasibility of developing localized temperature standards applicable within the Clearwater subbasin.
6. Strategy: Conduct habitat inventories throughout the Lower Clearwater assessment unit, placing emphasis on canopy closure/stream shading data collection.
7. Strategy: Continue development of TMDLs, EAWSs, and other watershed scale assessments to define localized factors negatively influencing temperature regimes (See Appendix E for TMDL schedule).
8. Strategy: Address relevant issues delineated under “Prioritization of efforts” section.

D. Objective: Develop an increased understanding of the thermal impacts of Dworshak Dam operations on life history characteristics of fall chinook salmon, other fishes, and associated wildlife species in downstream reaches, and reduce negative impacts by 2010.

1. Strategy: Conduct thorough, up-to-date review of relevant literature and data from pre- and post Dworshak Dam periods to ascertain impacts to various species.
2. Strategy: Relate changes in temperatures due to dam operations to life history characteristics of benthos, fish, and associated wildlife species.

E. Objective: Reduce instream sedimentation to levels meeting applicable water quality standards and measures, with an established upward trend in the number of stream miles meeting such criterion by 2017.

1. Strategy: Continue development of TMDLs, EAWSs, and other watershed scale assessments designed to define localized sediment sources and opportunities to ameliorate impacts.
2. Strategy: Develop a coordinated sediment production, transport, and fate monitoring program within the subbasin.
3. Strategy: Inventory and prioritize areas where sediment reductions would be most beneficial to various target species.
4. Strategy: Reduce sediment inputs through implementation of forestry, agricultural, urban, stormwater and other BMPs.
5. Strategy: Continue road decommissioning efforts in critical habitat areas, areas contributing to critical habitats, and on failure-prone landscapes.
6. Strategy: Revegetate tailings, glory holes, and other mining impact areas known to be chronic sources of sediment.
7. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

F. Objective: By 2010, develop a nutrient allocation plan for the subbasin which investigates the potential benefits to fish and wildlife of nutrient additions or reductions.

~~8.~~1. Strategy: Inventory and map all potential anthropogenic nutrient inputs including wastewater treatment facilities, industrial sources, and feedlots.

~~9.~~2. Strategy: Define nutrient poor or rich stream reaches throughout the subbasin and target nutrient additions or reduction efforts accordingly to benefit aquatic and terrestrial species.

~~10.~~3. Strategy: Coordinate with and utilize TMDLs and other efforts to evaluate nutrient loads and allocations.

~~F.~~G. Objective: Improve aquatic habitat diversity and complexity to levels consistent with other objectives outlined in this document, with particular emphasis on recovery of anadromous (Table 2) and fluvial stocks.

1. Strategy: Continue aquatic habitat improvement efforts consistent with existing federal, tribal, state, and local habitat improvement plans and guidelines.
2. Strategy: Facilitate development of more diverse and complex aquatic habitats through coordination of appropriate measures aimed at individual components (e.g. temperature and sediment). "Appropriate measures" will largely be defined within smaller scale assessments (e.g. TMDLs or EAWSs).
3. Strategy: Develop a method to monitor biological response to habitat improvement (consistent with Component Hypothesis 2, Objective A, Strategy 2).
4. Strategy: Monitor long-term effectiveness of habitat improvement efforts.
5. Strategy: Identify and rehabilitate wetland and floodplain areas.
6. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

VIII. Component Hypothesis 8: The extensive loss of prairie grassland habitats in the Lower Clearwater AU and Lolo-Middle Fork AU has negatively impacted native focal species including Jessica's aster, Palouse goldenweed, and broadfruit mariposa lily. Loss of prairie habitats was also a factor contributing to extirpation or diminished populations of bighorn sheep, mountain goat, the Federally listed Spalding's catchfly and various grassland bird species.

A. Objective: Protect remaining native prairie remnants.

1. Strategy: Inventory and map existing prairie remnants.
2. Strategy: Protect remaining native prairie remnants through land acquisition, fee title acquisitions, conservation easements, or land exchanges. Give priority to larger remnants or those that contain rare species.
3. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

B. Objective: Restore 2000 acres of historic native prairie habitat by 2017.

1. Strategy: Explore techniques for effectively restoring prairie habitats in coordination with the Palouse Prairie Foundation and other interested landowners, agencies and organizations.
2. Strategy: Actively improve or create native prairie habitats through noxious weed control, cultural practices and seeding.
3. Strategy: Continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore Palouse and canyon grasslands.

IX. Component Hypothesis 9: Coarse scale estimates indicate that ponderosa pine coverage in the Clearwater subbasin has declined by almost 500,000 acres since historic times. The loss of these habitats, particularly mature ponderosa pine stands, has negatively impacted native focal wildlife species including the flammulated owl, goshawk, and the white-headed woodpecker. Loss of mature ponderosa pine habitats has occurred primarily in the lower elevation areas of the subbasin.

A. Objective: Protect mature Ponderosa Pine habitats.

1. Strategy: Inventory and map existing mature ponderosa pine habitats.
2. Strategy: Protect existing mature ponderosa pine communities through land purchase, fee title acquisitions, conservation easements, land exchanges or other strategies. Give priority to larger remnants and those with the highest potential to be lost.
3. Strategy: Where appropriate to the habitat type, use prescribed burning and/or understory removal to protect mature stands from stand-replacing fire events.
4. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.
5. Strategy: Continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore low elevation ponderosa pine forests.

B. Objective: Encourage the development of 150,000 acres of additional ponderosa pine communities.

1. Strategy: Where appropriate to the habitat type, use prescribed burning and selective thinning to encourage succession and the establishment of mature ponderosa pine communities.
2. Strategy: Where historic ponderosa pine communities have been deforested, actively replant.
3. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

X. Component Hypothesis 10: The loss of wetland and riparian habitats particularly in the Lower Clearwater AU, Lolo-Middle Fork, and South Fork AU has negatively impacted native terrestrial focal species including the harlequin duck, Townsend's big eared bat, fringed myotis, boreal toad and Coeur d' Alene salamander. Loss and degradation of wetlands has also negatively impacted watershed hydrology, and culturally important species such as camas.

A. Objective: Protect all currently functioning wetlands.

1. Strategy: Finalize National Wetlands Inventory maps across the subbasin, develop restoration priorities and assess wetland functionality (rely upon work completed by the USFWS and cooperators).

2. Strategy: Protect wetland habitats through land acquisition, fee title acquisitions, conservation easements, land exchanges, public education, promotion of BMPs, promotion of alternative grazing strategies and the installation of alternative forms of water for livestock.
3. Strategy: Continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore wet meadow and wetland habitats.

B. Objective: Restore 500 acres of historic wetlands areas to proper functioning condition by 2017.
1. Strategy: Use hydric soils maps to determine the location of historic wetlands, particularly in the area of Craigmont, Gifford and Ruebens where herbaceous wetlands were most common historically.
2. Strategy: Restore identified historic wetland areas, with a minimum target size of 5 acres.
3. Strategy: Improve wetland function and quality by controlling invasive species such as reed canary grass, purple loosestrife, water milfoil, and bullfrogs.

C. Objective: Protect and restore an additional 300 miles of riparian habitats by 2017.
1. Strategy: Give first priority to riparian habitats along streams that support spawning and rearing anadromous or resident salmonids, particularly those identified as water quality limited during the Total Maximum Daily Load (TMDL) process.
2. Strategy: Protect riparian communities through land purchase, fee title acquisitions, conservation easements, land exchanges, promotion of BMPs and land stewardship, promotion of alternative grazing strategies and the installation of alternative forms of water for livestock.
3. Strategy: Increase enrollment by landowners in the Continuous Conservation Reserve Program (CCRP).
4. Strategy: Increase understanding of the importance of riparian habitat through education programs for both the general public and road maintenance personnel.
5. Strategy: Continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore riparian habitats.
6. Strategy: Address relevant issues delineated under “Prioritization of efforts” section.

XI. Component Hypothesis 11: The introduction of noxious weeds and nonnative plant species into the Clearwater Subbasin has negatively impacted native terrestrial focal species including the northern goshawk, boreal toad, Jessica’s aster, Palouse goldenweed,

and Broadfruit mariposa lily. Noxious weeds have also been implicated in reductions in Spalding's catchfly, bighorn sheep, mountain goat, mountain quail, and elk populations.

A. Objective: Prevent the introduction, reproduction, and spread of noxious weeds and invasive exotic plants into and within the subbasin.

1. Strategy: Minimize ground disturbing activities in habitats highly susceptible to weed invasion.
2. Strategy: Encourage the use of weed free seeds and feeds.
3. Strategy: Develop and implement programs and policies designed to limit the transportation of weed seeds from vehicles and livestock
4. Strategy: Develop education and awareness programs in noxious weed identification, spread prevention and treatment.
5. Strategy: Minimize establishment of new invaders by supporting early detection and eradication programs.
6. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

B. Objective: Reduce the extent and density of established noxious weeds

1. Strategy: Support and enhance the noxious weed inventory and management efforts of the Clearwater River Basin Weed Management Area Coordinating Committee.
2. Strategy: Implement the most economical and effective treatment methods to meet the area and species specific Weed Management Objectives and Priorities developed by the Clearwater River Basin Weed Management Area Coordinating Committee.
3. Strategy: Where appropriate, encourage the use of biological control agents as a long-term control strategy without the potentially negative financial and environmental impacts of widespread herbicide use.
4. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

XII. Component Hypothesis 12: Historic and current livestock grazing adversely impacted fish and wildlife habitats and populations in some portions of the subbasin.

A. Objective: Reduce the negative impacts of livestock grazing in riparian and wet meadow habitats.

1. Strategy: Encourage establishment of riparian pasture systems, exclusion fences and off-site watering areas
2. Strategy: Reduce grazing pressure in areas containing significant stream and/or wetland habitats.

3. Strategy: Identify concentrated winter feeding operations negatively impacting water quality, and design management actions to minimize sediment and nutrient inputs to streams.
4. Strategy: Adjust seasonal timing of livestock grazing to minimize soil compaction and erosion.

B. Objective: Reduce conflicts between livestock and wildlife and plant populations.
1. Strategy: Encourage the reduction or elimination of domestic sheep and goat grazing within bighorn sheep habitat.
2. Strategy: Develop grazing management plans to limit adverse impacts to rare or culturally important plant populations.
3. Strategy: Minimize the potential for livestock to facilitate the spread of noxious weeds through weed-free hay programs, quarantine requirements, and other actions.
4. Strategy: Where possible, alter grazing management to minimize cattle/elk conflicts, especially on elk winter range areas.

XIII. Component Hypothesis 13: The expansion of urban and rural human development, particularly in the Lower Clearwater AU, has negatively impacted native terrestrial focal species. including the Clearwater phlox, Jessica's aster, Palouse goldenweed, white-headed woodpecker, Townsend's big-eared bat, fisher, wolverine, fringed myotis, gray wolf, and grizzly bear and the listed Spalding's catchfly, water howellia, and Ute ladies' tresses.

A. Objective: Minimize the negative impact of current and future development on the native terrestrial species of the subbasin.
1. Strategy: Identify, and map critical habitats and travel corridors.
2. Strategy: Work with city and county governments to include consideration of these critical habitats in the planning process.
3. Strategy: Encourage compliance with ordinances and covenants addressing weed and pet control.
4. Strategy: Protect existing critical habitats under threat of development through land purchase, fee title acquisitions, conservation. easements, land exchanges and other actions.

XIV. Component Hypothesis 14: The loss of late seral forest habitats in the Clearwater subbasin has negatively impacted native terrestrial focal species including the fisher, flammulated owl and goshawk.

A. Objective: Protect existing old growth areas and encourage old growth establishment in areas where old growth is below the historic range of variability.
1. Strategy: Map and inventory existing old growth and potential old growth areas.

2. Strategy: Determine historic range of variability of old growth communities based on habitat type.
3. Strategy: Maintain old growth habitats where their extent is currently within the historic range of variability.
4. Strategy: Use understory thinning and prescribed burning to encourage the establishment of old growth habitat in areas where old growth is below the historic range of variability and where the historic fire regime consisted of frequent and repeated underburns.
5. Strategy: Protect existing old growth habitat through land purchase, fee title acquisitions, conservation easements, land exchanges or other strategies.
6. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

XV. Component Hypothesis 15: The loss of early seral habitats, particularly in the Upper North Fork, Lochsa, South Fork, Lower Selway, and Upper Selway AUs has negatively impacted native terrestrial species, including the ESA listed lynx and the culturally important elk.

A. Objective: Increase extent and distribution of early seral habitats in the subbasin to within the historic range of variability for the habitat type (strategies 1-4 have been adopted from Clearwater National Forest 1999).

1. Strategy: Where appropriate to the habitat type and natural disturbance regime, use prescribed burning and selective harvest to restore disturbance and return early seral habitats back to the historic range of variability.
2. Strategy: Put early seral vegetation species, particularly western white pine and western larch, back into the ecosystem while reducing the dominance of grand fir and Douglas-fir.
3. Strategy: Excluding agencies lacking the ability to manage wildfires with a less than total suppression tactic, use prescribed burns or partial suppression to mimic natural disturbance effects of fires.
4. Strategy: Break up broad expanses of mid-seral vegetation and aging lodgepole pine by creating a mosaic of openings with patch sizes typical for the habitat type.
5. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

XVI. Component Hypothesis 16: Road construction, timber harvest and/or fire suppression have altered the size, distribution and juxtapositions in and between the habitat patches of the Lower North Fork AU, Lochsa AU, and South Fork AU. These changes have reduced habitat suitability for native terrestrial focal species including the fisher, wolverine, goshawk, black-backed woodpecker, and lynx. Habitat patches used by

Rocky Mountain elk, a culturally important species, have similarly been altered by road construction and/or fire suppression.

A. Objective: Reduce the impact of the transportation system on wildlife populations and habitats.

    1. Strategy: Conduct a transportation system analysis on the roads system of the Clearwater subbasin. Recommend for decommissioning roads not critical for transportation, recreation and land management activities which most negatively impacting terrestrial and aquatic habitats.
    2. Strategy: Encourage continued protection of diverse communities and high quality habitats in existing roadless areas.
    3. Strategy: Implement road closure and decommissioning programs in areas with high road densities or those containing high quality wildlife habitat.
    4. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

B. Objective: Restore natural patch size distribution and juxtapositions.

    1. Strategy: Restore natural fire regimes in wilderness areas, roadless areas and other areas where human life and structures would not be jeopardized.
    2. Strategy: Used prescribed burning to break up large patches of mid-seral vegetation.
    3. Strategy: Use timber harvest techniques that mimic the scale and pattern of natural disturbance in the habitat type.
    4. Strategy: Address relevant issues delineated under "Prioritization of efforts" section.

XVII. Component Hypothesis 17: The loss or dramatic reduction in anadromous fish runs throughout the subbasin has reduced nutrient inputs and reduced habitat suitability for salmon-dependent wildlife. The Harlequin duck focal species and the ESA listed bald eagle and grizzly bear have been demonstrated to have a strong-consistent relationship to salmon. Numerous other species in the system are considered to have a recurrent, indirect or rare relationship to salmon. Declines in populations of these species may be linked to reductions in anadromous fish runs (Cederholm et al. 2001).

A. Objective: Restore natural nutrient input cycles and mitigate for damages to aquatic and terrestrial populations due to the loss of these nutrients.

    1. Strategy: Assess nutrient inputs and cycling in the Clearwater subbasin. Where appropriate, consider carcass additions or other innovative approaches to restore nutrient recycling.
    2. Strategy: Investigate innovative methods to restore nutrient loading to upland areas similar to those currently used to restore nutrient loads to streams (compensatory loads to offset salmon loss).

3. Strategy: Coordinate terrestrial habitat restoration efforts with aquatic habitat restoration efforts, to when possible, benefit both aquatic and terrestrial species simultaneously.

4. Strategy: Evaluate the extent of secondary losses to wildlife populations caused by the construction and continued operation of the hydropower system. Quantify these losses within five years of the adoption of the Clearwater Subbasin Plan.

Socioeconomic

XVIII. Component Hypothesis 18: Program and subbasin management plan integration with existing programs, projects, and initiatives can achieve benefits beyond the value of an individual program or project and will promote the application of ecosystem management principles.

A. Objective: Develop programs and project proposals to be compatible with existing community needs and to integrate with local watershed protection, restoration and management objectives and activities.

1. Strategy: Promote a ridgetop-to-ridgetop stewardship of natural resources through enhanced local involvement and support.

2. Strategy: Seek formal local support for programs and project proposals.

B. Objective: Integrate program and project proposals with existing watershed protection, restoration, and management activities.

1. Strategy: Develop a prioritization process to achieve multiple objectives, values, and benefits.

2. Strategy: Coordinate plan implementation with federal, tribal, state, local, and other interests, and avoid program and project duplication.

C. Objective: Identify high priority fish and wildlife areas requiring policies consistent with high levels of protection.

Strategy: The Policy Advisory Committee will provide federal, tribal, state, and local policy makers with information regarding high priority areas for their consideration.

XIX. Component Hypotheses 19: Economic factors play an important role in determining the effective and efficient implementation of habitat-related improvement or protection strategies.

A. Objective: Evaluate the economic effectiveness and efficiency of project proposals as part of a prioritization process.

Strategy: Develop simple and useful tools to evaluate the economic effectiveness and efficiency of project proposals.

B. Objective: Account for the economic impacts of habitat-related improvements or protection strategies in the subbasin.

1. Strategy: Develop measures to evaluate the economic effectiveness and efficiency of implementing the Clearwater Subbasin Plan.
2. Strategy: In the case of land purchases or easements, efforts should be made to minimize loss of local government revenues.
3. Strategy: Efforts should be made to utilize local labor forces, contractors, and suppliers when implementing habitat improvement projects.

XX. Component Hypothesis 20: Long-term program implementation is more successful where projects are locally developed.

A. Objective: Participate in existing, and contribute to the further development of, local watershed and technical advisory groups.

1. Strategy: Assist SWCDs, WAGs, and other existing groups to organize project goals and implementation strategies.
2. Strategy: Assist interested groups with organizing local watershed programs.
3. Strategy: Facilitate networking of these groups with technical assistance in the subbasin.

B. Objective: Increase resource information and education delivery in the subbasin

1. Strategy: Implement actions identified in this management plan
2. Strategy: Provide information and assistance to SWCDs, WAGs, watershed groups, and other interested parties for information and education programs.
3. Strategy: Provide opportunities for subbasin-wide information distribution, such as periodic public meetings, newsletters, web sites, etc.

3.4 Research, Monitoring, and Evaluation Plan

The following chapter describes the specific conditions and situations identified in the Clearwater subbasin that will require research, monitoring, and evaluation (RM&E) studies to aid in resolving management uncertainties. The RM&E section was developed in response to fish and wildlife limiting factors identified in the Clearwater Subbasin Assessment and associated vision, hypotheses, objectives, and strategies sections of the subbasin management plan.

The RM&E activities were formulated from a combination of the assessment process and from a series of meetings with technical personnel representing various tribal, federal, state and county agencies involved in the management of fish and wildlife resources in the Clearwater subbasin. Current or ongoing RM&E efforts are identified in the Clearwater Subbasin Inventory.

Both the terrestrial and aquatics portion of the proposal describe high priority RM&E needs. These needs are defined as programs that gather data or conduct research that furthers our understanding of ecosystem function, fills existing knowledge or data gaps, answers questions critical to successful management of species or communities, tests or develops innovative restoration/management techniques, or allows evaluation of the relative success of ongoing restoration/management activities, thereby facilitating adaptive management.

The RM&E proposal presented below is not intended to be a field-ready program; rather it represents a first step in program development and will be expanded over the course of the five-year iterative review process. Current or ongoing RM&E programs (as described in the Clearwater Subbasin Inventory) likely incorporate many of the RM&E needs identified in this section. Development of any new plans will therefore be coordinated with existing programs to maximize effectiveness and reduce redundancy.

The aquatics portion of this proposal is structured in part using the hierarchical approach presented in the Federal Caucus (2000) document, which defines regional RM&E protocol used as part of the Columbia Basin Salmon Recovery effort (refer to Table 3). Specifically, M&E data will be collected at three tiers of increasing detail. Tier 1 is the most general level. The data collected at this level establishes baseline conditions and provides a broad level of environmental conditions. Tier 2 data is more detailed and provides a picture of both aquatic population status (abundance and trend) and environmental status. Tier 3 data is the most detailed and is designed primarily to gauge the effectiveness of management actions and/or reproductive success of naturally-spawning hatchery fish.

The terrestrial portion of the RM&E focuses on research of wildlife and rare plant populations and their habitats. Research and monitoring of terrestrial populations will enable us to better understand these species, their requirements, and their responses to management. Evaluating changes in the availability and quality of habitat since historic will enable wildlife management efforts to focus on developing effective methods of habitat restoration and identifying critical areas for protection.

Table 3 Outline of proposed monitoring and evaluation sampling design (reproduced from Federal Caucus 2000)

	Tier 1	Tier 2	Tier 3	Landscape imagery	Compliance logbook
Sampling Frequency	Once every 3-4 years	Annually	Frequency dependent upon study; minimum annually	Once every three years	Once every 6 months (action agency): arbitrarily to monthly (regulatory agency)
Relevant to monitoring types†	1,2,3,4,5	1,2,3,4,5	3,5	2	5
Goals††	A, B	B, C	C, D	B	
Number of sites	To cover all potentially used areas in a population	To be determined by power analyses	Minimum 3 per ESU; minimum 2 for each major management action	Entire Columbia Basin	All management actions
Data type – salmonid population	Presence/absence	Counts of juveniles and spawners	Dependent on management action; hatchery spawner reproductive success	None	None
Data type – habitat	General, qualitative	Qualitative and quantitative	Quantitative, dependent on management action	Landscape-level attributes	None

† Relevant to monitoring types: 1 = population status monitoring, 2 = environmental status monitoring, 3 = effectiveness monitoring, 4 = quality of regional databases, 5 = compliance (implementation) monitoring

†† Goals: a = establish fish habitat use or range; b = establish associations between environmental characteristics and population status; c = estimate population growth rates or stage-specific survival rates; d = establish mechanistic links between management actions and salmon population response

Aquatics

I. General

1. Proposed Research: *Investigate effects of potential loss or lack of nutrients due to declines in anadromous salmonid populations*

   Goal: Assess where nutrient reductions/additions would be beneficial to focal salmonid species.

   Proposed M&E: Population and environmental status monitoring. Coordinate new and existing M&E activities to spatially and temporally relate trends in nutrient availability and salmonid population response

   Coordination Potential: Coordinate with ongoing agency and tribal water quality monitoring programs (e.g. TMDL, BURP, etc.) and population status monitoring programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E)

   Geographic Scope: Current and historic anadromous waters

   Relationship to other proposed RM&E:

   Relationship to Component Hypothesis: 1, 2, 7, 16

2. Proposed Research: *Determine migration characteristics and timing of smolts outmigrating from the subbasin and assess hatchery:wild ratio*

   Goal: Develop a better understanding of life-stage specific habitat use and natural production of anadromous salmonids

   Proposed M&E: Life-stage survival, biological, and physical/environmental monitoring and evaluation. Establish or use preexisting index sites to gather baseline, trend, and comparative data. New index sites should correspond to PMU's that support anadromous spawning, rearing, and/or migration. Sites should be distributed probabilistically within a PMU, ensuring that both "good" and "bad" sites are appropriately represented.

   Coordination Potential: Coordinate with ongoing anadromous population status M&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E), specifically those with established index sites and/or trend data

   Geographic Scope: Current anadromous waters

   Relationship to other proposed RM&E:

   Relationship to Component Hypothesis: 1, 2, 3, 7,

3. Proposed Research: *Develop appropriate intensity and spatial distribution of monitoring to estimate parr carrying capacity*

   Goal: To compliment and enhance Natural Production Monitoring

   Proposed M&E: Population status monitoring

Coordination Potential: Coordinate with ongoing population status M&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E), specifically those with index sites and/or trend data

Geographic Scope: Current and potentially usable anadromous waters

Relationship to Component Hypothesis: 2, 3, 7

II. Water Quality

1. Proposed Research: *Define and treat spatial and temporal gaps in temperature M&E at the subbasin scale*

   Goal: Define areas throughout the subbasin that lack stream temperature data of sufficient quantity or quality to determine temperature trends and/or potential habitat utilization by focal salmonid species. Establish new temperature monitoring programs/stations to fill data gaps.

   Proposed M&E: Regional data/database review and coordination, and environmental status monitoring. First, review existing temperature monitoring data (focusing on identification of data gaps) and compile into a subbasin-wide database. Second, implement environmental status monitoring following identification of data gaps. Collect Tier 1 data to enable prioritization of areas where Tier 2 M&E efforts should take place.

   a. Tier 1 data will address key environmental factors that influence the thermal regime of streams and rivers. Specific information to be collected and analyzed (where not already or currently conducted) includes
      i) Riparian canopy closure
      ii) Stream shading data
      iii) Stream temperature data (continuous monitoring)
      iv) Flow data.

   b. Tier 2 data will establish relationships between salmonid populations and key environmental correlates. Information to be collected and analyzed (if not already completed) includes
      i) Juvenile counts
      ii) Aquatic insect diversity and abundance
      iii) Primary production
      iv) Abundance of non-indigenous species.

   Coordination Potential: Coordinate with ongoing agency and tribal water quality monitoring programs (e.g. TMDL, IASCD BMP, M&E programs, BURP) and population status monitoring programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E)

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E: II-2, IX-3

   Relationship to Component Hypothesis: 2, 7

2. Proposed Research: *Assess temperature-amelioration restoration projects*

   Goal: To determine the efficacy of stream temperature amelioration projects and to guide future prioritization of areas where temperature restoration would be most beneficial to various target species.

   Proposed M&E: Effectiveness and compliance. Conduct Tier 3 M&E at sites that have undergone riparian habitat restoration, cattle exclusions, or are in subwatersheds where riparian-specific agricultural or forestry BMPs have been instituted. Data collected at the Tier 3 sampling sites will include

   i) Fry to smolt survival rates
   ii) Juvenile movement and habitat utilization (monitor through the use of PIT tags and associated trapping techniques)

   Coordination Potential: Ongoing restoration effectiveness monitoring programs that collect (among other information) temperature data (e.g. Soil and Water Conservation District Ag. BMP effectiveness monitoring programs, Nez Perce Tribe Control/Treatment M&E programs, etc.). Data collected through ongoing population status RM&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E) should be used collaboratively to define salmonid use in or near restoration sites.

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E: II-1

   Relationship to Component Hypothesis: 2, 7

3. Proposed Research: *Develop temperature standards*

   Goal: Establish a scientifically-based set of temperature criteria to aid in resource management and restoration prioritization

   Proposed M&E: Regional data/database review and coordination, landscape imagery, environmental status monitoring, and effectiveness monitoring. (1) Verify temperature models through landscape imagery (GIS) and/or a subbasin-wide review of existing temperature data; (2) Implement Tier one and two sampling to validate model accuracy; (3) Conduct effectiveness monitoring in restoration areas to provide an acceptable (based on focal salmonid habitat utilization) range of practices designed to thermally buffer management activities. Landscape imagery will be updated/verified once every three years to ensure layer accuracy and utility.

   Coordination Potential: Coordinate with ongoing agency and tribal water quality monitoring programs (e.g. TMDL, BURP, etc.), landscape assessments (e.g. EAWS), and population status monitoring programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E). Also, coordinate with ongoing restoration effectiveness monitoring programs that collect (among other information) temperature data (e.g. Soil

and Water Conservation District Ag. BMP effectiveness monitoring programs, Nez Perce Tribe Control/Treatment M&E programs, etc.).

Geographic Scope: Subbasin wide

Relationship to other proposed RM&E: II-1, II-2

Relationship to Component Hypothesis: 2, 7

4. Proposed Research: *Assess temperature impacts of Dworshak Dam operations on downriver fish populations*

   Goal: To ascertain the thermal effects of Dworshak Dam flow releases on life history characteristics of fall chinook salmon and other fishes.

   Proposed M&E: Effectiveness monitoring and compliance monitoring. Conduct effectiveness and compliance monitoring following the institution of integrated rule curves and modified operational criteria at Dworshak Dam. Modifications to flows should endeavor to be consistent with actions outlined in the Dworshak Operation Plan (IDWR 2000), and should contribute to improvements in habitat conditions for salmonids in the lower North Fork Clearwater and lower Clearwater rivers.

   Coordination Potential: Coordinate actions with ongoing water quality monitoring programs (e.g. IDWR, IDEQ).

   Geographic Scope: North Fork Clearwater River (below Dworshak Dam) and the lower Mainstem Clearwater River (downriver from the North Fork confluence)

   Relationship to other proposed RM&E: II-2; II-3

   Relationship to Component Hypothesis: 2, 5, 7

III. Water Quantity/Passage

1. Proposed Research: *Designate minimum flow requirements*

   Goal: Evaluate the need for the establishment of minimum flow requirements for waterways inhabited by focal fish species

   Proposed M&E: Verification of regional databases, environmental status monitoring, and population status monitoring. (1) Evaluate the accuracy and extent of existing stream gauge data, information collected during IFIM studies, or information that aids in the definition of the volume of surface water flows required by anadromous salmonids at different life history stages; (2) Implement Tier one and two sampling in areas where natural hydrographs have been altered (i.e. subwatersheds containing diversions or lacking appropriate water storage) or in areas lacking appropriate flow data (focus on IFIM sampling protocol); (3) Conduct (or coordinate) population status monitoring at different times of the year and throughout different parts of the subbasin to establish species- and life stage-specific habitat use at varying flows.

   Coordination Potential: Coordinate with agencies charged with the collection and/or maintenance of surface flow data (e.g. USGS, IDWR, IDEQ, USFS) and with entities collecting habitat data (e.g. Soil and Water Conservation District Ag. BMP effectiveness

M&E, USFS PACFISH/INFISH M&E programs, NPT Watershed M&E Program, etc), and population status M&E (ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E).

Geographic Scope: Subbasin wide

Relationship to Component Hypothesis: 1, 2, 5, 7

2. Proposed Research: *Evaluate habitat connectivity and existing or potential migration barriers to focal salmonid species*

   Goal: (1) to determine where human-made structures (i.e. culverts, dams, impoundments) impede, or may be expected to impede migration of focal salmonid species into otherwise accessible habitat; (2) to determine where removal or bypass of natural structures (e.g. waterfalls, chutes) would benefit focal salmonid species; (3) to evaluate where elimination of barrier(s) may pose a high risk to the genetic makeup of upstream fish stocks.

   Proposed M&E: Environmental status M&E, population status M&E, effectiveness M&E. To address Goal 1, implement the following using Tier one and two sampling

   i) Subbasin-wide culvert inventories using accepted methods/protocol
   ii) Subbasin-wide inventories of diversions (including permanent and push-up), dams, or other human-made impoundments

   Conduct environmental and population status studies to determine where removal or bypass of natural structures would be beneficial. Compile results from sampling efforts (and/or preexisting data) into a comprehensive database.

   Using the results from Tier one and two sampling, implement barrier removal/bypass projects and monitor their effectiveness through the collection of Tier three data. Data collection will enable evaluation of

   i) Benefits to focal salmonid species

   ii) Impacts to resident, or preexisting species inhabiting reaches upstream of the project. Impacts will be based on the degree of genetic interaction between reintroduced/newly introduced fish with preexisting populations

   Coordination Potential: Review existing 'barrier' databases maintained by various management entities (e.g. IDL culvert database, IDOT road condition database, USFS, NPT) and/or available landscape imagery to define barrier locations. Utilize data from ongoing population status monitoring programs (ISS, ISSS, LSRCP, NPT Hatchery M&E, USFS PACFISH/INFISH M&E) to aid in the assessment of 'isolated' salmonid populations. Work with IDFG, NPT and others to help define the potential impacts and benefits of barrier bypass. Utilize treatment and control stream data maintained by the NPT, IDFG, and USFWS to aid in project effectiveness determinations

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E:

   Relationship to Component Hypothesis: 2, 4, 7

IV. Habitat - General

1. Proposed Research: *Define sediment budget, rates, restoration efforts, and restoration opportunities*

   Goal: To define trends in sedimentation, identify point and nonpoint sediment sources, and assess opportunities to ameliorate impacts on focal salmonid species

   Proposed M&E: Review of baseline data, landscape imagery, environmental status monitoring, population status monitoring, effectiveness monitoring, and compliance monitoring. Baseline data collected during landscape assessment efforts (e.g. EAWS, TMDL, etc.) will be used to define trends in sedimentation, localized sediment sources and opportunities to ameliorate impacts. Specific data to be collected includes

   a. Tier one and two biological and environmental data that supports a coordinated sediment production-transport-fate monitoring program within the subbasin.
   b. Tier one environmental status data that aids in the identification of chronic sediment source areas (e.g. tailings, gloryholes, failure-prone roads, erosion-prone agricultural areas, etc.). Use landscape assessment data or other previously collected or modeled information to guide sampling efforts.
   c. Tier three effectiveness M&E at restoration sites. Monitor sediment production and fate in areas that have undergone restoration, specifically focusing efforts in agricultural areas for which BMPs have been instituted and in areas that have undergone road decommissioning. Data to be collected includes
      i) Freeze-core sediment sampling
      ii) Emergence success monitoring
      iii) Fry to smolt survival rates
      iv) Habitat utilization (e.g. summer and winter rearing life history stages)
      v) Sediment production estimations (e.g. volume produced in excess of natural background levels)
   d. Compliance M&E of BMPs. Where appropriate, monitor land use activities to ensure that sediment reducing, best management practices are being implemented.

   Coordination Potential: The majority of the components associated with this RM&E program are currently being addressed through ongoing efforts by resource management entities within the subbasin. Coordination of these efforts will streamline the process of gaining a better understanding of sediment source and fate and the ramifications on aquatic resources. Programs of specific utility include TMDLs (coordinated through the NPT, IDEQ, IDFG, USFS, Soil Conservation Districts), the BURP and WBAG programs (IDEQ), Section 7 and PACFISH/INFISH M&E efforts (BLM, USFS), and population status M&E programs (ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E)

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E:

   Relationship to Component Hypothesis: 2, 4, 7, 10

2. Proposed Research: *Develop/expand index areas*

   Goal: To define spatial and temporal changes, or trends, in habitat quantity and quality as they relate to salmonid productivity

   Proposed M&E: Environmental status and population status M&E. Coordinate the establishment of new index areas with entities who currently have ongoing M&E programs that incorporate treatment and control streams or preestablished reference sites (i.e. NPT, IDFG, USFWS). New index sites should correspond to respective PMUs that support anadromous spawning, rearing, and/or migration. Sites should be distributed probabilistically within a PMU, ensuring that both "good" and "bad" sites are appropriately represented. Collection of Tier 1 and Tier 2 data (refer to Table 3) will provide the backbone for M&E.

   a. Implement Tier 1 sampling every 3-4 years where the following baseline information is lacking:

      i) Fish
      - Presence/absence of spawners and/or juveniles
      - Presence/absence of hatchery-origin spawners

      ii. Habitat
      - Stream temperature
      - Pesticide and/or heavy metal concentrations (water sampling)
      - Presence/number of diversions or dams
      - Qualitative/quantitative assessment of erosion processes
      - Channel modification (including placer mining)
      - Channel morphology
      - Substrate
      - Riparian condition
      - Categorization of land use in the riparian area
      - Presence/absence of nonindigenous fish species or dominant riparian plant species

   b. Conduct Tier 2 sampling at each index site annually (following completion of Tier 1 sampling). Specific goals associated with Tier 2 sampling efforts include a) defining population growth rates; b) detecting changes in growth rates, or changes in relative abundance over a reasonable time; and c) identifying associations between population trends and environmental attributes (particularly with changes in those attributes over time). Data to be collected include

      i. Fish
      - Spawner or redd counts at spawning sites
      - Juvenile counts
      - Counts of hatchery fish at spawning sites
      - Counts at dams and weirs
      - Age of spawners (subset of sites)

      ii. Habitat
      - Aquatic insect diversity and abundance
      - Primary production

- Abundance of nonindigenous species
- Pesticide and/or heavy metal concentrations (water sampling)

Coordination Potential: The majority of the components associated with this RM&E program are currently being addressed through ongoing efforts by resource management entities within the subbasin. Programs of specific utility include PACFISH/INFISH Habitat M&E programs (BLM, USFS), Treatment and Control sites monitored by the NPT, IDFG, USFWS, and other instream habitat M&E administered by IDEQ, Soil Conservation Districts, etc.

Geographic Scope: Subbasin wide

Relationship to other proposed RM&E: I-2; I-3; II-2; II-1; IV-1, IX-2, IX-3

Relationship to Component Hypothesis: 2, 4, 6, 7, 10, 16

V. Hatchery-Wild Interactions

1. Proposed Research: *Quantify salmon and steelhead stray rates and potential genetic consequences.*

   Goal: Quantify stray rates of Clearwater chinook and steelhead within the Clearwater subbasin and Mountain Snake Province and ascertain the effects (if any) of hatchery strays on wild/naturally reproducing anadromous stocks.

   Proposed M&E: Population status monitoring and evaluation. Use currently accepted methods (e.g. coded wire tags, pit tags, radio tags, etc.) to monitor anadromous salmonid homing activity. Research and monitoring should be coordinated with ongoing province and basin-wide coordinated tagging studies (e.g. PITAGIS). Secondly, using genetic profiling, determine if hatchery strays are contributing to reduced genetic fitness of locally adapted native salmon and steelhead populations

   Coordination Potential: Coordinate with ongoing tagging studies (i.e. PITAGIS) hatchery programs (NPT, IDFG, USFWS), ongoing or historic genetic inventories (i.e. USFWS) and associated out-of-subbasin agencies (i.e. PSMFC, NMFS, WDFW, ODFW).

   Geographic Scope: Accessible anadromous waters

   Relationship to other proposed RM&E:

   Relationship to Component Hypothesis: 1, 3

2. Proposed Research: *Assess competitive interactions between reintroduced and native anadromous salmonid populations*

   Goal: To determine if reintroduced anadromous salmonids pose a competitive threat to the production of existing native salmon and steelhead

   Proposed M&E: Environmental and population status M&E. Using appropriate methods, assess habitat use by reintroduced species and native species where overlap

occurs. Ideally, study sites will correspond to index areas. Monitor for redd superimposition or other competitive interactions when and where appropriate.

Conduct Tier 2 sampling at each index site annually. Specific goals associated with Tier 2 sampling efforts include a) defining differences in population growth rates between native and reintroduced species; b) detecting changes in those growth rates, or changes in relative abundance in a reasonable time; and c) identifying species-specific changes in production

Coordination Potential: Coordinate environmental and population status monitoring with the NPT Coho Restoration Program.

Geographic Scope:

Relationship to other proposed RM&E:

Relationship to Component Hypothesis: 1, 3, 7

VI. Resident Fish - General

1. Proposed Research: *Definition of fluvial cutthroat trout habitat utilization, population dynamics and potential for genetic interchange with resident forms*

   Goal: To evaluate the condition of existing fluvial cutthroat trout habitat, estimate population abundance, distribution, and movement, and estimate the refounding capacity of resident populations by fluvial forms

   Proposed M&E: Environmental and population status monitoring. Concentrate Tier 3 sampling efforts in preestablished index streams/reaches. Data collected during Tier 3 M&E should define the type and amount of habitat available for fluvial forms, estimate relative abundance, distribution, and migration patterns, and examine interaction, or potential for interaction, with resident populations. Sampling efforts will include
   a. Environmental status monitoring of habitat connectivity between fluvial and resident populations
      i) culvert surveys and landscape imagery to aid in the definition of barriers
   b. Environmental status monitoring of overwintering and migratory habitat, focusing on pool habitat quality and quantity
   c. Population status monitoring of fluvial x resident cutthroat genetic interchange

   Coordination Potential: Coordinate with ongoing landscape assessment programs (i.e. EAWS, Section 7 assessments), habitat assessment programs, including PACFISH/INFISH (BLM, USFS), IFIM (USFWS), BURP (IDEQ), or other programs for which trend or baseline habitat data is available. Coordinate population status monitoring with IDFG, NPT, USFWS, or other agencies/studies currently collecting genetics data or fluvial cutthroat population dynamics data

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E: III-1; III-2; IV-1; IV-2

   Relationship to Component Hypothesis: 4, 7

2. Proposed Research: *Assess the effectiveness of planting sterile rainbow trout in the upper and lower North Fork Clearwater assessment units*

   Goal: To evaluate current management practices of outplanting triploid rainbow trout in the upper and lower North Fork Clearwater assessment units

   Proposed M&E: Population status monitoring and effectiveness monitoring. Estimate relative abundance, distribution, habitat utilization and movement of sterile rainbow trout in the North Fork system. Compare stocking density data with angler effort and creel census data. Evaluate relationships between angling opportunities and sterile trout habitat utilization

   Coordination Potential: Coordinate with ongoing IDFG sterile rainbow trout planting program

   Geographic Scope: Upper and lower North Fork AUs

   Relationship to other proposed RM&E: VII-2

   Relationship to Component Hypothesis: 4, 5

3. Proposed Research: *Assess population status, limiting factors, and rehabilitation potential for Pacific lamprey in the Clearwater subbasin*

   Goal: To define population status and rehabilitation potential of Pacific lamprey in the Clearwater subbasin

   Proposed M&E: Environmental and population status M&E. Collection of M&E data will be coordinated with IDFG to prevent overlap of sampling sites and consistency in data collection methods, which are currently defined in the lamprey evaluation program. M&E sampling will include collection of life history, distribution, abundance by life stage, and genetic and homing behavior attributes of Pacific lamprey ammocetes and macrothalmia in the Clearwater subbasin. Genetic analysis of ammocetes will be coordinated through ongoing programs (i.e. USGS lab at Cook WA). Homing behavior will include tagging of individuals (using methods consistent with ongoing programs) and subsequent evaluation upon recapture. Use data collected through habitat assessments and population surveys to identify potential restoration opportunities

   Coordination Potential: Coordinate with ongoing lamprey evaluation program (IDFG) and program cooperators (i.e. CRITFC, USGS, NPT). Ensure that smolt traps (such as those used in ISS and ISSS studies) are adequately equipped to collect lamprey and that trap operators are informed as to data collection procedures

   Geographic Scope: Accessible anadromous waters

   Relationship to other proposed M&E: I-2; I-3; II-4; III-1; IV-1; IV-2

   Relationship to Component Hypothesis: 1, 2, 7

4. Proposed Research: *Assess population status, limiting factors, and genetics of redband rainbow trout in the Clearwater subbasin.*

Goal: To use scientifically-based information to aid in the management of redband rainbow trout populations throughout the subbasin.

Proposed M&E: Environmental and population status M&E. M&E sampling will collect information on life history, distribution, abundance by life stage, and habitat utilization of redband populations. Redband populations existing in allopatry and sympatry with steelhead will also be identified, and will be spatially and genetically segregated using DNA-marker and GIS (landscape imagery) technology.

Coordination Potential: Coordinate with ongoing redband population studies, and/or other resident fish RM&E programs. Also coordinate with ongoing landscape assessment programs (i.e. EAWS, Section 7 assessments), habitat assessment programs, including PACFISH/INFISH (BLM, USFS), IFIM (USFWS), BURP (IDEQ), or other programs for which trend or baseline habitat data is available.

Geographic Scope: Subbasin wide

Relationship to other proposed RM&E: I-3; II-3; II-4; III-1; III-2; IV-2; VI-1; VI-2; VI-3

Relationship to Component Hypothesis: 4, 7

5. Proposed Research: *Assess effectiveness of brook trout eradication programs.*

   Goal: To evaluate the success of brook trout removal programs.

   Proposed M&E: Population status M&E and effectiveness M&E. Coordinate RM&E efforts with ongoing brook trout removal programs to ensure consistency in data collection methods and avoid redundancy. Evaluate population trend data where it exists, focusing on upper and lower limits of distribution and overlap of brook and bull trout populations. Effectiveness monitoring will include evaluation of angler harvest incentive programs and mountain lake/tributary brook trout elimination programs.

   Coordination Potential: Coordinate all efforts with ongoing brook trout eradication programs. Coordinate effectiveness M&E efforts with IDFG creel surveys and any associated harvest data/databases.

   Geographic Scope: Subbasin wide

   Relationship to other proposed RM&E: III-2; IV-2; VI-1

   Relationship to Component Hypothesis: 4

VII. Resident Fish - Dworshak

1. Proposed Research: *Assess flow augmentation on bull trout in the North Fork and Lower Clearwater Rivers.*

   Goal: (1) To determine the downriver effects of cold water releases from Dworshak on bull trout populations inhabiting the North Fork tailrace and lower mainstem Clearwater; (2) to determine the effects of reservoir drawdown on bull trout populations in the lower and upper North Fork Clearwater Aus.

Proposed M&E: Environmental and population status M&E. Evaluate existing baseline population status data on bull trout inhabiting the upper and lower North Fork Clearwater AUs and those inhabiting the mainstem Clearwater. Baseline data should address population connectivity, lifestage-specific habitat use, movement, growth patterns, behavioral response to changes in flow/water temperature, distribution, and relative abundance by life stage. Coordinate data collection efforts with ongoing fisheries investigations where possible.

Coordination Potential: Coordinate actions with ongoing Dworshak and mainstem fisheries investigations (e.g. USFWS, IDFG, NPT)

Geographic Scope: Upper and lower North Fork Clearwater AUs and the lower Mainstem Clearwater River (downriver from the North Fork confluence)

Relationship to other proposed RM&E: II-2; II-3; II-4; III-1; III-2; IV-2; VI-3; VI-4

Relationship to Component Hypothesis: 4, 5, 7

2. Proposed Research: *Evaluate the kokanee trap-and-rear hatchery program*

   Goal: Establish the efficacy and attainability of proposed fish densities using a kokanee 'trap-and-rear' hatchery program.

   Proposed M&E: Population status M&E and effectiveness M&E. Collect data sufficient to determine entrainment, harvest, and recruitment rates of kokanee produced from current hatchery stock(s) and that developed from spawners migrating from Dworshak Reservoir. Evaluate program success through comparisons of trends in creel survey data and/or kokanee sampling data prior to program implementation and following (or during) program implementation.

   Coordination Potential: Coordinate with ongoing Dworshak fisheries investigations (i.e. IDFG, USACE)

   Geographic Scope: Upper and Lower North Fork Clearwater AUs

   Relationship to other proposed RM&E: VI-2; VII-1

   Relationship to Component Hypothesis: 4, 5, 7

3. Proposed Research: *Investigate minimizing entrainment at Dworshak Dam.*

   Goal: To assess the effectiveness of programs designed at minimizing entrainment of fish in Dworshak Dam water releases.

   Proposed M&E: Population status and effectiveness M&E. Collect M&E data to evaluate changes in kokanee and bull trout relative abundance above Dworshak Dam. Evaluate program success through comparisons of trends in population relative abundance pre- and post-implementation of management activities designed to minimize entrainment rates.

   Coordination Potential: Coordinate with ongoing entrainment minimization studies (e.g. IDFG)

Geographic Scope: Lower Clearwater AU

Relationship to other proposed RM&E: VII-1; VII-2;

Relationship to Component Hypothesis: 4, 7

VIII. Anadromous Fish

1. Proposed Research: *Investigate population status of chinook, coho, and summer steelhead*

   Goal: To gather improved population status information on ESA listed and focal anadromous salmonids in the Clearwater subbasin

   Proposed M&E: Population status M&E. Continue ongoing efforts at assessing the current status of natural and hatchery-derived populations of salmon and steelhead. Tier two and three data collection will identify tributary-specific life history characteristics, juvenile and adult migration patterns, juvenile rearing areas, adult holding areas, survival factors, smolt-to-adult survival, adult spawner abundance, distribution, timing and parentage, spawning success, and spawner-to-spawner ratios. Coordination Potential: Coordinate with ongoing anadromous population status M&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E), specifically those with established index sites and/or trend data

   Geographic Scope: Current anadromous waters

   Relationship to other proposed RM&E: I-1; I-2; I-3; II-2; II-3; II-4; III-1; III-2; IV-2; V-1; V-2

   Relationship to Component Hypothesis: 1, 2, 3, 7

2. Proposed Research: *Profile anadromous salmonid genetics.*

   Goal: To more accurately define genetic stock structure and/or subpopulations of ESA-listed and reintroduced anadromous salmonids in the Clearwater subbasin.

   Proposed M&E: Population status monitoring. Collect relevant genetics data on spring and fall chinook, coho, and A-run/B-run summer steelhead. Examine the genetic stock structure of coho in relation to initial broodstock. Conduct genetic profiling to define steelhead sub-populations within the subbasin to determine geographic structure, gene flow, and genetic similarity.

   Coordination Potential: Coordinate with ongoing genetics research efforts (e.g. USFWS, IDFG, NMFS, NPT Coho Reintroduction Program, etc.) and/or other population status M&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E).

   Geographic Scope: Current anadromous waters

   Relationship to other proposed RM&E: I-2; III-2; IV-2; V-1; V-2; VIII-1

   Relationship to Component Hypothesis: 1, 2, 3, 7

3. Proposed Research: *Assess out-of-subbasin factors affecting smolt outmigration success.*

   Goal: To determine the effectiveness of improvements in juvenile passage throughout the Snake and Columbia hydropower system.

   Proposed M&E: Population status M&E. Continue the collection and analysis of juvenile mortality data from downriver FCRPS facilities and improve/expand index surveys to enable calculation of returns per spawner for chinook, coho, and summer steelhead.

   Coordination Potential: Coordinate with ongoing anadromous population status M&E programs (e.g. ISS, ISSS, LSRCP, NPT Hatchery M&E, NPT Fall Chinook Salmon Restoration, NPT Fall Chinook Yearling M&E, USFS PACFISH/INFISH M&E), specifically those with established index sites and/or trend data. Research and monitoring should be coordinated with ongoing province and basin-wide coordinated tagging studies (e.g. PITAGIS)

   Geographic Scope: Current anadromous waters, including the lower Snake and Columbia Rivers

   Relationship to other proposed RM&E: I-2; III-1; IV-2; V-1; VIII-1

   Relationship to component hypothesis: 1, 2, 3, 7

4. Proposed Research: *Assess effectiveness of hatchery production to sustain or rebuild natural production. This research is primarily directed at actions not currently encompassed within designed/funded M&E programs.*

   Goal: Determine the effectiveness of ongoing and planned hatchery actions, such as adult and juvenile salmon and steelhead outplants, toward meeting Clearwater subbasin goals and objectives, ESA objectives, and subbasin managers' fishery management objectives.

   Proposed M&E: Population status M&E and effectiveness M&E. Focus on recruitment success of both direct adult outplants and the recruitment success of their naturally spawning progeny. For juvenile outplants, focus on adult return and recruitment of first and second generation progeny from the adult return. Assessment must be structured to determine that effects are due to in-basin hatchery actions and not external environmental or management factors.

   Coordination Potential: Coordinate with ongoing natural production programs and/or population status M&E (ISS, ISSS, LSRCP, NPTH); Coordinate with U.S. v Oregon parties for management actions specified in U.S. v Oregon agreements.

   Geographic Scope: Current accessible anadromous waters in the Clearwater subbasin.

   Relationship to other proposed RM&E: I-2; I-3; IV-2; V-1; V-2; VIII-1; VIII-2

   Relationship to component hypothesis: 1, 2, 3, 7

5. Proposed Research: *Assess hatchery marking practices.*

   Goal: Determine the efficacy of using dorsal fin erosion to identify adult hatchery steelhead.

   Proposed M&E: Population status M&E and effectiveness M&E.

   Coordination Potential: Coordinate with ongoing tagging studies (i.e. PITAGIS) hatchery programs (NPT, IDFG, USFWS), conservation/enforcement departments (i.e. IDFG, USFWS, NPT) and other associated out-of-subbasin agencies (i.e. PSMFC, NMFS, WDFW, ODFW)

   Geographic Scope: Accessible anadromous waters

   Relationship to other proposed RM&E: I-2; IV-2; V-1; V-2; VIII-1; VIII-2

   Relationship to component hypothesis: 1, 2, 3, 7

6. Proposed Research: *Evaluate unclipped hatchery steelhead released in the Clearwater and Salmon River subbasins.*

   Goal: Use return rates, distribution, and juvenile population densities to determine how well the unclipped steelhead outplanted in the Clearwater and Salmon river subbasins perform in terms of increasing natural production where intended.

   Proposed M&E: The use of unclipped fish is of special concern because it departs from the standard practice in the Columbia River Basin of adipose-fin clipping all hatchery steelhead, and thus poses difficulties for established management efforts. Evaluation of the program is need to answer three key questions: (1) does the supplementation action return fish at higher rates than other artificial propagation programs; (2) do returning adult fish spawn where intended, and (3) does the natural juvenile population increase? Research needs to estimate the number of adult returns based on data collected at the Lower Granite Dam fish trap, determine spawning distribution by radio tagging and tracking adult fish through the spawning season, and monitor changes in the natural population using snorkel counts of young-of-year fish.

   Coordination Potential: Coordinate with ongoing management practice of releasing un-clipped hatchery steelhead in SF Clearwater tributaries.

   Geographic Scope: Current anadromous waters.

   Relationship to other proposed RM&E: I-2; I-3; IV-2; V-1; V-2; VIII-1; VIII-2

   Relationship to Component Hypothesis: 1, 2, 3, 7

Terrestrial

IX. Terrestrial Populations

1. Proposed Research: *Comprehensive inventory and monitoring program for wildlife, rare plants, and habitats of the Clearwater Subbasin.*

   Goal: Identify protect and restore important habitats for wildlife and plant populations to ensure the maintenance of viable populations in the Clearwater subbasin.

   Proposed M&E: Initiate a comprehensive inventory for wildlife and rare plant species to identify presence/absence and distribution and to ensure the maintenance of viable populations throughout the region. Prioritize focal species, special status species and species potentially impacted by the loss of nutrients associated with blocked or diminished anadromous fish runs. Collect related information on vegetation cover type, structure and other habitat components. Maintain and update comprehensive wildlife database detailing observations and habitat use. Regular population and habitat assessment provide valuable information on causal mechanisms and effects of various disturbances. It is important to monitor wildlife populations in a managed landscape to assess potential impacts of land management activities.

   Coordination Potential: Coordinate with the Northern Region Landbird Monitoring Program, Partners in Flight, the Declining Amphibians Population Task Force, Palouse Prairie Foundation and other initiatives and monitoring agencies to adopt standardized monitoring procedures. The Clearwater wildlife database will continue to be closely coordinated with the Conservation Data Center (CDC).

   Geographic Scope: Clearwater Subbasin

   Relationship to component hypothesis: 6, 8, 11,10, 12, 13, 15, 16, 17

X. Terrestrial Habitat

1. Proposed Research: Identify and quantify the historic and current distribution of habitats in the subbasin. Prioritize initial efforts on rare and threatened habitat types including ponderosa pine forests, remnant prairie grasslands, and wetlands. Develop techniques for restoration where habitat has been disturbed.

   Goal: To spatially define where native vegetative communities used to, and currently, occur throughout the subbasin so that appropriate management actions (i.e. protection or restoration) may transpire.

   Proposed M&E: Use landscape imagery, soil and plant inventories, and existing data sets to aid in native vegetative community delineation. Continue to refine habitat delineation as more data becomes available and technology improves. Evaluate wildlife community composition on altered and non-altered sites. Use results from comparisons to guide management prescriptions.

   Coordination Potential: Work with soil and water conservation districts, NRCS, IDFG, Idaho GAP, the USFS, National Wetland Inventory Program, Palouse Prairie Foundation, and other entities charged with the collection, dissemination, and/or inventory of vegetation and soils data

Geographic Scope: Subbasin wide

Relationship to component hypothesis, 8, 9, 10, 12, 13

2. Proposed Research: *Investigate the extent and nature of historic disturbance regimes and resulting forest structure. Identify areas where current forest structure is outside the historic range of variability and explore techniques for restoration.*

   Goal: To assess the natural fluctuation of ecological and physical processes that define forest structure. Restore old-growth and early seral communities to their historic prominence to maximize the ability of the subbasin's forests to support native wildlife and plant populations. Identify and protect existing old-growth communities.

   Proposed M&E: Assign an interagency team to review and evaluate existing stand structure data. Identify data gaps and address with baseline data collection. Evaluate trend data at index sites to identify missing vegetative types or growth stages, as it relates to vegetative types and/or growth stages. Describe historic fire frequencies. Prescribe appropriate management (i.e. burning (prescribed or natural), thinning, protection of mature forests etc.) where needed. Monitor and evaluate management prescription success as it relates to terrestrial biodiversity and influence on watershed processes.

   Coordination Potential: Work with soil and water conservation districts, NRCS, IDFG, Idaho GAP, the USFS, and other entities charged with the collection, dissemination, and/or inventory of plant and soils data.

   Geographic Scope: Early seral communities--primarily in the Upper North Fork, Lochsa, South Fork, Lower Selway, and Upper Selway AUs; Late seral communities—subbasin-wide.

   Relationship to component hypothesis: 14, 15

3. Proposed Research: *Assess riparian condition and species composition across the subbasin*

   Goal: To create a subbasin-wide, shared database of standardized riparian information that spatially quantifies the amount, species composition and condition of riparian vegetation

   Proposed M&E: Assign an interagency team of individuals to collect, assimilate, evaluate, standardize, and enter preexisting riparian data into a common database accessible to all resource managers in the subbasin. Identify data gaps during, and following, data QA/QC. Continue riparian M&E at pre-established index sites and institute new sites where appropriate. Coordinate ongoing/future entry of M&E data into the repository through the interagency team. Use M&E results to guide prioritization efforts and/or management strategies.

   Coordination Potential: Since most resource management agencies/entities in the Clearwater subbasin collect data on the occurrence and/or condition of riparian plant species, coordination potential is very broad. If possible, use pre-established index sites

where trend data is available during applied M&E. Expand on these sites where appropriate. Defer coordination efforts to regional protocol if available

Geographic Scope: Subbasin wide

Relationship to component hypothesis: 2, 4, 7, 10, 12

4. Proposed Research: *Assess effectiveness of upland vegetative BMPs for protecting terrestrial and instream habitat.*

   Goal: To evaluate the success of vegetative best management practices on terrestrial and aquatic resources and adjust practices as necessary.

   Proposed M&E: Effectiveness monitoring. Analyze existing vegetative composition, vegetative structure, sediment inputs, and hydrologic data for areas where vegetative BMPs have been implemented. Identify data gaps and implement new M&E where necessary. Compare pre- and post BMP data within and between drainages. Modify, continue, discontinue, or implement new BMPs based on results and landowner participation. Monitor and evaluate results.

   Coordination Potential: Work closely with soil conservation districts, NRCS, SCC, Idaho State Department of Agriculture (ISDA), BLM, USFS, NPT, landowners, and others who are currently involved in the implementation and/or oversight of BMP practices. Consult with agencies/entities to determine where BMP effectiveness, has or has not been evaluated.

   Geographic Scope: Subbasin wide

   Relationship to component hypothesis: 2, 4, 6, 7, 10 12

5. Proposed Research: *Evaluate and develop strategies to mitigate for the impact of the transportation system on wildlife populations*

   Goal: To identify for improvement, closure, restriction, or decommissioning, existing roads or road networks that are not critical for transportation, recreation and land management activities, but that are negatively impacting wildlife populations and aquatic resources.

   Proposed M&E: Evaluate transportation system to identify roads that are the greatest threat to wildlife security, and wildlife travel patterns and those that contribute to fragmentation of prime wildlife habitats. Coordinate with aquatic, recreational, and cultural resource experts to make recommendations for road improvement, closure, restriction, or decommissioning that maximize the benefit to both terrestrial and aquatic resources while minimizing impact to the transportation system. Use any pre-existing M&E or research to aid in decision-making process. Compare pre- and post-M&E data at index sites to evaluate project effectiveness.

   Coordination Potential: Work closely with County road departments, the USFS, BLM, NPT, and/or other agencies/entities charged with the management of road systems in the Clearwater subbasin. Coordinate efforts with groups who have experience in road construction, maintenance, and/or decommissioning

Geographic Scope: Subbasin wide (primarily on Federally-owned lands)

Relationship to component hypothesis: 13, 16

6. Proposed Research: *Assess the effects of elimination of marine-derived nutrients on terrestrial ecosystems in the North Fork Clearwater*

   Goal: To determine the degree to which losses of anadromous fish in the North Fork drainage have impacted terrestrial resources

   Proposed M&E: Conduct a paired watershed study to detect differences in terrestrial response to marine derived nutrients and lack thereof. Control and treatment watersheds should be accessible to anadromous fish (i.e. Upper and Lower Selway AU) and non-accessible to anadromous fish (i.e. Upper and Lower North Fork Clearwater AU) respectively. Monitor nutrient cycling processes in both watersheds over the course of 3-5 years. Evaluate growth, abundance, diversity, distribution, and movement patterns of wildlife species with "strong, consistent relationships" or "recurrent relationships" (e.g. Cederholm et al. 2000) to salmon and steelhead. Gauge relative impact on magnitude of differences detected

   Coordination Potential: Coordinate study with IDFG, NPT, USFWS, USFS, and/or other agencies/entities charged with wildlife management.

   Geographic Scope: Upper and Lower North Fork AU and Upper and Lower Selway AU

   Relationship to component hypothesis: 17

7. Proposed Research: *Assessment, prevention, and treatment of noxious weeds*

   Goal: To identify noxious weed communities, prevent their introduction, reproduction, and spread, and reduce their density where already established

   Proposed M&E: Use landscape imagery, plant surveys, and existing data to continue to monitor the extent and density of noxious weed populations in the subbasin . Continue to develop and evaluate techniques for fighting the spread of noxious weeds. Develop education and awareness programs in noxious weed identification, spread prevention and treatment.

   Coordination Potential: Work with agencies/entities actively involved in noxious weed identification, prevention, and eradication (i.e. NPT, Clearwater Basin Weed Management Area, USFS, BLM, Soil Conservation Districts, NRCS, SCC, private landowners, county government, universities, and interested organizations and individuals).

   Geographic Scope: The Clearwater treatment areas (mainstem Clearwater, Potlatch River, North Fork, Lolo Creek, Lochsa River, Selway River, and South Fork Clearwater River)

   Relationship to component hypothesis: 11, 12

3.5 Prioritization of Efforts

Prior sections illustrated the need for resource management and research critical to the success of aquatic and terrestrial restoration strategies within the subbasin. A number of issues involved with fish production and harvest will not be addressed in this prioritization section. These issues are being addressed in the Hatchery Genetic Management Plans currently being developed in a separate process, or, for harvest, in other policy arenas. Given the high impacts of out-of-subbasin impacts on fish from the Clearwater, hatchery production is considered a high priority to maintain existing populations, although specific actions will not be prioritized in this plan.

In addition to out-of-subbasin factors (which have the greatest impact on fish in the subbasin), five high priority factors primarily limit aquatic and terrestrial species and habitats in the Clearwater subbasin: instream temperatures, sedimentation, loss or disturbance of riparian habitats, changes in vegetative structure, and alteration of environmental processes (e.g. fire regimes). The ability of future restoration efforts to address these particular issues may be used as a coarse screen to determine their broader value within the subbasin. However, focused efforts to address other variables may have significant and desirable benefits to local resources.

Within the context of these overarching issues, the causative factors (and actions necessary to address them) vary substantially throughout the subbasin. A spatially explicit prioritization approach has been developed to highlight the primary protection and restoration needs within each of the 22 Potential Management Units (PMUs)[3] delineated in the Clearwater Subbasin Assessment (Table 4, Table 5, Table 6) The PMUs are an intermediate scale planning unit that facilitate an ecosystem approach to subbasin management and restoration that balance the needs of both terrestrial and aquatic species.

The 22 PMUs in the Clearwater are divided into three groups, those dominated by private ownership (excluding corporate ownership), mixed ownership (including corporate ownership), or federal ownership. Within the Clearwater subbasin, land use and management strategies differ substantially between these ownership areas; these differences will impact planning strategies and opportunities for action. In developing the prioritization tables it was assumed that opportunity for action is High on Federal lands, Moderate on private and mixed ownership areas, and Low in areas heavily influenced by Private Timber Companies (due to presumed continued intensive use) (Table 4, Table 5, Table 6).

Based on review of the Biological and Environmental Objectives developed by the Clearwater Technical Advisory committees for the Clearwater Subbasin Plan, 19 issues most likely to impact the natural resources of the Clearwater subbasin now and in the immediate future were summarized for prioritization.

[3] PMUs are groups of HUCs (either contiguous or non-contiguous) that characterize areas, with similar species distributions, disturbance regimes, and other features important to restoration or recovery planning. The PMUs are a broad landscape scale, planning unit and their use facilitates an ecosystem approach to subbasin management and restoration that attempts to balance the needs of both terrestrial and aquatic species. A complete characterization of each PMU can be found in the Clearwater Subbasin Assessment; maps and a brief overview of each PMU are presented in Appendix F of this document.

General Issues

- Wilderness - Protected Areas; continued protection of wilderness is implied.
- Roadless - Protected Areas; continued protection of diverse communities and high quality habitats in roadless areas within the subbasin is high priority as part of this plan.
- Roads - High densities were used as an indicator of any of a multitude of issues including hydrology, habitat fragmentation, noxious weed distributions and more.
- Landslide Prone Roads - Address roads where they exist on areas of mod-high landslide hazard.
- Sediment - Address sediment production and sources through locally appropriate methods (BMPs, reduced activity, road system planning, etc.)
- Mining Impacts- Investigate and minimize impacts of current and/or historic mining activities including mines, glory holes, and instream workings.
- Grazing Impacts - Considers intensity/distribution and relation to riparian/wetland impacts and sedimentation concerns.
- Surface Erosion – Specifically indicates that inherent surface erosion risk is high; may relate to numerous other activities or cumulative impacts (grazing, roads, harvest, fire, etc.)
- Dworshak Impacts - Used to represent potential negative impacts of Dam/Reservoir operations on aquatic species above or below Dworshak Dam.
- Water Use - Intensive water use resulting in substantial reductions in habitat availability or condition; Pertains specifically to LOID water use within PMU PR-4.
- Hydrology - Flashy nature of flows impacts aquatic habitats, and situation is believed to be exaggerated by current land use practices with potential for restoration.

Terrestrial Issues

- Ponderosa Pine (P-Pine) - Protection and restoration of Ponderosa pine stands. Prioritized only for PMUs with at least 5% P-pine coverage; localized efforts may be important elsewhere.
- Grasses - Protection and restoration of Prairie Grassland habitats
- Structure - restoration of the range of vegetative successional stages (early, mid, late seral) where they have been altered. May involve harvests, reduced fire suppression efforts, intentional burning or other methods, independently or in concert.
- Habitat Fragmentation - Not directly stated in prioritization scheme; degree of habitat fragmentation is considered to be indexed using Roads theme described above

Aquatic Issues

- Water Temperature – High water temperatures inhibiting the distribution or survival of focal fish species; often related to watershed-scale disturbance or land uses, but may be due to natural factors in some areas.
- Instream - in channel habitat work/improvements; Priority may be listed as "Undefined" since the need for such work is generally site specific and not definable at broader scales
- Riparian/Wetland - Protection of existing resources is first priority. Restoration of additional riparian/wetland areas may improve fish habitat, hydrology/flows, wildlife habitats or other factors.
- Exotics - Competitive interactions of native and exotic species exist; appropriate actions may range from investigation of interactions to removal of exotics dependent on local situation and knowledge.

The identified issues are not uniform concerns across the subbasin. To help focus attempts to address these issues, the PMUs where the issue is of the greatest concern were identified, and a priority rating of high, moderate or low was assigned (Table 4, Table 5, Table 6). The issue ratings are relative and only issues important for the PMU are listed. Therefore, if listed under a given PMU, an issue rated as low priority is important, but less critical than those defined as moderate or high priority.

The PMU based prioritization system provides a method, consistent across the subbasin, to plan and evaluate projects. Due to the broad-scale nature of the PMUs, and the associated variability

in conditions within a PMU, prioritization by PMU cannot accurately prioritize all potential projects. Important and high priority projects may be proposed to address an issue not highlighted as a priority at the scale of the PMU. The PMUs provide a spatial framework for structuring projects, but project level planning and evaluation will need to continue considering site specific information.

Prioritization of issues at the subbasin scale does not allow for effective consideration of cumulative impacts to resources from a variety of disturbances. Although prioritization may provide a coarse level of insight into where cumulative impacts are more likely to occur (those areas with more defined issues), it can not define the need to address such impacts at the project scale. Understanding the potential extent and nature of cumulative impacts will require site specific knowledge, and should be considered during the planning/proposal phase of individual projects. Failure to do so may substantially reduce the perceived benefits of the project.

Table 4. Restoration issues and related priorities for PMUs dominated by Federal ownership

PMU	Opportunity	Goal	Issue	Priority	Notes
FD-1	High	Restore	Water Temperature	Low	Low priority based on predominance of mainstem channel (S. Fork Clearwater) within this PMU; primary restoration need is in contributing PMUs.
		Restore	Mining Impacts	Moderate-High	Priority based primarily on localized impacts from glory holes; High in American River and Elk City area, Moderate elsewhere.
		Restore	Grazing Impacts	Moderate-High	Moderate priority based on prohibitive topography and use proximal to aquatic habitats in most areas. High priority applies to American River and Elk City township where past and current impacts may be significant (particularly on private grounds).
		Restore	Roads	High	High priority based on relative influence of roads on key limiting factors to aquatic and terrestrial species.
		Restore	Surface Erosion	Low	Low priority due to limited harvest levels (current); presumed impact level is currently low, although inherent risk may be high.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Restore	Vegetative Structure	Moderate	Moderate priority based on patchy nature of both need and opportunity (highest on federal lands) for vegetative structure/composition management in this PMU
		Protect/ Restore	Exotics	Low	Low priority based on existence of brook trout in a migratory corridor used by bull trout; interaction may occur but is probably minimal.
FD-2	High	Restore	Water Temperature	Moderate	Moderate priority based on generally suitable conditions in low order tributaries (resident fish areas) but higher temperatures in higher order tributaries (anadromous production areas). These areas also contribute directly to other anadromous production areas.
		Restore	Mining Impacts	High	High priority due to substantial impacts from glory holes coupled with widespread direct dredge impacts to stream channels.
		Restore	Grazing Impacts	High	High priority based on widespread effects in this PMU, although impacts may be localized; significant legacy effects exist on private land portions of the Red River drainage. Grazing issues here also include effects on noxious weed distributions and culturally significant food and medicinal plants.
		Restore	Roads	High	High priority based on EAWS schedule and relative influence of roads on key limiting factors to aquatic and terrestrial species.
		Restore	Vegetative Structure	High	High priority based on combination of high need and high opportunity to actively manage stand structure/composition.
		Restore	Instream	High	High priority based on degree of in channel disturbance due to mining/dredging and other disturbance factors; rating is consistent with smaller scale assessments by the USFS.

Table 4. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
FD-2 (cont.)		Protect/ Restore	Exotics	Moderate	Moderate Priority reflects widespread distribution of both brook and bull trout; situation needs to be understood, but probably cannot be altered significantly.
FD-3	High	Restore	Water Temperature	Moderate	Moderate priority based on generally suitable conditions in low order tributaries (resident fish areas) but higher temperatures in higher order tributaries (anadromous production areas). These areas also contribute directly to other anadromous production areas.
		Restore	Mining Impacts	Moderate	Moderate priority based on localized impacts from dredging; restoration may be high priority at some specific sites.
		Restore	Roads	Moderate	Moderate priority based on spotty road distribution within high priority area (according to EAWS schedule and prioritization of areas).
		Restore	Vegetative Structure	High	High priority based on combination of high need and high opportunity to actively manage stand structure and composition.
		Restore	Instream	High	High priority based on degree of in channel disturbance due to mining/dredging and other disturbance factors; rating is consistent with smaller scale assessments by the USFS.
		Protect/ Restore	Riparian/Wetland	High	Riparian and wetland restoration projects can be used to restore areas damaged by dredging and/or grazing, thereby improving both aquatic and terrestrial habitats.
		Protect/ Restore	Exotics	Moderate	Moderate priority reflects widespread distribution of both brook and bull trout; situation needs to be understood, but probably cannot be altered significantly.
FD-4	High	Restore	Water Temperature	Moderate	Moderate priority based on generally suitable conditions in low order tributaries (resident fish areas) but higher temperatures in higher order tributaries (anadromous production areas). These areas also contribute directly to other anadromous production areas.
		Restore	Grazing Impacts	High	Priority based on high levels of historic and continued widespread grazing activity. Significant opportunities exist to restore impacted areas. Grazing issues here also include effects on noxious weed distributions and culturally significant food and medicinal plants.
		Restore	Roads	High	Numbers and magnitudes of opportunities to positively change temperature and sedimentation issues are greater than those associated with improvements in grazing issues.
		Protect	Wilderness	Highest	Maintaining the protected status of Wilderness Areas within the subbasin is essential to successful ecosystem management/recovery.
		Protect	Roadless	Highest	Protection of existing high quality resources (species diversity, habitat quality) within currently roadless areas is critical.

Table 4. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
FD-4 (cont.)		Restore	Vegetative Structure	High	High priority based on combination of high need and high opportunity to actively manage stand structure and composition.
		Protect/ Restore	Exotics	Moderate	Priority reflects widespread use by bull trout and largely unknown distribution of brook trout; scope of issue needs to be defined and appropriate actions taken to minimize impacts to native species if possible.
FD-5	High	Restore	Water Temperature	Moderate	Moderate priority based on contribution to downstream areas needing temperature restoration, although temperature concerns may exist in portions of this PMU.
		Restore	Roads	High	High priority because this PMU often borders refugia areas - follows idea of building out from existing areas of high condition.
		Restore	Surface Erosion	Low	Low priority due to limited harvest levels (current); presumed impact level is currently low although inherent risk may be high.
		Restore	Grazing Impacts	Low	Low priority due to limited occurrence within this particular PMU.
		Protect	Roadless	Highest	Protection of existing high quality resources (species diversity, habitat quality) within currently roadless areas is critical.
		Restore	Vegetative Structure	High	High priority based on combination of high need and high opportunity to actively manage stand structure and composition.
		Restore	Instream	Undefined	Localized need/potential may exist in some areas of the PMU.
		Protect/ Restore	Exotics	Moderate	Moderate priority based on the PMU representing the fringes of major protected areas; Most HUCs within this PMU have both bull trout and brook trout present in mixed abundance. Rainbow/cutthroat interaction may also be an issue. Disjunct nature of this PMU makes studying or addressing the issue independently of other areas difficult.
FD-6	High	Restore	Water Temperature	Moderate	Moderate priority based on generally suitable conditions in low order tributaries but higher temperatures in higher order tributaries. These are important contributing areas.
		Restore	Roads	High	Priority based on occurrence of high road densities relative to other federally managed areas within the subbasin.
		Restore	Sediment	High	High priority based on combination of high road densities (disturbance), high inherent landslide hazards and, in some areas, high surface erosion risks.
		Restore	Landslide prone Roads	High	This PMU is defined by the occurrence of both high road densities and high inherent landslide potential, making this a high priority issue in these subwatersheds.
		Restore	Grazing Impacts	Low	Low priority reflects patchy and limited occurrence of grazing (USFS allotments) in this PMU. Coupled with surface erosion and general sediment concerns, grazing may however pose a localized concern where it occurs.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands. This priority may change later based on outcomes of inventory activities.

Table 4. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
FD-6 (cont.)		Restore	Vegetative Structure	Moderate	Vegetative structure and composition is believed to be substantially altered from historic conditions. Moderate priority is based on mixed ownership pattern, which may complicate coordinated land management in this PMU. Existing opportunities to restore vegetative structure and composition should be investigated and implemented as feasible.
		Restore	Instream	Moderate	Moderate priority reflects potential to benefit multiple species, but localized need within this PMU due to protected status of some areas. Efforts should be site specific and address localized needs.
		Protect/ Restore	Exotics	Low	Rainbow/cutthroat trout interactions in North Fork Clearwater drainage are a primary concern. Low priority is based on limited extent of this PMU within the North Fork.
FD-7	High	Restore	Water Temperature	Low	Low priority based on relatively limited restoration opportunity since this PMU is largely (75%+) roadless. Where opportunity exists, restoration may have localized and downstream benefits to aquatic resources.
		Protect	Roadless	Highest	Protection of existing high quality resources (species diversity, habitat quality) within currently roadless areas is critical.
		Restore	Landslide prone Roads	High	High priority due to limited occurrence and proximity to refuge (roadless) areas.
		Restore	Vegetative Structure	Moderate	Vegetative structure/composition is believed to be substantially altered from historic conditions. Moderate priority is based on limited opportunity for active management due to protected (roadless) nature of area. Management would likely involve reduced fire suppression and some additional focused efforts where feasible.
		Protect/ Restore	Exotics	Moderate	Moderate priority based on the PMU representing the fringes of major protected areas. Most HUCs within this PMU have both bull trout and brook trout present in mixed abundance. Rainbow/cutthroat interaction may also be an issue; disjunct nature of this PMU makes studying or addressing the issues independently of other areas difficult.
FD-8	High	Restore	Water Temperature	Low	Temperature concerns do exist within this PMU particularly within higher order streams; low priority based on relatively limited restoration opportunity since this PMU is largely (90%+) roadless.
		Protect	Roadless	Highest	Protection of existing high quality resources (species diversity, habitat quality) within currently roadless areas is critical.
		Restore	Vegetative Structure	Moderate	Vegetative structure and composition is believed to be substantially altered from historic conditions. Moderate priority is based on limited opportunity for active management due to protected (roadless) nature of area; management would likely involve reduced fire suppression and some additional focused efforts where feasible.

Table 4. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
FD-8 (cont.)		Protect/ Restore	Exotics	High	Priority based on existence of exotic species (e.g. brook and rainbow trout) in protected, high quality habitat areas used by various native species; distributions and interactions need to be well defined, and appropriate measures taken to protect native species.
FD-9	High	Restore	Water Temperature	Low	Temperature concerns exist within this PMU, particularly within higher order streams; low priority based on relatively limited restoration opportunity since this PMU is largely (95%+) wilderness.
		Protect	Wilderness	Highest	Maintaining the protected status of wilderness areas within the subbasin is considered essential to successful ecosystem management/recovery.
		Restore	Vegetative Structure	Low	Low priority based on limited opportunity for active management due to protected (wilderness) nature of area; vegetative management would likely focus on reduced fire suppression.
		Protect/ Restore	Exotics	High	Priority based on existence of exotic species (e.g. brook and rainbow trout) in protected, high quality habitat areas used by various native species; distributions and interactions need to be well defined, and appropriate measures taken to protect native species.

Table 5. Restoration issues and related priorities for PMUs dominated by mixed ownership

PMU	Opportunity	Goal	Issue	Priority	Notes
MX-1	Moderate	Restore	Water Temperature	Moderate	Moderate priority based on generally suitable conditions in low order tributaries but higher temperatures in higher order tributaries. These are important contributing areas.
		Restore	Roads	Moderate-High	Priority based on Moderate opportunity and use by numerous aquatic focal species (Anadromous, Bull Trout, Cutthroat)
		Restore	Sediment	High	High priority based on combination of high road densities (disturbance), and high inherent landslide and surface erosion risks.
		Restore	Landslide prone Roads	High	High priority due to associated sediment issues
		Restore	Grazing Impacts	Moderate	Moderate priority reflects patchy occurrence of grazing in areas with high surface erosion hazard and multiple disturbances.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; Moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Restore	Vegetative Structure	Moderate	Vegetative structure/composition is believed to be substantially altered from historic conditions. Moderate priority is based on largely on mixed ownership pattern, which may complicate coordinated land management in this PMU; Existing opportunities to restore vegetative structure/composition should be investigated and implemented as feasible.
		Restore	Instream	High	High priority reflects ability to enhance habitat for multiple focal aquatic species (anadromous and resident); efforts should be site specific and address localized needs.
		Protect/ Restore	Exotics	Moderate	Rainbow/Cutthroat trout interactions are primary concern
MX-2	Low	Restore	Water Temperature	High	High priority based on importance of area to westslope cutthroat trout, model results showing the prevalence of high temperatures, and substantial timber harvest activity due to predominance of corporate ownership (Potlatch Corp.).
		Restore	Roads	Low	Low priority based on combination of low opportunity (Potlatch Corp) and low production area (no anadromous, limited resident)
		Restore	Sediment	High	High priority based on combination of high road densities (disturbance), and high inherent landslide and surface erosion risks.
		Restore	Landslide prone Roads	High	High priority due to associated sediment issues

Table 5. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
MX-2 (cont.)		Restore	Grazing Impacts	Low	Low priority reflects localized nature of activity within this PMU, and the relative impact of grazing vs. other local land uses including intensive timber harvest and roading.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; Moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Restore	Vegetative Structure	Low	Vegetative structure/composition is substantially altered from historic conditions. Low priority is based on extensive management currently promoting early seral structure and limited occurrence of remaining late seral stands; Although protection or restoration opportunities are presumed limited in this PMU, existing opportunities should be addressed, particularly with regard to protection of remaining late seral stands.
		Restore	Instream	Low	Low priority reflects limited use of much of this PMU by focal aquatic species; Focused restoration efforts may be beneficial.
		Protect/ Restore	Exotics	Moderate	Rainbow/Cutthroat trout interactions are primary concern
MX-3	Low-Moderate	Restore	Water Temperature	Moderate-High	High priority applies to areas inhabited by cutthroat and bull trout; Moderate priority elsewhere flows contribute to downstream areas with temperature concerns.
		Restore	Roads	Low-Moderate	Low-Moderate opportunity is based on sub-dominance of State ownership in Potlatch area; Priority is based on low sedimentation concern (surface or mass) and ownership pattern implying continued heavy disturbance
		Restore	Grazing Impacts	Low	Grazing is sporadic and generally not heavy in this PMU; localized impacts may be important
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; Moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Restore	Vegetative Structure	Low	Vegetative structure/composition is substantially altered from historic conditions. Low priority is based on extensive management currently promoting early seral structure and limited occurrence of remaining late seral stands; Although protection or restoration opportunities are presumed limited in this PMU, existing opportunities should be addressed, particularly with regard to protection of remaining late seral stands.
		Protect/ Restore	Exotics	Low	Very localized brook/bull trout interaction within this PMU (Portions of the North Fork Clearwater drainage)
MX-4	Moderate	Restore	Water Temperature	Moderate-High	High priority applies to areas inhabited by cutthroat and bull trout; Moderate priority elsewhere flows contribute to downstream areas with temperature concerns.

Table 5. (continued)

PMU	Opportunity	Goal	Issue	Priority	Notes
MX-4 (cont.)		Restore	Roads	High	High priority due to associated surface erosion concerns
		Restore	Surface Erosion	High	High priority because defining factor of PMU is inherently high surface erosion hazard
		Restore	Grazing Impacts	Low	Grazing is sporadic and generally not heavy in this PMU; localized impacts may be important
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; Moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Restore	Vegetative Structure	Moderate	Vegetative structure/composition is believed to be substantially altered from historic conditions. Moderate priority is based on largely on mixed ownership pattern, which may complicate coordinated land management in this PMU; Existing opportunities to restore vegetative structure/composition should be investigated and implemented as feasible.
		Restore	Instream	Moderate	Instream work within this PMU may benefit various focal aquatic species; projects should address localized needs
		Protect/ Restore	Exotics	Low	Very localized brook/bull trout interaction within this PMU (portions of Lolo Creek)
MX-5	Moderate	Restore	Water Temperature	Moderate	Bull trout utilize this PMU which is also important contributing area to downstream PMUs.
		Restore	Roads	Moderate	Moderate priority based on variable road densities - reduction efforts should be focused on high density areas within the PMU
		Restore	Sediment	Low	Sediment work should target small problem areas within this PMU
		Restore	Vegetative Structure	Moderate	Moderate priority reflects high importance of preservation/development of late seral; Management by Plum Ck Timber Co. may currently address early seral needs.
		Protect/ Restore	Exotics	High	Bull trout stronghold with widespread brook trout presence
MX-6	Moderate	Restore	Water Temperature		All native focal species utilize this PMU which is also important contributing area to downstream PMUs.
		Restore	Roads	Moderate	Moderate priority based on variable road densities - reduction efforts should be focused on high density areas within the PMU
		Restore	Sediment	Low	Sediment work should target small problem areas within this PMU
		Restore	Vegetative Structure	Moderate	Moderate priority reflects high importance of preservation/development of late seral; Management by Plum Ck Timber Co. may currently address early seral needs.

Table 6 Restoration issues and related priorities for PMUs dominated by private ownership

PMU	Opportunity	Goal	Issue	Priority	Notes
PR-1	Moderate	Restore	Water Temperature	High	High priority based on impacts of Dworshak Dam operations of fish use and survival.
		Restore	Landslide prone Roads	Moderate	Moderate priority reflects potential for substantial localized impacts; most sediment load is from upstream sources.
		Restore	Sediment	Low	Surface erosion concerns throughout and localized mass wasting concerns; low priority reflects amount of contributing area in this PMU; most sediment contribution is from upstream/tributary sources.
		Restore	Dworshak Impacts	High	Investigation and amelioration of negative operational impacts to reservoir and downstream fisheries.
		Restore	Grazing Impacts	Low	Low priority reflects mainstem reach; localized impacts are small relative to contributions from upstream/tributary sources.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible
PR-2	Moderate	Restore	Water Temperature	Low	Low priority based on mainstem nature of PMU; issues exist but need to be addressed in contributing areas.
		Restore	Landslide prone Roads	Moderate	Moderate priority reflects potential for substantial localized impacts; most sediment load is from upstream sources.
		Restore	Sediment	Low	Surface erosion concerns throughout and localized mass wasting concerns; low priority reflects amount of contributing area in this PMU. Most sediment contribution is from upstream/tributary sources.
		Restore	Grazing Impacts	Low	Low priority reflects mainstem reach; localized impacts are small relative to contributions from upstream/tributary sources.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
PR-3	Low-Moderate	Restore	Water Temperature	High	Temperatures allow for salmonid use, but are less than optimal in this PMU; concern translates to downstream areas where thermal issue is more substantial (Potlatch River).

Table 6. continued

PMU	Opportunity	Goal	Issue	Priority	Notes
PR-3 (cont.)		Restore	Roads	High	Opportunity is due to Potlatch Corp involvement; road issues are high priority due to associated sedimentation concerns (both mass wasting and surface erosion hazards), and because this area is the headwaters of a historically very productive, but currently severely degraded system.
		Restore	Sediment	High	Sediment issues are high priority due to combined mass wasting and surface erosion hazards, and because this area is the headwaters of a historically very productive, but currently severely degraded system.
		Restore	Grazing Impacts	High	High priority based on high surface erosion hazard, instream sediment concerns, and cumulative impacts in this area.
		Restore	Vegetative Structure	Moderate	Vegetative structure/composition is believed to be substantially altered from historic conditions. Moderate priority is based largely on mixed ownership pattern, which may complicate coordinated land management in this PMU; existing opportunities to restore vegetative structure/composition should be investigated and implemented as feasible.
		Restore	Instream	Low	Priority is related to sedimentation concerns, which should be addressed prior to significant instream efforts; wild A-run steelhead populations would likely benefit from some focused rehabilitation efforts.
PR-4	Moderate	Restore	Water Temperature	Moderate	Temperatures limit fish use and survival, but are closely tied to water withdrawl from this PMU.
		Restore	Water Use	High	Water use is a substantial limiting factor to wild A-run steelhead in this PMU.
		Restore	Surface Erosion	High	Sedimentation from surface erosion (primarily agricultural) is a substantial limiting factor to wild A-run steelhead in this PMU.
		Restore	Grazing Impacts	Moderate	Priority reflects presence of more grazable lands in this PMU relative to other privately owned PMUs combined with instream sediment concerns.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
		Restore	Instream	Low	Instream work may be used to improve habitat, but must follow or coincide with improvements in flow and temperature conditions to be effective.
		Protect/ Restore	Riparian/Wetland	Moderate	Moderate priority based on substantially impacted riparian areas; aquatic habitat condition however is more severely impacted by water use and sedimentation in this PMU.
PR-5	Moderate	Restore	Water Temperature	Moderate	High summer water temperatures exist, but may be driven (at least in part) by flashy hydrograph resulting in reduced flows.

Table 6. continued

PMU	Opportunity	Goal	Issue	Priority	Notes
PR-5 (cont.)		Restore	Hydrology	Low	Flashy runoff increases sediment transport and limits utility by focal fish species; low priority reflects that these areas were probably historically flashy (although that has likely been exacerbated by land uses), and actions aimed at controlling surface erosion (e.g. agricultural BMPs) will improve hydrologic stability as well.
		Restore	Surface Erosion	High	Sedimentation from surface erosion (primarily from agriculture) is a substantial limiting factor to wild A-run steelhead in this PMU.
		Restore	Grazing Impacts	Moderate	Moderate priority reflects need to minimize riparian/wetland impacts; sediment impacts from agricultural inputs likely far outweigh those from grazing.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; Moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
		Restore	Instream	Low	Instream work may be used to improve habitat, but must follow or coincide with improvements in flow, temperature, and sediment loading to be effective.
		Protect/ Restore	Riparian/Wetland	High	This PMU is presumed to have the most substantial loss of historic wetlands, and aquatic habitats are impacted by flashy flows; restoration of wetland areas would be well beneficial to aquatic and terrestrial species.
PR-6	Moderate	Restore	Water Temperature	High	Subwatersheds are used by wild A-run steelhead and possibly other salmonids, and have less than optimal temperatures.
		Restore	Landslide prone Roads	Low-Moderate	Priority based on moderate road densities with mod-high landslide hazard; restoration need may be highly localized since many roads in the private (PR) PMUs are on flatter upland terrain rather than in steep canyons.
		Restore	Sediment	High	High priority is because both mass wasting and surface erosion risks are substantial in this PMU; most streams within the PMU are considered sediment limited.
		Restore	Grazing Impacts	Moderate	Moderate priority due to potential for substantial riparian impacts due to grazing coupled with high surface erosion concerns.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
		Restore	Instream	Low	Priority is related to sedimentation concerns, which should be addressed prior to significant instream efforts. Wild A-run steelhead populations would likely benefit from some focused rehabilitation efforts.

Table 6. continued

PMU	Opportunity	Goal	Issue	Priority	Notes
PR-6 (cont.)		Protect/ Restore	Riparian/Wetland	Undefined	Localized need/potential is thought to exist in some areas of the PMU, although supporting information is limited.
		Protect/ Restore	Exotics	Low	Localized potential for brook/bull trout interaction (Lolo Creek, Clear Creek).
PR-7	Moderate	Restore	Water Temperature	High	Subwatersheds are used by wild A-run steelhead and possibly other salmonids, and have less than optimal temperatures.
		Restore	Surface Erosion	High	Sedimentation from surface erosion is a substantial limiting factor to wild A-run steelhead in this PMU. Land use is dominated by agriculture, suggesting applicable BMP implementation may be appropriate strategy.
		Restore	Grazing Impacts	Low	Low priority because grazing impacts (sediment production) are believed to be far outweighed by surface erosion from agricultural practices; substantial localized riparian impacts from grazing may occur .
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
		Restore	Instream	Low	Priority is related to sedimentation concerns, which should be addressed prior to significant instream efforts; wild A-run steelhead populations would likely benefit from focused rehabilitation efforts.
		Protect/ Restore	Riparian/Wetland	Undefined	Localized need/potential is thought to exist in some areas of the PMU, although supporting information is limited.
PR-8	Moderate	Restore	Water Temperature	High	Subwatersheds are used by wild A-run steelhead and possibly other salmonids, and have less than optimal temperatures.
		Restore	Surface Erosion	High	Sedimentation from surface erosion is a substantial limiting factor to wild A-run steelhead in this PMU; land use is dominated by agriculture, suggesting applicable BMP implementation may be appropriate strategy.
		Restore	Grazing Impacts	Low	Low priority because grazing impacts (sediment production) are believed to be far outweighed by surface erosion from agricultural practices; substantial localized riparian impacts from grazing may occur.
		Protect/ Restore	Ponderosa Pine	High-Moderate	High priority is to conduct inventories of existing mature stands; moderate priority reflects need to protect and restore existing stands - this priority may change later based on outcomes of inventory activities.
		Protect/ Restore	Grasses	High	Priority is based on need to inventory and protect existing prairie grassland remnants and restore communities where feasible.
		Restore	Instream	Low	Priority is related to sedimentation concerns, which should be addressed prior to significant instream efforts; wild A-run steelhead populations would likely benefit from some focused rehabilitation efforts.
		Protect/ Restore	Riparian/Wetland	Undefined	Localized need/potential is thought to exist in some areas of the PMU, although supporting information is limited.

4 Endangered Species Act and Clean Water Act Considerations

4.1 Endangered Species Act

The Clearwater Subbasin contains several species listed as threatened or endangered under the Endangered Species Act (ESA). 16 U.S.C. §§ 1531-44. The ESA is a powerful tool in the recovery of endangered species. The ESA commands all federal agencies to "conserve" listed species, and "conservation" is defined very broadly. 16 U.S.C. § 1532(3). Section 9, 16 U.S.C. § 1538, prohibits "taking" by anyone, and that too is broadly defined. 16 U.S.C. § 1532(19). Enforcement of the ESA is delegated to the secretaries of Commerce and Interior, however, the Act specifically allows any person to commence a civil lawsuit on his own behalf in federal district court for violations of the ESA or regulations issued under the authority of the ESA. The prevailing party may be awarded costs of litigation including reasonable attorney and expert witness fees (16 U.S.C. § 1540 (g)(4)).

The National Marine Fisheries Service (NOAA Fisheries) listed Snake River fall chinook salmon and Snake River steelhead as threatened on April 22, 1992 (57 FR 14653 and August 18, 1997 respectively). NOAA Fisheries has designated critical habitat for threatened Snake River fall chinook salmon. The designated habitat for Snake River fall chinook salmon in the Clearwater Subbasin includes: the Clearwater River from its confluence with the Snake River upstream to its confluence with Lolo Creek; the North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam; all river reaches presently or historically accessible to Snake River fall chinook salmon (except reaches above impassable natural falls) in the Clearwater and Lower North Fork Clearwater hydrologic units (58 FR 68546).

Critical habitat for all listed Snake River salmon includes the bottom and water of the waterways and adjacent riparian zone. The riparian zone includes those areas within 300 feet (91.4m) of the normal line of high water of a stream channel, or from the shoreline of a standing body of water. Essential features of these areas include adequate (1) Substrate (especially gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions.

The US Fish and Wildlife Service and NOAA Fisheries are developing recovery plans for species listed under the ESA. Actions called for in the Clearwater Subbasin Plan should be coordinated, consistent and integrated with these recovery plans and the performance measures of the Federal Columbia River Power System Biological Opinion (FCRPS Biop, NMFS 2000). The FCRPS Biop requires certain federal actions to be taken within specific time frames in order to continue to operate the power system without jeopardizing the existence and recovery of listed salmonids.

The Clearwater PAC recognizes that NOAA Fisheries intends to use subbasin plans as key building blocks for recovery of Snake River salmon and steelhead species listed as threatened or endangered under the ESA. NOAA Fisheries staff have noted that this draft represents significant progress toward meeting that need for the Clearwater drainages. The Interior Columbia Technical Recovery Team (TRT) has been tasked by NOAA Fisheries to develop a series of products in support of effective recovery planning. Those products include defining populations within each of the listed ESUs, providing the region with delisting criteria applicable

to the specific populations identified within each ESU, and criteria for use at the ESU level. In addition, the TRT is charged with summarizing key information regarding fish/habitat relationships within a particular ESU and developing a limiting factor/factors driving the decline report. It is envisioned that the TRT will work in coordination with regional technical teams engaged in subbasin planning efforts on the latter tasks. The TRT products and efforts should help in the synthesis of information regarding the relationship between salmon and steelhead viability and the specific factors limiting their productivity in the Clearwater. These syntheses should help provide a foundation for addressing priority problems in a manner that meets ESA recovery and FCRPS biological opinion needs.

Section 7

Section 7 of the Endangered Species Act [16 U.S.C. 1531 *et seq.*] outlines the procedures for federal interagency cooperation to conserve federally listed species and designated critical habitats.

Proactive Conservation Efforts by Federal Agencies

Section 7(a)(1) directs the Secretary (Secretary of the Interior/Secretary of Commerce) to review other programs administered by them and utilize such programs to further the purposes of the ESA. It also directs all other federal agencies to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of species listed pursuant to the ESA.

This section of the ESA makes it clear that all Federal agencies should participate in the Under this provision, federal agencies often enter into partnerships and memoranda of understanding with the Fish and Wildlife Service (FWS) or NOAA Fisheries for implementing and funding conservation agreements, management plans, and recovery plans developed for listed species. The services encourage the development of these types of partnerships and planning efforts to develop proactive approaches to listed species management.

Avoiding Adverse Effects of Federal Actions

Section 7(a)(2) states that each federal agency shall, in consultation with the secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In fulfilling these requirements, each agency must use the best scientific and commercial data available. This section of the ESA defines the consultation process. which is further developed in regulations promulgated at 50 CFR §402.

Section l0(a)(l)(B) permits (Conservation Plans)

Permits for incidental take under section 10(a)(l)(B) require a FWS or NOAA Fisheries intra-service consultation. These consultations are conducted in the same manner as under section 7 except that the incidental take statement is governed by section 10(a)(1)(B) to the extent that mitigation, including off-site compensation not directed at the affected individuals, may be considered. The services have developed a handbook for Habitat Conservation Planning and Incidental Take Permit Processing (November 1996), which should be referenced to for further information.

4.2 Clean Water Act

In Idaho, state water quality standards have been established and approved by the U.S. Environmental Protection Agency (EPA). These standards, required under the Clean Water Act, are designed to protect, restore, and preserve water quality in waterbodies that have designated beneficial uses such as drinking water, contact recreation (e.g. fishing and swimming), cold or warm water aquatic life (salmonids). "Designated uses" have been identified for most, but not all, water bodies within Idaho. Each use has narrative and/or numeric standards that describe the level of water quality necessary to support the use. For those bodies not yet designated, the presumed existing uses are cold water aquatic life and primary or secondary contact recreation. Designated uses and standards can be found in Idaho Code IDAPA 58.01.02. (Idaho Department of Environmental Quality web site)

When a lake, river or stream fails to meet the water quality criteria that support its "designated uses," specific actions are required under state and federal law to ensure that the "impaired" waterbody is restored to a healthy fishable, swimmable condition. In the Clearwater Subbasin, 106 sections of rivers and streams encompassing 975 stream miles and three lakes have been identified as impaired. These rivers, streams and lakes are part of the Idaho 1998 Clean Water Act §303(d) list.

The state of Idaho and EPA have a legal, court ordered responsibility to ensure that these impaired waters be dealt with in a timely manner. This means that a Total Maximum Daily Load (TMDL) must be written for each impaired waterbody. The TMDL is a quantitative assessment of water quality problems and contributing pollutant sources. It specifies the amount of pollution reduction necessary to meet water quality standards, allocates the necessary pollutant limits among the contributing sources in the watershed, and provides a basis for taking actions needed to restore the waterbody. The Idaho Department of Environmental Quality (DEQ) is responsible for preparing the TMDLs. Stream segments within the exterior boundaries of the Nez Perce Indian Reservation are developed through a tri-party agreement between Idaho State, the Nez Perce Tribe, and the EPA. TMDL development also includes coordination with the Clearwater Basin Advisory Group and Watershed Advisory Groups (BAG andWAG) as required by Idaho Code IDAPA Title 39, Chapter 36. Organized WAGs in the Clearwater Subbasin include those for Jim Ford Creek, Winchester Lake, Cottonwood Creek (Idaho County), Lower North Fork Clearwater River, and the South Fork Clearwater River.

The Idaho 1998 §303(d) list includes a schedule for completing TMDLs and has recently been revised. An agreement revising the schedule for the development of TMDLs for impaired waterbodies in Idaho was reached in August 2002 by the DEQ, EPA, and the Idaho Conservation League and Lands Council. The agreement was negotiated in response to a legal challenge alleging that EPA and the state had violated the Clean Water Act by failing to evaluate and establish TMDLs to meet water quality standards in a timely manner. The revised Idaho 1998 §303(d) list and TMDL schedule is contained in Appendix E of this document. All listed streams in the Clearwater Subbasin are scheduled to have completed TMDLs by 2007.

The most common pollutants impacting waterbodies in the Clearwater subbasin on the Idaho 1998 §303(d) list are sediment and temperature. These pollutants have also been identified in this plan to be two of the five high priority factors limiting aquatic and terrestrial species and habitats in the Clearwater Subbasin.

Future project implementation actions to address problems identified by the TMDL process will often coincide with aquatic and terrestrial species and habitat implementation actions. Although, because water quality actions are usually implemented first where waterbodies are most impaired, and habitat protection and restoration actions begin where conditions and populations are healthiest, coincidental implementation may not always occur. Project implementation will be coordinated where water quality and aquatic concerns coincide.

5 References

Cederholm, C.J., D.H. Johnson, R.E Bilby, L.G. Dominguez, A.M. Garrett, W.H. Graeber, E.L. Greda, M.D. Kunze, B.C. Marcot, J.F. Palmisano, R.W. Plotnikoff, W.G. Pearcy, C.A. Simenstad, and P.C. Trotter. 2001. Pacific Salmon and Wildlife – Ecological Contexts, Relationships, and Implications for Management. Pp. 628-684 In: Johnson, D. H., and T. A. O'Neill, Managing Directors, Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Corvallis, OR. 736 pp.

Cederholm, C. J.; Johnson, D. H.; Bilby, R. E.; Dominguez, L. G.; Garrett, A. M.; Graeber, W. H.; Greda, E. L.; Kunze, M. D.; Marcot, B. G.; Palmisano, J. F. 2000. *Pacific Salmon and Wildlife-Ecological Contexts, Relationships, and Implications for Management*. Olympia: Washington Department of Fish and Wildlife.

Cichosz, T.A., and eight others. 2001. *Draft Clearwater Subbasin Summary*. Prepared for the Northwest Power Planning Council.

Clearwater National Forest. 1999. North Fork Big Game Habitat Restoration on a Watershed Scale (BHROWS): Watersheds within the North Fork Clearwater River Subbasin. North Fork Ranger District.

Ecosystem Diagnosis and Treatment 2002. An information based decision support tool for ecosystem management. http://www.edthome.org/ Accessed 8/23/02

Federal Caucus 2000. Conservation of Columbia Basin Fish – Final Basinwide Salmon Recovery Strategy. Volume I.

Idaho Department of Water Resources (IDWR). 2000. Dworshak Operation Plan – Amendment to the North Fork Clearwater River Basin Plan within the Comprehensive State Water Plan. Prepared for Idaho Water Resources Board.

National Marine Fisheries Service 2000. Biological Opinion on the Federal Columbia River Power System. Portland, Oregon.

Northwest Power Planning Council. (2001). Technical Guide for Subbasin Planners. Council document 2001-20.

6 Technical Appendices

Appendix A - Numerical criteria reviewed to develop subbasin goals for anadromous fishes

Table 7 Comparison of anadromous fish objectives from various plans pertaining to the Clearwater Subbasin.
CRITFC=Spirit of the Salmon; 1990 Plan= 1990 Clearwater Subbasin Salmon and Steelhead Production Plan; NMFS 2002=NMFS recent Draft Interim Abundance Goals; CRFMP=Columbia River Fish Management Plan; IDFG=IDFG Anadromous Fisheries Management Plan 1992-96.

Species	Long-term Return Objective	Natural Spawning Component	Hatchery Spawning Component	Total Spawning Component	Harvest Component	Overall Goal
Spring chinook						
CRITFC	60,000	10,000	*5,000 est*	*15,000 est*	45,000	Long Term Recovery
1990 Plan	60,000	10,000	5,000	15,000	45,000	Long Term Recovery
NMFS 2002	----	----	----	----	----	N/A
CRFMP	----	25,000[1]	10,000[1]	35,000[1]	----	Interim Goal
IDFG	----	14,100	4,700	18,800	----	
Summer chinook						
CRITFC	50,000	----	----	----	----	Long Term Recovery
1990 Plan	----	----	----	----	48,000	Interim Goal
NMFS 2002	----	----	----	----	----	N/A
CRFMP	----	----	----	----	----	N/A
IDFG	---	---	---	---	---	
Fall chinook						
CRITFC	50,000	----	----	----	----	Long Term Recovery
1990 Plan	----	----	----	1,000	5,000	Interim Goal
NMFS 2002	----	2,500 [2]	----	----	----	Interim Abund., Delisting
IDFG	undefined	undefined	undefined	undefined	undefined	
CRFMP	----	----	----	----	----	N/A
Coho						
CRITFC	14,000	----	----	----	----	Long Term Recovery
1990 Plan	----	----	----	500	4,000	Interim Goal
NMFS 2002	----	----	----	----	----	N/A

Species	Long-term Return Objective	Natural Spawning Component	Hatchery Spawning Component	Total Spawning Component	Harvest Component	Overall Goal
IDFG	undefined	undefined	undefined	undefined	undefined	
CRFMP	----	----	----	----	----	N/A
B-run steelhead						
CRITFC	91,000	12,000	*5,000 est*	*17,000 est*	74,000	Long Term Recovery
1990 Plan	*91,000 est*	12,000	5,000	*17,000*	74,000	Long Term Recovery
NMFS 2002	----	17,700 [3] (16,338)	----	----	----	Interim Abund., Delisting
IDFG	----	16,500	----	----	----	
CRFMP	< 13,300[4]	----	----	----	----	Interim Management Goal
A-run steelhead						
CRITFC	2,000	1,000	None	1,000	1,000	Long Term Recovery
1990 Plan	2,000	1,000	None	1,000	1,000	Interim Goal
NMFS 2002	----	(1,362) [3]	----	----	----	Interim Abund., Delisting
IDFG	----	1,000	----	----	----	
CRFMP	< 62,200[4]	----	----	----	----	Interim Management Goal
Lamprey						
CW Tech. Group	10,000[5]	----	----	----	----	Interim Goal
1990 Plan	----	----	----	----	----	N/A
NMFS 2002	----	----	----	----	----	N/A
IDFG	----	----	----	----	----	N/A
CRFMP	----	----	----	----	----	N/A

1 CRFMP, which has expired, establishes interim management goals for fish passing over Lower Granite Dam; Clearwater specific goals are not defined.
2 Represents interim abundance goal for Snake River ESU; Does not define Clearwater component.
3 NMFS did not differentiate runs; Original value includes both A and B runs; Values in parenthesis are run-specific estimates using same ratio of A and B run used by CRITFC and 1990 plan (1:12).
4 CRFMP establishes interim management goals for fish passing over Lower Granite Dam; Clearwater specific goals are not defined.
5 Interim goal is based on historic (late 1960's) counts >30,000 at Lower Snake River dams

Appendix B – Reasonable and Prudent Actions (RPAs) pertinent to the Clearwater Subbasin.

Dworshak Dam Actions	
Action 3	The Action Agencies, coordinating through the Technical Management Team, shall develop and implement a 1- and 5-year water management plan and in-season action plans for the operation of the FCRPS.
Action 17	The Action Agencies shall coordinate with NMFS, USFWS, and the states and Tribes in preseason planning and in-season management of flow and spill operations. This coordination shall occur in the Technical Management Team process (see Section 9.4.2.2).
Action 33	The Corps, in coordination with USFWS, shall design and implement appropriate repairs and modifications to provide water supply temperatures for the Dworshak National Fish Hatchery that are conducive to fish health and growth, while allowing variable discharges of cold water from Dworshak Reservoir to mitigate adverse temperature effects on salmon downstream in the lower Snake River.
Action 34	The Action Agencies shall evaluate potential benefits to adult Snake River steelhead and fall chinook salmon passage by drafting Dworshak Reservoir to elevation 1,500 feet in September. An evaluation of the temperature effects and adult migration behavior should accompany a draft of Dworshak Reservoir substantially below elevation 1,520 feet.
Action 35	The Corps shall develop and conduct a detailed feasibility analysis of modifying current system flood control operations to benefit the Columbia River ecosystem, including salmon. The Corps shall consult with all interested state, Federal, Tribal, and Canadian agencies in developing its analysis. Within 6 months after receiving funding, the Corps shall provide a feasibility analysis study plan for review to NMFS and all interested agencies, including a peer-review panel (at least three independent reviewers, acceptable to NMFS, with expertise in water management, flood control, or Columbia River basin anadromous salmonids). A final study plan shall be provided to NMFS and all interested agencies 4 months after submitting the draft plan for review. The Corps shall provide a draft feasibility analysis to all interested agencies, NMFS, and the peer-review panel by September 2005.
Action 139	The Corps shall investigate TDG abatement options at Dworshak Dam and implement options, as warranted, in coordination with the annual planning process.
Habitat Actions	
Action 149	BOR shall initiate programs in three priority subbasins (identified in the Basinwide Recovery Strategy) per year over 5 years, in coordination with NMFS, FWS, the States and others, to address all flow, passage, and screening problems in each subbasin over 10 years. The Corps shall implement demonstration projects to improve habitat in subbasins where water-diversion-related problems could cause take of listed species. Under the Council program, BPA addresses passage, screening, and flow problems, where they are not the responsibility of others. BPA expects to expand on these measures in coordination with the Council process to complement BOR actions described in the action above.
Action 150	In subbasins with listed salmon and steelhead, BPA shall fund protection of currently productive non-Federal habitat, especially if at risk of being degraded, in accordance with criteria and priorities BPA and NMFS will develop by June 1, 2001.

Habitat Actions (continued)	
Action 151	BPA shall, in coordination with NMFS, experiment with innovative ways to increase tributary flows by, for example, establishing a water brokerage. BPA will begin these experiments as soon as possible and submit a report evaluating their efficacy at the end of 5 years.
Action 152	The Action Agencies shall coordinate their efforts and support offsite habitat enhancement measures undertaken by other Federal agencies, states, Tribes, and local governments by the following: Supporting development of state or Tribal 303(d) lists and TMDLs by sharing water quality and biological monitoring information, project reports and data from existing programs, and subbasin or watershed assessment products. Participating, as appropriate, in TMDL coordination or consultation meetings or work groups. Using or building on existing data management structures, so all agencies will share water quality and habitat, data, databases, data management, and quality assurance. Participating in the Council's Provincial Review meetings and Subbasin Assessment and Planning efforts, including work groups. Sharing technical expertise and training with Federal, state, Tribal, regional, and local entities (such as watershed councils or private landowners). Leveraging funding resources through cooperative projects, agreements and policy development (e.g., cooperation on a whole-river temperature or water quality monitoring or modeling project).
Action 153	BPA shall, working with agricultural incentive programs such as the Conservation Reserve Enhancement Program, negotiate and fund long-term protection for 100 miles of riparian buffers per year in accordance with criteria BPA and NMFS will develop by June 1, 2001.
Action 154	BPA shall work with the Council to ensure development and updating of subbasin assessments and plans; match state and local funding for coordinated development of watershed assessments and plans; and help fund technical support for subbasin and watershed plan implementation from 2001 to 2006. Planning for priority subbasins should be completed by the 2003 check-in. The action agencies will work with other Federal agencies to ensure that subbasin and watershed assessments and plans are coordinated across non-Federal and Federal land ownerships and programs.
Action 155	BPA, working with BOR, the Corps, EPA, and USGS, shall develop a program to 1) identify mainstem habitat sampling reaches, survey conditions, describe cause-and- effect relationships, and identify research needs; 2) develop improvement plans for all mainstem reaches; and 3) initiate improvements in three mainstem reaches. Results shall be reported annually.
Action 156	The Action Agencies and NMFS shall study the feasibility (including both biological benefits and ecological risks) of habitat modification to improve spawning conditions for chum salmon in the Ives Island area.
Action 157	BPA shall fund actions to improve and restore tributary and mainstem habitat for CR chum salmon in the reach between The Dalles Dam and the mouth of the Columbia River.

Habitat Actions (continued)	
Action 158	During 2001, the Corps and BPA shall seek funding and develop an action plan to rapidly inventory estuarine habitat, model physical and biological features of the historical lower river and estuary, identify limiting biological and physical factors in the estuary, identify impacts of the FCRPS system on habitat and listed salmon in the estuary relative to other factors, and develop criteria for estuarine habitat restoration.
Action 159	BPA and the Corps, working with LCREP and NMFS, shall develop a plan addressing the habitat needs of salmon and steelhead in the estuary.
Action 160	The Corps and BPA, working with LCREP, shall develop and implement an estuary restoration program with a goal of protecting and enhancing 10,000 acres of tidal wetlands and other key habitats over 10 years, beginning in 2001, to rebuild productivity for listed populations in the lower 46 river miles of the Columbia River. The Corps shall seek funds for the Federal share of the program, and BPA shall provide funding for the non-Federal share. The Action Agencies shall provide planning and engineering expertise to implement the non-Federal share of on-the-ground habitat improvement efforts identified in LCREP, Action 2.
Action 161	Between 2001 and 2010, the Corps and BPA shall fund a monitoring and research program acceptable to NMFS and closely coordinated with the LCREP monitoring and research efforts (Management Plan Action 28) to address the estuary objectives of this biological opinion.
Action 162	During 2000, BPA, working with NMFS, shall continue to develop a conceptual model of the relationship between estuarine conditions and salmon population structure and resilience. The model will highlight the relationship among hydropower, water management, estuarine conditions, and fish response. The work will enable the agencies to identify information gaps that have to be addressed to develop recommendations for FCRPS management and operations.
Action 163	The Action Agencies and NMFS, in conjunction with the Habitat Coordination Team, will develop a compliance monitoring program for inclusion in the first 1- and 5-year plans.
Harvest and Hatchery Actions	
Action 164	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies in a multiyear program to develop, test, and deploy selective fishing methods and gear that enable fisheries to target nonlisted fish while holding incidental impacts on listed fish within NMFS-defined limits. The design of this program and initial implementation (i.e., at least the testing of new gear types and methods) shall begin in FY 2001. Studies and/or pilot projects shall be under way and/or methods deployed by the 3-year check-in.

Harvest and Hatchery Actions (continued)	
Action 165	The Action Agencies shall work with NMFS, USFWS, Tribal and state fishery managers, and the relevant Pacific Salmon Commission and Pacific Fishery Management Council (PFMC) technical committees to develop and implement methods and analytical procedures (including revising and/or replacing current fishery management and stock assessment models based on these methods and procedures) to estimate fishery and stock-specific management parameters (e.g., harvest rates). The Action Agencies shall place particular emphasis on current methods and procedures affected by the transition to mass marking of Columbia River basin hatchery produced fish and/or deployment of selective fishery regimes in the Columbia River basin, addressing these concerns within a time frame necessary to make the new selective fishing regimes feasible. Specifically, the Action Agencies shall facilitate the development of models, methods, and analytical procedures by the 3-year check-in.
Action 166	The Action Agencies shall work with NMFS, USFWS, the Pacific States Marine Fisheries Commission, and Tribal and state fishery management agencies to implement and/or enable changes in catch sampling programs and data recovery systems, including any required changes in current databases (e.g., reformatting) and associated data retrieval systems, pursuant to the time frame necessary to implement and monitor mass marking programs and/or selective fishery regimes in the Columbia River basin. Specifically, the Action Agencies shall facilitate the revision of programs and systems, as needed, by the 3-year check-in.
Action 167	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies to develop improved methods for estimating incidental mortalities in fisheries, with particular emphasis on selective fisheries in the Columbia River basin, doing so within the time frame necessary to make new marking and selective fishery regimes feasible. The Action Agencies shall initiate studies and/or develop methods by the 3-year check-in.
Action 168	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies to develop methods for crediting harvest reforms, and the survival benefits they produce, toward FCRPS offsite mitigation responsibilities. A crediting approach shall be agreed upon by the 3-year check-in.
Action 169	The Action Agencies shall fund the development of NMFS-approved HGMPs for implementation, including plans for monitoring and revising them as necessary as new information becomes available. HGMPs have to be completed first for the facilities and programs affecting the most at-risk species (Upper Columbia and Snake River ESUs), followed by those affecting mid-Columbia, and then the Lower Columbia ESUs. HGMPs for all the Columbia basin hatchery programs and facilities should be completed (and approved by NMFS) by the 3-year check-in.
Action 170	Using new authorizations and appropriations and/or BPA funds as necessary and appropriate, the Corps, working with USFWS, shall oversee the design and construction of capital modifications identified as necessary in the HGMP planning process for Lower Snake River Compensation Plan anadromous fish hatchery programs. These improvements shall begin immediately after the relevant HGMPs are completed and approved by NMFS, and shall be completed as expeditiously as is feasible. BPA shall provide for the operations and maintenance costs of these reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. The Corps shall have begun to implement reforms for programs affecting the most at-risk species by the 3-year check-in.

Harvest and Hatchery Actions (continued)	
Action 171	BOR shall implement the reforms identified in the HGMP planning process for the Grand Coulee mitigation anadromous fish hatchery programs, beginning immediately following completion of the relevant (NMFS approved) HGMPs and completing the work as expeditiously as feasible. BPA shall fund the operations and maintenance costs of the reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. BOR shall have begun to implement reforms for programs affecting the most at-risk species by the 3-year check-in.
Action 172	The Corps shall implement the reforms identified in the HGMP planning process for the Corp's Columbia River basin mitigation anadromous fish hatchery programs, beginning immediately after the relevant HGMPs are completed and are approved by NMFS. The work shall be completed as expeditiously as feasible. BPA shall fund the operations and maintenance costs of the reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. The Corps shall have begun to implement reforms for the programs affecting the most at-risk species by the 3-year check-in.
Action 173	BPA shall implement the reforms identified in the HGMP planning process for Federal and Federally funded hatcheries, beginning immediately after the relevant HGMPs are completed and approved by NMFS. The work shall be completed as expeditiously as possible. BPA shall have begun to implement reforms for the programs affecting the most at-risk species by the 3-year check-in.
Action 174	Working through regional prioritization processes to the extent feasible and in coordination with NMFS, BPA shall collaborate with the regional, state, Tribal, and Federal fish managers and the Pacific States Marine Fisheries Commission to enable the development and implementation of a comprehensive marking plan.Included in this action are the following four steps: Develop a comprehensive marking strategy for all salmon and steelhead artificial production programs in the Columbia River basin by the end of 2001. Provide funding by March 1, 2001, to begin marking all spring chinook salmon that are currently released unmarked from Federal or Federally funded hatcheries. Provide funding, beginning in FY 2002, to implement the Action Agencies' share of the comprehensive marking plan for production not addressed in (2) above. Obtain funding contributions as appropriate for additional sampling efforts and specific experiments to determine relative distribution and timing of hatchery and natural spawners.
Action 175	BPA shall, in coordination with NMFS, USFWS, and the relevant state and Tribal comanagers, fund the four-step planning process described above as quickly as possible and, if so determined by that process, implement safety-net projects as quickly as possible at least for the following salmon and steelhead populations: 1) A-run steelhead populations in the Lemhi River, main Salmon River tributaries, East Fork Salmon River, and Lower Salmon River; 2) B-run steelhead populations in the Upper Lochsa River and South Fork Salmon River; and 3) spring/summer chinook populations in the Lemhi, East Fork, and Yankee Fork Salmon rivers, and Valley Creek.
Action 176	BPA shall, in coordination with NMFS, USFWS, and the relevant state and Tribal comanagers, fund the development of HGMPs for the Grande Ronde and Tucannon spring/summer chinook safety-net programs.
Action 177	In 2002, BPA shall begin to implement and sustain NMFS-approved, safety-net projects.

Harvest and Hatchery Actions (continued)	
Action 178	BPA shall commit to a process whereby funds can be made quickly available for funding the planning and implementation of additional safety-net projects for high-risk salmon and steelhead populations NMFS identified during the term of this biological opinion.
RM&E Actions	
Action 179	The Action Agencies and NMFS shall work with affected parties to establish regional priorities within the congressional appropriations processes to set and provide the appropriate level of FCRPS funding to develop recovery goals for listed salmon ESUs in the Columbia River basin. Tasks shall include defining populations based on biological criteria and evaluating population viability in accordance with NMFS' viable salmonid population approach. These tasks shall be completed by 2003.
Action 180	The Action Agencies and NMFS shall work within regional prioritization and congressional appropriation processes to establish and provide the level of FCRPS funding to develop and implement a basinwide hierarchical monitoring program. This program shall be developed collaboratively with appropriate regional agencies and shall determine population and environmental status (including assessment of performance measures and standards) and allow ground-truthing of regional databases. A draft program including protocols for specific data to be collected, frequency of samples, and sampling sites shall be developed by September 2001. Implementation should begin no later than the spring of 2002 and will be fully implemented no later than 2003.
Action 181	The Action Agencies and NMFS shall work within regional prioritization and congressional appropriations processes to establish and provide the appropriate level of FCRPS funding for a program to acquire and digitize aerial or satellite imagery of the entire Columbia River basin once every 3 to 5 years.
Action 182	The Action Agencies and NMFS shall work within regional priorities and congressional appropriations processes to establish and provide the appropriate level of FCRPS funding for studies to determine the reproductive success of hatchery fish relative to wild fish. At a minimum, two to four studies shall be conducted in each ESU. The Action Agencies shall work with the Technical Recovery Teams to identify the most appropriate populations or stocks for these studies no later than 2002. Studies will begin no later than 2003.
Action 183	Initiate at least three tier 3 studies (each necessarily comprising several sites) within each ESU (a single action may affect more than one ESU). In addition, at least two studies focusing on each major management action must take place within the Columbia River basin. The Action Agencies shall work with NMFS and the Technical Recovery Teams to identify key studies in the 1-year plan. Those studies will be implemented no later than 2003.

Appendix C – Public and Government Participation Plan and overview of focus group comments.

Public and Government Participation Plan[4]

Public Participation

The development of the Clearwater Subbasin Plan included three specific phases for outreach and participation from the public. The first phase gathered input about the Vision of the Plan, which is a description of the desired state of the Clearwater Subbasin, and the goals intended to achieve the vision. The second phase reported on the progress of the planning process and provide access to information. The third phase gathered comments on the final draft Clearwater Subbasin Plan.

Phase one of public participation reconnoitered how the proposed philosophy behind the Clearwater Subbasin Plan coincides with the public philosophy. This phase identified ways to amend the proposed philosophy to bridge the two where they may be different and/or include omissions recommended through this phase of public participation. Phase one of public participation occurred early in the planning process. The foundation for discussions was the Clearwater Policy Advisory Committee's drafted Clearwater Subbasin Vision and Goals. Information and materials presented to each public group were standardized for consistency. These materials included the following:

- Draft copies of the Clearwater Subbasin Vision and Goals
- Background reference to project and Clearwater Focus Program
- Other

Invitations for participation will be extended to atleast the following groups:

- Clearwater Basin Advisory Group
- 2- Focus Groups (in Lewiston and Kamiah)

Public participation meetings were facilitated by Clearwater Focus Program staff, Clearwater Policy Advisory Committee membership, and others as requested. Comments were collected and compiled to use to amend, where appropriate, the final draft Clearwater Subbasin Plan Vision and Goals. A copy of the compiled comments were mailed to all participants from this phase.

Phase Two of public participation occurred in early summer 2002 to report on progress of the plan. Notice was published in area newspapers announcing the availability of additional information and contacts for acquiring information. A summary letter was distributed to the groups and individuals that participated in Phase One.

Phase Three of public participation occurred in mid July to collect comments on the final draft Clearwater Subbasin Plan. Two public meetings will be announced and held within the Clearwater Subbasin at different locations. Clearwater Focus Program staff, Clearwater Policy

[4] The Clearwater Policy Advisory Committee adopted the final draft Public and Government Participation Plan on March 27, 2002

Advisory Committee facilitated the meetings. Comments from these meetings were collected and compiled for review and potential use in amending the final draft Clearwater Subbasin Plan and adoption of the final Clearwater Subbasin Plan.

Government Participation
Members of the Clearwater Policy Advisory Committee assumed the responsibility of insuring appropriate review and comment of the Clearwater Subbasin Plan by the staff from each of the respective governments, agencies and organizations represented on the Clearwater Policy Advisory Committee. Opportunities for review and comment by governments, agencies, and organizations not specifically participating on the Policy Advisory Committee were organized and facilitated by the Clearwater Focus Program staff, Clearwater Policy Advisory Committee, and others as requested.

Specific communication and request for meetings were made and information presented by Clearwater Focus Program staff, Clearwater Policy Advisory Committee, and others as requested to the following governmental groups.

- County Commissions (Clearwater, Idaho, Latah, Lewis, and Nez Perce)
- Nez Perce Tribal Executive Committee
- Soil and Water Conservation Districts (Clearwater, Idaho, Latah, Lewis, and Nez Perce)
- Municipal Governments

Implementation of Public and Government Participation Plan

Public Participation
Phase One was implemented through a presentation to the Clearwater Basin Advisory Group and two Focus Group discussions. Recommendations were collected for contacts that represented various interest groups organized in the subbasin, including recreational user groups, environmental organizations, political organizations, and elected politicians. Invitations and background information on the Clearwater Focus Program and subbasin planning were sent to 138 individuals to attend a Focus Group. These discussions were held June 5 and 6, 2002 in Lewiston, Idaho and Kamiah, Idaho respectively. A total of 19 people attended the meetings, 11 individuals representing various interests and 8 representing the Clearwater Focus Program and the Policy Advisory Committee (PAC). A compilation of comments is attached. This compilation was mailed to meeting participants and members of the PAC. The PAC considered recommendations made during the two meetings at the September 5, 2002 meeting and concluded that the recommendations made were already included in the existing language.

Phase Two was implemented July 11, 2002 by letter announcing the availability of the draft Clearwater Subbasin Plan to the Focus Group participants. Announcements were sent to eight area newspapers, two published the information: they were the Lewiston Morning Tribune and the Clearwater Tribune (Orofino, ID). KRLC-AM radio station in Lewiston also announced availability of the draft subbasin plan. Notice was sent to the 138 person mailing list used for the Focus Discussion Groups announcing the availability of the August Draft Clearwater Subbasin Plan. Two individuals requested copies of the August Draft Clearwater Subbasin Plan for review.

Phase Three was amended by PAC action at the July 23, 2002 meeting because participation in the Focus Group discussions was considered low. The PAC decided that presentations describing the subbasin plan and planning process would be given in conjunction with Idaho Department of Fish and Game fall breakfast meetings. These meetings were held September 3, 2002 in Lewiston, September 18, 2002 in Orofino, and September 19, 2002 in Grangeville. Two individuals from these meetings requested copies of the August Draft Subbasin Plan for review. At the September 5, 2002 PAC meeting it was further determined that a public meeting would be held in the Clearwater Subbasin in conjunction with the Northwest Power Planning Council's Columbia Basin-wide public review. Comments collected from this public meeting will be compiled and submitted through the Council review process.

Government Participation

Presentations about the subbasin planning process were given by the Focus Program in February 2002 to the following: Latah, Lewis, and Nez Perce County Commissions, Clearwater, Idaho, Latah, Lewis, and Nez Perce Soil and Water Conservation Districts, and Nez Perce Tribe Executive Committee. Announcement of the July and August Drafts Clearwater Subbasin Plan were made to the PAC Notes email list and the Clearwater technical contact list on July 8, 2002 and August 28, 2002 respectively. Copies of the July Draft Clearwater Subbasin Plan for comment were distributed to 38 agency representatives, CDs were sent to 13 agency representatives on June 11, 2002. The subbasin plan writer contractor made a presentation to the Nez Perce Tribal Fisheries Department retreat in July, 2002.

Clearwater Focus Discussions – Compilation of Comments

Lewiston and Kamiah Idaho
June 5 & 6, 2002

Facilitators:

Janet, Clearwater Focus Program/ISCC
Ira, Clearwater Focus Program/NPT
Cal Groen, IDFG
Jerome Hansen, IDFG
Darin Saul, ecovista
Kristy Hopfensperger, ecovista
Jim Bellatty, Idaho DEQ

Participants:

Rocky Mountain Elk Foundation
Retired professor, Trout Unlimited
Friends of the Clearwater
Native Plant Society and Palouse Prairie Foundation
Nez Perce Soil and Water Conservation District
Clearwater County Commissioner
Idaho Conservation League
Lewis County Commissioner
Idaho State Representative
Rancher Central
Idaho Wildlife Federation
Joseph Spinazola, Bureau of Reclamation
Idaho Hound Hunters

1. Vision Statement: *The vision for the Clearwater Subbasin is a healthy ecosystem with abundant, productive, and diverse aquatic and terrestrial species, which will support sustainable resource-based activities.*

    - Hay-day of resource economies in Clearwater were the mid-1980s. But a high cut does not maintain an elevated economy. Need both blue and white color sustainable salaries providing money to spend in local communities. It should be clear that "resource-based activities" are not the same as resource-extraction economies.

    Recommendation: Amend to read, "sustainable and diversified resource-based activities"

    - Agrees with above statement. Sustainable resource based economy is an oxymoron since resource based economies have always been boom and bust. The Clearwater may be overpopulated.

    Recommendation: Wildlands or self-willed lands, should be included in the vision statement and the goals statements.

    - Other activities are essential to a community besides resource extraction, such as medical services and schools. Doctors are here because of the recreation (outdoor lifestyle) we must recognize this to keep services.

2. Goal: *What does salmon recovery mean to you?*

    - Studies have shown old growth nutrients came from the ocean and fish, what happens to sustainable populations when the nutrient base is lost? We need more

than having enough fish to catch, we need enough for the system, but we will never get back what we have lost. Do healthy populations imply there is harvestable populations

- There are upcoming studies that indicate the importance of the nutrient connection even more concretely.
- Salmon are important for the bear populations. Recovery is connected to all species.
- Does a healthy population mean harvestable or sustainable population?
- Why habitat restoration? The problem with salmon is out there (ocean) not here. Habitat is in pretty good shape, although lower watersheds could use some work.
- Clearwater Elk Initiative should be part of goals and work with the forest service to encourage and facilitate work to get elk populations back up.

3. Goal: *What is your opinion about emphasis on ESA and native species habitat restoration as a recovery method?*
    - It boils down to the question of what do folks have to give up or are willing to give up to achieve recovered or native species? Will losses be compensated?
    - Using ESA wrong we need to change the way look at the landscape. Recovery for some species questionable, for example, lynx because the Clearwater is on the edge of original range.
    - Invasive plant species are not as big a problem in the forests, as much as they are in the open areas.
    - Best restoration efforts may not be active.

Miscellaneous

- ESA is a minimum standard.
- Let's not wait until species is listed.
- Figure out what to do now.
- Avoid litigation, go for action.
- Less study, more action.
- Inadequate studies may result in inadvertent destruction.

4. Goal: *Information, education, participation, communication needs in subbasin.*
    - Resource issues are contentious, nice to create situation where divergent interests are on same page.
    - Contentious nature will get worse before it gets better or it will get better soon. How can we get folks on the same page?
    - Are we lacking an education component for public awareness? Something will have to give, we must develop a diversified community, maybe we could be more direct.

- Individuals must be involved in the process, no spokespeople. To get the public involved and behind this, we need to provide a living and demonstrate that people and the economy are part of the solution.
- Need to work for open conversation that does not shut down communication.
- Back to education of people…people think that timber is not over in the Clearwater. If something does not impact them on a day-to-day basis, they won't be motivated to be involved.
- The timber industry will not come back to the way it was.
- People must turn to non-polluting industries and other economic opportunities.
- Education must begin in the grade schools.
- We must look at the broader issues: conflict will not be eliminated we must be aware of biological realities such as the Clearwater may be overpopulated. There is hubris in "people" doing restoration, let nature heal itself.
- The language used in this kind of discussion scares people, like "ecosystem". People must have a personal stake in issues like these to become involved.

5. Goal: *What grade would you give to the agencies in the Clearwater for their coordination?*
    - The agencies are not coordinated; agencies need to reach goals in front of them together, see more action.
    - There is coordination, but not total coordination, it goes on in bits and pieces.
    - Rocky Mountain Elk Foundation has money for projects.
    - For example, it is hard to get information about the planning committee for the Clearwater, it seemed as if it was a secret society. The planning needs to be more open and expansive.
    - Cooperation is a result of lawsuits driving people to cooperate, a forest service employee said, if you want the forest service to work on something, then sue us.
    - We need to take care of plants before it gets bad
    - Don't get into a listing situation, political madness! Issue will be buried in a lawsuit and then the species of concern will be gone.
    - ESA is driven by individual species and ignores ecosystem concept and processes, no matter how many times we say a focus species represents the ecosystem. In a perfect world there is groundwork being done. It is time to set aside differences and take action!
    - We must look at the historical state of the Clearwater. What with introduced and extirpated species we will never recover what was here, but what was here could give us an idea of what could be here.
    - Agencies get an "F" for coordination.
    - Federal agencies do not accomplish anything, maybe they can though.

How does the subbasin planning process fit with the US Forest Service plans that are undergoing revision?

- The US Forest Service would use the subbasin plan heavily for their plans.
- Subbasin planning provides NMFS with a local-effort component for recovery planning.

Does the subbasin planning process oversee Forest Service plans? Is it a different structure or hierarchical structure? Does subbasin planning go through NEPA?

- Subbasin planning is a coordination effort, not hierarchical with any other agency. Subbasin plans do not go through a NEPA process. *(Note: The NEPA response given at the meeting on June 5, 2002 was incorrect, this is the correct response.)*

6. Goal: *What are your priority issues for the next 5 to 10 years or 10 to 20 years?*

- Identify good habitat and protect it, for example, cedar grove, coastal disjunct, western hemlock, grasslands. Some specific areas include, Dollar Cr., No Name Cr.
- I agree include roadless areas in the list and emphasize intensive road removal in key watersheds. Conduct intensive restoration where it will be most effective, not extensive restoration all over. Let natural processes recover areas.
- We need more forest openings for improved elk habitat, clear cuts and burns.
- Results and accountability, policy level stuff, we need to show results from efforts.
- Need to demonstrate if habitat restoration really works and makes an improvement in the numbers of fish.
- If unable to protect salmon and steelhead from going extinct important ecosystem connections will be lost and we will begin to lose even more. We must look at population size of humans. We need to quantify if habitat restoration help salmon returns. This needs to be in goals for accountability results.
- Riparian areas are most important when diverse, not only if have rare plants.
- Existing diversity in some instances may be more important than a location where a species of concern exists. Areas with natural water regimes are critical. Weeds are a big problem, weed efforts are not coordinated
- The Craig Weyden Act provides funding to counties that have suffered a loss of timber money. Parts of the funds are for conservation work such as weed control.
- Short term – educate the public. Provide opportunities to see completed projects and bring new focus on these efforts.
- Weeds need more coordination, weeds are a big problem.
- Education is extremely under funded.

- The Craig Weyden Act money can be used for education and weed control.

How often is monitoring and evaluation information from BPA projects made publicly available?

- Projects are required to submit quarterly and annual reports to BPA.
- Although, the public in general does not try to get them and projects don't make strong efforts to distribute them except for contracting purposes.

****

The following goal statements received the greatest number of votes during a straw poll conducted at each focus discussion.

- Foster ecosystem protection, enhancement, and restoration that results in ridgetop-to-ridgetop stewardship of natural resources, recognizing all components of the ecosystem, including the human component.
- Protect, enhance, and restore habitats in a way that will sustain and recover aquatic and terrestrial species diversity with emphasis on the recovery of Endangered Species Act listed and native species.
- Provide opportunities for natural resource-based economies to recover in concert with aquatic and terrestrial species.
- Develop a scientific foundation for prioritizing projects and for monitoring and evaluation.

Appendix D – Overview of EDT and existing results.

The Northwest Power Planning Council, in cooperation with Mobrand Biometrics, and subbasin planners is working to establish a protocol for using the Ecosystem Diagnosis and Treatment Method (EDT) as a tool for developing working hypothesis and restoration priorities during the subbasin planning process. EDT employs a technique for comparing existing and desired conditions called Patient-Template Analysis (PTA). PTA compares existing populations and habitat (patient) with a hypothetical potential state (template), where conditions in the watershed are optimal. Historic conditions are often used in the EDT model as an approximation of Template conditions.

EDT uses an environmental attributes database and a set of mathematical algorithms that compute productivity and capacity parameters for the diagnostic species. EDT output defines biological performance in terms of life history diversity, productivity, and capacity. These elements of performance are characteristics of the ecosystem that describe persistence, abundance, and distribution potential of a population.

EDT has been run at the broadscale across the Columbia Basin using spring chinook for the diagnostic species. Output from this run is available at a scale similar to the 4th field HUC (Table 8, EDT 2002). In the Clearwater subbasin EDT was run using environmental attributes describing only the 131 6th field HUCs that provide the primary habitat for spring chinook in the subbasin (Figure 1). Currently, the process for refining the broadscale Columbia Basin scale run of EDT with subbasin specific data, expanding the model to include other anadromous and resident fish species, and increasing the geographic extent to include all areas of the subbasin is still in development. EDT may play a valuable role in future refinements to the Clearwater subbasin plan but its current utility is limited.

Table 8. EDT results relevant to the Clearwater subbasin spring chinook population.

Spring Chinook Population	Scenario	Diversity Index	Productivity (return spawner)	Capacity	Equilibrium Abundance	Date of EDT Run
Lochsa River	Patient	100.0%	5.13	5,565.7	4,480.8	1/25/2000
Lochsa River	Template	100.0%	25.00	30,418.7	29,201.8	1/25/2000
Lower Clearwater R	Patient	71.0%	2.13	4,934.9	2,622.0	1/25/2000
Lower Clearwater R	Template	100.0%	23.62	61,947.1	59,324.4	1/25/2000
MF Clearwater R	Patient	100.0%	3.43	1,501.6	1,064.0	1/25/2000
MF Clearwater R	Template	100.0%	22.37	8,688.4	8,299.9	1/25/2000
NF Clearwater	Patient	0.0%	0.00	0.0	0.0	1/25/2000
NF Clearwater	Template	100.0%	28.67	69,889.9	67,451.9	1/25/2000
Selway River	Patient	100.0%	5.01	8,033.5	6,429	1/25/2000
Selway River	Template	100.0%	26.48	45,617.6	43,894.9	1/25/2000
SF Clearwater R	Patient	90.0%	4.74	3,955.6	3,121.4	1/25/2000
SF Clearwater R	Template	100.0%	25.23	21,902.3	21,034.2	1/25/2000

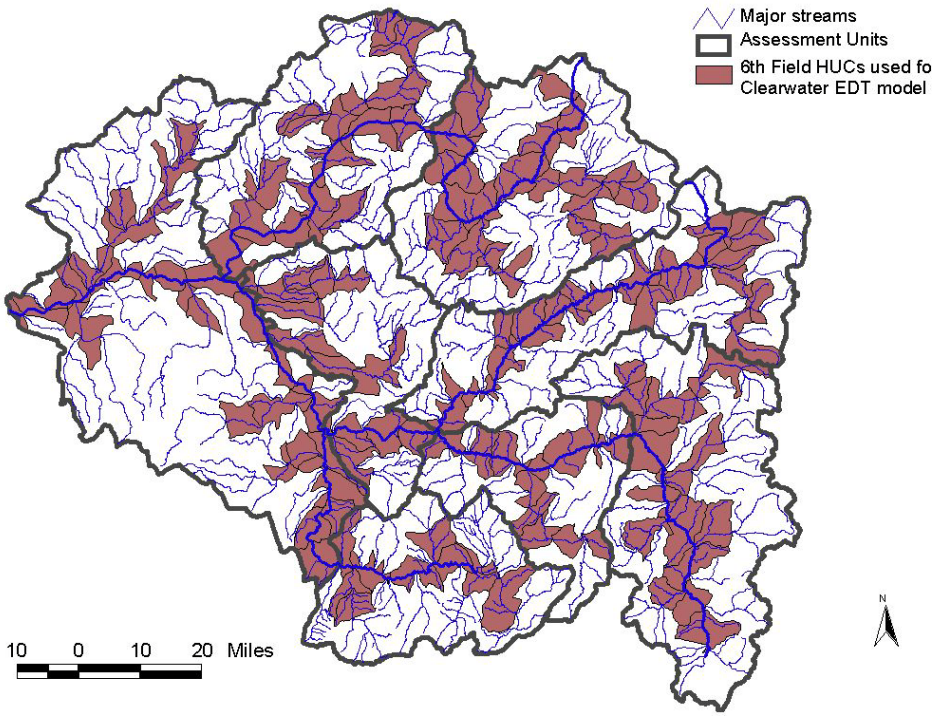


Figure 1. 6th Field HUCS used in Clearwater EDT model

Appendix E – Idaho State 1998 §303(d) List, EPA's 2000 Additions, and TMDL schedule.

HUC# 17060302 Lower Selway**				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3262	FD6	O'Hara Creek	Hamby Fork to Selway River	Assm't	SED	4.42
5096	FD7	Island Creek	Headwaters to Selway River	done	SED	3.97
5172	FD7	Slide Creek	Headwaters to Selway River	2000	SED	4.17
				TOTAL MILES OF LISTED STREAMS		12.56

HUC# 17060303 Lochsa				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3236		Lochsa River **	Crooked Fk/Walton. to Selway/MF Clearwater	Assm't done 2000	TEMP	68.74
3257	MX1	Boulder Creek	Headwaters to Lochsa River	2007		
5037	MX1	Canyon Creek	Headwaters to mouth	2007		
5068	MX1	WF Deadman Creek	Headwaters to mouth	2007		
5080	MX1	Glade Creek	Headwaters to mouth	2007		
5137	MX1	Nut Creek	Headwaters to mouth	2007		
5183	MX1	SF Canyon Creek	Headwaters to mouth	2007		
5265	MX1	Walde Creek	Headwaters to mouth	2007		
	FD8	Fish Creek	Headwaters to mouth	2007		
	FD6	Placer Creek	Headwaters to mouth	2007		
	FD6	Polar Creek	Headwaters to mouth	2007		
	FD9	Storm Creek	Headwaters to mouth	2007		
				TOTAL MILES OF LISTED STREAMS		68.74

HUC# 17060305 South Fork Clearwater River						STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3288	PR5	Cottonwood Creek	Headwaters to SF Clearwater	Done	BAC DO HALT NH3 NUT SED TEMP	31.19
3289	PR5	Red Rock Creek	Headwaters to Cottonwood Creek	Done	SED	11.04
3290	PR5	SF Cottonwood Creek	Headwaters to Cottonwood Creek	Done	BAC HALT NUT TEMP	6.96
3291	PR5	Threemile Creek	Headwaters to SF Clearwater River	2003	BAC DO QALT HALT NH3 NUT SED TEMP	19.18
3292	PR5	Butcher Creek	Headwaters to SF Clearwater River	2003	BAC DO QALT HALT SED TEMP	12.37
3301	FD2	Newsome Creek	Beaver Creek to SF Clearwater River	2003	SED	6.91
4002		Lucas Lake		2003	SED	.00

HUC# 17060305 South Fork Clearwater River Continued				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
5015	FD2	Beaver Creek	Headwaters to Newsome Creek	2003	SED	4.95
5030	FD2	Buffalo Gulch	Headwaters to American River	2003	SED	6.49
5056	FD3	Dawson Creek	Headwaters to Red River	2003	SED	2.29
5136	FD2	Nugget Creek	Headwaters to Newsome Creek	2003	SED	2.72
5169	FD2	Sing Lee Creek	Headwaters to Newsome Creek	2003	SED	3.09
5185	FD3,5	SF Clearwater River	Red River to Clearwater River	2003	HALT SED TEMP	63.79
5217	FD4	Cougar Creek	Headwaters to SF Clearwater River	2003	SED	6.37
5221	PR5	Long Haul Creek	Headwaters to SF Cottonwood Creek	Done	ADD UNKN	1.64
5644	PR5	Shebang Creek	Headwaters to Cottonwood Creek	Done	ADD UNKN	14.56
7288	PR5	Stockney Creek	Headwaters to Cottonwood Creek	Done	BAC SED	11.95
				TOTAL MILES OF LISTED STREAMS		204.50

HUC# 17060306 Clearwater River				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3137	PR7	Long Hollow Creek	Headwaters to Little Canyon	2006	BAC DO QALT HALT NUT SED	16.03
3139	PR1	Clearwater River	Confluence of North Fork to Washington State line	2006	TDG	40.03
3140	PR7	Holes Creek	Headwaters to Little Canyon	2006	BAC DO QALT HALT MTU NH3 NUT O/G ORG PST SED	9.08
3141	PR4	Lindsay Creek	Boundary to Clearwater River	2006	BAC DO QALT HALT NUT SED TEMP	7.35
3142	PR6	Hatwai Creek	Headwaters to Clearwater River	2006	BAC HALT NUT TEMP	7.93
3143	PR4	Lapwai Creek	Unnamed trib 26.2 km upstream to Clearwater River	2006	BAC DO QALT HALT NUT SED TEMP	16.32
3145	PR4	WF Sweetwater Creek	Headwaters to NPT Boundary	2006	BAC DO QALT HALT NUT QRG PST SED TEMP	19.53
3146	PR4	Webb Creek	Headwaters to NPT Boundary	2006	BAC DO QALT HALT NUT SED TEMP	5.58
3148	PR1	Catholic Creek	Headwaters to Clearwater River	2006	BAC DO QALT HALT NH3 NUT ORG SED TEMP	9.60
3149	PR6	Potlatch River	Bear Creek to Clearwater River	2005	BAC DO QALT HALT NH3 NUT O/G ORG PST SED TEMP	14.13
3150	PR3,8	Potlatch River	Headwaters to Bear Creek	2005	BAC QALT HALT NUT SED TEMP	40.47
3155	PR8	Pine Creek	Headwaters to Potlatch River	2005	BAC QALT HALT NUT SED TEMP	12.97
3156	PR6	Cedar Creek	Leopold Creek to Potlatch River	2005	CHS	5.17
3157	PR3	EF Potlatch River	Ruby Creek to Potlatch River	2005	BAC QALT HALT NUT SED TEMP	4.73
3158	PR3	Ruby Creek	Unnamed trib 3.4 km upstream to EF Potlatch River	2005	BAC QALT HALT NUT SED TEMP	2.14
3159	PR3	Moose Creek	Headwaters to Potlatch River	2005	BAC QALT HALT NUT pH SED TEMP	5.76
3161	PR8	Pine Creek	NPT Boundary to Clearwater River	2006	NH3 NUT 0/G SED	1.95

HUC# 17060306 Clearwater River Continued				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3162	PR8	Bedrock Creek	Headwaters to NPT Boundary	2006	BAC DO QALT HALT NH3 NUT O/G SED TEMP	6.08
3164	PR7	Big Canyon Creek	Sixmile Canyon to Clearwater River	2006	BAC QALT HALT NUT SED TEMP	13.77
3171	MX3,4	Jim Ford Creek	Headwaters to Clearwater River	Done	BAC DO QALT HALT NH3 NUT O/G SED TEMP	27.00
3172	MX3	Grasshopper Creek	Headwaters to Jim Ford Creek	Done	BAC QALT HALT NUT SED TEMP	8.25
3173	MX1,4, P6	Lolo Creek	Eldorado Creek to Clearwater River	2005	BAC DO QALT HALT NUT O/G SED TEMP	28.44
3176	FD5	Jim Brown Creek	Headwaters to Musselshell Creek	2005	BAC QALT HALT NUT SED TEMP	13.33
3179	PR7	Sixmile Creek	Headwaters to Clearwater River	2005	BAC DO QALT HALT NH3 NUT O/G QRG PST SED TEMP	8.10
3180	PR5	Lawyer Creek	Headwaters to NPT Boundary	2006	BAC DO QALT HALT NH3 NUT O/G SED TEMP	7.30
3181	PR7	Sevenmile Creek	Headwaters to Lawyer Creek	2006	HALT SED	7.25
4010	PR7	Pine Creek	Headwaters to NPT Boundary	2006	BAC DO QALT HALT NUT SED TEMP	10.01
5048	PR3	Corral Creek	Headwaters to Potlatch River	2005	SED	9.94
5125	PR7	Middle Potlatch Creek	Headwaters to Potlatch River	2005	BAC QALT HALT NUT SED TEMP	16.42
5130	FD5	Mud Creek	Headwaters to Lolo Creek	2005	SED	3.83
5211	PR3	WF Potlatch River	Cougar Creek to Potlatch River	2005	SED	3.07
5216	MX4	Yakus Creek	Molly Creek to Lolo Creek	2005	SED	2.94
5222	PR6	Texas Creek	Headwaters to Lolo Creek	2005	ADD UNKN	5.71
5223	PR6	Schmidt Creek	Headwaters to Lolo Creek	2005	ADD UNKN	4.48
5224	PR3	Boulder Creek	Pig Creek to Potlatch River	2005	ADD UNKN	2.83
7143	PR4	Winchester Lake and upper Lapwai Creek		Done	BAC DO QALT HALT NUT PST SED TEMP	.00
7162	PR8	Bedrock Creek	NPT Boundary to Clearwater River	2006	NUT SED	3.46
7164	Pr7,8	Big Canyon Creek	Headwaters To Sixmile Canyon	2006	BAC DO QALT HALT NH3 ORG PST TEMP	19.45
				TOTAL MILES OF LISTED STREAMS		420.43

HUC# 17060307 Upper North Fork Clearwater River**				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3215	MX4,FD6	Orogrande Creek	Headwaters to NF Clearwater River		SED	19.51
3225	FD5	Osier Creek	Headwaters to Moose Creek		QALT HALT SED TEMP	8.09
3229	FD5,8	Gravey Creek	Headwaters to Cayuse Creek		SED	8.96
5040	FD5	China Creek	Headwaters to Osier Creek		SED	4.89
5045	FD7	Cold Springs Creek	Headwaters to NF Clearwater River		SED	4.94
5047	FD7	Cool Creek	Headwaters to Cold Springs Creek		SED	3.32
5049	FD6	Cougar Creek	Headwaters to Quartz Creek		SED	3.69
5059	FD5	Deception Gulch	Headwaters to NF Clearwater River		SED	4.74
5088	FD6	Grizzly Creek	Headwaters to Quartz Creek		SED	4.53

HUC# 17060307 Upper North Fork Clearwater River** Continued				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
5093	FD5	Hem Creek	Headwaters to Sylvan Creek		SED	4.96
5104	FD5	Laundry Creek	Headwaters to Osier Creek		SED	4.39
5119	FD5	Marten Creek	Headwaters to Gravey Creek		SED	4.47
5123	FD7	Middle Creek	Headwaters to Weitas Creek		SED	13.32
5178	FD6	Sneak Creek	Headwaters to NF Clearwater River		CHS	3.49
5189	FD7	Sugar Creek	Headwaters to Swamp Creek		SED	3.99
5190	FD7	Swamp Creek	Headwaters to Osier Creek		SED	5.39
5192	FD5	Sylvan Creek	Headwaters to French Creek		SED	4.31
5193	FD6	Tamarack Creek	Headwaters to Orogrande Creek		SED	3.92
5200	Mx3	Tumble Creek	Headwaters To Washington Creek		Sed	4.60
					TOTAL MILES OF LISTED STREAMS	115.41

HUC# 17060308 Lower North Fork Clearwater River				TMDL		STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
3184	MX1	NF Clearwater River	Dworshak Dam to Clearwater River	2006	TDG	1.91
3188	MX2	Long Meadow Creek	Headwaters to Dworshak Reservoir	2004	BAC QALT HALT NUT SED TEMP	12.15
3189	MX1,2	Elk Creek	Headwaters to Dworshak Reservoir	2004	BAC QALT HALT NUT SED TEMP	20.85
3190	MX1	Elk Creek Reservoir		2004	BAC DO QALT HALT NUT SED TEMP	
3191	MX4	Cranberry Creek	Headwaters to Dworshak Reservoir	2004	BAC QALT HALT NUT SED TEMP	6.79
3192	MX2	Swamp Creek	Headwaters to Dworshak Reservoir	2004	BAC QALT HALT NUT SED TEMP	7.36
3193	FD6, MX1,2	Reeds Creek	Headwaters to Dworshak. Reservoir	2004	SED	15.95
3197	MX1,2	Breakfast Creek	Headwaters to Clearwater River	2004	DO QALT HALT SED	8.84
3198	M1	Floodwood Creek	Headwaters to Breakfast Creek	2004	DO QALT HALT SED	13.59
3199	M2	Stoney Creek	Headwaters to Breakfast Creek	2004	DO QALT HALT SED	12.23
5014	M2,3	Beaver Creek	Headwaters to NF Clearwater River	2004	SED	15.97
5016	M2	Bertha Creek	Headwaters to Beaver Creek	2004	SED	2.72
5020	M2	Bingo Creek	Headwaters to Beaver Creek	2004	SED	2.77
5063	FD7	Dog Creek	Headwaters to Isabella Creek	2004	SED	3.88
5095	FD7	Isabella Creek	Headwaters to NF Clearwater River	2004	SED	8.54
5100	MX1	Johnson Creek	Tributary to Elk Creek	2004	SED	3.27
5140	MX1	Partridge Creek	Headwaters to Elk Creek	2004	SED	4.85
5181	MX3	Sourdough Creek	Headwaters to Beaver Creek	2004	SED	3.12
5182	MX2	SF Beaver Creek	Headwaters to Beaver Creek	2004	SED	4.75
5209	MX1	WF Elk Creek	Headwaters to Elk Creek	2004	SED	3.50
					TOTAL MILES OF LISTED STREAMS	153.04

Key to Headings on the 1998 §303(d) List

WQLS:	Water Quality Limited Segment Number
Waterbody:	Idaho Geographic Society Name for the waterbody
Boundaries:	Extent of segment
TMDL Due:	Year TMDL required to be competed as directed by August 2, 2002 agreement
Stream Miles:	Miles in segment
HUC:	Hydrologic Unit Code

Pollutants:

BA	Bacteria	pH	H^+ ions
CHS	Channel Stability	SAL	Salinity
DO	Dissolved Oxygen	SED	Sediment
HALT	Habitat Alteration	TEMP	Temperature
MTH	Metals (Hg)	UNKN	Unknown
MTU	Metals (unknown)	QALT	Flow Alteration
NUT	Nutrients	NH3	Ammonia
O/G	Oil/Gas	PST	Pesticides
ORG	Organic	TDG	Total Dissolved Gas

**The August 2002 agreement revising the schedule for the development of TMDLs stipulates that the preliminary determinations to delist the Lower Selway, mainstem Lochsa, and Upper North Fork Clearwater River by Idaho Department of Environmental Quality be reevaluated using the final Water Body Assessment Guide II. The results of the reevaluation will be reflected in DEQ's 2002 §303(d) list.

References: Idaho Division of Environmental Quality 1998 §303(d) Package
Settlement agreement August 2002 to revise schedule for TMDL development.

Appendix F – Locations and characteristics of PMUs.

PMUs are groups of HUCs (either contiguous or noncontiguous) that characterize areas with similar species distributions, disturbance regimes, and other features important to restoration or recovery planning. The PMUs are a broad landscape scale, planning unit and their use facilitates an ecosystem approach to subbasin management and restoration that attempts to balance the needs of both terrestrial and aquatic species. PMUs were developed as part of the Clearwater Subbasin Assessment (Volume 1 of the Clearwater Subbasin Plan). To aid readers in the interpretation of the Clearwater Subbasin Plan tables describing primary factors used in delineation of the PMUs and maps of their locations are presented below.

The 22 PMUs in the Clearwater are divided into three groups: those dominated by private ownership (excluding corporate ownership), mixed ownership (including corporate ownership), or Federal ownership. Within the Clearwater subbasin, land use and management strategies differ substantially between these ownership areas; these differences will impact planning strategies and opportunities for action.

Table 9 Comparison of primary characteristics (or combinations) used to differentiate PMUs throughout Federally owned lands within the Clearwater subbasin. Characteristics in bold are primary defining characteristics of each PMU

	Potential Disturbance			Natural Hazards		Protection
PMU	Mining	Grazing	Road Density	Landslides	Surface Erosion	Type and Degree
FD-1	**Mod.-V High**	**Mod.-High**	**Mod.-V High**	Low	**Mod.-High**	Minimal
FD-2	**Mod.-V High**	**High**	**Mod.-V High**	Very Low	Very Low	Minimal
FD-3	**Mod.-V High**	**Minimal**	Low-V High	Very Low	Very Low	Minimal
FD-4	Minimal	**High**	Mod.-High	V Low-Low	Very Low	Variable
FD-5	Minimal	Minimal	**Mod.-High**	V Low-Low	Variable	Variable
FD-6	Minimal	Minimal	**Mod.-V High**	**Mod.-V High**	Variable	Variable
FD-7	Minimal	N/A	**Low-Mod.**	Low-V High	Low-Mod.	**Inv. Roadless; >75%**
FD-8	Minimal	N/A	Minimal	V Low-Mod	V Low-Mod.	**Inv. Roadless; >90%**
FD-9	Minimal	N/A	Minimal	V Low-Low	V Low-Mod.	**Wilderness; >95%**

Table 10. Comparison of primary characteristics used to differentiate PMUs delineated throughout mixed ownership areas within the Clearwater subbasin. Characteristics in bold print are primary defining characteristics of each PMU

	Ownership		Potential Disturbance			
PMU	Dominant	Sub-Dom.	Road Density	Landslide Hazard	Surface Eros. Hazard	Primary Sediment source
MX-1	Mixed	Mixed	Mod.-V High	**Mod.-V High**	**Mod.-V High**	Landslide/Surface
MX-2	Potlatch	Mixed	Mod.-V High	**Mod.-V High**	**Mod.-V High**	Landslide/Surface
MX-3	**Potlatch**	State	High-V High	**V Low-Low**	**Very Low**	Limited
MX-4	**State/Priv.**	State/Priv.	High-V High	**Low**	**High**	**Surface Erosion**
MX-5	Federal	**Plum Ck.**	Low-V High	V Low-Low	V Low-High	Variable
MX-6	Federal	**Plum Ck.**	Mod.-V High	V Low-Mod.	Low-Mod.	Variable

Table 11. Comparison of primary characteristics used to differentiate PMUs delineated throughout areas dominated by private ownership within the Clearwater subbasin. Characteristics in bold print are primary defining characteristics of each PMU

						Potential Disturbance			
PMU	Species Present	Dominant Owner	Water Use	Peak Runoff	Land Cover Dominant/Sub-Dom.	Road Density	Landslide Hazard	Surface Eros. Hazard	Primary Sediment source
PR-1	**All**	Private	Moderate	May	Ag./Forest	Mod.- High	**Mod.-High**	High	Mass/Surface
PR-2	**All**	Private	Moderate	May	Forest/Ag.	Mod.- High	**Very High**	**Very High**	Mass/Surface
PR-3	A-run SH	**Mixed**	Low	May	**Forest/None**	**High**	V Low-High	High-V High	**Mass/Surface**
PR-4	A-run SH	Private	**V High**	April	Ag./Forest	Moderate	Low	Very High	Surface Erosion
PR-5	A-run SH	Private	Low-Mod.	**March**	Ag./None	Moderate	Very Low	High-V High	Surface Erosion
PR-6	A-run SH	Private	Low-Mod.	April	Ag./Forest	Moderate	**Mod.-High**	**Very High**	**Mass/Surface**
PR-7	A-run SH	Private	Low	April	**Ag./None**	Moderate	V Low-Low	High-V High	Surface Erosion
PR-8	A-run SH	Private	Low	April	**Ag./Forest**	Moderate	V Low-Low	High-V High	Surface Erosion

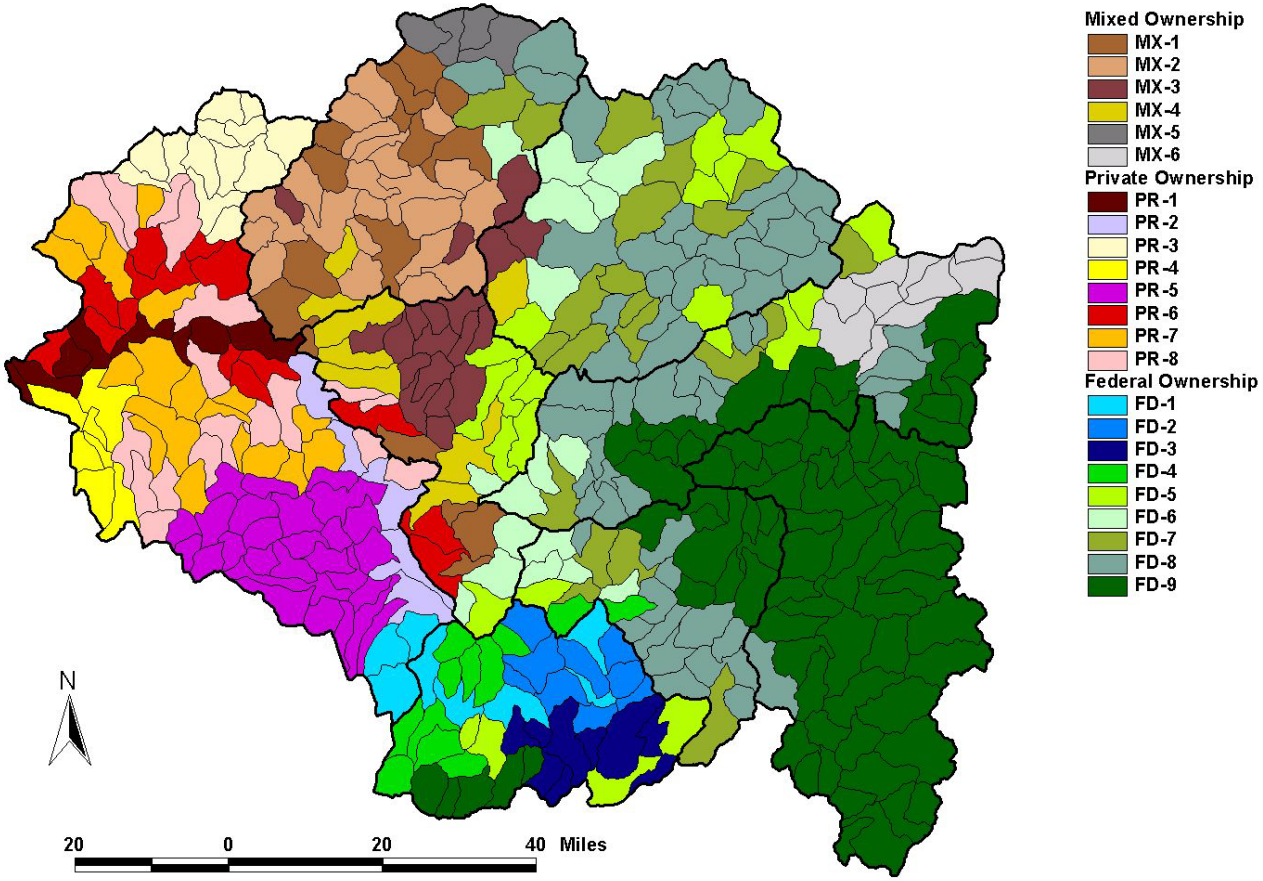


Figure 2. Potential Management Units (PMUs) delineated in the Clearwater subbasin.