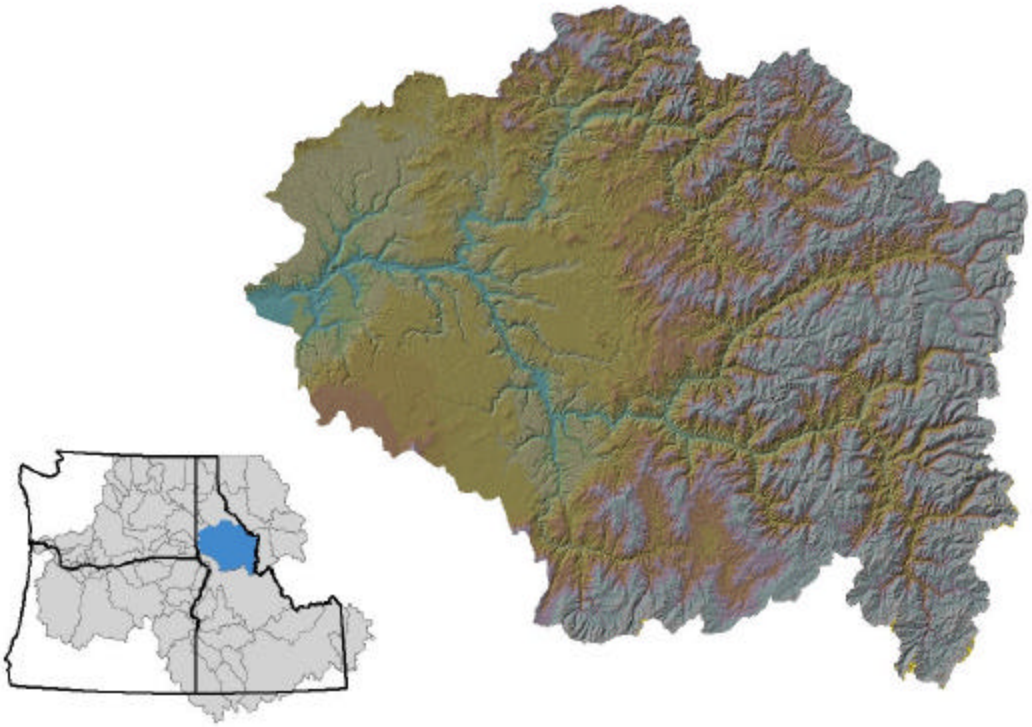
Draft
Clearwater Subbasin Management Plan

November 2003



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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.

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Acronym	Definition
Agencies or Groups	
APAC	Artificial Production Advisory Committee
BAG	Clearwater Basin Advisory Group (IDAPA 39-3613)
BLM	U.S. Bureau of Land Management
BoR	U.S. Bureau of Reclamation
BPA	Bonneville Power Administration (Bonneville)
CBFWA	Columbia Basin Fish and Wildlife Authority
CNF	Clearwater National Forest
Council	Northwest Power Planning and Conservation Council
CSWCD	Clearwater Soil and Water Conservation District
EDT	Ecosystem Diagnosis and Treatment Method
EPA	U.S. Environmental Protection Agency
FSA	USDA Farm Service 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
IDT	Idaho Department of Transportation
IDWR	Idaho Department of Water Resources
IFIM	Instream Flow Incremental Methodology
ISWCD	Idaho Soil and Water Conservation District
LHTAC	Local Highway Technical Assistance Council
LSCD	Lewis Soil Conservation District
LSWCD	Latah Soil and Water Conservation District
NOAA Fisheries	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPNF	Nez Perce National Forest
NPS	National Park Service
NPSWCD	Nez Perce Soil and Water Conservation District
NPT	Nez Perce Tribe
NRCS	USDA Natural Resources Conservation Service
PAC	Clearwater Policy Advisory Committee
SCC	Idaho Soil Conservation Commission
TU	Trout Unlimited
USBR	U.S. Bureau of Reclamation
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 (IDAPA 39-3615)
Terms	
APRE	Artificial Production Review and Evaluation
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
EQIP	Environmental Quality Incentive Program
ESA	Endangered Species Act
FCRPS	Federal Columbia River Power System
GAP	Gap Analysis Program
HGMP	Hatchery Genetic Management Plan

Acronym	Definition
HUC	Hydrologic Unit Code
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
LOD	Large Organic Debris
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.
PSSZ	Potential Sediment Source Zone
PMU	Potential Management Unit
RHCA	Riparian Habitat Conservation Area
RRWMA	Red River Wildlife Management Area
SI	Salmon Initiative
SPZ	Streamside Protection Zone
STIP	State Transportation Improvement Program
TMDL	Total Maximum Daily Load
WBAG II	Water Body Assessment Guidance 2002
WQPA	Idaho Water Quality Program for Agriculture (SCC)
WHIP	Wildlife Incentive Program (NRCS)
WRP	Wetland Reserve Program (NRCS)

1 Introduction

The Clearwater Subbasin Plan has been developed as part of the Northwest Power and Conservation Council's (Council; See Table 1 for a complete list of acronyms used in this document) Columbia River Basin Fish and Wildlife Program. Subbasin plans will be reviewed and eventually adopted into the Council's 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, 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 as building blocks in recovery planning to meet the some of their requirements of the 2000 Federal Columbia River Power System Biological Opinion. Subbasin planning through the Council's program will also assist Bonneville with some of the requirements they have under the 2000 BiOp.

The Clearwater Policy Advisory Committee and the Nez Perce Tribe intend the Clearwater Subbasin Plan to serve multiple purposes. They intend the plan to meet the Council's call for subbasin plans as part of its Columbia Basin wide program and to provide a resource for federal agencies involved with Endangered Species planning efforts. But equally important this plan is a locally organized and implemented effort involving the major resource managers and local governments in the subbasin to develop the best possible approach to protecting, enhancing and restoring fish and wildlife in the Clearwater Subbasin. This plan is intended to provide resources necessary to develop activities forwarding the vision of the Clearwater Policy Advisory Committee at both subbasin/programmatic scales and to provide the context and information for developing site specific projects. The Clearwater Subbasin Plan is comprised of three volumes that are interdependent, but each provides a unique way in understanding the characteristics, management, and goals for the future of the Clearwater subbasin. The three volumes generally conform to the guidance set forth in the Council's *Technical Guide for Subbasin Planners* (2001), which became available during the middle of the project.

Assessment-- The assessment develops the scientific and technical foundation for the subbasin plan. The assessment provides an overview, a discussion of focal species and habitats, including environmental conditions and ecological relationships, limiting factors and synthesis and interpretation. The Clearwater Subbasin Assessment provides the analysis and background information to support the recommendations made in the Clearwater Subbasin Management Plan.

Inventory-- The inventory includes information on existing fish and wildlife programs, projects and activities past (last 5 years) and future. This information provides an overview of the management context, including existing resources for protection and restoration in the subbasin.

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

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 (SCC) 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).

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 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.

The Clearwater Focus Program convened the Clearwater Policy Advisory Committee (PAC) to coordinate a multi-agency, ecosystem-based approach to protection and restoration of fish and wildlife habitat and to oversee the Clearwater subbasin planning process. PAC membership includes representatives from the 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
Kerby Cole, Idaho Department of Environmental Quality
Terry Cundy, Potlatch Corporation
Larry Dawson, Clearwater National Forests
Allen Slickpoo, Jr.*, 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

In response to the more complete ecosystem view of subbasin planning emerging in the Council, a terrestrial subcommittee was formed by the PAC in mid-2000 to guide the development of the Clearwater Terrestrial Subbasin Assessment. The NPT's Wildlife Department was contracted to produce the terrestrial portion of the assessment in early 2001. 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 Plan during 2002. Writing team members for these efforts include the following

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

The aquatics portion of the assessment was disseminated for review throughout the development phase using email lists compiled by Focus Program staff and as an entire draft in August 2001. Large portions of the aquatic assessment were also incorporated into the Clearwater Subbasin Summary, released May 2001 (Cichosz et al. 2001) and reviewed accordingly as part of the development process for that document. The terrestrial portion of the assessment was first disseminated for review as described for the aquatic assessment and as an entire draft in January 2002 and then again in a merged document March 2002. Through these review processes, hundreds of comments, suggestions and clarifications were received from local, state, tribal, and federal representatives with relevant professional expertise (Individual reviewers and contributors are listed in Table 2). Data, comments, and working knowledge of these individuals as it relates to the Clearwater subbasin have been integrated into the document to improve its accuracy and utility. There were 14 PAC and 10 subcommittee technical meetings, six Focus Program contracting meetings, and 2 meetings with NOAA Fisheries, Focus Program, and CEEd staffs during development of the Clearwater Subbasin Assessment (September 1999 – August 2001).

Subbasin planning began January 2002. The Clearwater PAC had functioned as the aquatic technical review subcommittee during the assessment phase, calling on respective staff for participation. The PAC decided for the planning phase an Aquatic Subcommittee should be formed to complement the Terrestrial Subcommittee, to provide technical direction to the contract writers of the subbasin plan. Membership on the subcommittees included Clearwater PAC members and staff representatives from fish and wildlife agencies in the subbasin. The subcommittees reviewed and worked on components of the subbasin plan as they were developed prior to each Clearwater PAC review. E-mail announcement of component re-writes were distributed to the technical contact list developed by the Focus Program staff (also used during the assessment phase). These reviews were prior to and independent of the July, August, September, and October (2002) releases of the subbasin plan drafts, which included the subbasin assessment, for comment. There were 13 PAC and nine technical subcommittee meetings, one conference call with NOAA Fisheries staff, and 11 public meetings held during development of

the Clearwater Subbasin Management Plan and Inventory (January 2002 – October 2002). See Appendix C for a complete description of the Public and Government Participation Plan and overview of its implementation during the planning process. Individuals who participated in meetings, provided comment, or drafted portions during the planning phase of the Clearwater Subbasin Plan are listed in Table 2.

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]

The *Final Draft Clearwater Subbasin Plan* was presented to the full Council on November 14, 2002; a workshop was held later in November 2002 for the Independent Scientific Review Panel (ISRP) and a number of federal agencies in November 2002. The ISRP review of the Clearwater Subbasin Plan became available in February (Council Document 2003-3). NOAA Fisheries provided informal comments on the plan in February 2003 as well. The Clearwater PAC decided to go through a revision phase prior to submitting the subbasin plan for adoption into the Council's program.

Revision of the *Final Draft Clearwater Subbasin Plan* began April 2003 and was completed October 31, 2003 with the Clearwater PAC having held six meetings and the technical subcommittees four to complete revisions. Clearwater PAC representatives, Ecovista staff, and Council staff (Idaho) meet with NOAA fisheries staff from Idaho and Portland on May 8, 2003 to discuss the ESU population delineations made by the Interior Columbia Technical Recovery Team and again in a more regional meeting in July 2003. After each technical subcommittee meeting another draft of the subbasin management plan was prepared and announced for review using email lists compiled throughout the process. Individuals who participated in meetings, provided comment, or drafted portions during the revision phase of the Clearwater Subbasin Plan are listed in Table 2.

The Clearwater PAC endorsed the Clearwater Subbasin Plan and recommended it be submitted to the Council for adoption by motion on October 31, 2003.

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[1] The Clearwater PAC (referred to hereafter as the Parties)understand that this Plan shall be presented to the Northwest Power and Conservation 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.

The Clearwater PAC will continue under the 2000 Columbia Fish and Wildlife Program and the Clearwater Subbasin Plan. The Clearwater Subbasin Plan will be reviewed and amended as necessary at least every five years after adoption into the Council's program.

The Clearwater Focus Program created by the 1994 Columbia Basin Fish and Wildlife Program will continue under the 2000 Columbia Basin Fish and Wildlife Program and the Clearwater Subbasin Plan. Proposals for appropriate operational funding will be made during provincial reviews or whatever other funding cycle the program endorses after subbasin planning. See Section 2 of the Clearwater Subbasin Inventory for a description of the subbasin plan review process and the functions of the Focus Program and PAC.

Table 2. Individuals who participated in the development of the Clearwater Subbasin Plan. Present and former Clearwater PAC members and alternates are shown in bold print.

Name	Agency	Specialty
Althouse, Scott	NPT	Law
Ballou, Erv	IDWR	Mining/Water Resources
Beach, Ted	Rocky Mtn Elk Foundation	
Bellatty, Jim	**IDEQ**	**Management**
Bennett, David	UI	Biology Fish
Blair, Steve	NPNF	Biology Wildlife
Blew, David	IDWR	Biology Aquatic
Bowler, Bert	IDFG	Biology Fish
Brege, Dale	**NOAA**	**Biology Fish**
Brostrom, Jody	IDFG	Biology Fish
Burge, Howard	USFWS	Biology Fish
Butterfield, Bart	IDFG	Biology Fish
Carter, Marcie	NPT	Biology Wildlife
Caswell, Jim	**IOSC**	**Management**
Cichosz, Tom	Ecovista	Biology Fish
Cochanauer, Tim	IDFG	Biology Fish
Cronce, Jeff	NPT	Biology Wildlife
Cundy, Terry	**Potlatch Corp**	**Hydrology**
Dansart, Bill	ISCC	Geology/Hydrology/GIS
Davidson, Anne	Ecovista	Biology Wildlife
Davis, Dan	CNF	Biology Wildlife
Davis, Russ	ACOE	Biology Wildlife
Dawson, Larry	**CNF**	**Management**
Dupont, Joe	**IDL**	**Biology Fish**
Eichert, Joe	**IDL**	**Management**
Eichstaedt, Rick	NPT	Law
Enneking, George	**Idaho County Commissioner**	**Local Government**
Espinoza, Al	Consultant	Biology Fish
Falter, Michael	UI	Limnology
Funkhouser, Zachary	ITD	Planner
Garcia, Steve	USGS	Hydrology

Name	Agency	Specialty
Gerhardt, Nick	NPNF	Hydrology
Gould, Justin	**Nez Perce Tribe Executive Committee**	**Local Government**
Graham, Bill	IDWR	Planning
Gray, Karen	Idaho Native Plant Society/Palouse Prairie Foundation	Biology Botany
Green, Dave	NPNF	GIS/database
Groen, Cal	**IDFG**	**Management**
Haagen, Ed	NRCS	Soils
Hansen, Jerome	**IDFG**	**Biology Wildlife**
Hansen, Richard	IDWR	Water Rights
Hassemer, Pete	IDFG	Biology Fish
Hawley, Kyle	**Farmer**	**Local Government**
Henderson, Kent	Idaho Wildlife Federation	
Hesse, Jay	NPT	Biology Fish
Hohle, Janet	SCC – Focus Program	Management
Hood, Ric	Clearwater County Commissioner	Local Government
Hornbeck, Twila		State Legislator
Huntington, Chuck	Clearwater Biostudies	Biology Fish
Iverson, Tom	CBFWA	Biology Fish
Jackson, Bob		Rancher/Houndhunter
Jahn, Phil	**NPNF**	**Management**
Johnson, Craig	BLM	Biology Fish
Johnson, Dave	NPT	Biology Fish
Jones, Dick	CNF	Hydrology
Jones, Ira	**NPT – Focus Program**	**Management**
Keen, Shelly	IDWR	Water Rights Coordinator
Keersemaker, John	**CNF**	**Management**
Kendrick, John	NRCS	Planning
Kiefer, Sharon	IDFG	Biology Fish
Klein, Linda	LRK Communications	Soils
Kozakiewicz, Vince	**NOAA**	**Biology Fish**
Koziol, Deb	NPSWCD	Biology Wildlife
Krakker, Joe	USFWS	Biology Fish
Kronemann, Loren	NPT	Biology Wildlife
Kucera, Paul	NPT	Biology Fish
Larson, Ed	NPT	Biology Fish
Larson, Jessica	IDWR	GIS / Water Planning
Lawrence, Keith	NPT	Biology Wildlife
Leitch, Joe	Lewis County Commissioner	Local Government
Lewis, Reed	Idaho Geological Survey	Geology
Lloyd, Rebecca	NPT	Engineer Environmental
Lozar, Ed	CNF	GIS/database
Macfarlane, Gary	Friends of the Clearwater	Range Ecology
Maiolie, Melo	IDFG	Biology Fish
McCool, Don	USDA Research	Agriculture

Name	Agency	Specialty
McGowan, Felix	NPT	Biology
McKnight, Bob	**IDL**	**Management**
McRoberts, Heidi	NPT	Biology Aquatic
Miles, Aaron	NPT	Forestry
Miller, Bill	**USFWS**	**Biology Fish**
Mitchell, Victoria	USGS	Geology
Morgan, Gail	NPT	Biology Wildlife
Morse, Tony	IDWR	Geology/GIS
Moser, Brian	**Potlatch Corp**	**Biology Wildlife**
Murphy, Pat	CNF	Biology Fish
Papanicolaou, Thanos	WSU	Hydrology
Paradis, Wayne	NPNF	Biology Fish
Parsons, Russ	UI Landscape Dynamics Lab	GIS
Peppersack, Jeff	IDWR	Water Rights
Rabe, Craig	Ecovista	Biology Aquatic
Rabe, Fred	Consultant	Biology Aquatic
Rasmussen, Lynn	NRCS	Agriculture
Rieman, Bruce	USFS-RMRS	Biology Fish
Ries, Bob	NOAA	Biology Aquatic
Russell, Scott	NPNT	Biology Fish
Saul, Darin	Ecovista	Ecology
Schriever, Ed	IDFG	Biology Fish
Scott, Mike	UI Landscape Dynamics Lab	Spatial Ecology
Servheen, Gregg	**IDFG**	**Biology Wildlife**
Somma, Angela	NOAA	Biology Fish
Sondenaa, Angela	NPT	Biology Wildlife/Botany
Spinazola, Joe	Bureau of Reclamation	Planner
Sprague, Sherman	NPT	Biology Fish
Statler, Dave	NPT	Biology Fish
Stinson, Ken	**LSWCD**	**Management**
Storrar, Ann	NPT	Water Resources
Svancara, Leona	UI Landscape Dynamics Lab	GIS
Taylor, Emmit	NPT	Engineer
Ulmer, Lewis	**Idaho County Commissioner**	**County Government**
Villavicencio, Adam	NPT	Conservation Enforcement
Weigel, Dana	BoR	Biology Fish
Yetter, Dick	NRCS	Biology Fish

2 Overview of the Subbasin Assessment

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 – Assessment Chapter 3**. This chapter 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 – Assessment Chapter 4**. This chapter 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 – Assessment Chapter 5**. This chapter 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 – Assessment Chapter 6**. This chapter identifies the location, quality, and productivity of habitat for focal anadromous and resident fishes in the subbasin.
- **Fishery Resources – Assessment Chapter 7**. This chapter 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 – Assessment Chapter 8**. This chapter describes the development of Potential Management Units (PMUs) for the subbasin. PMUs are groups of 6th 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 Overview of the Inventory

The Clearwater Subbasin Inventory is provided under separate cover as Volume 2 and presents information on existing activities, projects, and programs underway in the subbasin. The inventory does not include artificial production activities in the Clearwater because artificial production Review and Evaluations (APRE) and Hatchery Genetic Management Plans (HGMP) were in draft form and being edited when the Clearwater Subbasin Plan was being completed. To address these and other related issues Component Problem 3 Objective C Strategy 1 calls for the organization of a subbasin hatchery production committee of fisheries managers to enhance communication and coordination. The inventory has eight components.

- **Introduction – Inventory Chapter 1**
- **Management Programs and Policies – Inventory Chapter 2**. This chapter describes agency project funding programs and existing policies affecting resource management.
- **Existing Management Plans – Inventory Chapter 3**. Information presented here highlights some of the most recent or relevant plans guiding land and resource management in the Clearwater subbasin.
- **Watershed Assessments, Watershed Scale Plans, Biological Assessments, and TMDLs – Inventory Chapter 4**. Information in this chapter is focused on a finer scale watershed level than those described in Chapter 3 and are more closely related to project development. Four primary types of documents are listed: watershed scale assessments, watershed scale plans, biological assessments (ESA compliance documents), and TMDLs.
- **Planned Assessments – Inventory Chapter 5**. Table of assessments scheduled by various agencies in the Clearwater.
- **Existing, Past and Planned Project Efforts – Inventory Chapter 6**. This chapter is composed of three parts: inventory of restoration projects and research/monitoring/evaluation activities, review of the inventory reported by drainage, and a conclusion section. The inventory was compiled through survey, telephone and in-person interviews with agencies staff throughout the subbasin. The amount of information contained in the inventory and the way it is presented precludes convenient hard copy duplication. Instead, the Inventory Appendix found on CD is an excel spreadsheet of the project inventory that can be manipulated by planners.
- **Research, Monitoring, and Evaluation Activities – Inventory Chapter 7**. This chapter presents narrative summaries of these activities that are usually applied on a larger scale than projects contained in the Inventory Appendix.
- **References – Inventory Chapter 8**

4 Clearwater Subbasin Management Plan

4.1 Vision Statement[2]

The vision statement for the Clearwater subbasin was developed by the Clearwater PAC during the Spring of 2002. The vision describes the desired future condition of the subbasin. It is qualitative and reflects the policies, legal requirements and local conditions, values and priorities of the subbasin. The vision provides guidance for implementing actions in the future, and frames the biological objectives and strategies for the subbasin. The vision presents a general vision of the future of the subbasin that is both ideal and, at the same time, practical and attainable within the span of a couple decades.

4.1.1 Vision for the Clearwater Subbasin

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.

Guiding Principles

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 and abundance 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 diagnosing biological problems, for designing and prioritizing projects and for monitoring and evaluation to guide improving management to better achieve objectives.

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

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

4.2 Hypotheses, Problems, 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.

The various components (working hypothesis, problems, objectives and strategies) of the Clearwater Subbasin Management Plan described in this section have been developed from information presented in the Clearwater Subbasin Assessment. References to information contained in other volumes or sections of the Management Plan are provided where applicable to aid readers in finding more detailed information regarding the hypotheses, objectives and strategies.

Although the Problems, 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 of the subbasin 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.

4.2.1 Working Hypothesis

As defined by the Council, the working hypothesis summarizes the scientifically-based understanding of the subbasin when the management plan is developed, and begins to bridge the gap between science and strategies (Council 2001). The following working hypothesis is based on information and findings presented in the subbasin assessment, thereby summarizing the available science and setting the stage for development of the management plan. The working hypothesis is subsequently broken into various problem statements under which objectives and strategies are organized, thereby providing a linkage between science and strategies presented within this plan.

> 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 (See Assessment Chapters 5, 6, and 8 for species discussions). 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 (See Assessment Section 8.3.1), and by in-subbasin factors related to habitat quantity, quality, complexity and connectivity (See Assessment Sections 8.3.2 through 8.3.6). 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 (See Assessment Section 8.2). 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 (See Assessment Sections 8.1.1 through 8.1.4 and 8.2), 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 (See Assessment Sections 8.3.2 through 8.3.6). Impacts of Dworshak Dam operations to both resident and anadromous fish species (See Assessment Sections 7.1.1, 7.1.2, 8.3.1 and 8.3.2) can be lessened by modification of operations to better combine economic, biologic, and flood control needs with those of fish and people.

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 (See Assessment Sections 6.3, 6.4 and 6.7 for species specific discussions). 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 (See Assessment Sections 5.9.3, 6.7.1, and 6.7.2). 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 (See Assessment Sections 6.2, 6.7.9, 7.2 for discussion describing relationships of anadromous fish and other 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 (described in the Subbasin Inventory) 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.

4.2.2 Problem Statements, Objectives, and Strategies

The following is a list of problem statements with associated objectives and strategies derived from the above working hypothesis. Problem statements, objectives and strategies are grouped for organizational purposes as "Biological" "Environmental" or "Socioeconomic", although the three groups are intrinsically linked. "Biological" problems, 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, problem statements, objectives, and strategies aimed at improving plant and wildlife populations are addressed through habitat management, and are therefore addressed as "Environmental." The "Socioeconomic" problem statement acknowledges the importance of the human component in successfully implementing the Clearwater Subbasin Management Plan. Addressing the "Socioeconomic" problem statement 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. 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. Although issues of scale and data availability precluded quantifying many objectives in this plan, this plan is consistent with Section C-2 of the Council's Fish and Wildlife Program (Council 2000) which states that qualitative basin level objectives should become "*increasingly quantitative* and measurable at the province and subbasin levels."

Problem, objective and strategy statements in this plan are strongly tied to information presented in the subbasin assessment, most notably the limiting factors information presented in Assessment Sections 5.9, 6.7 and 8.3. Problem statements presented below summarize issues identified in the subbasin assessment as impacting fish and wildlife populations. Objective statements are formulated in direct response to individual factors identified as limiting to fish and wildlife species in Assessment Sections 5.9, 6.7 and 8.3.2. Essentially, one or more objective statements were designed to address each identified limiting factor. Additional objective statements were developed to address data or information gaps which currently inhibit successful management or restoration efforts. Strategies were developed by the Technical Advisory Committees using information from the assessment, existing restoration and management plans and best professional judgment.

Problem 1: Out of subbasin factors are primary in limiting adult recruitment in the Clearwater subbasin (See Assessment Section 8.3.1).

A. Objective: Increase the number of naturally spawning adults to achieve goals in Table 3 within 24 years (timeline is consistent with the Council's Fish and Wildlife Program). This should amount to 4-6% SAR for spring-summer chinook, 3% for fall chinook, and 4% for steelhead as measured at Lower Granite Dam, within next 24 years.

1. Strategy: Participate in province and basin-wide coordinated studies and water management forums 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 basin-wide environmental effects. Work with other entities to ameliorate and mitigate limiting factors (See Section 3.4.1 of this volume, proposals II-4, VIII-1 and VIII-3).
2. Strategy: Define and establish anadromous index stocks within the Clearwater subbasin (comparable to existing Snake River index stocks) to evaluate Clearwater specific adult abundance, 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 (See Section 3.4.1 of this volume, proposal IV-2).
3. Strategy: Improve flows and temperatures to increase 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 (See Section 3.4.1 of this volume, proposals II-1, II-4, and VIII-3).
4. Progress will be evaluated at least every 2 generations.

Discussion: Out-of-subbasin factors including estuarine and ocean conditions, hydropower 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 (See Assessment Section 8.3.1). Out-of-subbasin work combined with in-subbasin work is needed to achieve goals in Table 3 and the SARs listed in this objective. Achieving these SARs for anadromous species will reflect progress made towards improving out-of-basin conditions. Increases in both anadromous adult escapement and habitat carrying capacity will be required to achieve anadromous fish objectives set forth in Table 3 and in this objective. Habitat carrying capacity and fish survival have been reduced in the

subbasin by land management activities which impact hydrology, sedimentation, habitat distribution and complexity, and water quality (CBFWA 1999) although it is widely understood that the present habitat capacity is underutilized. To achieve the extensive rebuilding of stocks called for in this plan, it will be necessary to improve both out-of-subbasin and in-subbasin conditions. The interaction of out-of-subbasin effects with subbasin restoration efforts will require coordination and cooperation in province and basin-wide efforts to address problems impacting Clearwater subbasin fish stocks. Improvement of out-of-subbasin conditions using resources in the Clearwater subbasin (e.g. Dworshak operations) will provide benefits to stocks from the Clearwater subbasin and elsewhere.

Establishment of index stocks is necessary to allow for long term monitoring of anadromous population abundance trends applicable to the Clearwater subbasin (including escapement, life stage specific survival, etc…). Existing Snake River index stocks do not provide life stage specific information applicable to stocks within the Clearwater subbasin, where B-run steelhead are widely distributed, and wild spring chinook runs have been lost (existing natural runs are comprised of natural and reintroduced hatchery stocks). Life stage specific information relevant specifically to Clearwater anadromous fish populations is necessary for their successful management.

Table 3. Anadromous adult return objectives for the Clearwater subbasin[1].

Species	Goals	Long-term Return[2]	Natural Spawning Component[3]	Hatchery Component[4]		Harvest Component
				Broodstock Need	Rack Return	
Spring Chinook	Future	60,000[5]	∞10,000	5,000	Undefined	45,000[6]
	Existing Condition	=11, 802	1,832[7]	4,800[8]	4,311[9]	5,170[10]
Fall Chinook	Future	50,000	Up to 10,000	5,000	Undefined	Up to 35,000
	Existing Condition	477[11]	1,019[12]	1,300[13]	0	0
Coho[14]	Future	14,000	Undefined	1,650	Undefined	Undefined
	Existing Condition	512[15]	52[16]	Undefined	339[17]	0
B-run Steelhead[18]	Future	42,000-91,000	∞12,000	5,000	Undefined	25,000-74,000
	Existing Condition	=16, 642	Unknown	4,000[19]	5,520[20]	12,642[21]
A-run Steelhead	Future	5, 900-10,000[22]	4,900[23]	0	0	1,000
	Existing Condition	Unknown	Unknown	0	0	0
Lamprey[24]	Future	10,000-20,000	Unknown	Undefined	Undefined	Undefined
	Existing Condition	Unknown	Unknown	0	0	0
Sturgeon[25]	Future	Undefined	Undefined	Undefined	Undefined	Undefined
	Existing Condition	Unknown	Unknown	0	0	0

[1] Goals are derived from various management plans as described in Appendix A, Table 8 of this plan and do not imply consensus by all management agencies. This table merely gives direction to managers who must workout the restoration and recovery of each specie and population over time through implementation of the plan.

[2] Clearwater River Subbasin Production Plan 1990. Appendix A, Table 8 of this plan provides the opinions of various management documents as to what the long-term return goal should be. Most values displayed here were derived from the Tribal Recovery Plan, CRITFC (1996).

[3] Intensive chinook spawning grounds redd count data from 24 streams from 1994-2002.

[4] Total rack returns for hatchery broodstock and adult outplants to selected streams.

[5] Adult return objectives are 9,135 for Dworshak National Fish Hatchery and 11,915 for Clearwater Fish Hatchery (Lower snake River Compensation Plan), 3,000 Kooskia National Fish Hatchery (U.S. Fish and Wildlife Service), and 1,500 Nez Perce Tribal Hatchery for a total 25,550 hatchery adult chinook. While these are numerical goals, actual recovery levels may vary.

[6] The harvest component was derived from utilization objectives developed for the 1990 Clearwater River Subbasin Production Plan wherein planners worked with a Public Advisory Committee to derive long-term objectives for non-tribal utilization with an equal share subsequently added for tribal utilization.

[7] Intensive spawning ground redd count data from 24 streams from 1994-2002 (comparable years from 3 different sources); using a 2.31 fish/redd expansion rate from PATH (Beamesderfer, et al. 1998); total adults were summed for all streams by individual year and then an average taken for 1994-2002.

[8] Broodstock estimated for Dworshak (1200), Kooskia (700), Clearwater (1,800) and Nez Perce Tribal (528) hatcheries to meet both on station and satellite releases within the subbasin; total estimate 4,756 adults at 1:1 male to female ratio.

[9] Average hatchery return, all Clearwater drainage weirs and hatchery racks, 1994-2002.

[10] Idaho Department of Fish and Game Harvest reports 1994-2002 for sport harvest of hatchery chinook and Nez Perce Tribe unpublished creel census data for tribal harvest. Total sport and tribal harvest was summed by individual year in which seasons were held between 1994-2002, and then an average taken. Value is a minimum as not all Clearwater drainage tribal harvest is recorded.

[11] Redd count data expansion 1999-2002 (NPT- unpublished data).

[12] Intensive spawning ground redd count data from the NPT Clearwater river from 1994-2002 (comparable to spring chinook time series); uses a 6.13 fish/redd average number from the Snake River calculated over a 10-year period (Arnsberg – unpublished data); total adults were estimated by year and then averaged for 1994-2002.

[13] Broodstock estimated to provide NPTH production of 1.4 million Age-0 smolts and FCAP production of 150,000 Age-1 and 500,000 Age-0 smolts within the subbasin. Survival/mortality factors can be found in the AOP production documents. Current broodstock comes from Lyons Ferry Hatchery and Lower Granite Dam. Future broodstock sources could include capture at NPTH sites in addition to captures at the dam and Lyons Ferry.

[14] Nez Perce Tribe's Clearwater Coho Restoration Management Plan is currently being developed and will scope ranges to allow management of this population.

[15] Average number of coho recognized at Lower Granite Dam from 1997 through October 24,2003 (NPT unpublished data).

[16] Redd count expansion for 2001-2002 from coho M&E by NPT – unpublished data.

[17] A 4-year average for coho broodstock collected in the subbasin from 1999-2002; rack returns have ranged from 45 to 635 fish, a composite of females, males and jacks.

[18] There is agency concern regarding the accuracy of this future management and harvest goal; the current artificial adult goal is 34,000 for Dworshak and Clearwater hatcheries combined; TAC (1985) estimated wild B-run escapement at 10,000 with 80% designated for the Clearwater River; therefore the future B-run escapement goal for both hatchery and wild may range from 42,000 upwards to 91,000. Harvest goal estimates differ similarly ranging from 25,000-74,000. Infinite detail as to how this difference will be achieved is not explained in this plan but must be worked out after implementation of the plan.

[19] Steelhead broodstock estimate for Clearwater and Dworshak Hatchery releases in the Clearwater basin.

[20] Average hatchery return, all Clearwater drainage weirs and hatchery racks, 1987-2003.

[21] Idaho Department of Fish and Game Harvest reports 1987-2002 for sport harvest of hatchery steelhead and Nez Perce Tribe unpublished creel census data for tribal harvest. Total sport and tribal harvest was summed by individual year and then an average taken for 1987-2002.

[22] Managers do not agree on the future population size; they do agree on a range estimate of 5,900 to 10,000 until better information is obtained on actual population size potentials. NPT Fisheries staff estimate is higher based on professional opinion after inventories from streams in 1980's.

[23] NOAA Interim abundance goal; dependent on which tributaries are included in the estimate; Tom Cooney for further discussion.

[24] Lamprey populations are not yet determined; future 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; Appendix A, Table 8 identifies an Interim abundance goal of 10,000 based on 1960's counts of 30,000 at Snake River dams.

[25] Some managers believe sturgeon once played a role in the anadromous system of the Clearwater but no history exists; research has been ongoing since 1996 and a Benefit Risk Assessment Team 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.

Problem 2: Anadromous fish production is limited by habitat quantity, quality and connectivity in portions of the subbasin.

B. Objective: Increase anadromous fish productivity and production, and life stage specific survival through habitat improvement.

1. Strategy: Identify and prioritize primary limiting factors in each PMU by anadromous species life stage. Use the general and aquatic issues delineated and prioritized in a spatially explicit manner in Section 4.4 of this volume as the first iteration of this prioritization and expand and improve as possible. Areas should be identified for protection as well as restoration.
2. Strategy: Evaluate alternative habitat treatments and expected outcomes to address limiting factors in each PMU by species.
3. Strategy: Establish a set of index streams stratified by PMUs for monitoring. These streams should be representative of the area in which they occur and should not be confused with reference streams. Utilize existing GPM and other data where possible (See Section 3.4.1 of this volume, proposal IV-2;
4. Strategy: Identify and develop indices to evaluate biological response(s) to habitat improvement projects, using appropriate fish production models or empirical data to link the developed index to fish production potential (See Section 3.4.1 of this volume, proposals I-3, II-4, IV-2, VII-1, and VIII-3).
5. Strategy: Implement projects following prioritization developed in Strategy 1 and 2. Coordinate with implementation of strategies and actions delineated under environmental strategies section below.
6. Strategy: Improve habitat conditions in the lower North Fork Clearwater and lower Clearwater rivers through application of integrated rule curves and modified operational criteria at Dworshak Dam. Use the Dworshak Operation Plan to assist in guiding this effort (IDWR 2000).
7. Strategy: Monitor and evaluate habitat improvement projects. Use indices developed in Strategy 4 to monitor the effectiveness of habitat improvement efforts to provide biological benefits. (See Section 3.4.1 of this volume, proposal IV-2). Integrate results and other new information into the process by adapting management to reflect new information.

Discussion: The natural production areas for anadromous fish species within the Clearwater subbasin are currently underseeded as a result of downriver conditions in the migration corridor, estuary and ocean (See Assessment Section 8.3.1). However, attainment of goals presented in Table 3 will require improvements in downriver conditions as well as habitat productivity within the Clearwater subbasin.

The interconnectedness between the productivity of anadromous species and the condition of anadromous habitats is implicit – the condition of one is essentially a

reflection of the condition of the other. It is based on this premise that consideration of habitat improvement is included under 'Biological' objectives in this plan. Specific anadromous species habitat problem and strategy statements are further delineated as part of 'Environmental' objectives and strategies listed below.

Based on a thorough review of existing data, it is currently not possible to quantitatively establish, with any degree of accuracy, life stage specific determinations of survival, productivity and production for anadromous species in the Clearwater subbasin. It is reasonable to assume, however, that anadromous production/productivity would improve given an improvement in the condition of the habitat (See Assessment Section 7.1), and that these improvements can only occur with a reduction in impacts of limiting factors (defined in Assessment Section 8.3).

The use of the general and aquatic limiting factors defined in Section 4.4 of the assessment provides us with an initial starting point for the identification and treatment of problems affecting anadromous populations throughout the Clearwater. Treatments may range from fine scale efforts designed to provide immediate benefits, such as identification and removal of passage barriers (refer to Assessment Section 8.3.5), to broad scale efforts designed to provide long-term benefits, such as sediment amelioration in the lower Clearwater (refer to Assessment Section 4.6).

The most effective way to determine the degree to which the productivity of a certain life history stage of anadromous salmonid is being limited is to conduct spatially explicit examinations of respective populations, stratified by habitat types sharing common themes. The establishment of PMU representative index streams and their successive monitoring would facilitate this need by providing researchers with requisite life-stage specific survival information, which would then allow for focused and effective treatment of problems as well as baseline information against which restoration success can be assessed.

Problem 3: Management of hatchery and natural production are not adequately integrated to meet mitigation, restoration, harvest and recovery goals. (See Assessment Sections 8.1 and 8.2 for information about ongoing hatchery practices and existing knowledge of hatchery/wild interactions within and between species).

C. Objective: Develop an integrated management plan to optimize the use of hatchery fish to meet recovery and harvest objectives.

1. Strategy: Increase communication and coordination--organize a subbasin hatchery production committee of fisheries managers to enhance communication and coordination.
2. Strategy: Continue to develop stock specific knowledge of interactions between hatchery and wild fish (See Section 3.4.1 of this volume, proposal V-2).
3. Strategy: Increase hatchery effectiveness--develop hatchery fish stocking and marking guidelines for all life stages to optimize the use of hatchery fish (See Section 3.4.1 of this volume, proposals V-1, V-2, VI-2, VII-2, VIII-4, VIII-5, and VIII-6).

Discussion: The development of an integrated management plan will complement objectives set forth in APREs and HGMPs, but will be written so as to collectively optimize hatchery production to meet recovery and harvest goals. The HGMPs and APREs that are currently being developed for the Clearwater subbasin are hatchery and/or species specific, and are therefore unique from one another. Upon five years of their completion (most APREs and HGMPs are in their final draft iterations), a planning committee and action team will be convened and initiate the drafting of an integrated management plan designed to unite the information contained in the APREs and HGMPs into a single, subbasin-wide restoration plan.

The first step will be to develop a planning committee and action team comprised of hatchery managers and fisheries management biologists. These groups will collaborate and work towards the development of a vision statement, identification of critical factors, and action strategies needed towards the attainment of the goal of optimizing hatchery production, at the subbasin scale, to meet recovery and harvest goals.

In the interim, it will be necessary to further our knowledge of specific hatchery stocks and their potential interactions with wild fish. Hatchery supplementation of wild fish stocks has the potential to adversely impact the genetic or biological integrity of existing stocks (Reisenbichler and Rubin 1999; Reisenbichler et al. 2002; Rubin and Reisenbichler 2002; Busby et al. 1996; Evans et al. 1997; USFWS and NPT 1995). Interactions of hatchery and wild anadromous fish stocks in the Clearwater subbasin have been investigated and may have negative impacts to wild stocks (USFWS and NPT 1995 and 1997). However, such negative interactions have not been fully evaluated in the Clearwater subbasin. Potential impacts include 1) predation; 2) competition; 3) adverse behavioral interactions; 4) disease transmission; 5) alteration of the gene pool; (6) harvest and/or (7) facility operation and maintenance. Obtaining a better understanding of where hatchery fish may be interbreeding with wild fish, or where hatchery fish are competing for the same resources used by wild fish, will provide the management and action teams with critical information needed to draft the integrated management plan (See Assessment Sections 8.1 and 8.2 for information about affected species and hatchery practices).

The Clearwater subbasin IMP will be an important tool for optimizing hatchery effectiveness. As discussed in Section 8.2, hatchery programs run by the IDFG, Council, NPT, and USFWS each have a specific intent. Some of the hatcheries are operated for supplementation, some for harvest/mitigation, while others are designed to operate for reintroduction purposes. And while each program has its merit, the division of effort is not conducive towards the overarching achievement of subbasin- and basin-wide recovery and harvest goals. A primary intent of the IMP would therefore be to develop a common set of stocking guidelines for all life stages so that hatchery effectiveness will be optimized.

D. Objective: Utilize a mix of hatchery and natural production strategies for native, localized, and reintroduced populations to meet subbasin goals delineated in Table 3 within 25 years.

1. Strategy: Maximize hatchery effectiveness in the subbasin--continue existing and/or implement innovative hatchery production strategies in appropriate areas to support fisheries, natural production augmentation and rebuilding, reintroduction, and research. See Assessment Sections 8.1 and 8.2 for information about ongoing hatchery practices. See Section 3.4.1 of this volume, proposals V-1, V-2, VI-2, VII-2, VIII-4, VIII-5, and VIII-6 for related RM&E proposals.
2. Strategy: Apply safety net hatchery intervention based on extinction risk analysis and benefit risk assessments.
3. Strategy: Implement artificial propagation measures and continue existing natural production strategies.
4. Strategy: Monitor and evaluate effectiveness of implementation of hatchery and natural production strategies.
5. Strategy: Modify Strategy 1 as necessary based on information provided by Strategy 3 and other new information.

Discussion: In an effort to meet adult return management objectives identified in Table 3, a mix of artificial propagation and natural production measures will be undertaken. Implementation of artificial propagation measures, habitat restoration actions, improved mainstem passage and survival, and harvest management strategies will form the integrated approach to improve anadromous fish returns to the Clearwater River subbasin. The application of artificial propagation measures are intended to realize anadromous fish restoration, recovery objectives, and harvest goals in Table 3. Effectiveness of the implemented artificial propagation measures will be assessed through monitoring and evaluation to provide information relative to numerical goals and objectives and will guide adaptive management of the program.

Currently, extinction risk analyses are being performed under the Safety Net Artificial Propagation Project to identify anadromous fish populations at serious risk of extirpation. Implementation of safety net hatchery intervention would be viewed as a priority if the extinction risk and benefit risk analyses identified that hatchery intervention was necessary to prevent extirpation of a threatened species under the ESA.

Coordination of artificial propagation measures would occur with the appropriate planning processes currently underway such as U.S. v. Oregon, HGMP, APRE, and management planning identified in Objective 3C.

Problem 4: Long-term persistence and abundance of native resident fish species within the Clearwater subbasin is threatened by genetic introgression, loss of fluvial population components, genetic interchange, population connectivity, and habitat quality and quantity (See Assessment Sections 8.1.5 through 8.1.9 and 8.3).

E. Objective: Evaluate needs and opportunities to increase native resident populations of westslope cutthroat and bull trout throughout the subbasin by 2005 (See Assessment Sections 8.1.6 and 8.1.7 for species discussions; See Section 3.4.1 of this volume, proposals III-1, III-2, IV-2, V-2, VI-1, VI-5, and VII-1 for related RM&E needs).

1. Strategy: Refine knowledge of limiting factors and restoration opportunities--conduct subbasin-wide assessment of native resident fish populations to delineate areas of probable impacts and opportunities for restoration or enhancement (See Section 3.4.1 of this volume, proposal VI-1).
2. Strategy: Prioritize opportunities for protection and restoration. For this iteration, use the prioritization established in Section 4.4 of this volume.
3. Strategy: Repeat strategies 1 and 2 every 5 years, incorporating new monitoring, evaluation and research data.

Discussion: Native resident populations of westslope cutthroat and bull trout in the Clearwater are limited by temperature, sediment, watershed disturbance, exotics/genetic introgression, harvest, and in some cases, connectivity/passage (refer to Assessment Section 8.3.2). The identification and treatment of areas where these problems are most severe is currently occurring. Additional efforts are needed to ensure a proactive approach to preventing further losses of or declines in resident fish stocks or stock components (e.g. fluvial) within the subbasin, particularly in areas where anadromous fish runs have been lost. Continued data collection for resident species is necessary to refine the current knowledge base regarding resident species. Where possible, such efforts should be incorporated or coordinated with other efforts to maximize data collection efficiency. As additional information becomes available, protection and restoration efforts aimed at resident species should be adjusted in response.

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

1. Strategy: Manage impact of harvest on native resident populations. Maintain and adjust harvest regulations to control impacts as needed to improve native resident fish populations.
2. Strategy: Improve habitat conditions for native resident populations consistent with environmental objectives and strategies outlined in this management plan (see Problem Statement 7 below). Projects should be implemented following the prioritization develop in Objective E, Strategies 1-3.

3. Strategy: Evaluate the physical and biological response to habitat projects.

4. Provide research, monitoring and evaluation data to effort outlined in Objective E, Strategies 1-3. Revise program as required.

Discussion: The relative abundance and distribution of westslope cutthroat and bull trout populations in the Clearwater subbasin has been reduced from historic conditions. Data collected by IDFG indicate that the population of westslope cutthroat trout within the Selway River subbasin has experienced declines in the abundance of large fluvial individuals over the past two decades, while populations in the South Fork AU are classified as depressed through the majority of their range, primarily due to loss of fluvial population components. Bull trout throughout the Clearwater subbasin are most commonly designated as depressed where status information is available (See Assessment Sections 8.1.6 and 8.1.7).

The susceptibility of westslope cutthroat trout to angling pressure has contributed to population declines throughout much of their range (Behnke 1992). Angling pressure has also affected bull trout in the Clearwater, especially when they were historically considered to be a nuisance species (refer to Section 8.1.7). However, many populations have been shown to respond positively to restrictive angling regulations (Nez Perce National Forest 1998) with increased survival, abundance, and size (Bjornn and Johnson 1978, cited in Behnke 1992). Attainment of Objective F will require continuing to manage the impact of angler harvest on native resident populations, using annual monitoring to evaluate effectiveness.

Realization of increased westslope cutthroat and bull trout populations will also require an improvement in habitat conditions. Both species are limited by the current condition of their habitats (refer to Assessment Section 8.3.2) although cutthroat trout have greater flexibility in their requirements than do bull trout. Addressing the condition and function of cutthroat and bull trout habitat will therefore require a balance of protection and restoration efforts, but in the long term will allow populations to persist at greater densities and throughout a wider area.

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

1. Strategy: Determine extent of hybridization problems--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 (See Section 3.4.1 of this volume, proposal V-2).

2. Strategy: Prioritize protection and restoration opportunities. For this reiteration, use or integrate the prioritization established in Section 4.4 of this volume.

3. Strategy: Evaluate management options--evaluate the option of stocking only sterile rainbow trout in the upper and lower North Fork Clearwater

assessment units (especially Dworshak Reservoir) (See Section 3.4.1 of this volume, proposal VI-2). Evaluate the management option of using westslope cutthroat trout progeny from local native broodstock for fisheries mitigation and genetic conservation (See Section 3.4.1 of this volume, proposal VI-1). Evaluate feasibility of selective harvest to reduce the risk of introgression.

4. Strategy: Protect quality habitat and restore degraded habitat to promote natural distribution of native resident fish (in coordination with environmental objectives following priorities established under Strategy 2 and Objective E, Strategies 1-3.

5. Strategy: Monitor and evaluate effectiveness of activities implemented under Strategies 3 and 4. Integrate data into Strategies 1 and 2 and into Objective E. Revise strategies 3, and 4 if necessary based on new information.

Discussion: Hybridization with exotic trout is considered the greatest threat to native westslope cutthroat trout in northern Idaho and western Montana (Allendorf and Leary 1988, cited in Weigel 1997). Cutthroat x rainbow trout hybridization in the North Fork Clearwater has been identified as a factor worthy of additional investigation (refer to Assessment Section 8.1.6). The same may be true in other areas of the Clearwater subbasin, although preliminary investigations have not been conducted to evaluate the potential for such hybridization. Weigel and Statler (2001) indicated that genetic introgression with rainbow trout was detected in about 2/3 of the sites sampled in the North Fork Clearwater subbasin (1/3 low introgression, 1/3 moderate introgression). However, the lack of baseline genetic data on natural introgression of rainbow trout into populations of the North Fork Clearwater River, combined with the lack of understanding regarding the effect Dworshak Dam and the removal of the anadromous component has had on the degree of natural introgression in the North Fork Clearwater drainage warrants further study.

Treatments to address westslope cutthroat trout x rainbow trout hybridization problems are currently being investigated and/or proposed. Efforts currently underway include those implemented by the IDFG, which has taken steps to protect wild cutthroat trout via the stocking of only sterile rainbow trout in Dworshak Reservoir. It is estimated that program implementation and subsequent monitoring and evaluation will require at least 10 years.

H. Objective: Reduce and prevent impacts of brook trout on bull trout, including hybridization. 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 (See Assessment Sections 8.1.7 and 8.1.8 for discussion of bull and brook trout populations, respectively).

1. Strategy: Determine specific populations and areas impacted by hybridization problems--continue and expand ongoing distribution surveys of both brook and bull trout, including standardized genetic sampling to

determine levels of hybridization (See Section 3.4.1 of this volume, proposals V-2 and VI-5.

2. Strategy: Prioritize problems and projects. For this iteration, use or integrate the prioritization established in Section 4.4 of this volume and in Strategy E.
3. Strategy: Reduce brook trout impacts on bull trout—continue to implement ongoing projects and evaluate the effectiveness of brook trout removal efforts, including harvest regulations/incentives and brook trout removal and suppression projects in mountain lake and tributary areas where both species currently occur (See Section 3.4.1 of this volume, proposal VI-5).
4. Strategy: Investigate alternative measures to eliminate or reduce brook trout populations where they compete or potentially compete with bull trout. Evaluate with short and long-term cost effectiveness measures (See Section 3.4.1 of this volume, proposal VI-5).
5. Strategy: Prevent spread of exotic species--develop and test methods to prevent the spread of brook trout, thereby reducing the spread of impacts of hybridization on bull trout and other species (See Section 3.4.1 of this volume, proposal VI-5).
6. Monitor and evaluate outcomes of Strategies 3 and 5. Integrate data into next reiteration of Strategies 1, 2 and 4, along with other new data developed for objectives. Integrate data into Objective E. Revise strategies as necessary to reflect new information and repeat strategies for subsequent iterations.

Discussion: Competition between bull and brook trout (including, but not limited to hybridization) is currently a factor defined as limiting to bull trout populations within the Clearwater subbasin (See Assessment Section 8.3.2). Preliminary review of ongoing brook trout removal efforts have shown some potential, but will be costly if applied at the subbasin scale. Ongoing research and experimentation into alternative methods is necessary to find more cost-effective methods, or a combination of methods that will succeed in meeting long term objectives.

Existing data relative to bull x brook trout hybridization is incomplete, or simply does not exist, thereby precluding a scientifically-based determination of its extent and location throughout the Clearwater (refer to Assessment Section 8.1.7). Existing surveys are not proceeding at a rate to provide the necessary information. An additional problem is the lack of standardization in genetic sampling protocols used in the subbasin. Standardization would allow the various survey efforts to be integrated into a subbasin-wide assessment of these populations and problems of hybridization.

Problem 5: Dworshak reservoir operations and management impact important resident fisheries within the reservoir including kokanee, smallmouth bass, bull trout, rainbow trout, and westslope cutthroat (See Assessment Section 4.11 for background on the dam, 8.1.9 for discussion of resident fish in the reservoir, 8.3.2 (resident fish section) for discussion of Dworshak Reservoir operations and impacts to resident fisheries, and 8.1.7 for discussion of bull trout).

I. Objective: Maintain 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: Conduct studies to compare impacts of variable annual entrainment and harvest on recruitment rates of kokanee.
2. Strategy: Minimize annual entrainment rates of kokanee salmon from Dworshak Reservoir to achieve a minimum target of 50% annual age specific survival of kokanee less than 3 years old . Continue and improve current management strategies by utilizing existing 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 (See Section 3.4.1 of this volume, proposal VII-3).
3. Monitor and evaluate outcomes of management actions. Integrate new data and lessons into strategies for managing kokanee in Dworshak Reservoir. Revise Strategy 2 as necessary.

Discussion: Kokanee salmon fill a pelagic niche within many reservoir environments, are unique in their ability to build to high population numbers in this drawdown reservoir environment, and provide a highly desirable and popular sport fishery in Dworshak Reservoir. Kokanee are most commonly limited in the reservoir by indirect influences of water level fluctuations which impact reservoir productivity and available food sources. However in some years, the population's biggest limiting factor has been entrainment through Dworshak Dam; in the spring of 1996, Idaho Department of Fish and Game estimated that 1.3 million kokanee were entrained, potentially reducing the kokanee population in the reservoir by 95% (Assessment Section 8.3.2). The objective to achieve a 50% minimum target annual survival in reservoir is consistent with the IDFG 2001-2006 fisheries management plan (IDFG 2001). IDFG is currently researching the effectiveness of strobe lights in driving kokanee away from areas where they are susceptible to entrainment (see Inventory Appendix B on accompanying CD for descriptions of the IDFG research); these projects should continue. Research portions of these steps are also outlined as project VII-2 and VII-3 in Section 4.3.1 of this volume. It is believed that current research and management efforts aimed at reducing impacts on kokanee will benefit a suite of resident species which are similarly impacted by reservoir operations.

J. Objective: Maintain Dworshak Reservoir as bull trout habitat (See Section 3.4.1 of this volume, proposals VII-2).

1. Strategy: Implement monitoring and evaluation studies designed to collect information on bull trout distribution, timing, and usage of Dworshak Reservoir.
2. Strategy: Estimate annual population size of bull trout migrating to and from Dworshak Reservoir, and develop abundance trends over time (See Section 4.3.1 of this volume, proposals VI-1).
3. Strategy: Collect data to determine which operations are important limiting factors for bull trout in Dworshak Reservoir. If no important limiting factor is identified than cease this effort. If one or more are identified, then continue with the following steps.
4. Strategy: Identify and prioritize changes in facilities or operations to reduce impacts.
5. Strategy: Minimize impact of Dworshak operations on bull trout--modify facilities and operations to limit impacts.
6. Strategy: Monitor and evaluate bull trout population responses to changes in facilities and/or operations to determine success at reducing impacts from limiting factors. Repeat Strategies 4-7 revising strategies as necessary based on new information.

Discussion: Dworshak reservoir is part of the North Fork Clearwater unit, designated as one of 10 key watersheds for bull trout conservation (See Assessment Section 8.1.7). Spawner size in some tributaries of the North Fork Clearwater River suggest that some bull trout spend extensive amounts of time feeding in the reservoir (A. Espinosa, Espinosa Consulting, personal communication, 1999). Current research documents bull trout catches in Dworshak Reservoir, and through use of radio-tags, has documented their migration into headwater tributaries of the North Fork Clearwater River to spawn (Schriever and Schiff 2001) and return to the reservoir for overwintering. Entrainment was not identified in Clearwater assessment as a limiting factor for bull trout in the Lower Clearwater AU (See Assessment Section 8.3.2), although reservoir operations limit many species in the reservoir, directly (e.g. entrainment) or indirectly (e.g. reduced productivity; See Assessment Section 8.3.2). The same may apply to bull trout using the reservoir although specific information regarding this relationship is not currently available.

K. Objective: Evaluate the viability of using hatchery outplants to maintain harvestable sterile rainbow trout densities in Dworshak Reservoir (See Assessment Section 8.2.3 and Section 3.4.1 of this volume, proposals VI-2 and VI-3).

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: Consider alternative strategies towards more effective achievement of ACOE resident fish mitigation at Dworshak, including option of stocking progeny of native cutthroat broodstock from the NF Clearwater.
3. Strategy: Conduct annual creel surveys on Dworshak Reservoir to determine angler use, harvest, catch, and ability to meet goals of resident fishery.
4. Strategy: Estimate entrainment rates of stocked rainbow trout from Dworshak Reservoir.

Discussion: Nearly thirty years of effort have focused on developing and maintaining harvestable rainbow populations in Dworshak Reservoir (Assessment Table 59), with mixed results (Assessment Section 8.1.9). Since 2000, only sterile rainbow have been stocked under this program. Rainbow trout provide the majority of shoreline catch in the reservoir and in years of low kokanee abundance rainbow trout comprise the majority of consumptive fishing opportunities (Assessment Section 8.1.9). However, the relative cost and value of maintaining this fishery has not been fully investigated. These programs have been focused on meeting resident fish mitigation of 100k pounds of resident fish annually required as mitigation by the ACOE for Dworshak Dam. This objective focuses on gathering information to determine the importance, success and limiting factors to the rainbow trout stocks used in Dworshak Reservoir. Once a clearer picture of these issues has been developed, then adaptive management actions can be taken to maximize the effectiveness of the existing programs. See RM&E proposal VI-2 in Section 4.3.1 of this volume for additional discussion of information gathering related to this objective.

L. Objective: Maintain and improve in-reservoir resident fish habitat and fisheries. (See Assessment Section 8.1.9).

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).
2. Strategy: Monitor and evaluate the effects of Strategy 1 on the habitat conditions in Dworshak Reservoir. Modify activities in Strategy 1 as necessary based on new information.

Discussion: Dworshak Dam operations are directly or indirectly limiting to multiple fish species in the reservoir (see Assessment Sections 8.1.9 and 8.3.2). Operations are commonly used to increase flows and decrease temperatures in the Snake River corridor to benefit anadromous outmigrants. Due to the sometimes inverse relationship of benefits to in-reservoir versus downstream fish populations, consideration of integrated rule curves is necessary to maximize benefits to all species. This objective is related to Objective B, Strategy 6 and Objective L, Strategy 1, which also call for application and monitoring of the impacts of rule curves for the benefit of downriver fish populations.

Problem 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 (See Assessment Chapters 5 and 6 for presentation of available data related to terrestrial communities).

M. Objective: Increase understanding of the composition, population trends, and habitat requirements of the terrestrial communities of the Clearwater (See Section 3.4.2 of this volume, proposals IX-1).

1. Strategy: Collect data--develop a subbasin-wide survey program and database for terrestrial focal, ESA listed, neotropical migrant, and culturally important species.
2. Strategy: Increase documentation--support the efforts of the Idaho Conservation Data Center (CDC) to document the occurrence of rare species and work toward increased reporting of sightings (See Assessment Section 6.0 for an overview of inconsistency in reporting of rare species).
3. Strategy: Research life history requirements--continue to research the habitat requirements of the terrestrial species of the Clearwater subbasin, focus efforts on focal, ESA listed and culturally important species.

Discussion: Increasing the amount of data collection focused on terrestrial species will improve our understanding and ability to manage these species. Establishing a baseline understanding of current habitat conditions and population numbers will allow managers to evaluate the affects of future management activities and swiftly adapt them if necessary.

N. Objective: Evaluate and quantify wildlife losses associated with continued operation and secondary impacts of Dworshak Dam and reservoir (See Assessment Section 6.2; See Section 3.4.2 of this volume, proposal X-6).

1. Strategy: Assess impacts of Dworshak Dam on wildlife--develop a methodology to assess continued operational and secondary losses associated with Dworshak Dam including literature reviews, modeling, and/or data analysis.
2. Strategy: Assess impacts to wildlife from loss of anadromous stocks--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: Mitigate wildlife impacts related to Dworshak Dam--Develop a program to mitigate for operational and secondary wildlife losses in the Clearwater subbasin.

Discussion: The construction of Dworshak Dam inundated 16,970 acres of upland, riparian and riverine habitats. The loss of these habitats has impacted the many terrestrial species that depend on these habitats. Of particular note is the loss of approximately 15,000 acres of deer and elk winter range and the loss of representatives of the "refugium ecosystem" plant communities that are comprised of species most commonly found in coastal areas. In 1992, BPA purchased the Craig Mountain Wildlife Mitigation Area as partial mitigation for losses to wildlife and wildlife habitat incurred with the inundation of Dworshak dam. However, the operation of Dworshak Dam and reduced nutrient inputs into the North Fork system due to the loss of anadromous fish continue to impact the wildlife species of the area. This strategy seeks to quantify these losses so that they can be appropriately mitigated for.

Environmental

Problem 7: Water quantity and quality, connectivity, and habitat complexity are key environmental factors that limit the production of anadromous and resident fish species and aquatic wildlife (See Assessment Sections 8.3.2 through 8.3.6).

O. Objective Complete adequate flow designations for all anadromous fish bearing waterways by 2010

1. Strategy: Complete designation of adequate flow requirements where appropriate by 2017. Conduct appropriate consultation amongst local, state, tribal, federal, and other relevant agencies/entities to designate adequate flow requirements by 2010 (Assessment Section 4.8.1 provides an overview of existing minimum flow requirements).
2. Strategy: Determine need--Research adequate flows for specific life history and species composition. Identify problems and opportunities for improvement.
3. Strategy: Prioritize problems and activities for protection and restoration. Integrate information from Section 4.4. of this volume into the assessment.
4. Strategy: Restore adequate flows--where hydrographs have been altered (See Assessment Hydrology Sections 4.7.2 and 4.7.3), continue and expand efforts aimed at increasing base flows and restoring natural flow timing through riparian, floodplain and wetland enhancement, definition and establishment of adequate flow levels, and implementation of forest and agricultural BMPs.
5. Strategy: Cooperate with user groups--where hydrographs have been altered by high surface water withdrawls (See Assessment Section 4.8.1), work with user groups to decrease water withdrawls.
6. Strategy: Secure water rights--coordinate efforts with the Idaho Department of Water Resources to secure water rights designated to meet flows where necessary by 2017.
7. Strategy: Monitor and evaluate outcomes of Strategies 4, 5 and 6. Integrate new data with information from Strategy 7. Revise strategies 1-3 as necessary to reflect new information. Continue or repeat strategies 4-8 until all flows are adequate.

Discussion: Low flows or dewatering has been identifies as limiting to both anadromous and resident fish species in some portions of the Clearwater subbasin (see Assessment Section 8.2). Recommendation and/or licensing of minimum stream flows has been completed for most major waterways in the North Fork Clearwater River where anadromous fish are excluded; Establishment of minimum flows in anadromous fish bearing waterways has been less comprehensive (refer to Assessment Section 4.8.1). The most substantial licensed water rights dedicated to the maintenance of minimum instream flows for anadromous species occur on the Lochsa and Selway Rivers. Surface water

rights for minimum stream flows are also substantial at the head of the Middle Fork Clearwater River, the only other anadromous accessible stream segment in the Clearwater subbasin with licensed surface water rights designated for maintenance of minimum instream flows. Minimum instream flow requirements pertinent to anadromous waterways have been recommended and applied for on three additional stream segments in the Lower Clearwater AU (refer to Assessment Section 4.8.1).

The degree to which hydrograph alteration in the Clearwater subbasin is problematic to anadromous species is not well established. It is clear however, that further degradation of instream flows will not reverse the declining trend of anadromous salmonid populations, making it necessary to adopt the current recommendations for evaluation of additional minimum flow designations. Research will initiate by focusing on areas where natural hydrographs have been altered, and establishing the extent of impairment the reduced flows may be having upon various life history stages of anadromous salmonids.

P. Objective: Reduce number of artificially blocked streams by 2017 (See Assessment Section 8.3.5; See Section 3.4.1 of this volume, proposal III-2).

1. Strategy: Identify need--compile and evaluate a comprehensive database of existing and potential barriers to fish migration in the Clearwater subbasin by 2010.
2. Strategy: Prioritize barriers for removal or modification
3. Strategy: Remove or modify human-caused barriers--emphasize alteration/removal of unnatural barriers over natural barriers.
4. Strategy: Avoid introgression--where elimination of barriers may pose a high risk to the genetic make-up of upstream fish stocks, de-emphasize barrier removal or elimination until the risk of introgression is minimized or eliminated.
5. Strategy: Monitor and evaluate biological response resulting from Strategy 3 and 4. Integrate new data into Strategy 1 and 2. Modify strategies based on new information and repeat until artificial barriers have been removed.

Discussion: The degree to which connectivity limits fish migration and production within the Clearwater subbasin is thought to be under represented by existing data and reports. No data source exists which accurately documents known or potential barriers to fish migration within the Clearwater subbasin in a useable and widespread format. Particularly lacking are records of culvert conditions in relation to fish passage, which is thought to be a substantial issue throughout the Clearwater subbasin.

Upon the improvement and/or establishment of a fish passage database, known barriers will be prioritized for removal or alteration and decisions will be made to either replace structures with fish/aquatic species friendly crossings, or to remove crossing if it is no longer needed. Barrier modification will only occur upon the validation that it will not

negatively impact upstream populations. The effects of barrier removal/alteration will be evaluated through subsequent monitoring.

Q. Objective: Reduce water temperatures to levels meeting applicable water quality standards for life stage specific needs of anadromous and native resident fish, with an established upward trend in the number of stream miles meeting standards by 2017 (See Assessment Sections 4.9.1, 4.9.2, and 8.3.6; See Section 3.4.1 of this volume, proposal II-1 through II-4, X-1, X-3 and X-4).

1. Strategy: Identify and prioritize need--inventory and prioritize areas where temperature amelioration would most benefit various target species (See Assessment Sections 4.9.1, 4.9.2, and 8.3.6). Conduct habitat inventories throughout the Lower Clearwater assessment unit, placing emphasis on canopy closure/stream shading data collection (See Section 3.4.2 of this volume, proposal IX-1). Develop comprehensive water temperature database. Start with the prioritization established in Section 4.4 of this volume and in Strategy E. Prioritize problems, opportunities and areas. This prioritization will determine sequencing of activities in Strategies 2-4.
2. Strategy: Restore hydrologic functions related to temperature--identify and rehabilitate wetland and floodplain areas (See Assessment Sections 5.1, 5.2, 5.5.13 and 5.9.3 for existing information on wetlands and limiting factors; See Section 3.4.2 of this volume, proposal X-1 and X-3).
3. Strategy: Restore riparian functions related to temperature--continue efforts aimed at increasing streamside shading where streamside shading has been reduced by anthropogenic activities, This includes implementing forest and agricultural BMPs (See Section 3.4.2 of this volume, proposal X-4). Restore watershed functions impacting temperatures.
4. Strategy: Improve regulatory efforts--continue efforts to examine the need and/or feasibility of developing localized temperature standards applicable within the Clearwater subbasin (See Assessment Section 8.3.6; See Section 3.4.1 of this volume, proposal II-3).
5. Strategy: Identify additional problems--continue TMDLs, EAWSs, and other watershed scale assessments to define localized factors negatively influencing temperature regimes (See Appendix E for TMDL schedule; Refer to Subbasin Inventory for overview of relevant existing documents).
6. Strategy: Monitor and evaluate the results of all implementation strategies. Integrate data with other new information and revise assessment and priority strategies. Repeat implementation and monitoring and evaluation strategies until water temperature is no longer a problem in the subbasin.

Discussion: Excessive stream temperatures in various portions of the Clearwater subbasin are considered to be limiting factors to anadromous and native salmonid populations (refer to Section 8.3). More than eighteen percent of the total linear mileage of Clearwater streams and rivers were listed by IDEQ in 1998 as failing to meet their designated beneficial uses, or for exceeding state water quality criteria (refer to Assessment Section 4.9.2).

Prioritization of stream reaches for temperature amelioration is needed. 303d-listed reaches inhabited by multiple focal species, or those influencing habitats containing key species will direct restoration prioritization efforts. On-the-ground restoration efforts will focus on the rehabilitation of a naturally functioning thermal regime, which will entail addressing hydrologic function in riparian areas, wetland areas, and floodplains. Monitoring and evaluation of restoration efforts, including agricultural and forestry BMPs will ensure quality assurance/quality control and efficient use of resources.

It has been suggested for some systems in the Clearwater subbasin that temperature exceedances are a regular and natural occurrence and allow for all beneficial uses to be met due to local variations/adaptations (refer to Section 4.9.2). Continued effort should therefore be dedicated to the investigation and/or establishment of localized temperature standards to account for local variability in biological response to temperature conditions.

R. Objective: Develop an increased understanding of the thermal impacts of Dworshak Dam operations on life history characteristics of fall chinook salmon, other fishes (See Assessment Sections 4.9.1, 8.1.1, 8.3.2 and 9.1.1), and associated wildlife species (See Assessment Section 6.2 and 6.7.9) 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. Relate changes in temperatures due to dam operations to life history characteristics of benthos, fish, and associated wildlife species.
2. Strategy: Integrate this research with research, monitoring and evaluation activities and implementation strategies in Objective L and Objective B, Strategy 8.

Discussion: Dworshak Dam operations are commonly used to benefit salmonid outmigrants by increasing flows and decreasing temperatures in the Snake River corridor. Due to the relatively small size of the Clearwater River in relation to the Snake River, localized effects of these operations may be detrimental to native species using the lower North Fork Clearwater and Clearwater Rivers. Flow fluctuation, substantial reductions in temperature, and alteration of natural temperature regimes may all impact resident fish in the lower North Fork Clearwater and Clearwater Rivers. Wildlife species with strong ties to anadromous or resident fish populations (e.g. Bald Eagle) in these areas may also be negatively impacted.

Thorough review of existing data should be conducted to define impacts of dam operations on localized fish and wildlife populations. This is directly related to Objective

B, Strategy 6 and Objective L, Strategy 1, which apply and monitor the impacts of rule curves and operational modifications to upstream and downstream habitats.

S. 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: Identify problems and opportunities--continue development of TMDLs, EAWSs, and other watershed scale assessments designed to define localized sediment sources and opportunities to ameliorate impacts (See Appendix E for TMDL schedule; Refer to Subbasin Inventory for overview of relevant existing documents).
2. Strategy: Research ecosystem function--develop a coordinated sediment production, transport, and fate monitoring program within the subbasin (See Section 3.4.1 of this volume, proposal IV-1).
3. Strategy: Prioritize areas--inventory and prioritize areas where sediment reductions would be most beneficial to various target species (See Assessment Sections 4.6, 4.9, 7.1, 8.3.1 through 8.3.4, and Chapter 9). For this reiteration of subbasin planning, use or start with the prioritization in Section 4.4 of this volume.
4. Strategy: Reduce sediment--reduce sediment inputs by implementing practices that address problems from logging, mining, agriculture and other historic and current sediment producing activities.
5. Strategy: Monitor and evaluate results of all implementation activities. Integrate new data and information into Strategies 1-3. Revise and repeat implementation strategies until problem is adequately addressed.

Discussion: Sedimentation in the Clearwater is cited as a primary limiting factor affecting at least two, and as many as five, species in all assessment units (refer to Assessment Section 8.3.2). Instream sedimentation concerns are most widespread in the Lolo/Middle Fork AU, where an estimated 95% of the available stream miles used by spring chinook and 76% of stream miles used by steelhead are limited (refer to Assessment Section 8.3.3). Sedimentation also is problematic for anadromous and resident species throughout most of the Lower Clearwater and South Fork AUs (refer to Assessment Sections 8.3.2 and 8.3.3).

In an effort to address reach-specific issues, including sedimentation problems, watershed-scale assessments have been and are being developed. These finer-scale assessments are helpful in the definition of localized source areas and use reach-specific data to address problems and provide treatments. Also helpful are studies specifically designed to identify sediment production areas, track sediment movement, and estimate where sediment deposition will occur. By using a combination of these and other approaches, and establishing where sedimentation will cause the greatest ecologic impact, managers will be able to prioritize sediment abatement actions that will be most beneficial to subbasin resources.

Sediment abatement activities currently being implemented within the subbasin include road decommissioning, riparian fencing, forestry BMPs, agricultural BMPs. Program effectiveness is being monitored in some cases, but additional M&E efforts are needed to define effectiveness of various efforts and allow for adaptive management approaches.

T. 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 (See Assessment Sections 4.9.2, 6.1, 6.2, 6.7.9, 7.2, 8.3.1; See Section 3.4.2 of this volume, proposal I-1 and X-6).

1. Strategy: Inventory and map all potential anthropogenic nutrient inputs including wastewater treatment facilities, industrial sources, feedlots, and non-point sources. Define nutrient poor or rich stream reaches throughout the subbasin.
2. Strategy: Coordinate with and utilize TMDLs and other efforts to evaluate nutrient loads and allocations.
3. Strategy. Prioritize nutrient sources and problems for treatment. Integrate information in Section 4.4 into prioritization process.
4. Strategy: Target nutrient additions or reduction efforts accordingly to benefit aquatic and terrestrial species.
5. Strategy: Monitor and evaluate nutrient efforts. Integrate data and new information into effort. Refine strategies as needed.

Discussion: Portions of the Clearwater subbasin suffer from excessive nutrients, while other areas are thought to be nutrient deficient. Approximately 72% and 73% of the linear miles of stream channel in the Lower Clearwater AU and Lolo/Middle Fork AU (respectively) are listed by the state for high nutrient levels (refer to Assessment Section 4.9.2). Nutrient additions to these and other waterways in the Clearwater are most often transported via overland flows or surface erosion, and are for the most part indirect source inputs.

Point source discharges are not believed to present a substantial water quality issue within the Clearwater subbasin, with the exception of the Potlatch Corporation Mill located on the lower mainstem Clearwater River. Using the online Permit Compliance System (U.S. Environmental Protection Agency 1999), thirty-eight facilities within the Clearwater subbasin were identified as having NPDES identification numbers, and all are described as active (refer to Section 4.9.3 in the Assessment). However, only 30 had been issued NPDES permits at the time of this writing, and of those only the Dworshak National Fish Hatchery permit was defined as current.

Efforts to collect information on where streams or stream segments may be limited by excessive nutrients or where they may be limited due to nutrient deficiencies need to be increased. Current knowledge is largely based on the 303(d) list and TMDL process which focuses on defining areas of excessive nutrient input. The loss of marine derived nutrients due to diminished anadromous salmonid runs may impact both fish and wildlife

species (see Assessment Section 6.2), but such impacts are not clearly defined within the Clearwater subbasin. Upon the establishment of a broader knowledge base, it will be possible to further prioritize where nutrient abatement efforts should occur and/or where nutrient additions may be most beneficial. Monitoring and evaluation will be implemented for all such programs (See Section 3.4.2 of this volume, proposal I-1 and X-6).

U. 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 3) and fluvial stocks

1. Strategy: Identify the need—identify habitats that have been simplified to a degree detrimental to anadromous and resident populations.
2. Strategy: Follow existing plans--continue aquatic habitat improvement efforts consistent with existing federal, tribal, state, and local habitat improvement plans and guidelines (Refer to Subbasin Inventory for overview of relevant existing plans and guidelines).
3. Strategy: Prioritize actions--Prioritize problems and protection and restoration using the information generated by Strategies 1, 2 and 4 and using Section 4.4 of this volume as a starting point.
4. Strategy: Restore complexity--address priority problems with protection and restoration activities designed to promote development of more complex and diverse habitats through improved watershed condition and function. This will involve coordination of activities aimed at individual components (e.g. temperature and sediment).
5. Strategy: Restore ecosystem functions--identify and rehabilitate upland, wetland and floodplain areas (See Assessment Sections 5.1, 5.2, 5.5.13 and 5.9.3 for existing information on wetlands and limiting factors; See Section 3.4.2 of this volume, proposal X-1 and X-3).
6. Strategy: Develop a method to monitor biological response to habitat improvement (consistent with Problem 2, Objective B, Strategies 2-4).
7. Strategy: Monitor long-term effectiveness of habitat improvement efforts (as described for proposals throughout Section 3.4 of this volume). Modify strategies based on new information as necessary.

Discussion: Aquatic habitat conditions (including diversity and/or complexity components) are defined as limiting all focal species in at least some areas of the subbasin (see Assessment Sections 7.1 and 8.3). Improvement in habitat productivity within the subbasin is considered critical to attainment of goals for both anadromous (Table 3) and resident species. Accomplishment of this objective is reliant on extensive coordination of efforts described throughout this Plan (with special emphasis on Problem Statements 2, 4, and 7); The influence of upland activities on instream habitat conditions leaves this objective closely tied not only to those objectives aimed at aquatic issues, but also to those aimed at upland areas or terrestrial species (Problem Statements 8-17). This objective is not achievable by attainment of any single goal or objective defined in this

plan, but requires a combined and coordinated approach of efforts individually addressing individual components of habitat complexity or factors acting upon it.

Problem 8: The extensive loss and degradation of the prairie grassland habitats of the Lower Clearwater have negatively impacted numerous native plant and animal species dependent on these habitats.

V. Objective: Protect remaining native prairie remnants.

1. Strategy: Collect and map data--inventory and map existing prairie grassland remnants, building on the work of Weddell and Lichthardt (1998). (See Section 3.4.2 of this volume, proposal IX-1).
2. Strategy: Prioritize opportunities--give priority to larger remnants or those that contain rare species. Integrate information presented in Section 4.4 of this volume and the inventory of Strategy 1.
3. Strategy: Protect remnants--protect remaining native prairie grassland remnants through land acquisition, fee title acquisitions, conservation easements, or land exchanges.
4. .Strategy: Monitor and evaluate the effectiveness of protecting prairie remnants as a strategy for providing prairie grassland habitats and protecting prairie grassland dependent wildlife species. Integrate new information into Strategies 1 and 2 as part of next iteration of program.

Discussion: The aerial extent of grassland habitats native to the lower elevation areas of the subbasin has decreased the most of any vegetative community in the subbasin. Native bunchgrass habitat historically covered 15.7% of the subbasin. Estimates of current native grassland cover (which include both the rare prairie and more common canyon grassland habitats) range from 0.3% (ICBEMP) to 4% (GAP) of the subbasin (See Assessment Section 5.2). The loss and degradation of these habitats has negatively impacted numerous species including the focal species Jessica's aster, Palouse goldenweed, and broadfruit mariposa lily (See Assessment Sections 5.6.2, 5.6.3, 5.6.6, 6.2 and 6.7). Loss of grassland 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 (See Assessment Sections 6.5.1, 6.5.2, 5.7.1 and 6.5.4, respectively). Because remnants of native prairie grasslands are very rare they are of high protection priority. Preservation of relatively intact prairie grasslands will provide habitat for the many species that depend on them as well as preserving a template to guide restoration efforts aimed at expanding the extent of these habitats (See Objective W).

W. Objective: Restore 2000 acres of historic native prairie grassland habitat to natural conditions by 2017.

1. Strategy: Research prairie restoration methods--explore techniques for effectively restoring prairie habitats in coordination with the Palouse

Prairie Foundation and other interested landowners, agencies and organizations.

2. Identify and prioritize areas for prairie restoration. Integrate information from Objective V, Strategy 2 into process.
3. Strategy: Restore prairie habitats--actively improve or create native prairie habitats through noxious weed control, cultural practices and seeding. Encourage the use of native species in existing state, federal, and tribal habitat programs.
4. Strategy: Acquire and restore grasslands--continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore prairie and canyon grasslands. Develop new programs to acquire and restore prairie and canyon grasslands.
5. Monitor and evaluate the effectiveness of Strategies 3 and 4. Integrate new information into Strategies 1 and 2. Modify Strategies as necessary based on new information.

Discussion: Even prairie habitats that have not been outright converted to cultivated, or urban lands have been degraded through the introduction of exotic species, grazing practices, fragmentation etc. Restoring these habitats to a more natural state and building connections between habitat fragments will benefit the many terrestrial species that depend on this habitat type.

With current technologies the restoration of degraded grassland systems is expensive and time consuming. The terrestrial subcommittee selected the 2000 acre goal with these constraints in mind. However, they recognized that as new techniques for grassland restoration are developed this goal may need to be increased in future iterations of the plan.

Problem 9: Reductions in the extent of mature ponderosa pine habitats in the subbasin have negatively impacted the numerous wildlife species that utilize these habitats.

X. Objective: Protect mature ponderosa pine habitats.

1. Strategy: Collect and map data--inventory and map existing mature ponderosa pine habitats (See Section 3.4.2 of this volume, proposal IX-1).
2. Strategy: Prioritize ponderosa pine communities for protection--give priority to larger remnants and those with highest potential to be lost. Integrate information presented in Section 4.4 of this volume into prioritization process.
3. Strategy: Protect ponderosa pine communities--protect existing mature ponderosa pine communities through land purchase, fee title acquisitions, conservation easements, land exchanges or other strategies. Encourage the planting of ponderosa pine in existing state, federal and tribal reforestation efforts.

4. Strategy: Protect ponderosa pine communities--where appropriate to the habitat type, use prescribed burning and/or understory removal to protect mature stands from stand-replacing fire events (See Assessment Section 5.5.8).

5. Strategy: Continue effective efforts--continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore low elevation ponderosa pine forests. Develop new programs to acquire and restore mature ponderosa pine forests.

6. Strategy: Monitor and evaluate effectiveness of protection activities to reduce negative impacts to wildlife species. Integrate new information into Strategies 1 and 2. Modify implementation strategies as necessary.

Discussion: Coarse scale estimates indicate that ponderosa pine coverage in the Clearwater subbasin has declined by almost 500,000 acres since historic times (See Assessment Section 5.2). This loss is primarily a result of timber harvest, grazing, pressure conversion to agriculture, and encroachment by Douglas-fir and other conifers following fire suppression. Under historic fire regimes ponderosa pine stands were usually maintained in a late seral single layer structure.

Ponderosa pine needles, cones, buds, pollen, twigs, bark, seeds, and associated fungi and insects provide food for many species of birds and mammals. Ponderosa pine provides numerous species of birds and mammals with shelter at each stage of growth but the tree is part is particularly valuable in mature stands and as snags, where it provides spacious housing for numerous cavity dwelling species and valuable perch trees. Reductions in ponderosa pine habitats, has negatively impacted native focal wildlife species including the flammulated owl, goshawk, and the white-headed woodpecker (See Assessment Sections 5.5.8, 6.3.3, 6.3.9, 6.3.4, and 6.7.1).

Loss of mature ponderosa pine habitats has occurred primarily in the lower elevation forests of the subbasin, where ponderosa pine is the most common and development has been the most intense (See Assessment Section 5.5.8). Protection of mature stands of ponderosa pine in areas where the species was historically the community dominant will help to preserve ponderosa pine dependent wildlife.

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

1. Strategy: Identify and prioritize areas to develop into ponderosa pine communities. Integrate information developed in Objective X Strategies 1, 2 and 6 and information in Section 4.4 of this volume.

2. Strategy: Manage successional stages--where appropriate to the habitat type, use prescribed burning and selective thinning to encourage succession and the establishment of mature ponderosa pine communities (See Assessment Section 5.2, 5.3, and 5.5.8).

3. Strategy: Restore ponderosa pine communities--where historic ponderosa pine communities have been deforested, actively replant (See Assessment Section 5.2).
4. Monitor and evaluate the effectiveness of Strategies 2 and 3 at addressing Objective Y. Integrate new information to modify strategies 1-3 as necessary.

Discussion: As discussed in Objective X, timber harvest, grazing, land use conversion, and fire suppression have resulted in a substantial decline in the abundance of ponderosa pine forests in the subbasin. Management for the restoration of ponderosa pine to areas of historic dominance and encouragement of natural succession processes, will increase the amount of ponderosa pine habitats (and eventually mature ponderosa pine habitats) available to dependent wildlife. The 150,000 acre goal was selected because the terrestrial subcommittee felt it was small enough to be feasible within the current political, social and ecological context of the subbasin, but as 30% of the estimated loss of this habitat type since historic, was substantial enough to be biologically significant.

Problem 10: The loss of wetland and riparian habitats particularly in the Lower Clearwater AU, Lolo-Middle Fork, and South Fork AU has negatively impacted the numerous wildlife species that utilize these habitats.

Z. Objective: Protect all currently functioning wetlands.

1. Strategy: Prioritize restoration activities--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--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 effective activities--continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore wet meadow and wetland habitats. Develop new programs to acquire and restore wet meadow and wetland habitat.
4. Monitor and evaluate effort to protect wetlands. Integrate information into Strategy 1 and modifying activities under Strategy 2 and 3 as necessary based on new information.

Discussion: Wetlands cover only a small portion of the subbasin, but offer some of the most diverse and unique habitats available. Wetlands occur as small ponds filled by spring runoff, wet meadows, springs and seeps, bogs, small lakes, and riverine and streamside riparian areas. Many wetland communities in the subbasin have been degraded by livestock grazing, road development, landuse conversion, urban expansion,

and altered hydrologic regimes. This has negatively impacted numerous focal species including chinook salmon, steelhead, redband, cutthroat and bull trout, the harlequin duck, Townsend's big eared bat, fringed myotis, boreal toad and Coeur d' Alene salamander (See Assessment Sections 8.11, 8.12, 8.15, 8.16, 8.17, 6.3.6, 6.3.7, 6.3.8, 6.3.11 and 6.3.12, respectively. They also harbor unique plant species such as Clearwater phlox (*Phlox idahonis*), which is endemic to only a few wet meadows within the Clearwater subbasin.

AA. Objective: Restore 500 acres of historic wetlands to proper functioning condition by 2017.

1. Strategy: Identify areas for restoration--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 (See Assessment Sections 4.5, 5.2, 5.5.13, and 5.9 for related information).
2. Prioritize areas for restoration using information developed in Strategy 1 and information in Section 4.4 of this plan.
3. Strategy: Restore historic wetlands--restore identified historic wetland areas, with a minimum target size of 5 acres (See Assessment Sections 5.2 and 5.5.13; See Section 3.4.2 of this volume, proposals IX-1 and X-1).
4. Strategy: Restore existing wetlands--Improve wetland function and quality by controlling invasive species such as reed canary grass, purple loosestrife, water milfoil, and bullfrogs.
5. Monitor and evaluate wetland restoration. Integrate new information into Strategies 1 and 2. Modify Strategies 3 and 4 as necessary based on new information and priorities.

Discussion: Within the Clearwater subbasin, large expanses of wetland areas have been eliminated. The primary cause of this loss has been filling for agricultural use. Large wet meadow areas were converted to agricultural use in the Reubens, Craigmont, and Ferdinand areas. Many other wetland areas have been degraded through landuse and hydrologic changes, and the introduction of exotic species. Working to restore these areas will benefit numerous native species. The terrestrial subcommittee selected the 500 acre figure as a balance between biological significance and feasibility. This objective needs to be coordinated with Objective Z and with Objective U, Strategy 5, which also deal with wetlands.

BB. Objective: Protect and restore an additional 300 miles of riparian habitats by 2017.

1. Strategy: Identify and prioritize riparian habitats for protection and restoration. Use Section 4.4 of this volume to guide and spatially prioritize protection and restoration of riparian and wetland habitats and communities. Give highest priority to riparian habitats supporting

spawning and rearing for anadromous and native resident salmonids. Give priority to habitats identified as water quality limited during the TMDL process. (Refer to Subbasin Inventory for overview of TMDL documents completed to date; See Appendix E of this Plan for future TMDL development schedule).

2. Strategy: Protect and restore riparian habitats-- 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: Protect and restore riparian habitats—protect and restore riparian communities in agricultural lands through increased enrollment by landowners in the Continuous Conservation Reserve Program (CCRP; described in Subbasin Inventory Section 2.1).
4. Strategy: Increase stewardship and public knowledge--increase understanding of the importance of riparian habitat through education programs for both the general public and road maintenance personnel.
5. Strategy: Continue and develop effective programs--continue existing programs such as the Nez Perce Tribe Dworshak Wildlife Mitigation Program that work to acquire and restore riparian habitats. Develop new programs that work to acquire and restore riparian habitats.
6. Strategy: Monitor and evaluate efforts to protect and restore riparian habitats to address Objective BB. Integrate new information into Strategy 1 and modify implementation strategies as necessary.

Discussion: Available information on riparian condition and relative distribution/abundance of riparian habitats, although critical for fish recovery efforts, is largely addressed in terrestrial sections of the subbasin Assessment (See Assessment Sections 5.1, 5.2, 5.3, 5.5.13, 5.9.3). The organization allows for discussion of all vegetative communities (including riparian communities) in a uniform manner and location within the assessment and in no way implies a limited importance of riparian habitats to aquatic species.

Wetlands and riparian areas cover only a small portion of the subbasin but offer some of the most diverse and unique habitats available, critical for both aquatic and terrestrial species. GAP data shows slightly less than 2% of the subbasin currently constitutes wetland or riparian cover (Assessment Section 5.2). Loss or removal of riparian vegetation may lead to other changes which also impact aquatic and terrestrial resources including altered development of meanders, side channels, and attached wetlands that provide important habitat for both aquatic and terrestrial species (See Assessment Section 6.7.1).

Habitat degradation including loss or degradation of riparian habitats is considered a limiting factor for all focal aquatic species (See Assessment 7.3.2). Critical habitat as defined by NOAA Fisheries specifically includes riparian zones adjacent to waterways

used (or potentially used) by listed fish species (Assessment Section 6.1.1). The harlequin duck, Coeur d'Alene salamander, and fisher terrestrial focal species are closely associated with riparian areas and lotic environments. Changes to habitat components such as woody debris jams, vegetation, and/or hydrology are most likely to affect these species.

In some instances, riparian loss or degradation is addressed elsewhere in this plan specifically to achieve other objectives (e.g. temperature amelioration). Readers are referred to strategies addressing minimum flow concerns (Objective Q), temperature (Objective S) and livestock grazing (Objective GG). Strategies presented under these objectives also call for restoration of riparian condition for specific purposes (or in response to specific impacts), and are complimentary to those presented for this general riparian restoration objective.

Problem 11: The introduction of noxious weeds and nonnative plant species into the Clearwater subbasin has negatively impacted native terrestrial focal species.

CC. Objective: Protect the existing quality, quantity and diversity of native plant communities providing habitat to native wildlife species by preventing the introduction, reproduction, and spread of noxious weeds and invasive exotic plants into and within the subbasin (See Assessment Section 5.4; See Section 3.4.2 of this volume, proposal X-7).

1. Strategy: Identify and prioritize native plant communities for protection from exotic weeds. Integrate information from Section 4.4 of this plan. Prioritize by cost-effectiveness and expected biological response.
2. Strategy: Prevent reproduction--minimize ground disturbing activities in habitats highly susceptible to weed invasion.
3. Strategy: Prevent seed dispersal--encourage the use of weed free seeds and feeds.
4. Strategy: Prevent seed dispersal--develop and implement programs and policies designed to limit the transportation of weed seeds from vehicles and livestock
5. Strategy: Increase public participation--develop education and awareness programs in noxious weed identification, spread prevention and treatment.
6. Strategy: Prevent establishment--minimize establishment of new invaders by supporting early detection and eradication programs.
7. Strategy: Monitor and evaluate the effort to protect native plant communities from exotic plants. Integrate new information into Strategy 1 and modify implementation strategies as necessary.

Discussion: Introduced plants in the subbasin often out-compete native plant species and alter ecological processes, reducing habitat suitability for native fish and wildlife. Noxious weeds and other invasive plants have been identified as a factor limiting populations of focal species including the northern goshawk, boreal toad, Jessica's aster,

Palouse goldenweed, and broadfruit mariposa lily (See Assessment Sections 6.3.9, 6.3.11, 5.6.2, 5.6.3 and 5.6.6, respectively). Noxious weeds and invasive plants have also been implicated in reductions in Spalding's catchfly, bighorn sheep, mountain goat, mountain quail, and elk populations (See Assessment Sections 5.7.1, 6.5.1, 6.5.2, 6.5.5 and 6.6.1, respectively). Studies in other areas have shown an increased surface runoff and sediment yield in areas infested by noxious weeds, which would negatively impact aquatic systems. Currently noxious weeds are most common in the grasslands and transportation corridors of the subbasin, preventing their spread and establishment in other portions of the subbasin is a priority.

DD. Objective: Reduce the extent and density of established noxious weeds (See Assessment Section 5.4; See Section 3.4.2 of this volume, proposal X-7).

1. Strategy: Prioritize for treatment-- Identify and prioritize noxious weed infestations for treatment. Prioritize according to cost-effectiveness and expected biological response. Integrate information from the Clearwater River Basin Weed Management Area Coordinating Committee weed inventory and management efforts, Objective CC Strategies 1 and 7 and Section 4.4 into prioritization process.
2. Strategy: Treat weed infestations--implement the most economical and effective treatment methods for reducing weed densities or eliminating weed populations. Use the area and species specific Weed Management Objectives and Priorities developed by the Clearwater River Basin Weed Management Area Coordinating Committee.
3. Strategy: Encourage best practices--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: Monitor and evaluate efforts to reduce weeds. Integrate new information into Strategy 1 and modify implementation strategies as necessary.

Discussion: As discussed above, noxious weeds and invasive plants degrade habitat and reduce its suitability for native plants and animals. Working to develop effective methods for reducing the prominence of noxious weeds and invasive plants in the subbasin will be an important step in preserving native biodiversity.

Problem 12: Historic and current livestock grazing adversely impacted fish and wildlife habitats and populations in some portions of the subbasin (See Assessment Sections 4.10.7, 6.7.1 and Chapter 9).

EE. Objective: Reduce the negative impacts of livestock grazing on the fish, wildlife and plant populations in the subbasin. Focus efforts on riparian and wet meadow habitats.

1. Strategy: Identify and prioritize areas impacted by grazing for protection and restoration. Use Section 4.4 as a spatial prioritization structure until a more refined prioritization process can be carried out.
2. Strategy: Reduce grazing impacts--encourage establishment of riparian pasture systems, exclusion fences off-site watering areas, or riparian conservation easements. Adjust seasonal timing of livestock grazing to minimize soil compaction, erosion and noxious weed propagation.
3. Strategy: Reduce confined animal feeding operations impacts--identify concentrated winter feeding operations negatively impacting water quality, and design management actions to minimize sediment and nutrient inputs to streams.
4. Strategy: Monitor and evaluate the effort to protect and restore habitats from grazing impacts. Integrate new information into Strategy 1 and modify implementation strategies as necessary.

Discussion: Livestock grazing is an important economic activity in the subbasin and occurs on much of the non-cultivated private and tribal land in the subbasin as well as on allotments managed by the Clearwater National Forest, the Nez Perce National Forest, Idaho Department of Lands and the Bureau of Land Management. This land use can be detrimental to habitat for fish and wildlife particularly when it occurs in riparian and wetland habitats. Much of the livestock grazing that occurs in the subbasin occurs on steep slopes, this increases the importance of having an intact riparian zone to help reduce the introduction of contaminants and sediment to streams. Inventories conducted by the Nez Perce Soil and Water Conservation District found that 41% of feeding areas inventoried allowed livestock direct access to streams and 46% had less than adequate means of containing feedlot runoff to prevent stream contamination. Both the Clearwater and Nez Perce National Forests have documented areas of riparian disturbance and overuse on the allotments they manage. Most commonly this disturbance takes the form of reduced riparian vegetation, particularly shrub cover, soil damage and compaction, erosion and damage to stream banks (see Assessment Section 4.10.7 for detailed discussion of grazing distribution and impacts).

FF. Objective: Reduce conflicts between livestock and native wildlife and plant populations (See Assessment Sections 4.10.7, 5.9.1, 5.9.3, and 6.7.1)

1. Strategy: Reduce domestic animal/bighorn sheep conflicts--Encourage the reduction or elimination of domestic sheep and goat grazing within bighorn sheep habitat (See Assessment Section 6.5.1).
2. Strategy: Protect important plant populations--develop grazing management plans to limit adverse impacts to rare or culturally important plant populations (See Assessment Sections 5.7 and 5.8).
3. Strategy: Prevent seed dispersal--minimize the potential for livestock to facilitate the spread of noxious weeds through weed-free hay programs, quarantine requirements, and other actions

4. Strategy: Reduce cattle/elk conflicts--where possible, alter grazing management to minimize cattle/elk conflicts, especially on elk winter range areas (See Assessment Section 6.6.1).
5. Strategy: Monitor and evaluate efforts to reduce impacts of cattle on plant and wildlife species. Modify implementation strategies as necessary.

Discussion: Livestock can compete with native wildlife populations for forage. The overlap of native wildlife and livestock foraging in an area can have cumulative negative impacts on native plant species. The presence of livestock has been shown to influence elk movement and habitat use because elk tend to avoid livestock if possible (see Assessment Section 6.6.1). Carefully managing the areas and seasons of livestock use will help to limit these (and other) competitive interactions and their impact on native species.

Problem 13: The expansion of urban and rural human development, particularly in the Lower Clearwater AU, has negatively impacted native terrestrial species.

GG. Objective: Protect species--minimize the negative impact of current and future development on the native terrestrial species of the subbasin (See Section 3.4.2 of this volume, proposal IX-1).

1. Strategy: Identify, map, and prioritize for protection critical habitats and travel corridors.
2. Strategy: Work with city and county governments to include consideration of these critical habitats in the planning process. Provide factual information on the impacts of development on wildlife species and habitats.
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.
5. Strategy: Monitor and evaluate the effort to protect wildlife and their habitats from the effects of development. Integrate new information into Strategy 1 and modify implementation strategies as necessary.

Discussion: Although the trend is less pronounced than in some areas, the human populations and cities of the subbasin are increasing in size, encroaching upon wildlife habitats. Increasing development results in habitat fragmentation, higher road densities, and loss of wildlife security. Humans living in previously wild areas also result in significant predation on native fauna by pets. A large percentage of the terrestrial focal species within the Clearwater subbasin are hindered by habitat fragmentation due to growing human populations. The impacts of urban sprawl are far reaching and affect such species as Spalding's catchfly, water howellia, Ute ladies' tresses, Clearwater

phlox, Jessica's aster, Palouse goldenweed, camas, lomatium, fisher, wolverine, white-headed woodpecker, Townsend's big-eared bat, fringed myotis, gray wolf, elk, mountain goat, grizzly bear, bighorn sheep, sharp-tailed grouse, mountain quail, and sandhill crane (see Assessment Section 6.7).

Problem 14: The loss of late seral forest habitats in the Clearwater subbasin have negatively impacted native terrestrial species that depend on this habitat type.

HH. Objective: Protect existing old growth areas and encourage old growth establishment in areas where old growth is below the historic range of variability. Restore natural patch size distribution and juxtapositions. Strategy: Map and inventory existing old growth and potential old growth areas (See Section 3.4.2 of this volume, proposal IX-1).

1. Strategy: Determine historic range of variability of old growth communities based on habitat type (See Section 3.4.2 of this volume, proposals X-1 and X-2).
2. Strategy: Prioritize areas for protection and restoration-- use information obtained through Strategy 1 and Section 4.4 to prioritize areas where old growth habitats are most below the historic range of variability.
3. Strategy: Restore old growth-- 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. Address vegetative structure concerns identified in Strategy 2.
4. Strategy: Protect existing old growth habitat-- through land purchase, fee title acquisitions, conservation easements, land exchanges or other strategies.
5. Monitor and evaluate efforts to protect and restore old growth habitats. Revise strategies as necessary based on new information.

Discussion: In many areas of the subbasin the occurrence of late seral habitat types is below the range of what occurred historically. Timber harvest is the primary process responsible for this reduction (see Assessment Section 6.7). However fire suppression has also contributed to this loss, particularly in forest types like ponderosa pine or western larch which were maintained by frequent low intensity fires burning the understory (see Assessment Section 5.3). Many species of native wildlife and plants are associated with late seral habitats including the fisher, flammulated owl, goshawk and crenulate moonwort focal species (See Assessment Sections 6.3.1, 6.3.3, 6.3.9, 5.6.8 respectively) reductions in available habitat may be negatively impacting their populations.

Problem 15: The reduction in availability of early seral habitats has negatively impacted native terrestrial species.

II. Objective: Increase extent and distribution of early seral habitats in the subbasin to within the historic range of variability for the habitat type. Restore natural patch size distribution and juxtapositions (See Section 3.4.2 of this volume, proposals X-1 and X-2). Note: strategies 1-4 have been adopted from Clearwater National Forest 1999.

1. Strategy: In coordination with efforts focused on addressing Problem 14 map and inventory existing early seral habitat areas (See Section 3.4.2 of this volume, proposal IX-1).
2. Strategy: Determine historic range of variability of early seral communities based on habitat type (See Section 3.4.2 of this volume, proposals X-1 and X-2).
3. Strategy: Using information obtained through Strategies 1 and 2, Section 4.4, and the distributions of associated wildlife species, identify and prioritize areas where early seral habitats are most below the historic range of variability.
4. Strategy: Restore disturbance processes--where appropriate to the habitat type and natural disturbance regime, use prescribed burning and selective harvest to restore disturbance and return areas identified in Strategy 3 back to the historic range of variability.
5. Strategy: Restore community species composition--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.
6. Strategy: Mimic natural disturbance process--work with land management agencies to develop managed natural ignition fire policies where politically and ecologically appropriate.
7. Strategy: Create structural diversity--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.
8. Strategy: Monitor and evaluate efforts to restore early seral habitats on associated wildlife species. Integrate new information into Strategy 3 and modify implementation strategies as necessary.

Discussion: Since the early 1900s the availability of early-seral forage in the subbasin has been declining due to the reduced influence of fire (See assessment Section 5.3). This has lowered the suitability of the subbasin to support many grazing and browsing wildlife species including the economically important elk (See assessment Section 6.6.1). Reductions in early successional stage dependent prey have reduced the suitability of the subbasin to certain dependent predators, including the ESA listed lynx (See assessment Section 6.3 and 6.7). Fire suppression has increased the prevalence of mid-seral forest types like grand fir and Douglas-fir with a corresponding decrease in fire dependent

species like larch and ponderosa pine. Working to restore disturbance processes in a way compatible with the need to protect human life and property would help to increase forest patch, structure and species diversity and would increase the suitability of the subbasin to species dependent on early seral-forage.

Problem 16: Road construction, timber harvest and/or fire suppression have altered the size, quality, distribution and juxtapositions in and between habitat patches in the subbasin.

JJ. Objective: Reduce the impact of the transportation system on wildlife and fish populations and habitats (See Assessment Section 6.7; See Section 3.4.2 of this volume, proposal X-5).

1. Strategy: Plan restoration--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/or aquatic habitats.
2. Strategy: Reduce road impacts--implement road closure and decommissioning programs in areas identified in the assessment and Section 4.4 to have high road densities, high sediment production, high surface erosion and/or be landslide prone. Prioritize areas with high quality wildlife and fish habitat.
3. Strategy: Protect habitats--encourage continued protection of diverse communities and high quality habitats in existing roadless areas.
4. Strategy: Monitor and evaluate efforts to reduce the impact of roads on the fish and wildlife populations of the subbasin. Modify implementation strategies as necessary.

Discussion: The development and use of roads affect ecosystems and the wildlife and fish dependent on them in numerous ways. Wisdom et al. (2000) found roads to be detrimental to >70% of the 91 species of wildlife he considered. Road construction eliminates the habitat in its path and fragments surrounding habitat patches. They compact soils, disturb organic layers, and cause higher rates of erosion or mass wasting. Road culverts can pose barriers to fish migration. Automobile traffic associated with roads becomes a vector for the spread of noxious weeds, injures and kill animals through collisions, alters migration patterns, reduces security and increases harvest rates (see assessment Section 6.7). Implementation of these strategies should be consistent with Objective U.

Problem 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.

KK. Objective: Restore natural nutrient input cycles and mitigate for damages to aquatic and terrestrial populations due to the loss of these nutrients (See Assessment Section 6.2; See Section 3.4 of this volume, proposals I-1 and X-6).

1. Strategy: Determine need and practices--assess nutrient inputs and cycling in the Clearwater subbasin. Where appropriate, consider carcass additions or other innovative approaches to restore nutrient recycling. Coordinate with efforts under Objective T to, when possible, benefit both aquatic and terrestrial species.
2. Strategy: Research restoration practices--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: Research losses--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.
4. Prioritize areas for restoration of nutrient loads integrating information from Strategies 1-3 and from Section 4.4. of this plan.
5. Implement projects to restore nutrients to upland areas following prioritization develop in Strategy 1.
6. Monitor and evaluate efforts to restore nutrients to upland areas. Integrate new information into effort and revise strategies as needed.

Discussion: 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 (See Assessment Sections 6.3.6, 6.4.2, 6.4.4, respectively). Numerous other species in the system are considered to have a recurrent, indirect or rare relationship to salmon (See Assessment Section 6.2). Declines in populations of these species may be linked to reductions in anadromous fish runs (Cederholm et al. 2001).

Socioeconomic

Problem 18: As reflected in the inventory, numerous agencies and entities are implementing programs and projects in the subbasin. Lack of coordination and integration limit the economic, social, cultural and biological benefits of aquatic and terrestrial protection and restoration in the subbasin.

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

1. Strategy: Involve communities and finer scale efforts in subbasin planning, and in program and project planning.
2. Strategy: Coordinate plan implementation with federal, tribal, state, local, and other interests, and avoid program and project duplication.
3. Strategy: Seek formal local support for programs and project proposals.

Discussion: Coordination of programs and plans in the subbasin will achieve benefits beyond the value of an individual program or project, and will promote the application of ecosystem management principles. Existing programs and projects are listed in the Inventory. The Clearwater PAC already provides a forum for the integration of efforts at federal, state, tribal and local levels. Better integration of efforts will require further involving communities in subbasin in planning. This will enable the coordination of local efforts with subbasin scale efforts. This will also enable the development of as many projects as possible to provide cultural, social and economic benefits to local communities.

Problem 19: There is a great need for prioritization of activities addressing limiting factors. The limited resources available need to be used as efficiently as possible. The great diversity of issues and factors that need to be considered make prioritization a large task that will need to be frequently repeated and fine-tuned based on new information. Key data gaps currently limit the effectiveness of assessment, prioritization and planning in the Clearwater subbasin. Data needs also need to be prioritized and addressed.

MM. Objective: Identify high priority habitat areas requiring protection or restoration.

1. Strategy: Develop a prioritization process to achieve multiple objectives, values, and benefits. This will include cost-efficiency, multiple species and benefits, ESA, economic and social impacts, and expected biological benefits; it will prioritize habitat areas for restoration and protection. The spatial prioritization in Section 4.4 of this Plan is a beginning point for this effort. This needs to be done within one year of the adoption of the plan.
2. Strategy: Integrate prioritization processes to increase the comprehensiveness of criteria considered, and to increase the strategic

effectiveness of programs and projects implemented in the subbasin. See Table 4 for list of proposed prioritization activities.

3. Strategy: The Policy Advisory Committee will involve federal, tribal, state, and local policy makers in the prioritization process to integrate available knowledge and needs.

Discussion: Almost all efforts to address limiting factors lack the necessary resolution of prioritization. Table 4 contains 23 discrete prioritization exercises. If these efforts were organized into a more comprehensive prioritization exercise, resources could be most effectively focused on addressing problems at the subbasin scale. Integration of prioritization processes will enable coordination of implementation to achieve maximum and multiple benefits. The best way to develop local buy in and assistance with implementing a subbasin scale prioritization of restoration and protection activities is to involve local communities in the process as fully as possible. This prioritization process will serve as a focus point for integration and collaboration of efforts in the subbasin.

NN. Objective: Prioritize and coordinate efforts to address data gaps

1. Strategy: Develop a process to prioritize efforts to fill data gaps. This process should coordinate with efforts in Objective RR to consider similar factors when possible. This needs to be done within one year of the adoption of the plan.
2. Strategy: Prioritize data gaps to use limited data collection resources most efficiently.
3. Strategy: Integrate efforts to collect data through monitoring and evaluation efforts and other data collection efforts in the plan. Data collection efforts are listed in Table 5. Additional activities are addressed in the Research, Monitoring and Evaluation section.
4. Strategy: The Policy Advisory Committee will involve federal, tribal, state, and local policy makers in the prioritization process to integrate available knowledge and needs.

Discussion: The effectiveness of assessment and prioritization activities is limited by a lack of information. The amount of new data needed is much more than the resources for collecting data can address. Data needs must be prioritized to maximize the benefits of collecting new data. Where ever possible, finer scale monitoring and evaluation data such as project-level monitoring and evaluation data should be designed and collected to integrate into subbasin scale efforts. The prioritization of data gaps needs to be coordinated with activities in Objective RR. The effort to prioritize data gaps needs to consider the priority of limiting factors and projects established in Objective RR, although additional data needs exist that are not tied to habitat.

Table 4. Specific prioritization activities called for in the Clearwater Subbasin Plan objectives and strategies.

Obj	Str	Description	Scale
B	1	Prioritize limiting factors to anadromous species	Clearwater subbasin
E	2	Prioritize opportunities to restore native resident fish habitat	Clearwater subbasin
F	2	Prioritize activities to improve cutthroat and bull trout habitat	Clearwater subbasin
G	2	Prioritize opportunities to reduce rainbow x cutthroat hybridization	Clearwater subbasin
H	2	Prioritize problems and areas of bull x brook hybridization	Bull trout habitat
J	4	Prioritize changes to Dworshak operations to benefit bull trout	Dworshak Reservoir
O	3	Prioritize streams impacted by low flow for treatment	Clearwater subbasin
P	2	Prioritize barriers to fish passage for treatment	Clearwater subbasin
Q	1	Prioritize areas impacted by high water temperatures for treatment	Clearwater subbasin
S	3	Prioritize projects to reduce sediment impacts	Clearwater subbasin
T	3	Prioritize nutrient sources and problems for treatment	Clearwater subbasin
U	3	Prioritize actions to increase habitat complexity	Clearwater subbasin
V	2	Prioritize areas of prairie for protection	Historic prairie areas of the Clearwater
W	2	Identify and prioritize areas for prairie restoration	Historic prairie areas of the Clearwater
X	2	Prioritize ponderosa pine communities for protection	Ponderosa pine communities in the Clearwater
Y	1	Identify and prioritize areas for ponderosa pine establishment	Potential ponderosa pine communities in Clr.
Z	1	Identify and prioritize protection of functioning wetlands	Wetlands in Clr.
AA	2	Prioritize wetlands for restoration	Historic, current and potential wetlands in Clr.
BB	1	Identify and prioritize riparian areas	Riparian areas in the Clr.
CC	1	Identify and prioritize native plant communities for protection from weeds	Native plant communities in the Clr.
DD	1	Identify and prioritize weed infestations for treatment	Weed infestations in the Clr.
EE	1	Prioritize areas impacted by cattle for treatment	Grazed areas of the Clearwater
GG	1	Prioritize critical habitats and corridors	Clearwater subbasin
HH	2	Prioritize old growth habitats for protection and restoration	Clearwater subbasin
II	3	Identify and prioritize areas for restoration to early seral habitat	Clearwater subbasin
JJ	2	Prioritize roads for decommissioning and restoration	Clearwater subbasin
KK	4	Prioritize areas for nutrient restoration efforts	Clearwater subbasin

Table 5. Research, Monitoring and Evaluation proposed in the objectives and strategies of the Clearwater Subbasin Plan.

Obj	Str	Research, Monitoring and Evaluation	Scale
A	1	Research anadromous species migration timing, life history and survival	Clearwater, participate at Columbia Basin scale
A	2	Quantify tributary specific juvenile and adult abundance and productivity	Compare Clearwater with other subbasins
A	3	Monitor results of applying integrated rule curves	Area impacted by Dworshak
B	1	Identify limiting factors to anadromous fish	Anadromous habitat in Clearwater
B	2	Evaluate alternative habitat treatments for use in the Clearwater	Anadromous habitat in Clearwater
B	3	Develop index streams	Anadromous habitat in Clearwater
B	4	Identify and develop indices of biological response to habitat projects	Anadromous habitat in Clearwater
B	7	Monitor and evaluate anadromous habitat improvement projects	Anadromous habitat in Clearwater
C	2	Research stock specific interactions between wild and hatchery fish	Areas influenced by hatcheries in the Clearwater
C	3	Develop stocking and marking guidelines for all life stages	Areas influenced by hatcheries in the Clearwater
D	3	Monitor and eval. innovative hatchery and natural prod. practices, safety net implementation	Areas influenced by hatcheries in the Clearwater
E	1	Survey and assess native resident fish habitat and populations	Resident fish habitat in Clearwater
F	3	Monitor and evaluate effects of resident fish habitat improvement projects	Resident fish habitat in Clearwater
G	1	Genetic studies on rainbow x cutthroat hybridization	Resident fish habitat in Clearwater
G	3	Evaluate stocking and harvest management options in N. Fork Clr.	North Fork Clearwater
G	5	Monitor and evaluate efforts to reduce hybridization in the NF Clr	North Fork Clearwater
H	1	Distribution surveys and genetic sampling for brook and bull trout	Brook and bull trout habitat in the Clearwater
H	3	Evaluate brook trout removal options	Brook trout habitat in the Clearwater
H	4	Investigate alternative methods to remove brook trout	Brook trout habitat in the Clearwater
H	5	Develop and test methods to prevent spread of brook trout	Brook trout habitat in the Clearwater
H	6	Monitor and evaluate efforts to remove brook trout	Brook trout habitat in the Clearwater
I	1	Study impacts of variable annual entrainment and harvest rates on kokanee	Dworshak Reservoir
I	3	Monitor and evaluate results of modifications to operations on kokanee	Dworshak Reservoir
J	1	Study bull trout distribution, usage and timing in Dworshak Reservoir	Dworshak Reservoir
J	2	Study bull trout annual population and abundance trends	Dworshak Reservoir
J	3	Study limiting factors for bull trout in Dworshak	Dworshak Reservoir
J	4	Identify and prioritize changes in facilities operations to benefit bull trout	Dworshak Reservoir
J	6	Monitor and evaluate efforts to improve Dworshak bull trout habitat	Dworshak Reservoir
K	1	Evaluate value and cost of maintaining sterile rainbow fishery in Dworshak	Dworshak Reservoir
K	2	Consider alternative strategies to better meet ACOE mitigation goals	Areas potentially impacted by ACOE mitigation
K	3	Conduct surveys on angler use, harvest, and ability to meet mitigation goals	Dworshak Reservoir
K	4	Estimate entrainment rates at Dworshak for sterile rainbows	Dworshak Reservoir
L	2	Evaluate applying an integrated rule cure and modified operations	Dworshak Reservoir
M	1	Survey focal, ESA, neotrop. migrant, and culturally important terr. species	Clearwater subbasin

Obj	Str	Research, Monitoring and Evaluation	Scale
M	3	Research habitat requirements of important terrestrial species	Clearwater Subbasin
N	1	Develop and apply method to evaluate Dworshak Dam impacts on wildlife	Dworshak Reservoir
N	2	Quantify impacts to wildlife of loss of anadromous fish above Dworshak	North Fork Clearwater
O	2	Research adequate flow req. by life history stage and species comp.	Areas of Clearwater impacted by low flows
O	7	Monitor and evaluate efforts to improve flows	Areas of Clearwater impacted by low flows
P	1	Identify fish passage barriers	Fish habitat in the Clearwater
P	5	Monitor and eval. efforts to improve fish passage through barrier removal	Fish habitat in the Clearwater
Q	1	Identify areas and species impacted by high water temperature	Clearwater subbasin
Q	5	Identify water temperature problems through TMDL and other processes	Clearwater subbasin
Q	6	Monitor and evaluate efforts to reduce water temperature problems	Clearwater subbasin
R	1	Research thermal impacts of Dworshak	Downstream of Dworshak in Clearwater
R	2	Integrate research on Dworshak	Area impacted by Dworshak
S	1	Identify sediment sources and opportunities to reduce sediment impacts	Clearwater subbasin
S	2	Research and monitor sediment source, transport and fate	Clearwater subbasin
S	5	Monitor and evaluate efforts to reduce sediment	Clearwater subbasin
T	1	Inventory and map potential problem nutrient sources	Clearwater subbasin
T	5	Monitor and evaluate nutrient efforts	Clearwater subbasin
U	1	Identify areas where habitat has been simplified	Clearwater subbasin
U	6	Develop method to monitor biological response to habitat projects	Clearwater subbasin
U	7	Monitor long-term effectiveness of habitat restoration efforts	Clearwater subbasin
V	1	Identify prairie remnants	Historic prairie areas of the Clearwater
V	4	Monitor and evaluate effort to protect prairie remnants	Historic prairie areas of the Clearwater
W	1	Research prairie restoration methods	Historic prairie areas of the Clearwater
W	5	Monitor and evaluate prairie restoration projects	Historic prairie areas of the Clearwater
X	1	Identify and map ponderosa pine communities	Ponderosa pine communities in the Clearwater
X	6	Monitor and evaluate protection of ponderosa pine communities	Ponderosa pine communities in the Clearwater
Y	1	Identify and prioritize areas for ponderosa pine establishment	Potential ponderosa pine comm. in Clearwater
Y	4	Monitor and evaluate reestablishment of ponderosa pine communities	Potential ponderosa pine comm. in Clearwater
Z	1	Identify and prioritize protection of functioning wetlands	Wetlands in Clearwater
Z	4	Monitor and evaluate protection of wetlands	Wetlands in Clearwater
AA	1	Identify and prioritize restoration of wetlands	Historic, current, potential wetlands in Clearwater
AA	5	Monitor and evaluate restoration of wetlands	Historic, current, potential wetlands in Clearwater
BB	1	Identify and prioritize riparian areas	Riparian areas in the Clearwater
BB	6	Monitor and evaluate protection and restoration of riparian areas	Riparian areas in the Clearwater
CC	1	Identify and prioritize native plant comm. for protection from weeds	Native plant communities in the Clearwater
CC	7	Monitor and evaluate effort to protect native plant comm. from weeds	Native plant communities in the Clearwater
DD	1	Identify and prioritize weed infestations for treatment	Weed infestations in the Clearwater
DD	4	Monitor and evaluate weed reduction and elimination efforts	Weed infestations in the Clearwater
EE	1	Identify and prioritize areas impacted by grazing for treatment	Grazed areas of the Clearwater

Obj	Str	Research, Monitoring and Evaluation	Scale
EE	6	Monitor and evaluate efforts to reduce cattle impacts on habitats	Grazed areas of the Clearwater
FF	5	Monitor and evaluate efforts to reduce impacts of cattle on terr. species	Grazed areas of the Clearwater
GG	1	Identify and map critical habitats and corridors	Clearwater subbasin
GG	5	Monitor and evaluate efforts to protect critical habitats and corridors	Clearwater subbasin
HH	1	Determine historic range of variability of old growth habitat types	Clearwater subbasin
HH	5	Monitor and evaluate efforts to protect and restore old growth habitats	Clearwater subbasin
II	1	Identify and map early seral habitats	Clearwater subbasin
II	2	Identify historic range of variability for early seral habitats	Clearwater subbasin
II	3	Identify areas where early seral habitats most below range of variability	Clearwater subbasin
II	8	Monitor and evaluate efforts to restore early seral habitats	Clearwater subbasin
JJ	1	Conduct analysis to determine need for and problems with roads	Clearwater subbasin
JJ	4	Monitor and eval. efforts to reduce road impacts on habitats and species	Clearwater subbasin
KK	1	Assess nutrient problems impacting fish and wildlife	Clearwater subbasin
KK	2	Research innovative methods to restore nutrient loading to upland areas	Clearwater subbasin
KK	3	Evaluate secondary losses due to hydropower impacts	Clearwater subbasin
KK	6	Monitor and evaluate efforts to restore nutrients to upland areas	Clearwater subbasin

Problem 20: Economic and social factors play an important role in determining the effective and efficient implementation of habitat-related improvement or protection strategies. When they are not considered as part of protection and restoration activities, they can undermine success and reduce activity effectiveness.

OO. Objective: Evaluate the economic efficiency and impacts of projects as part of prioritization processes in the subbasin.

1. Strategy: Develop simple and useful tools to evaluate the economic efficiency and the social and economic impacts of projects.
2. Strategy: Develop indices of social and economic conditions and provide a baseline for determining social and economic benefits and impacts.
3. Strategy: Evaluate the specific economic and social factors affecting resource decision making.
4. Strategy: Integrate outcomes of Strategies 1-3 into Objective RR
5. Strategy: Collect data on projects and programs and feed into Strategies 1-3.

Discussion: It is necessary to determine more specifically the social and economic factors important to gauging benefits and impacts of restoring and protecting fish and wildlife in the Clearwater subbasin. Low cost tools need to be developed that can be used at the subbasin scale. Trend information is particularly important to understanding benefits and impacts that may take decades to manifest. Baseline data needs to be collected or augmented to allow for development of trend analysis. This analysis needs to be targeted towards the specific economic and social factors affecting resource decision making. Once these tools have been developed, a baseline established and an evaluation of current conditions made, this information needs to be integrated into the subbasin prioritization efforts outlined in Objective RR.

Problem 21: In the past, projects have not been successful in conditions where the local groups are not supportive. Long-term program implementation is more successful where projects are locally developed and implemented.

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

1. Strategy: Assist Soil and Water Conservation Districts, Watershed Advisory Groups, 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.

Discussion: Groups that recruit, assist and implement projects on private lands are extremely important to this effort, since private lands make up approximately a third of the subbasin, including important prairie and A-run steelhead habitats. Implementation of the subbasin plan will require efforts at multiple scales including subbasin, population, watershed and finer scales. In areas with no local efforts, additional groups need to be fostered. Technical expertise needs to be available for participation in finer scale efforts. This will help achieve continuity and consistency in local efforts as well as informing subbasin scale efforts.

QQ. Objective: Maximize social and economic benefits as much as possible while implementing the Clearwater Subbasin Plan.

1. Strategy: Maximize economic benefits of plan--for land purchases or easements, efforts should be made to minimize loss of local government revenues.
2. Strategy: Efforts should be made to utilize local labor forces, contractors, and suppliers when implementing habitat improvement projects.
3. Strategy: Monitor and evaluate the efforts to assist local areas and to maximize economic benefits. Modify Strategies as necessary.

Discussion: An important strategy for protecting areas is to purchase them for management by an agency or tribe. When private land is converted into federal or protected status, its designation on the county tax roles changes and the amount of annual tax paid to the county is reduced or eliminated. This can negatively impact counties and local services. This impact needs to be considered, and mitigated if possible, during the land acquisition or trade process.

Also important is to involve local labor and resources in protection and restoration efforts. This provides direct participation in the process while providing work and economic benefits to local areas.

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

1. Strategy: Promote a ridgetop-to-ridgetop stewardship of natural resources through enhanced local involvement and support.
2. Strategy: Implement information and education actions identified in this management plan.
3. Strategy: Provide information and assistance to Soil and Water Conservation Districts, Watershed Advisory Groups, watershed groups, and other interested parties for information and education programs.
4. Strategy: Provide opportunities for subbasin-wide information distribution, such as periodic public meetings, newsletters, web sites, etc.

Discussion: Over the long run, it is important to develop broad public understanding and commitment to fish and wildlife efforts in the Clearwater Subbasin. This effort needs to involve individuals as well as agencies. The primary current local groups need to coordinate with the subbasin scale effort. The coordination needs to work both ways. Information and resources from the agencies, NPT and subbasin scale efforts need to be provided to local groups, while local data, information and priorities need to be integrated into the subbasin scale effort. A sustained, long-term effort to provide information to communities and residents of the subbasin needs to be maintained indefinitely. If a single organization can't spearhead this effort, then it should be woven into projects and programs when possible. If possible, multiple roles and efforts should be underway at once.

4.3 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 based on the assessment process and 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 specific populations, their habitats, and their ecosystems, 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 6). 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 addresses 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 plan 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 will enable wildlife management efforts to focus on developing effective methods of habitat restoration and identifying critical areas for protection.

Table 6. 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

4.3.1 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 Problem Statements: 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 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.

   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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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, and 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 pre-established 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 6) 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 non-indigenous 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 non-indigenous 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 Problem Statements: 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, and USFWS), ongoing or historic genetic inventories (i.e. USFWS) and associated out-of-subbasin agencies (i.e. PSMFC, NMFS, WDFW, and ODFW).

   Geographic Scope: Accessible anadromous waters

   Relationship to other proposed RM&E:

   Relationship to Problem Statements: 1, 3

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

   Goal: To determine if reintroduced or other hatchery produced salmonids pose a competitive threat to the production of existing native salmonids

   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 Problem Statements: 1, 3, 7

VI. Resident Fish - General

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

   Goal: To evaluate the condition of existing fluvial cutthroat and bull 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 pre-established 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 Problem Statements: 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 Problem Statements: 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 ammocoetes and macrothalmia in the Clearwater subbasin. Genetic analysis of ammocoetes 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 1, 2, 3, 7

4.3.2 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 Problem Statements: 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 Problem Statements, 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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 Problem Statements: 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, etc.).

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

   Relationship to Problem Statements: 11, 12

4.4 Spatial Definition and Prioritization of Protection/Restoration Needs

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 anadromous 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 7, Table 8, Table 9) 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 7, Table 8, Table 9).

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

[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.

impact the natural resources of the Clearwater subbasin now and in the immediate future were summarized for prioritization.

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 7, Table 8, Table 9). 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 7. 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 7. (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 7. (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 7. (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 7. (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 8. 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 8. (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 8. (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 9. 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 9. 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 9. 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 9. 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.

5 Endangered Species Act and Clean Water Act Considerations

5.1 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.

5.1.1 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.

5.1.2 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.

5.1.3 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.

5.1.4 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.

5.2 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 and WAG) 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. 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 Idaho Department of Environmental Quality issued the *Principles and Policies for the 2002/2003 Draft Integrated (303(d)/305(b)) Report* in June 2003. It is expected that the report

will be submitted to the U.S. Environmental Protection Agency in November 2003 for approval. The IDEQ will continue to use the Idaho 1998 §303(d) list (report) until EPA makes a determination on the new integrated report.

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.

6 References

Batt, P. E. 1996. Governor Philip E. Batt's State of Idaho Bull Trout Conservation Plan. Boise.

Behnke, R. J. 1992. Native Trout of Western North America. Bethesda, MD: American Fisheries Society.

Busby, P. J.; Wainwright, T. C.; Bryant, G. J.; Lierheimer, L. J.; Waples, R. S.; Waknitz, F. W. and Lagomarsino, I. V. 1996. *Status Review of West Coat Steelhead from Washington, Idaho, Oregon, and California*. Seattle: National Marine Fisheries Service.

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 and Conservation 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

Evans, S.; Keller, S.; Lincoln, R.; Phelps, S.; Stern, L.; Stone, D. and Wright, S. 1997. *Draft Environmental Impact Statement: Wild Salmonid Policy*. Olympia: Washington Department of Fish and Wildlife.

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

Idaho Department of Fish and Game. 2001. IDFG Fisheries Management Plan 2001-2006. Idaho Department of Fish and Game, Boise, Idaho.

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.

McClure, M. and eleven others. 2003. Independent populations of Chinook, Steelhead, and Sockeye for Listed Evolutionarily Significant Units Within the Interior Columbia River Domain; Discussion Draft. Interior Columbia Technical Recovery Team.

Mobrand Biometrics 2003. Ecosystem Diagnosis and Treatment (EDT). http://www.mobrand.com/MBI/edt.html Accessed: November 2003

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

Nez Perce National Forest. 1998. *South Fork Clearwater River Landscape Assessment Vol. I: Narrative.*

Northwest Power and Conservation Council. 2000. Columbia River Basin Fish and Wildlife Program. Council document 2000-19.

Northwest Power and Conservation Council. 2001. Technical Guide for Subbasin Planners. Council document 2001-20.

Northwest Power and Conservation Council 2003. Qualitative Habitat Assessment (QHA) User's Guide Version 1.2 http://www.nwcouncil.org/fw/subbasinplanning/admin/guides/qha.htm Accessed: November 2003

Reisenbichler, R., Rubin, S., Wetzel, L., and Phelps, S. 2002. draft Genetic issues in supplementing natural populations from sea-ranched populations. In: Proceedings of the Second International Symposium on Stock Enhancement and Sea-ranching. January 28-February 1, 2002. Kobe, Japan.

Rubin, S. and Reisenbichler, R. 2002. draft Outmigration, survival, and growth of stream-reared steelhead of hatchery and wild parentage. U.S. Geological Survey, Western Fisheries Research Center. Seattle, WA

Reisenbichler, R. and Rubin, S. 1999. Genetic changes from artificial propagation of Pacific salmon affect the productivity and viability of supplemented populations. ICES Journal of Marine Science. 56: p.459-466.

Scheeler C. A. and thirteen others 2003. A Technical Guide for developing wildlife elements of a subbasin plan. http://www.nwcouncil.org/fw/subbasinplanning/admin/guides/wildlife.pdf Accessed: October 2003

Schriever, E. and D. Schiff. 2001. Bull Trout Investigations in the North Fork Clearwater Drainage, 2000. Report to the Clearwater National Forest. Idaho Department of Fish and Game, Lewiston, Idaho

The Nature Conservancy 2003. The Middle Rockies-Blue Mountain Ecoregional Plan.

U.S. Environmental Protection Agency. 1999. Permit Compliance System. http://www.epa.gov/enviro/html/pcs/pcs_overview.html

U.S. Fish and Wildlife Service and Nez Perce Tribe. 1995. *Interactions of Hatchery and Wild Steelhead in the Clearwater River of Idaho*. Ahsahka, ID:

U.S. Fish and Wildlife Service and Nez Perce Tribe. (1997). *Interactions of Hatchery and Wild Steelhead in the Clearwater River of Idaho*. Ahsahka and Lapwai, ID:

Weddell, B.J. and J. Lichthardt. 1998. Identification of Conservation Priorities for and Threats to Palouse Grassland and Canyon Grassland Remnants in Idaho, Washington, and Oregon. Prepared for Bureau of Land Management, Cottonwood, Idaho.

Weigel, D. E. 1997. *Genetic Inventory of West slope Cutthroat Trout in the North Fork Clearwater subbasin, Idaho: Annual Report 1996*. Orofino, ID: Nez Perce Tribe. Prepared for Bonneville Power Administration.

Weigel, D. E. and D. P. Statler. (2001; in process). *Genetic Inventory of Westslope Cutthroat Trout in the North Fork Clearwater subbasin, Idaho: Final Report 1999/2000*. Orofino, ID: Nez Perce Tribe. Prepared for Bonneville Power Administration.

Wisdom, M. J., R. S. Holthausen, D. C. Lee, B. C. Wales, W. J. Murphy, M. R. Eames, C. D. Hargis, V. A. Saab, T. D. Rich, F. B. Samson, D. A. Newhouse and N. Warren. 2000. Source habitats for terrestrial vertebrates of focus in the Interior Columbia Basin: Broad-scale trends and management implications. U.S. Department Agric., For. Serv., Pacific Northwest Res. Stat. Gen. Tech. Rep. PNW-GTR-485, Portland.

7 Technical Appendices

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

Table 10. 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] (12,800)	----	----	----	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	----	(4,900) [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 (17,700) includes both A and B runs; Values in parenthesis are run-specific estimates assuming mainstem tributaries produce A run and all other subbasin areas produce B run steelhead.

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 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: 1) Develop a comprehensive marking strategy for all salmon and steelhead artificial production programs in the Columbia River basin by the end of 2001. 2) Provide funding by March 1, 2001, to begin marking all spring chinook salmon that are currently released unmarked from Federal or Federally funded hatcheries. 3) Provide funding, beginning in FY 2002, to implement the Action Agencies' share of the comprehensive marking plan for production not addressed in (2) above. 4) 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 co-managers, 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 co-managers, 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 implementation summary, Clearwater Policy Advisory Committee participation summary and other subbasin technical review participation.

Public and Government Participation Plan[4]

Public Participation

The development of the Clearwater Subbasin Plan will include three specific phases for outreach and participation from the public. The goal of the first phase is to gather 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 goal of the second phase is to report on the progress of the planning process and provide access to information. The goal of the third phase is to gather comment on the final draft Clearwater Subbasin Plan.

Phase one of public participation is intended to reconnoiter how the proposed philosophy behind the Clearwater Subbasin Plan coincides with the public philosophy. This phase will identify ways to amend the proposed philosophy to bridge the two where they may be different and/or include omissions that are recommended through this phase of public participation. Phase one of public participation will occur early in the planning process. The foundation for discussions will be the Clearwater Policy Advisory Committee's drafted Clearwater Subbasin Vision and Goals. Information and materials to be presented to each public group will be standardized for consistency. These materials will include 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 at least the following groups.

- Clearwater Basin Advisory Group
- 2- Focus Groups (composition recommendations to be made by PAC)

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

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

Phase Three of public participation will occur in mid July to collect comments of 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, and others as requested will facilitate the meetings. Comments from these meetings will be 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 shall assume 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 will be organized and facilitated by the Clearwater Focus Program staff, Clearwater Policy Advisory Committee, and others as requested. For example, Idaho Department of Water Resources, Nez Perce Tribe Water Resources Department, U.S. Natural Resources Conservation Service, U.S. Army Corps of Engineers, U.S. Bureau of Land Management, and U.S. Bureau of Reclamation.

Specific communication and request for meetings will be 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 Tribe Executive Committee
- Soil and Water Conservation Districts (Clearwater, Idaho, Latah, Lewis, and Nez Perce)
- Municipal Governments

Public and Government Participation
A section will be included in the final Clearwater Subbasin Plan describing the public and government participation in the development of the Clearwater Subbasin Plan including a summary of how collected information was used.

Summary of the 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 PAC 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 July 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 and Conservation 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. Copies of the August Draft Clearwater Subbasin Plan were distributed to 40 agency representatives. The subbasin plan writer contractor made a presentation to the Nez Perce Tribal Fisheries Department retreat in July, 2002. Availability of the August and early October drafts were announced using email lists that had been compiled throughout the planning process.

The fifth draft of the subbasin plan, titled, *Final Draft Clearwater Subbasin Plan* was distributed to the Northwest Power and Conservation (then the Northwest Power Planning Council) in Coeur d'Alene, Idaho November 2002.

Clearwater Policy Advisory Committee Participation
The Clearwater PAC began participation in the subbasin assessment process in late 1999 working on the project until the Provincial review process began in early 2001. Assessment work was then put on hold until late 2001. Fourteen Clearwater PAC meetings were held to address the assessment and later provincial review and subbasin summary issues. Technical support for the development of both was provided by the Clearwater PAC and the PAC's Terrestrial Subcommittee. Availability announcements and review responses from other technical contacts representing resource agencies from with the Clearwater subbasin was managed using email lists. The aquatic and terrestrial assessment components were released for review independently in late 2001. Comments were taken and revision to both components was completed and the two

documents compiled into one document, again being released for review in January 2002. The assessment was later part of the four draft review releases for the entire subbasin plan.

Subbasin planning began January 2002. Fourteen Clearwater PAC meetings were held between January 2002 and November 2002 to address subbasin planning. The Clearwater PAC created the Technical (aquatic) Subcommittee to complement the Terrestrial Subcommittee, formed in the assessment process, to provide technical direction to the contract writers of the subbasin plan. Membership on the subcommittees included Clearwater PAC members and staff representatives from fish and wildlife agencies in the subbasin. The subcommittees reviewed and worked on components of the subbasin plan as they were developed prior to each Clearwater PAC review. There were nine subcommittee meetings held between March 2002 and June 2002. In addition to the subcommittee reviews, email distribution of component re-writes were distributed to the technical contact list developed by the Focus Program staff (also used during the assessment phase). These reviews were independent of the July, August, September, and October releases of the subbasin plan drafts. Essentially, this meant there were 13 technical review phases of the Clearwater Subbasin Plan before presentation to the Council.

Revision of the Final Draft Clearwater Subbasin Plan began formally April 2003 after which the Clearwater PAC held eight meetings to complete these efforts. Technical review of revisions was augmented using email lists. For a list of participants in the development of the plan see Table 2.

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
Bellatty, Idaho DEQ
Jerome Hansen, IDFG
Darin Saul, Ecovista
Kristy Hopfensperger, Ecovista
Jim

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
Idaho Wildlife Federation
Clearwater County Commissioner
Idaho Conservation League
Lewis County Commissioner
Idaho State Representative
Rancher Central
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.

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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 – Discussion of regional modeling efforts in relation to the Clearwater subbasin.

Ecosystem Diagnosis and Treatment (EDT)

The Northwest Power and Conservation 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 thirty-five environmental attributes, seventeen habitat attributes (see below) and a set of mathematical algorithms to 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 Environmental Quality Attributes

Natural confinement	Metals in water	Temperature max	Fish species introductions
Artificial confinement	Metals in soil	Temperature min	Harassment
Bed scour	Pollutants in water	Temperature spatial variation	Hatchery outplants
Embeddedness	Nutrient enrichment	Turbidity	Fish community richness
Fine sediment	Natural flow regime	Water withdrawals	Predation
Obstructions	Regulated flow regime	Salmon carcasses	Benthos community richness
Wood	Within year high flow	Riparian function	Predation
Alkalinity	Within year low flow	Gradient	Icing
Dissolved oxygen	Diel flow pattern	Fish pathogens	

EDT Habitat Attributes

Channel stability	Sediment load	Food	Competition
Habitat diversity	Temperature	Pathogens	Water withdrawals
Key habitat	Flow	Predation	
Obstructions	Oxygen	Harassment	
Chemicals	Salinity	Predation	

EDT has been run at the broad scale 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 11, EDT 2002). In the Clearwater subbasin EDT was run using environmental attributes describing the 131 6th field HUCs that provide the primary habitat for spring chinook in the subbasin (Figure 1). EDT analyses or output is not currently available for any other species in the Clearwater subbasin.

Table 11. 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

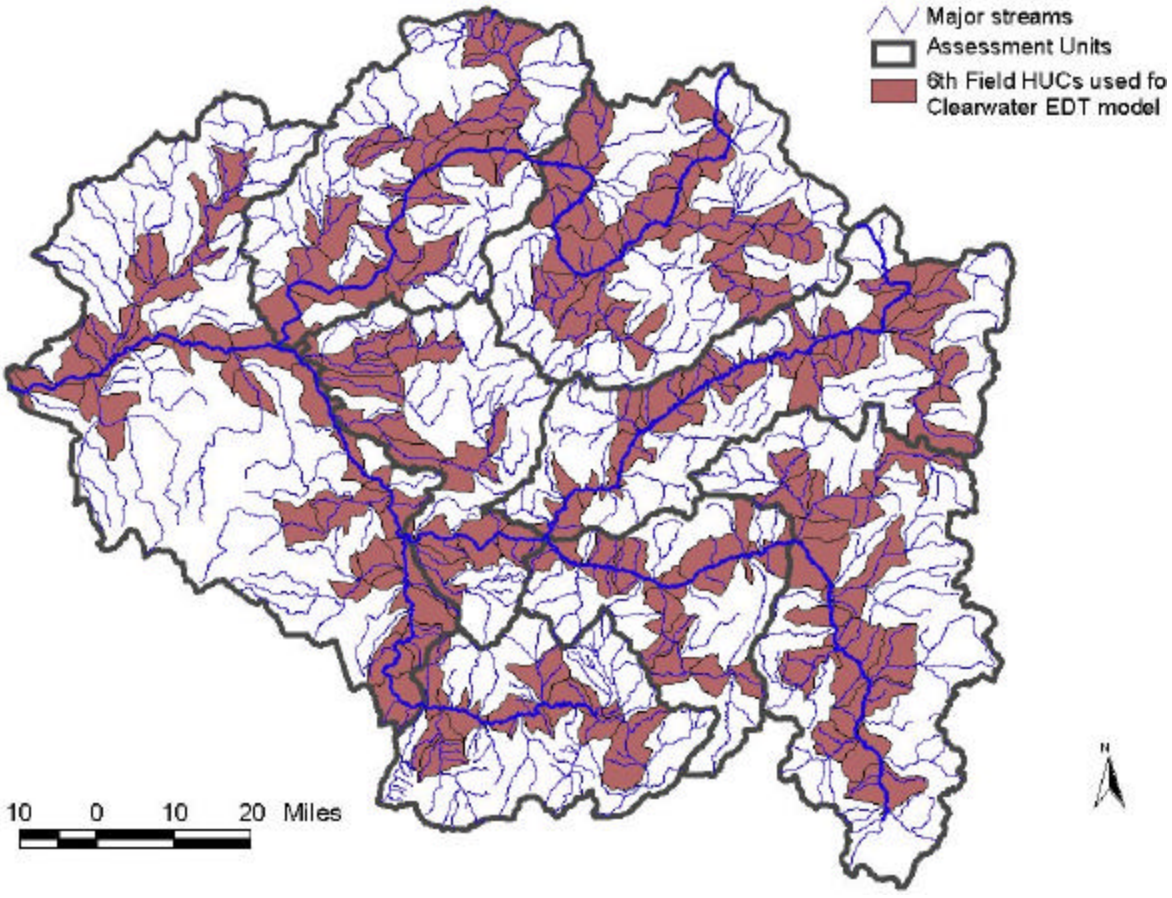

Figure 1. 6th Field HUCS used in Clearwater EDT model.

The Technical Guide for Subbasin Planners suggests running EDT at the subbasin scale to help in the identification of limiting factors (Council 2001). At the time of the development of the Clearwater Subbasin Assessment the methodology for applying EDT at the subbasin scale was still in development. Data with which to populate the EDT model was not available in a consistent format across the subbasin and, although the model accepts input of professional judgment, budgets, timelines and the size of the Clearwater subbasin precluded organization of a team qualified to populate the model in this manner.

It is hoped that as the process for running EDT at the subbasin scale becomes more refined it will be possible to run EDT in support of future iterations of the Clearwater Subbasin Plan. To prepare for this eventuality, this plan calls for improved standardization of data collection methods and identifies data gaps which, once filled, may provide additional information for use in running EDT.

Qualitative Habitat Analysis (QHA)

The Qualitative Habitat Assessment technique (QHA) provides a structured, "qualitative" approach to analyzing the relationship between a given fish species and its habitat. It does this through a systematic assessment of the condition of eleven aquatic habitat attributes (see below) that are thought to be key to biological production and sustainability. Habitat attribute findings are then considered in terms of their influence on a given species and life stage (Council 2003).

QHA Habitat Characteristics

Riparian condition	Fine sediment	Oxygen	Pollutants
Channel structure	High flow	Low winter temperature	Artificial obstructions
Habitat diversity	Low flow	High winter temperature	

QHA relies on the expert knowledge of natural resource professionals with experience in a given local area to describe physical conditions in the target stream and to create a hypothesis about how the habitat would be used by a given fish species. The hypothesis is the "lens" through which physical conditions in the stream are viewed. The hypothesis consists of weights assigned to life stages and habitat attributes, as well as a description of how reaches are used by different life stages. These result in a composite weight that is applied to a physical habitat score in each reach. This score is the difference between a rating of physical habitat in a reach under the current condition and a theoretical "reference" condition (Council 2003).

The ultimate result is an indication of the relative restoration and protection value for each reach and habitat attribute. QHA also provides a means to compare restoration and protection ratings to other biological and demographic information of the user's choosing. QHA includes features for documenting the decision process and describing the level of confidence that users have in the various ratings (Council 2003).

The QHA model was released for use following completion of the Clearwater Subbasin Assessment. Other subbasins are currently having success at running it during their subbasin planning processes. Although it is not a sophisticated analytical model, QHA supplies a framework for reporting information and analyzing the relationships between a species and its

environment that could be helpful to making management decisions about the Clearwater subbasin. Because the QHA model use fewer attributes and relies more aggressively on the integration of professional judgment into the process it may be less data, time, and money intensive than EDT.

SITES

The purpose of running the SITES model is to identify the suite of conservation sites and strategies that will ensure the long-term survival of all viable native plant and animal species and natural communities in the area. The SITES model is an optimization model that applies a combination of simulated annealing and iterative improvement to the portfolio design problem. The simulated annealing used by SITES is a minimization method, where biodiversity is a constraint and the goal is to minimize the cost or size of the portfolio. The unit of analysis used in efforts conducted to date was the 6th field HUC (TNC 2003).

The Nature Conservancy completed the running of SITES for numerous large ecoregions of approximately 50,000,000 acres in size in 2003. The Clearwater subbasin is part of three of these ecoregions: the Middle Rockies-Blue Mountain, the Canadian Rocky Mountains and the Columbia Plateau.

Running the SITES model involves three main steps

- Identifying the conservation targets that will help to maintain the biodiversity of the area.
- Identifying the desired representation of the conservation targets in the ecoregion.
- Identifying the costs and suitability of protection of different areas.

Conservation Targets

The Nature Conservancy planning team for the Middle Rockies Blue Mountain Ecoregion (similar methodology was used in the other two Ecoregions) identified 978 individual coarse and fine filter conservation targets distributed in both terrestrial and aquatic habitats. The data used to determine the distribution of the targets came from a variety of sources. Most data, such as the distribution of all plant and animal species targets in the ecoregion, were obtained from the four state Natural Heritage programs. The following criteria were used in the selection of conservation targets from this database

- All G1, G2, and federally listed species were included.
- G3 species were considered individually.
- G4 and G5 species were included if the species is declining over all or part of their range, if the population is disjunct from distant ecoregions, or if it is endemic.

Data obtained from other sources included the predicted distribution maps for wide ranging birds and mammals such as sage grouse, wolverine, gray wolf and lynx, which were obtained from the state GAP programs. The distribution data for wide-ranging fish were obtained from StreamNet. Aquatic community distribution data were developed by the planning team using a physically based classification model that was applied in a GIS to represent aquatic communities in the ecoregion (TNC 2003).

Representation Goals

The Nature Conservancy planning team developed conservation goals for the representation of each target element or surrogate in the portfolio. Portfolio representation goals were developed based on three primary factors:

- the distribution of the targets across the ecoregion.
- the number of occurrences or amount of area occupied.
- and the degree of endangerment for the conservation target.

Cost and Suitability

Factors considered in determining the cost and suitability of conservation of terrestrial habitats for the Middle Rockies-Blue Mountain Ecoregional Plan include (similar methodology was used for the other two Ecoregional Plans)

- The conservation suitability of private land was considered to be somewhat lower than the same area of public land. Cost would rise faster as private land area increased in a HUC6 than for a similar increase in public land area.
- The Nature Conservancy Planning Team wanted the model to choose areas of public land that were less roaded. So, they applied rules that would cause the first few roads in a HUC6 to dramatically increase the cost, but the rate of increase declines beyond a certain density threshold. In other words, it is the first roads that decrease the suitability the most and, after a point, the cumulative effect of additional roads becomes less.
- The opposite is true of private land. They did not want the model to avoid private land, so they applied rules under which a low level of roads and converted land did not dramatically increase the cost (decrease suitability). The cost rises slowly at first for private land, but more rapidly as the percentage of converted and roaded land increases in a HUC6.

Factors consider when rating the cost and suitability of conservation in aquatic habitats include

- Dams within the HUC
- Length of 303d in HUC
- # of point sources within HUC
- ICBEMP aquatic integrity scores

In order to account for the relatively low cost of continuing to protect areas with existing protection HUC6 watersheds that were completely of partially contained by a protected area >25 acres in size were locked into the portfolio selection (i.e. these areas were always selected in the development of the conservation strategy; TNC 2003).

SITES Outputs

The model begins by generating a completely random portfolio. Next, it iteratively explores trial solutions by making sequential random changes to this portfolio. Either a randomly selected selection unit (HUC6 watershed), not yet included in the portfolio, is selected, or a selection unit already in the system is deleted. At each step, the new solution is compared with the previous solution, and the best one is accepted. The modeled solution constituted the first draft of the conservation portfolio. The Nature Conservancy planning team and an independent review team then reviewed the first draft, and modified it based on personal experience in the ecoregion (TNC 2003).

Fifty-six percent of the Clearwater subbasin was selected in the combined conservation portfolios of the three applicable Ecoregions (Figure 2). Output from the Sites model for the Middle-Rockies Blue Mountain and the Canadian Rocky Mountain Ecoregions was just recently released and therefore was unavailable for use during the development of the Clearwater Subbasin Plan. However, there appears to be a strong correlation between areas included in the Sites Portfolio and those highlighted as important areas in Clearwater Subbasin Assessment and Plan. Current Council guidance on conducting Wildlife Assessments suggests using the Ecoregional Level SITES data in the assessment and potentially rerunning the SITES model at the subbasin level (Scheeler et al. 2003). Problem Statement 6 in this Clearwater Management Plan (refer to Section 4.2 of this document) discusses the need for increased collection of inventory data for the rare and focal species of the subbasin. This information would increase the accuracy of a subbasin specific SITES run. Subbasin specific SITES modeling will be considered in future iterations of the Clearwater Subbasin Plan.

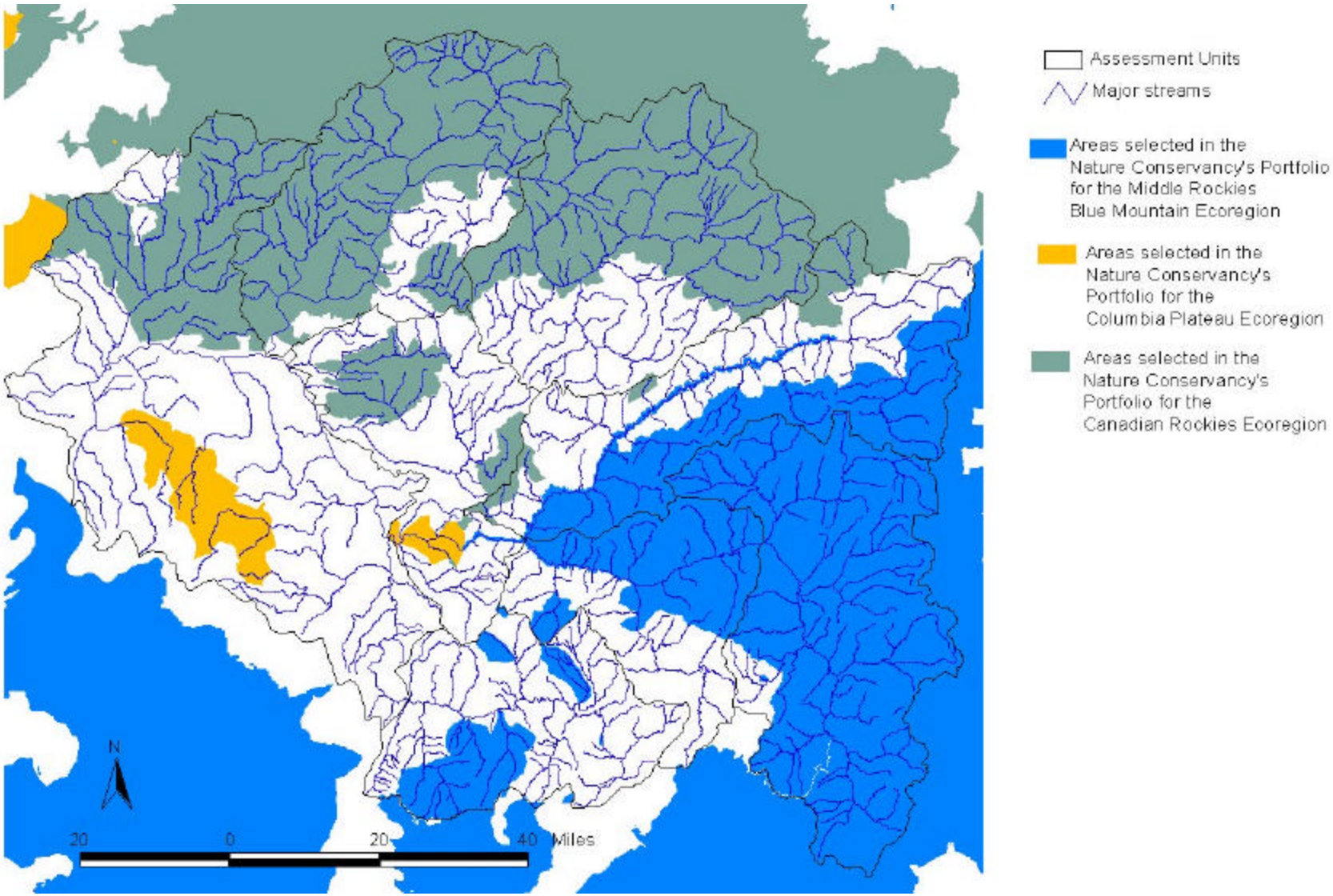

Figure 2. Areas selected by Sites for the Nature Conservancy's Conservation Portfolio in the Clearwater subbasin

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	TEMP	7.53
5037	MX1	Canyon Creek	Headwaters to mouth	2007	TEMP	10.12
5068	MX1	WF Deadman Creek	Headwaters to mouth	2007	TEMP	7.68
5080	MX1	Glade Creek	Headwaters to mouth	2007	TEMP	Unkn
5137	MX1	Nut Creek	Headwaters to mouth	2007	TEMP	3.07
5183	MX1	SF Canyon Creek	Headwaters to mouth	2007	TEMP	4.08
5265	MX1	Walde Creek	Headwaters to mouth	2007	TEMP	4.18
2084	FD8	Fish Creek	Headwaters to mouth	2007	TEMP	20.24
2085	FD6	Placer Creek	Headwaters to mouth	2007	TEMP	3.46
2086	FD6	Polar Creek	Headwaters to mouth	2007	TEMP	2.93
2087	FD9	Storm Creek	Headwaters to mouth	2007	TEMP	10.60
				TOTAL MILES OF LISTED STREAMS		142.63

HUC# 17060305 South Fork Clearwater River						STREAM
WQLS	PMU	WATERBODY	BOUNDARIES	DUE	POLLUTANT(S)	MILES
2088	FD2	Big Elk Creek	Headwaters to mouth	2002	TEMP	9.62
2089	FD2	Little Elk Creek	Headwaters to mouth	2002	TEMP	9.23
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	2002	BAC DO QALT HALT NH3 NUT SED TEMP	19.18
3292	PR5	Butcher Creek	Headwaters to SF Clearwater River	2002	BAC DO QALT HALT SED TEMP	12.37
3301	FD2	Newsome Creek	Beaver Creek to SF Clearwater River	2002	SED	6.91
4002		Lucas Lake		2002	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	2002	SED	4.95
5030	FD2	Buffalo Gulch	Headwaters to American River	2002	SED	6.49
5056	FD3	Dawson Creek	Headwaters to Red River	2002	SED	2.29
5136	FD2	Nugget Creek	Headwaters to Newsome Creek	2002	SED	2.72
5169	FD2	Sing Lee Creek	Headwaters to Newsome Creek	2002	SED	3.09
5185	FD3,5	SF Clearwater River	Red River to Clearwater River	2002	HALT SED TEMP	63.79
5217	FD4	Cougar Creek	Headwaters to SF Clearwater River	2002	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	223.35

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 N Fk. to 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	Lower 26.2 km	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	Lower 3.4 km	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	2006	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
5225	PR3,6,8	Big Bear Creek	W Fk. Big Bear to Potlatch River	2005	TEMP	18.07
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		438.50

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	Unscheduled	SED	19.51
3225	FD5	Osier Creek	Headwaters to Moose Creek	Unscheduled	QALT HALT SED TEMP	8.09
3229	FD5,8	Gravey Creek	Headwaters to Cayuse Creek	Unscheduled	SED	8.96
5040	FD5	China Creek	Headwaters to Osier Creek	Unscheduled	SED	4.89
5045	FD7	Cold Springs Creek	Headwaters to NF Clearwater River	Unscheduled	SED	4.94
5047	FD7	Cool Creek	Headwaters to Cold Springs Creek	Unscheduled	SED	3.32
5049	FD6	Cougar Creek	Headwaters to Quartz Creek	Unscheduled	SED	3.69
5059	FD5	Deception Gulch	Headwaters to NF Clearwater River	Unscheduled	SED	4.74
5088	FD6	Grizzly Creek	Headwaters to Quartz Creek	Unscheduled	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	Unscheduled	SED	4.96
5104	FD5	Laundry Creek	Headwaters to Osier Creek	Unscheduled	SED	4.39
5119	FD5	Marten Creek	Headwaters to Gravey Creek	Unscheduled	SED	4.47
5123	FD7	Middle Creek	Headwaters to Weitas Creek	Unscheduled	SED	13.32
5178	FD6	Sneak Creek	Headwaters to NF Clearwater River	Unscheduled	CHS	3.49
5189	FD7	Sugar Creek	Headwaters to Swamp Creek	Unscheduled	SED	3.99
5190	FD7	Swamp Creek	Headwaters to Osier Creek	Unscheduled	SED	5.39
5192	FD5	Sylvan Creek	Headwaters to French Creek	Unscheduled	SED	4.31
5193	FD6	Tamarack Creek	Headwaters to Orogrande Creek	Unscheduled	SED	3.92
5200	Mx3	Tumble Creek	Headwaters To Washington Creek	Unscheduled	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	Done	BAC QALT HALT NUT SED TEMP	12.15
3189	MX1,2	Elk Creek	Headwaters to Dworshak Reservoir	Done	BAC QALT HALT NUT SED TEMP	20.85
3190	MX1	Elk Creek Reservoir		Done	BAC DO QALT HALT NUT SED TEMP	NA
3191	MX4	Cranberry Creek	Headwaters to Dworshak Reservoir	Done	BAC QALT HALT NUT SED TEMP	6.79
3192	MX2	Swamp Creek	Headwaters to Dworshak Reservoir	Done	BAC QALT HALT NUT SED TEMP	7.36
3193	FD6, MX1,2	Reeds Creek	Headwaters to Dworshak. Reservoir	Done	SED	15.95
3197	MX1,2	Breakfast Creek	Headwaters to Clearwater River	Done	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	Done	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 (Table 12, Table 13, Table 14, Figure 3).

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 12. 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 13. 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 14. 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

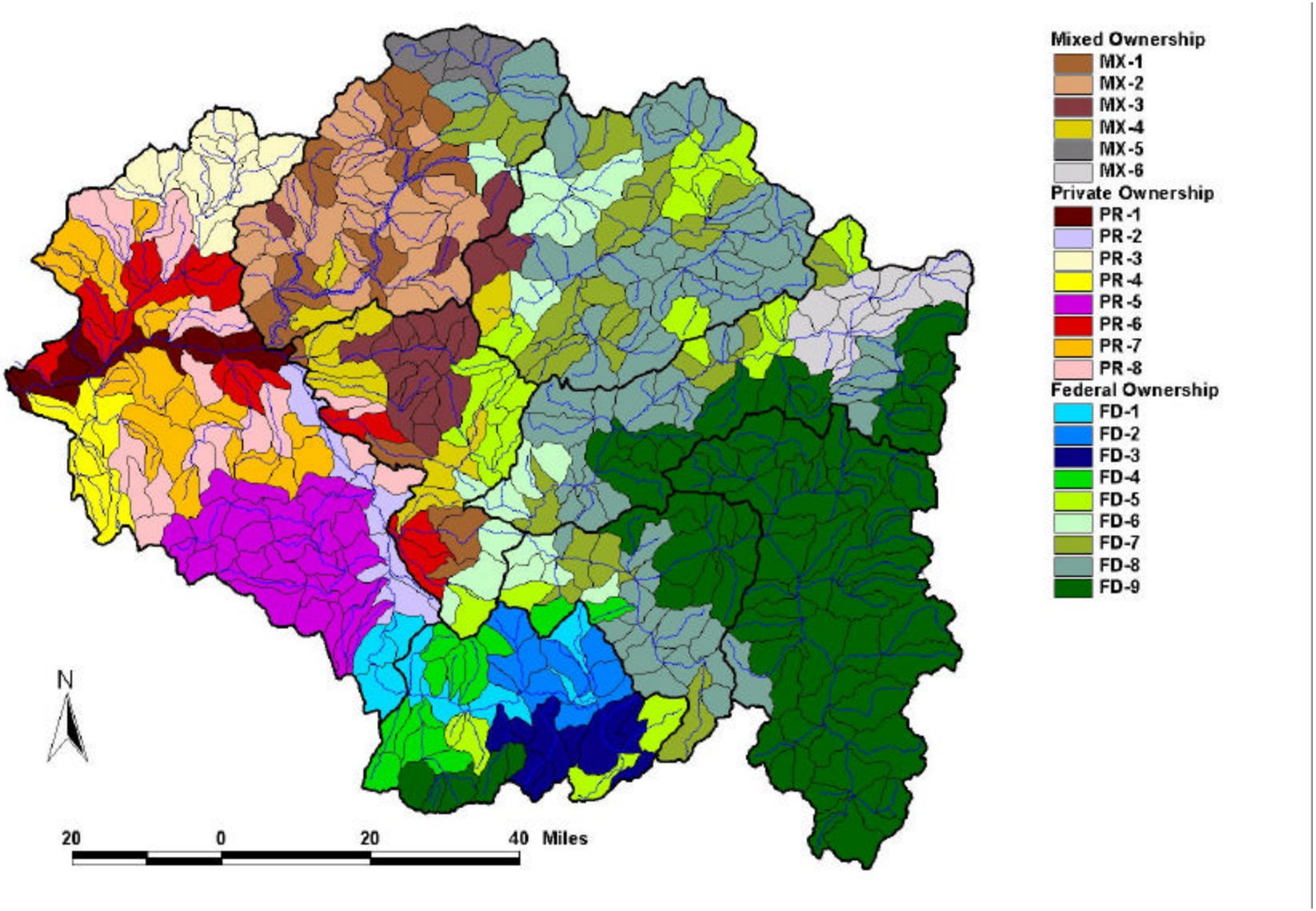

Figure 3. Potential Management Units (PMUs) delineated in the Clearwater subbasin.

Appendix G. Using the PMUs for project planning and review.

Protection and restoration issues and their priorities within PMUs developed as part of this plan are anticipated to be a useful tool in project planning, both within and outside of the BPA funding system. Project planners may frame project proposals within the PMU system to illustrate appropriateness of project type (issues to be addressed) and locale (is the issue appropriately addressed at the proposed location); those reviewing proposals may use the PMU system as a tool to assess, in part, the relative merit of a proposal based on these same issues.

The following information is presented to further facilitate the understanding and use of the PMU system by both project planners and reviewers. Table 15 provides a comparison of defined restoration concerns and their relative priority across all PMUs defined in the Clearwater subbasin assessment. Used in conjunction with the PMU map(s) provided in this assessment and plan, this information provides a quick screen of where in the Clearwater subbasin certain project types might be applied to benefit aquatic and terrestrial resources. This, in turn, will help to form a solid foundation for project proposals within the subbasin.

The following examples highlight how information in Table 15 may be used in various project planning scenarios:

1. Definition of widespread and/or high priority issues: Used with issue descriptions provided in assessment chapter 9, users can quickly discern the most widespread and/or high priority issues impacting resources within the Clearwater subbasin. Widespread issues generally occur in the greatest number of PMUs. Priority of issues varies spatially; using the information in Table 15 with that in Figure 3 will help users define where within the subbasin any given issue is of highest priority.
2. Application of specialized resources: Users with specialized restoration resources already in place may use Table 15 to define areas where those resources may be applied most effectively. For example, a group with staff and equipment specializing in road reconditioning or removal might begin by locating PMUs with moderate-high priority for addressing impacts of roads and/or landslide prone roads, particularly where they overlap with sedimentation concerns (e.g. MX-1 and FD-6; Table 15).
3. Summarization of issues across other spatial scales: Users can examine restoration concerns and their relative priorities spatially by watersheds, population areas, or other spatial units. This process would draw information from Table 15 as well as from chapter 9 of the subbasin assessment. The following discussion expands on this topic.

An illustrative 'small-scale' example of the application of PMU information to project planning is provided here using the Lapwai Creek drainage[5]. Readers are referred to Appendix H for similar examples summarizing PMU information across broader spatial scales (steelhead population areas defined by NOAA Fisheries; see McClure et al. 2003).

[5] This 'small-scale' example is presented based on its perceived common usage in project planning. Although information presented in this assessment and plan may be used to guide restoration planning within small scale watersheds (e.g. Lapwai Creek), conclusions reached at these scales should be used cautiously unless supported by finer scale data. In compiling the subbasin scale assessment and plan, data were often selected based on their appropriateness for use at the broad scale, and some data may have been ignored if they applied only to a small area within the subbasin; these same data may not be the most applicable or accurate at the small watershed scale.

Table 15. Summary of defined restoration needs/issues within each PMU of the Clearwater subbasin.

	PMU																						
Protection or Restoration Need	**PR-1**	**PR-2**	**PR-3**	**PR-4**	**PR-5**	**PR-6**	**PR-7**	**PR-8**	**MX-1**	**MX-2**	**MX-3**	**MX-4**	**MX-5**	**MX-6**	**FD-1**	**FD-2**	**FD-3**	**FD-4**	**FD-5**	**FD-6**	**FD-7**	**FD-8**	**FD-9**
Protection Needs																							
Wilderness	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	HH	--	--	--	--	HH
Roadless	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	HH	HH	--	HH	HH	--
Restoration Needs																							
Water Temperature	H	L	H	M	M	H	H	H	M	H	MH	MH	M	M	L	M	M	M	M	M	L	L	L
Instream Habitat	--	--	L	L	L	L	L	L	H	L	--	M	--	--	--	H	H	--	U	M	--	--	--
Exotic Spp. (Aquatic)	--	--	--	--	--	L	--	--	M	M	L	L	H	--	L	M	M	M	M	L	M	H	H
Sedimentation	L	L	H	--	--	H	--	--	H	H	--	--	L	L	--	--	--	--	--	H	--	--	--
Surface Erosion	--	--	--	H	H	--	H	H	--	--	--	H	--	--	L	--	--	--	L	--	--	--	--
Roads	--	--	H	--	--	--	--	--	MH	L	LM	H	M	M	H	H	M	H	H	H	--	--	--
Landslide Prone Roads	M	M	--	--	--	LM	--	--	H	H	--	--	--	--	--	--	--	--	--	H	H	--	--
Grazing Impacts	L	L	H	M	M	M	L	L	M	L	L	L	--	--	MH	H	--	H	L	L	--	--	--
Mining Impacts	--	--	--	--	--	--	--	--	--	--	--	--	--	--	MH	H	M	--	--	--	--	--	--
Water Use	--	--	--	H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrology	--	--	--	--	L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Riparian/Wetland	--	--	--	M	M	U	U	U	--	--	--	--	--	--	--	--	H	--	--	--	--	--	--
Vegetative Structure	--	--	M	--	--	--	--	--	M	L	L	M	M	M	M	H	H	H	H	M	M	M	L
Ponderosa Pine	HM	HM	--	HM	HM	HM	--	HM	HM	HM	HM	HM	--	--	HM	--	--	--	--	HM	--	--	--
Grasses (Prairie)	H	H	--	H	H	H	H	H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dworshak Impacts	H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

From information presented throughout the subbasin assessment it is known that the Lapwai Creek drainage lies within the Lower Clearwater Assessment Unit, and within the Lower Clearwater Steelhead Population Unit as defined by McClure et al. (2003). Land cover within the drainage is predominantly agricultural, with shrub and grasslands in canyons, and forested areas in the highest elevations. The drainage lies within the Nez Perce Tribal Reservation, and supports wild A-run steelhead, and is a relatively complex area with respect to restoration and/or recovery planning due to a wide range of past and current impacts.

The Lapwai Creek watershed is made up of all or portions of 3 different PMUs. PMUs PR-4, PR-7, and PR-8 comprise 6, 3, and 4 HUCs, respectively, within the watershed (refer to Table 17). The "PR" designation in the PMU titles makes it clear that the entire watershed is dominated by privately owned/managed lands. No single PMU is particularly dominant in its influence of the restoration/habitat recovery needs within the watershed, although PR-4 is somewhat more influential (6 HUCs) than the others (3-4 HUCs each).

The most widespread and highest priority issues of concern within the watershed are the protection and restoration of prairie grassland habitats, and reductions (restoration) in water temperature and soil surface erosion (Table 16). Restoration of grazing impacts and instream habitat conditions are widespread issues of lower priority within the watershed. Protection and restoration (including initial inventory) of ponderosa pine communities within PMUs PR-4 and PR-8 is of High-Moderate priority. Although a defined issue/concern, the priority of riparian/wetland restoration could not be established for 2 of 3 PMUs within the watershed due to lack of sufficient data.

Of special importance within the Lapwai Creek watershed is the high priority restoration need related to water use in the western portions of the watershed (PMU PR-4). This is the only PMU within the Clearwater subbasin in which restoration from impacts of water use is prioritized as a restoration need (See Table 15). Referring to the discussions of water use and irrigation projects in the subbasin assessment (Sections 4.8 and 4.11, respectively), readers will note that the water use in the Lapwai Creek watershed is primarily attributable to the Lewiston Orchards Irrigation District.

Issues evaluated and not defined to be of concern in the PMUs within the Lapwai Creek watershed include roads, landslide prone roads, mining impacts, sedimentation (undefined sources), exotic (aquatic) species, hydrologic alterations, vegetative structure, and protection of wilderness or roadless areas (Table 16).

The lack of a defined sediment concern may seem contradictory to information provided in the assessment since many stream segments within the Lapwai Creek watershed are identified as sediment limited on the 303d list (Appendix E), and steelhead habitat is defined as limited by instream sediment levels (See Assessment Section 7.1.1 and Assessment Appendix H). Rather than contradicting previously presented information, the PMU delineations go beyond reiterating the issue (instream sedimentation) and are interpretable to define and prioritize the sources of the sediment creating the concern (primarily surface erosion from agricultural fields, with additional influence of grazing in more localized areas).

Table 16. Summary of restoration issues and related priorities for PMUs included in the Lapwai Creek watershed.

		PMU and Relative Priority of Each Issue Within		
Restoration Issue	**Goal**	**PR-4**	**PR-7**	**PR-8**
Wilderness	Protect	N/A		
Roadless	Protect	N/A		
Water Temperature	Restore	M	H	H
Instream Habitat	Restore	L	L	L
Exotic Spp. (Aquatic)	Protect/Restore	N/A		
Sedimentation	Restore	N/A		
Surface Erosion	Restore	H	H	H
Roads	Restore	N/A		
Landslide Prone Roads	Restore	N/A		
Grazing Impacts	Restore	M	L	L
Mining Impacts	Restore	N/A		
Water Use	Restore	H	--	--
Hydrology	Restore	N/A		
Riparian/Wetland	Restore	M	Undef.	Undef.
Vegetative Structure	Restore	N/A		
Ponderosa Pine	Protect/Restore	H-M	--	H-M
Grasses (Prairie)	Protect/Restore	H	H	H
Dworshak Impacts	Restore	N/A		

A series of tables is provided to allow users to focus on those PMUs and associated issues applicable at various commonly used restoration scales. Tables cross referencing PMUs with assessment units and component drainages[6] (Table 17), defined steelhead population areas (Table 18), Idaho state key bull trout watersheds (Table 19) and Section 7 consultation areas (Table 20) within the Clearwater subbasin are presented below.

[6] For this purpose, drainages are defined as commonly recognized watershed areas made up of 3 or more 6th field HUCs, and are illustrated in Figure 4. In many cases these align with commonly described watersheds. In some cases, particularly those involving mainstem rivers and/or small surrounding face drainages, drainage delineation may not coincide with commonly used watershed names.

Table 17. Summary of the number of 6th code HUCs within each PMU, organized according to Assessment Unit and drainage.

Assessment Unit / Drainage*	PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	PR-8	MX-1	MX-2	MX-3	MX-4	MX-5	MX-6	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9
Lower Clearwater Assessment Unit																							
Big Bear Ck.			3			1	1	3															
Big Canyon Ck.					1	3	6	4															
Clearwater R. and Face Drainages	8	3		1		1	5	4															
Cottonwood Ck.					11																		
Lapwai Ck.				6			3	4															
Lawyers Ck.					12																		
Potlatch River			10			6	3	1															
South Fork Clearwater/Face Drainages		2			3										3								
Total	**8**	**5**	**13**	**7**	**27**	**11**	**18**	**16**							**3**								
Lochsa River Assessment Unit																							
Boulder Ck.																							3
Crooked/Brushy Fork														6					1		1		
Fish/Hungery Ck.																						3	
Lochsa R. and Face Drainages														2					3	3	3	10	3
Warm Springs Ck.																							3
White Sand Ck.														2								4	6
Total														**10**					**4**	**3**	**4**	**17**	**15**
South Fork Clearwater Assessment Unit																							
American R.															2	3							
Crooked R.																	4						
Johns Ck.																		3					3
Newsome Ck.																2		1					
Red R.																2	3		2				
S Fk. Clearwater R. and Face Drainages															3	2		6	2				
Tenmile Ck.																	2						2
Total															**5**	**9**	**9**	**10**	**4**				**5**
Lower Selway River Assessment Unit																							
Meadow Ck.																		1			1	9	
O'Hara Ck.																		1	1	1	1		
Selway R. and Face Drainages																				3	2	3	10
Total																		**2**	**1**	**4**	**4**	**12**	**10**

Assessment Unit / Drainage*	PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	PR-8	MX-1	MX-2	MX-3	MX-4	MX-5	MX-6	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9
Upper Selway River Assessment Unit																							
Bear Ck.																							6
Little Clearwater R.																							4
Moose Ck.																							16
Running Ck.																						1	2
Selway R. and Face Drainages																							16
White Cap Ck.																							3
Total																						**1**	**47**
Lolo / Middle Fork Assessment Unit																							
Clear Ck.						1			1										1	2			
Clearwater R. and Face Drainages								1															
Jim Ford Ck.											5	1											
Lolo Ck.						1		1	1		1	1							5	1			
Middle Fk. and Face Drainages						1			2			1								1			
Orofino Ck.									1		8	2							1				
Total						**3**		**2**	**5**		**14**	**5**							**7**	**4**			
Lower North Fork Assessment Unit																							
Breakfast Creek									3	4													
Dworshak Reservoir and Face Drainages									4	9		2											
Elk River									2	4	1												
Little N. Fk. Clearwater R.									2	1			4								1	3	
North Fork Clearwater R. and Face Drainages										1	1									1	1		
Reeds Ck.										3	1												
Total									**11**	**22**	**3**	**2**	**4**							**1**	**2**	**3**	
Upper North Fork Assessment Unit																							
Kelly/Cayuse Ck.																			3		2	13	
North Fork Clearwater R. and Face Drainages											2								2	4	3	8	
Orogrande Ck.												1							1	1			
Weitas Ck.																					6	4	
Total												**1**							**4**	**1**	**8**	**17**	

* For this purpose, drainages are defined as commonly recognized watershed areas made up of 3 or more 6th field HUCs, and are illustrated in Figure 4.

Table 18. Summary of the number of 6th code HUCs within each PMU, organized according to steelhead population areas defined by the Interior Columbia Basin Technical Recovery Team (see McClure et al. 2003).

Population Unit	PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	PR-8	MX-1	MX-2	MX-3	MX-4	MX-5	MX-6	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9
Lower Clearwater/Middle Fork Population Unit	8	5	13	7	27	13	18	15	4		13	4							2	3			
Lolo Creek Population Unit						1		1	1		1	1							5	1			
Lochsa River Population Unit														10					4	3	4	17	15
South Fork Clearwater Population Unit															8	9	9	10	4				5
Selway River Population Unit																		2	1	4	4	13	57
North Fork Clearwater R. *									11	22	5	3	4						6	6	13	28	

* North Fork Clearwater River drainage upstream of Dworshak Dam; No longer accessible, but defined as an historic independent population area.

Table 19. Summary of the number of 6th code HUCs within each PMU, organized according to Idaho state bull trout key watershed.

Idaho State Bull Trout Key Watershed *	PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	PR-8	MX-1	MX-2	MX-3	MX-4	MX-5	MX-6	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9
Little North Fork Clearwater													4								1	3	
Upper North Fk. Clearwater											2	1							6	5	11	25	
Lochsa River														10					4	3	4	17	15
Upper Selway River																		1			1	11	54
O'Hara Creek (Selway R)																		1	1	1	1		
Crooked River (South Fork)																1	4						
Johns Creek (South Fork)																		3					3
Mill Creek (South Fork)																		4					
Newsome Ck. (South Fork)																2		1					
Red River (South Fork)																1	3		2				
Tenmile Creek (South Fork)																	1						2

* Key watersheds are plotted on Figure 96 in the Subbasin Assessment; Names presented here are for descriptive purposes only.

Table 20. Summary of the number of 6th code HUCs within each PMU, organized according to ESA Section 7 consultation areas.

Section 7 Consultation Area *	PR-1	PR-2	PR-3	PR-4	PR-5	PR-6	PR-7	PR-8	MX-1	MX-2	MX-3	MX-4	MX-5	MX-6	FD-1	FD-2	FD-3	FD-4	FD-5	FD-6	FD-7	FD-8	FD-9
Potlatch River			13			7	4	4															
Orofino Creek									1		8	2							1				
Lolo Creek						1		1	1		1	1							5	1			
Middle Fork Clearwater R.						2			3			1							1	3			
Lochsa River														10					4	3	4	17	15
Selway River																		2	1	4	4	13	57
South Fork Clearwater R.		2			3										8	9	9	10	4				5
Other Areas (no consultation required)	8	3		7	24	4	14	13	11	22	10	47	4						6	6	13	28	

* Section 7 consultation areas are plotted on Figures 101 and 104 in the Subbasin Assessment; Names presented here are for descriptive purposes only.

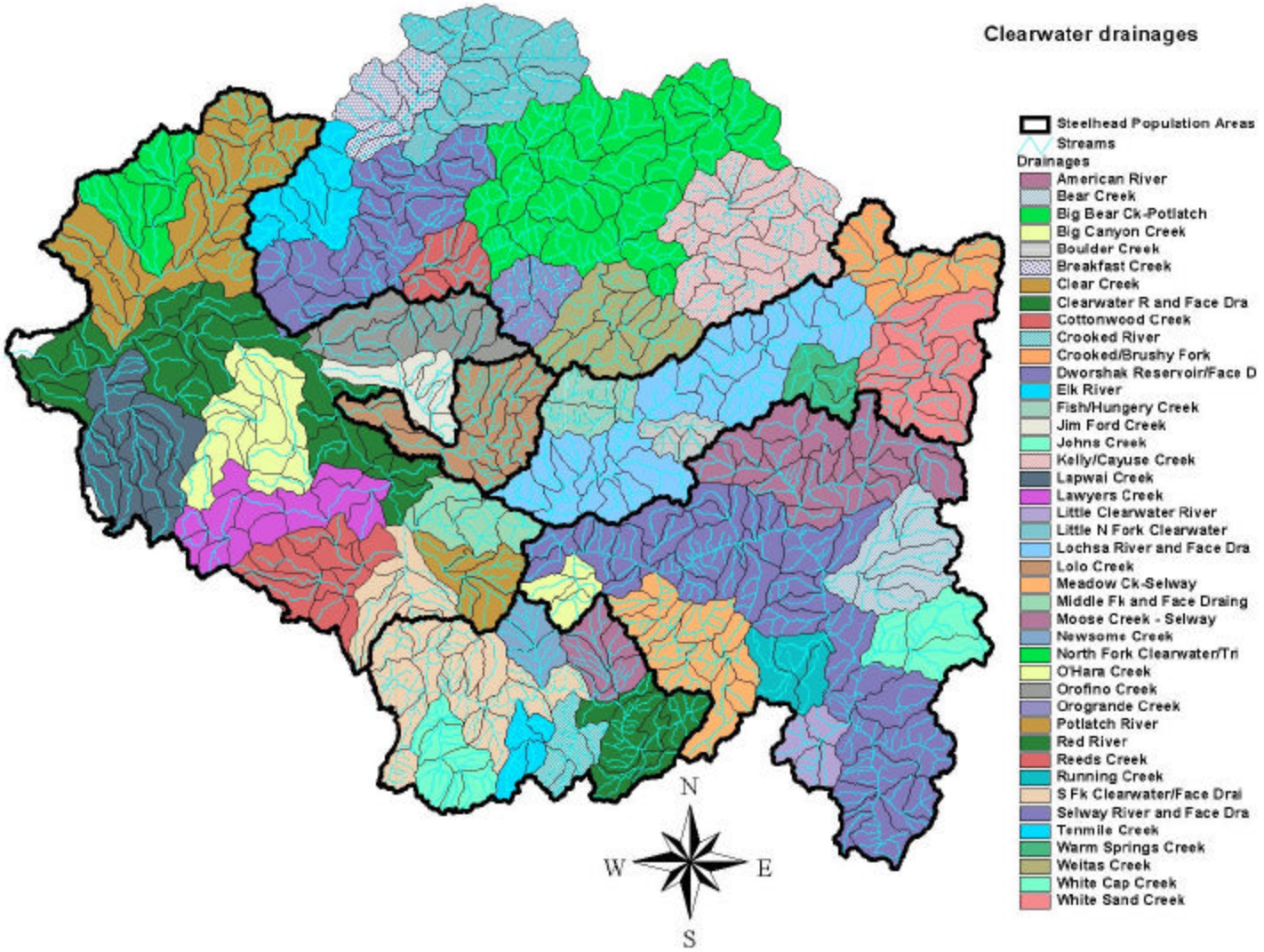

Figure 4. Drainages defined to aid in utilization of PMUs for project planning and review.

Appendix H. Estimated implementation budget.

A ten year budget was estimated to implement the Clearwater Subbasin Plan. The estimate is very general and not intended to be limiting or binding in any way. Because of survey limitations there may be omissions. Furthermore, the estimated budget does not address construction, maintenance, or artificial production costs by any agency or work done through the Lower Snake River Compensation Plan. Agencies conducting work in the Clearwater subbasin that is related to the objectives and strategies in the Clearwater Management Plan were surveyed for current and planned future work. The results of the survey were tabulated into four sections: habitat restoration, coordination, research, monitoring, evaluation (RME), and all categories where agencies responded with a single sum of expenditures. No inflation factor was used to adjust annual expenditure estimates. Reference to

Table 1 (List of acronyms) will facilitate use of Table 21 below (which is also included on the accompanying CD and titled Appendix H-Estimated implementation budget). Following are notes to provide additional information.

CWA 319 projects refer to section 319 of the Clean Water Act. These are Environmental Protection Agency funds that are allocated to the Nez Perce Tribe and to Idaho State. The Idaho Department of Environmental Quality has primacy to administer the Clean Water Act §319 Nonpoint Source Management Program for areas outside the Nez Perce Reservation. Funds focus on projects to improve water quality and are usually related to the TMDL process. These figures are based on the latest project selection cycle and it is assumed the program will have a similar presence in the Clearwater over the term of the estimated budget. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. Source: Idaho Department of Environmental Quality

WQPA The Water Quality Program for Agriculture administered by the Idaho Soil Conservation Commission. This program is also coordinated with the TMDL process. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. A fairly constant funding level is expected over the term of the estimated budget. Source: Idaho Soil Conservation Commission.

The RCRDP program is the Resource Conservation and Rangeland Development Program administered by the Idaho Soil Conservation Commission. This is a grant/loan program for implementation of agricultural and rangeland best management practices or loans to purchase equipment to increase conservation. Source: Idaho Soil Conservation Commission.

PL-566 The small watershed program administered by the USDA Natural Resources Conservation Service. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. Source: Idaho Soil Conservation Commission.

CRP Conservation Reserve Program and the Continuous Reserve Program are protection programs implemented on croplands and riparian areas respectively by the USDA Farm Service Agency. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. This total may be under-reported because of the difficulty extracting numbers for Latah and Idaho Counties, which include portions of other subbasins reported. Source: Idaho Soil Conservation Commission.

Existing watershed projects are those that have been coordinated through the Focus Program. These projects are sponsored by the Nez Perce Tribe Watershed Division or soil and water conservation districts and funded with Bonneville Power Administration funds in conjunction with other funding sources. Source: Clearwater Focus Program files

Stewardship projects The U.S. Army Corps of Engineers conducts these projects to improve wildlife habitat. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. Source: US Army Corps of Engineers.

New Upper and New Lower Subbasin Actions are watershed restoration projects that have been identified by the Clearwater and Nez Perce National Forests and other agencies in the subbasin. Source: Clearwater National Forest and Nez Perce National Forest report, conservation districts, Idaho Department of Fish and Game, Nez Perce Tribe.

Land acquisitions and conservation easements are estimated as part of the Nez Perce Tribes Wildlife program proposal before the Bonneville Power Administration and other potential acquisitions. This number is likely under-estimated. Source: Nez Perce Tribe Wildlife Department and conservation districts.

Craig/Wyden Bill Provides compensation to counties in lieu of lost tax revenue from diminished timber harvest. The bill is scheduled to expire next year, but is expected to be reauthorized. This figure is estimated based on present expenditures. Source: Nez Perce National Forest staff

NOAA Restoration Center Community-Based Restoration Funding source for habitat restoration for listed species. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. Source: Estimated from existing projects.

CEDA The Clearwater Economic Development Association coordinating projects in the Clearwater using in part Federal Emergency Management Act funding. Source: CEDA

The Focus Program The coordination function of the Northwest Power and Conservation Council's program and funded by the Bonneville Power Administration. Idaho State and the Nez Perce Tribe co-coordinate the program. See Section 2 Management Programs and Policies of the Clearwater Subbasin Inventory for more information. Source: Focus Program

Surveys and Monitoring – Forest The Clearwater and Nez Perce National Forests' habitat and population surveys and monitoring programs. These numbers are from the latest annual reports from each forest and the expenditures were simply extracted through the term of the estimated budget. Both forests have suffered funding cutbacks in the past few years. Source: 2002 annual reports from Clearwater and Nez Perce National Forests.

NPT Hatchery M/E Monitoring and evaluation of artificial production actions. Source: Bonneville Power Administration.

NPT Watershed M/E This is the implementation and effectiveness monitoring that the Nez Perce Tribe Watershed has implemented for restoration projects: Source: Nez Perce Tribe.

U.S. Army Corps of Engineers The estimated annual budget for monitoring. Source: U.S. Army Corps of Engineers.

Research/supplementation Idaho Department of Fish and Game, Nez Perce Tribe, and U.S. Fish and Wildlife Service work. See Section 7 Research, Monitoring, and Evaluation Activities of the Clearwater Subbasin Inventory for more information. Source: Bonneville Power Administration.

New Restoration monitoring Implementation and effectiveness monitoring for new projects started during the budget period. Source: Nez Perce Tribe and conservation districts.

New RME Estimated for actions to address data gaps and research needs. Source: Idaho Department of Fish and Game and Nez Perce Tribe.

Index Stream Monitoring Estimated need to implement Problem Component 2 Objective B Strategy 3 of the Clearwater Management Plan. Source: U.S. Fish and Wildlife Service.

The two Total Maximum Daily Load The process categories refer to the Nez Perce Tribe and Idaho Department of Environmental Quality preparation of TMDL documents. Source: Idaho Department of Environmental Quality.

TMDL Monitoring The Idaho Association of Conservation Districts participates in pre-TMDL preparation monitoring. See Section 4.3 TMDLs in the Clearwater Inventory and Section 4.2 Clean Water Act of the Clearwater Management Plan for additional information. Source: Idaho Association of Conservation Districts.

The Beneficial Uses Reconnaissance Program (BURP) The water body assessment protocol used to determine if streams are meeting the assigned beneficial uses. See Section 4.3 TMDLs in the Clearwater Inventory and Section 4.2 Clean Water Act of the Clearwater Management Plan for additional information. Source: Idaho Department of Environmental Quality.

The Dworshak Nez Perce Tribe Wildlife Mitigation Fund established in part to mitigate the losses of wildlife habitat from flooding caused by Dworshak Dam. The program is administered through the Nez Perce Tribe Wildlife Department. The Department also receives funding for project work from the Bureau of Indian Affairs. Source: Nez Perce Tribe Wildlife Department.

NPT Wildlife Category reflects the Bureau of Indian Affairs budget component of the Nez Perce Tribe Wildlife Department annual budget. Source: Nez Perce Tribe Wildlife Department.

Idaho Department of Fish and Wildlife and Potlatch Corporation Estimated total annual expenditures for restoration and monitoring. Source: Idaho Department of Fish and Wildlife and Potlatch Corporation.

Draft Bull Trout Recovery Plan Estimated cost for recovery plan implementation. Source: Draft Bull Trout Recovery Plan released in January 2003.

Table 21. Clearwater Plan estimated implementation budget (in dollars).

Category	Funding Source	Estimated Annual Budget Base FY2004	Potential Provincial Review Fiscal Year 2005	Fiscal Year 2006	Fiscal Year 2007	Potential Provinicial Review Fiscal Year 2008	Fiscal Year 2009	Fiscal Year 2010	Potential Provincial Review Fiscal Year 2011	Fiscal Year 2012	Fiscal Year 2013	Fiscal Year 2014	Potential Provincial Review Fiscal Year 2015
Habitat Restoration													
CWA 319 projects	EPA - not NPT	852,805	852,805	852,805	852,805	852,805	852,805	852,805	852,805	852,805	852,805	852,805	852,805
CWA 319 projects	EPA - NPT												
WQPA	SCC	305,134	355,134	355,134	355,134	355,134	355,134	355,134	355,134	355,134	355,134	355,134	355,134
RCRDP (Loan & Grant Prg)	SCC	157,233	157,233	157,233	157,233	157,233	157,233	157,233	157,233	157,233	157,233	157,233	157,233
PL-566	USDA	120,189	120,189	120,189	120,189	120,189	120,189	120,189	120,189	120,189	120,189	120,189	120,189
CRP	USDA	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938	2,966,938
Existing Watershed Projects NPT & SWCD sponsors	BPA	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404	4,004,404
Stewardship Projects	USACE	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
New Upper Subbasin Actions	Multiple		1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000
New Lower Subbasin Actions	Multiple		1,300,000	1,300,000	1,300,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000
Land Acquisition, Conservation Easements	Multiple		2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Craig/Wyden Bill	Federal	315,906	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
NOAA Restoration Center	NOAA Fisheries		50,000	50,000	50,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
CEDA	Fema, Private, NOAA, Clearwater County	121,000	150,000	200,000	200,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
	subtotal	8,943,609	13,756,703	13,806,703	13,806,703	14,281,703	14,281,703	14,281,703	14,281,703	14,281,703	14,281,703	14,281,703	14,281,703
Coordination													
Focus Program	BPA	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000
RM&E													
Surveys and Monitoring	CNF/NPNF	287,500	287,500	287,500	287,500	287,500	287,500	287,500	287,500	287,500	287,500	287,500	287,500
NPT Watershed M/E	BPA	215,000	215,000	215,000	215,000	215,000	215,000	215,000	215,000	215,000	215,000	215,000	215,000
Army Corps of Engineers	USACE	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
NPT Hatchery M/E	BPA	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Research/Supplementation	BPA	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
New Restoration Monitoring	Multiple		250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
New RME	Multiple		1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000	1,400,000
Index Stream Monitoring (8) Construction and O&M	Multiple		4,000,000	160,000	160,000	160,000	160,000	160,000	160,000	280,000	160,000	160,000	160,000
TMDL Process	IDEQ	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
TMDL Process	NPT(EPA)												
TMDL Monitoring	IASCD (SCC)	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000
Beneficial Uses Reconnaissance Program	IDEQ:($2000/sta) (30-40sta/yr)	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
	subtotal	3,831,500	9,481,500	5,641,500	5,641,500	5,641,500	5,641,500	5,641,500	5,641,500	5,761,500	5,641,500	5,641,500	5,641,500
Other Programs and Agencies - all Categories													
Dworshak NPT Wildlife Mitigation Budget	BPA Trust Fund	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000
NPT Wildlife	BIA	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
IDFG -All Categories	not BPA	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000
Potlatch Corporation - All Categories	Potlatch Corporation	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Draft Bull Trout Recovery Plan (1/03)	Multiple		500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
	subtotal	2,300,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000
	TOTAL	15,300,109	26,263,203	22,473,203	22,473,203	22,948,203	22,948,203	22,948,203	22,948,203	23,068,203	22,948,203	22,948,203	22,948,203

Appendix I. Response to NOAA Fisheries comments.

The Clearwater Subbasin Plan will provide a resource for use by NOAA Fisheries and the USFWS in threatened and endangered species recovery planning (Council 2001). NOAA Fisheries staff have noted that this document represents significant progress toward providing recovery planning information for the Clearwater subbasin, but there are concerns that recovery planners may have difficulty efficiently finding and compiling information within the voluminous Assessment and Plan. NOAA Fisheries (Angela Somma, personal communication, August 22, 2003) requested that, specifically, the following information be discussed in the context of each of the steelhead population areas defined within the Clearwater subbasin by the Interior Columbia Basin Technical Recovery Team (TMT; see McClure et al. 2003) to more effectively facilitate recovery planning efforts:

1. Areas most productive for steelhead,
2. Areas of altered conditions and,
3. Areas where the greatest cost effectiveness could be achieved through restoration (i.e. where the largest increase in fish numbers per unit of restoration cost would be observed upon completion of restoration efforts).

Prior to discussing these issues for individual population areas it is necessary to discuss the information collectively across the subbasin. The intent is to refer interested individuals to the relevant portions of the subbasin assessment and plan, and to highlight any caveats, cautions, or assumptions about the information that may influence its utility for use in recovery planning efforts across all population areas.

Overview of Available Data/Information

Productivity

With regard to relative productivity of spatially explicit areas throughout the Clearwater subbasin, readers are referred to Section 7.2 (Aquatic Productivity) of the Subbasin Assessment. In summary, trend data for fish production is not available within the Clearwater subbasin in a manner appropriate for estimating relative productivity of areas within the subbasin. Data available through redd surveys (adults) and the IDFG Parr Monitoring Database (juveniles) are unsuitable for use in estimating productivity throughout the subbasin because the data is from a post-dam time period and follows substantial declines in the abundance of upriver stocks. Since the era of regional dam construction ended adult steelhead returns have been heavily influenced by out-of-subbasin issues (migration and ocean conditions) and that smolt production from individual areas within the subbasin is currently reflective of adult recruitment, not local productivity. Based on this situation, both redd survey data and the Parr Monitoring Database are thought to be inappropriate for use in defining relative productivity of steelhead (or other species) throughout the Clearwater subbasin. This conclusion was reached based on multiple discussions with members of the Clearwater Policy and Technical Advisory Committees as well as members of the NOAA Fisheries staff.

Since information regarding spatial differences in productivity throughout the subbasin was known to be critical to successful recovery planning, an experimental approach was developed to examine the use of benthic macroinvertebrate biomass as an indicator of relative production potential (productivity). Results of this experimental modeling approach will be presented below for each of the steelhead population areas; NOAA Fisheries staff and TRT members are strongly

encouraged to review Section 7.2 of the Subbasin Assessment for explanations of the approach taken to derive the information as well as the critical assumptions made and caveats about use of this information.

Alteration of Conditions

For summarization of areas of altered condition within the Clearwater subbasin, recovery planners are referred to various discussions of Potential Management Units including Chapter 9 of the Subbasin Assessment (Resource Synthesis and Definition of Potential Management Units), Appendix G and Appendix F of this Subbasin Plan.

To synthesize the multitude of condition and disturbance information presented in the Subbasin Assessment, 22 Potential Management Units (PMUs) have been defined throughout the Clearwater subbasin (see Assessment Chapter 9 for complete discussion of PMUs). PMUs are groups of 6th field HUCs (either contiguous or noncontiguous) intended to characterize areas which have similar themes regarding species distributions, disturbance regimes, and other characteristics that will influence future subbasin scale restoration or recovery planning. PMUs were not delineated in a species-specific manner due to the multi-species nature of this plan, a lack of comprehensive distribution and status information for some species, the heavy reliance on landscape level characteristics used to define them, and the potential for altered species distributions in the future (through reintroductions or habitat improvement). Where applicable, notes on the distribution and status of individual focal species (e.g. steelhead) are provided within the discussion of individual PMUs (see Assessment Chapter 9). Prioritization of restoration needs is presented independently within each of the PMUs dependent upon localized conditions and needs.

In some instances information presented in this summary section may seem contradictory to information provided in the subbasin assessment. As an example, many stream segments within the South Fork Clearwater steelhead population area are identified as sediment limited on the 303d list (Appendix E), and chinook and steelhead habitat are both defined as limited by instream sediment levels (See Assessment Section 8.3.3), but PMU problem summaries lack a defined sedimentation concern. In this case, the PMU problem delineations go beyond reiterating the issue (sedimentation) and define and prioritize the known or likely sources of the sediment creating the concern (e.g. roads or landslide prone roads, grazing or mining impacts, surface erosion, etc.).

Within population specific discussions of alteration of conditions, various issues are discussed but highlighted as "likely to carry little weight in NOAA Fisheries steelhead recovery planning efforts" (e.g. brook trout populations and vegetative concerns such as loss of prairie grasses). Although such issues may not directly impact steelhead recovery efforts, awareness of the distribution and priority of these issues by NOAA Fisheries will be necessary if steelhead recovery planning is to be coordinated with other recovery efforts and actions occurring in the subbasin (e.g. USFWS will coincidentally be addressing the spread of brook trout as part of bull trout recovery planning).

Cost Effectiveness

Cost effectiveness of actions proposed in this plan has not been addressed. Given the data and tools available to develop this Plan, it was not feasible to conduct such an evaluation. Without productivity estimates for focal species (e.g. steelhead) it was not possible to quantitatively estimate the potential gains in species abundance from proposed restoration efforts. A model such as EDT may provide a tool to give relative merit to different variables on fish productions, but use of this model was not feasible in the Clearwater planning process. Although the modeled productivity information presented in Section 7.2 of the subbasin Assessment is considered helpful in providing an overview of relative productivity throughout the subbasin, the information is not adequate to perform specific evaluation(s) of cost effectiveness of proposed restoration/management actions.

The primary tool envisioned for use in defining cost-effectiveness of subbasin plans was the EDT model. EDT has been run at the broadscale across the Columbia Basin using spring chinook as the diagnostic species. Output from this run is available only at a scale similar to the 4th field HUC (See Appendix D). 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 become a valuable tool in future refinements to the Clearwater subbasin plan, particularly with regards to evaluating cost effectiveness of proposed actions, but its current utility is highly limited.

Population Specific Information

Based on the lack of information regarding cost effectiveness of proposed actions in the Clearwater Subbasin Plan, the following population area specific discussions will address only the two remaining discussion items requested by the NMFS staff (relative productivity and alteration of conditions).

Lower Clearwater/Middle Fork Population Area

Productivity

Productivity modeling efforts indicate either Moderate or High potential productivity throughout the Lower Clearwater/Middle Fork steelhead population area (See Assessment Figure 89). Modeled high productivity areas include the upper Potlatch River drainage, Cottonwood Creek (draining to the South Fork Clearwater River), the headwaters of Lawyer Creek, and the lower portions of the Lapwai Creek drainage area (including Tom Beall Creek). All other areas within this population area were predicted to have Moderate productivity.

The modeled productivity ratings are consistent with the limited anecdotal information available about historic productivity of fish throughout this portion of the subbasin. Although information is lacking regarding the spatial variation in steelhead production, the Clearwater National Forest (1997) stated that the most substantial production of spring chinook salmon in the Lower Clearwater probably occurred in the Lolo and Potlatch Creek drainages. This statement is consistent with modeled estimates of relative productivity presented in this plan.

Alteration of Conditions (PMU summary)

The Lower Clearwater/Middle Fork steelhead population area contains by far the most complex array of restoration concerns amongst population areas within the Clearwater subbasin. This is largely due to the large size of the population area coupled with a highly diverse ownership pattern and resultant diverse management history.

Table 22 summarizes information from Chapter 9 of the subbasin assessment to outline relevant restoration issues affecting the Lower Clearwater/Middle Fork steelhead population area, and the relative priorities for addressing those issues. Alteration of conditions within the population area, and the relative priority for addressing these issues, is discussed in the context of PMUs developed as part of the subbasin assessment. The population area contains 132 6th code HUCs which make up all or part of 13 PMUs including eight dominated by private ownership (PR prefix), three with highly mixed ownership (MX), and two dominated by federal land management (FD). Although limited in scope, the highest priority (HH) issue within this population area is the continued protection of existing high quality resources within inventoried roadless areas which make up portions of PMU FD-5 (Table 22).

The most widely distributed issues of concern for fish and wildlife restoration are restoration of water temperature, grazing impacts, instream habitat concerns, and the protection/restoration of ponderosa pine communities, with each of these issues identified in at least 10 of the 13 PMUs making up the population area (Table 22). Surface erosion, although defined as a concern in only six of 13 PMUs, is typically a high priority concern where it occurs. Additionally, there is widespread need for protection/restoration of prairie grasslands in those PMUs dominated by private ownership, and concern over exotic species (brook trout) and changes in vegetative structure is widespread in those PMUs dominated by mixed or federal ownership. Restoration of temperature, grazing impacts, instream habitat and surface erosion processes are the primary widespread factors affecting steelhead populations; protection and restoration of ponderosa pine communities, prairie grasslands, and vegetative structure are issues that, although important for subbasin planning, will likely carry little weight in NOAA Fisheries steelhead recovery planning efforts. Although priorities for addressing each of these issues vary by PMU, water temperature and surface erosion concerns are typically of highest priority where they occur. Priorities for addressing both grazing impacts and instream habitat conditions are highly variable (ranging from low to high) and dependent on local conditions (Table 22).

Restoration of riparian/wetland function, sedimentation concerns, landslide prone roads and impacts of Dworshak Dam impacts, water use, and altered hydrology are additional concerns affecting fishes in this population area. Priority of riparian wetland restoration is commonly undefined due to a lack of adequate data regarding current status of these resources. Impacts of Dworshak Dam, water use, and altered hydrologic processes are highly localized, with each factor occurring in a single PMU; impacts of Dworshak Dam and water use are however identified as high priority issues where they do occur (Table 22). Other issues are scattered within the population area, and the relative priority for addressing them is variable and dependent on local conditions (Table 22).

Table 22. Summary of restoration issues and related priorities for PMUs included in the Lower Clearwater/Middle Fork steelhead population area.

		PMU and Relative Priority of Each Issue Within												
Restoration Issue	**Goal**	**PR-1 (8)***	**PR-2 (5)**	**PR-3 (13)**	**PR-4 (7)**	**PR-5 (27)**	**PR-6 (13)**	**PR-7 (18)**	**PR-8 (15)**	**MX-1 (4)**	**MX-3 (13)**	**MX-4 (4)**	**FD-5 (2)**	**FD-6 (3)**
Wilderness	Protect													
Roadless	Protect	--	--	--	--	--	--	--	--	--	--	--	HH	--
Water Temperature	Restore	H	L	H	M	M	H	H	H	M	M-H	M-H	M	M
Instream Habitat	Restore	--	--	L	L	L	L	L	L	H	--	M	Undef.	M
Exotic Spp. (Aquatic)	Protect/Restore	--	--	--	--	--	L	--	--	M	L	L	M	L
Sedimentation	Restore	L	L	H	--	--	H	--	--	H	--	--	--	H
Surface Erosion	Restore	--	--	--	H	H	--	H	H	--	--	H	L	--
Roads	Restore	--	--	H	--	--	--	--	--	M-H	L-M	H	H	H
Landslide Prone Roads	Restore	M	M	--	--	--	L-M	--	--	H	--	--	--	H
Grazing Impacts	Restore	L	L	H	M	M	M	L	L	M	L	L	L	L
Mining Impacts	Restore													
Water Use	Restore	--	--	--	H	--	--	--	--	--	--	--	--	--
Hydrology	Restore	--	--	--	--	L	--	--	--	--	--	--	--	--
Riparian/Wetland	Restore	--	--	--	M	M	Undef.	Undef.	Undef.	--	--	--	--	--
Vegetative Structure	Restore	--	--	M	--	--	--	--	--	M	L	M	H	M
Ponderosa Pine	Protect/Restore	H-M	H-M	--	H-M	H-M	H-M	--	H-M	H-M	H-M	H-M	--	H-M
Grasses (Prairie)	Protect/Restore	H	H	--	H	H	H	H	H	--	--	--	--	--
Dworshak Impacts	Restore	H	--	--	--	--	--	--	--	--	--	--	--	--

* Numbers in parentheses indicate the number of subwatersheds (6^{th} code HUCs) within the population area and PMU.

Protection of wilderness areas is one of only two issues considered during PMU delineation which are not prioritized within the Lower Clearwater/Middle Fork Population area; no designated wilderness areas are located within this area. Mining impacts are the only other issues considered during PMU delineation which were not found to be impacting fish and wildlife resources in the Lower Clearwater/Middle Fork Population area (Table 22).

Lolo Creek Population Area

Productivity

Productivity modeling efforts indicate either Moderate or High potential productivity throughout the Lolo Creek steelhead population area (See Assessment Figure 89). Modeled high productivity areas include the uppermost portions of the drainage including the Eldorado Creek, Jim Brown Creek, and upper Lolo Creek subwatersheds. All other areas within this population area were predicted to have Moderate productivity.

The modeled productivity ratings are consistent with the limited anecdotal information available about historic productivity of fish throughout this portion of the subbasin. Although information is lacking regarding the spatial variation in steelhead production, the Clearwater National Forest (1997) stated that the most substantial production of spring chinook salmon in the Lower Clearwater probably occurred in the Lolo and Potlatch Creek drainages. This statement is consistent with modeled estimates of relative productivity presented in this plan.

Alteration of Conditions (PMU summary)

Alteration of conditions within the Lolo Creek steelhead population area, and the relative priority for addressing these issues, is discussed in the context of PMUs developed as part of the subbasin assessment. The Lolo Creek steelhead population area is made up of all or portions of 7 different PMUs, with PMUs PR-6, PR-8, MX-1, MX-3, MX-4 and FD-6 each comprising a single HUC within the population area; PMU FD-5 comprises 5 HUCs within the population area (Table 23).

Table 23 summarizes information from Chapter 9 of the subbasin assessment to outline relevant restoration issues affecting the Lolo Creek steelhead population area and the relative priorities for addressing those issues. It is apparent that the highest priority (HH) concern is continued protection of existing high quality resources within inventoried roadless areas which make up portions of PMU FD-5.

The most widely distributed issues of concern for fish and wildlife restoration within the Lolo Creek steelhead population area are water temperature, grazing impacts, exotic species (aquatic), instream habitat concerns, roads, and vegetative structure, with each of these issues identified in at least 5 of the 7 PMUs including FD-5 which is the predominant PMU (Table 23). Exotic species (brook trout) and vegetative structure are issues that, although important for subbasin planning, will likely carry little weight in NOAA Fisheries steelhead recovery planning efforts; temperature, grazing and road impacts, and instream habitat are the primary widespread factors affecting steelhead populations. Although priorities for addressing these issues vary by PMU, water temperature and road impacts tend to be of highest priority throughout the population area, instream habitat conditions of more moderate priority, and grazing impacts of lower priority (Table 23).

Sedimentation concerns, surface erosion, landslide prone roads, and riparian/wetland restoration needs are less widespread (but still important) concerns within the population area, all of which will impact steelhead trout within the area. Of these issues, surface erosion is the most widespread concern since it occurs in PMU FD-5 which accounts for nearly half of the population area; other concerns are defined in PMUs of lesser influence (each comprising a single HUC). The sedimentation concerns within this population area are likely the source of a complex suite of factors as illustrated by the fact that they are typically defined in areas with general road concerns (moderate-high density), landslide prone roads (a factor that may also be indicative of increased natural landslide hazard), and grazing impacts.

The protection and restoration of ponderosa pine and prairie grass communities is identified as a priority issue within the population area, but will not likely impact steelhead recovery planning effort. Issues considered during PMU delineation which are not defined as impacting the Lolo Creek steelhead population area include mining impacts, water use, hydrology, impacts related to Dworshak Dam and the need for protection of existing wilderness areas (Table 23).

Table 23. Summary of restoration issues and related priorities for PMUs included in the Lolo Creek steelhead population area.

		PMU and Relative Priority of Each Issue Within						
Restoration Issue	**Goal**	**PR-6 (1)***	**PR-8 (1)**	**MX-1 (1)**	**MX-3 (1)**	**MX-4 (1)**	**FD-5 (5)**	**FD-6 (1)**
Wilderness	Protect							
Roadless	Protect	--	--	--	--	--	HH	--
Water Temperature	Restore	H	H	M	M-H	M-H	M	M
Instream Habitat	Restore	L	L	H	--	M	Undef.	M
Exotic Spp. (Aquatic)	Protect/ Restore	L	--	M	L	L	M	L
Sedimentation	Restore	H	--	H	--	--	--	H
Surface Erosion	Restore	--	H	--	--	H	L	--
Roads	Restore	--	--	M-H	L-M	H	H	H
Landslide Prone Roads	Restore	L-M	--	H	--	--	--	H
Grazing Impacts	Restore	M	L	M	L	L	L	L
Mining Impacts	Restore							
Water Use	Restore							
Hydrology	Restore							
Riparian/Wetland	Restore	Undef.	Undef.	--	--	--	--	--
Vegetative Structure	Restore	--	--	M	L	M	H	M
Ponderosa Pine	Protect/ Restore	H-M	H-M	H-M	H-M	H-M	--	H-M
Grasses (Prairie)	Protect/ Restore	H	H	--	--	--	--	--
Dworshak Impacts	Restore							

* Numbers in parentheses indicate the number of subwatersheds (6^{th} code HUCs) within the population area and PMU.

Lochsa River Population Area

Productivity

Productivity modeling efforts indicate primarily low potential productivity throughout the Lochsa River steelhead population area (See Assessment Figure 89). Moderate productivity is predicted in limited areas within the upper half of the Lochsa River drainage including Fish Lake Creek, Crooked Fork, and the White Sands Creek drainage area upstream of (and including) the Colt Killed Creek subwatershed. No anecdotal or other information is available regarding the relative production of steelhead from the Lochsa River drainage to support or refute the model results presented in the subbasin Assessment.

Alteration of Conditions (PMU summary)

Alteration of conditions within the Lochsa River steelhead population area, and the relative priority for addressing these issues, is discussed in the context of PMUs developed as part of the subbasin assessment. The Lochsa River steelhead population area is made up of all or portions of 6 different PMUs, with PMUs MX-6, FD-5, FD-6, FD-7, FD-8, and FD-9 comprising 10, 4, 3, 4, 17, and 15 HUCs, respectively (Table 23).

Taking information from the relevant PMU descriptions, Table 24 summarizes relevant restoration issues affecting the Lochsa River steelhead population, and the relative priorities for addressing those issues. The highest priority (HH) concern is continued protection of existing wilderness areas and the high quality resources within inventoried roadless areas. Protection of these resources is a widespread need within this population area, identified for four of six PMUs delineated within it.

The most widely distributed issues of concern for fish and wildlife restoration within the Lochsa River steelhead population area are water temperature, vegetative structure, and exotic species (aquatic), with each of these issues identified in at least 5 of the 6 PMUs (Table 24). Restoration of impacts from high road densities (Roads) is identified as a moderate or high concern in those PMUs that are not dominated by roadless or wilderness areas (MX-6, FD-5, and FD-6) within this population area. Instream habitat degradation, sedimentation, surface erosion, grazing impacts, and landslide prone roads are less widespread (but still important) concerns within the population area (Table 24). Although of localized concern and variable priority, all of these factors will likely impact steelhead trout recovery planning within the area.

The need to address temperature concerns is widespread but of higher priority in more developed areas within the population area including PMUs MX-6, FD-5 and FD-6. The need to address sedimentation is greatest in PMU FD-6 where high concern (priority) exists coincidentally for sedimentation impacts, high road densities, and landslide prone roads; this same area also has grazing impacts (low priority) which may contribute to overall sedimentation rates.

Exotic species (brook trout), vegetative structure and protection/restoration of ponderosa pine communities are issues that, although important for subbasin planning, will likely carry little weight in NOAA Fisheries steelhead recovery planning efforts (Table 24). Issues considered during PMU delineation which are not defined as impacting the Lochsa River steelhead population area include mining impacts, riparian/wetland conditions, water use, hydrology, impacts related to Dworshak Dam and the need for protection/restoration of prairie grasslands (Table 24).

Table 24. Summary of restoration issues and related priorities for PMUs included in the Lochsa steelhead population area.

		PMU and Relative Priority of Each Issue Within					
Restoration Issue	**Goal**	**MX-6 (10)***	**FD-5 (4)**	**FD-6 (3)**	**FD-7 (4)**	**FD-8 (17)**	**FD-9 (15)**
Wilderness	Protect	--	--	--	--	--	HH
Roadless	Protect	--	HH	--	HH	HH	--
Water Temperature	Restore	M	M	M	L	L	L
Instream Habitat	Restore	--	Undef.	M	--	--	--
Exotic Spp. (Aquatic)	Protect/ Restore	--	M	L	M	H	H
Sedimentation	Restore	L	--	H	--	--	--
Surface Erosion	Restore	--	L	--	--	--	--
Roads	Restore	M	H	H	--	--	--
Landslide Prone Roads	Restore	--	--	H	H	--	--
Grazing Impacts	Restore	--	L	L	--	--	--
Mining Impacts	Restore						
Water Use	Restore						
Hydrology	Restore						
Riparian/Wetland	Restore						
Vegetative Structure	Restore	M	H	M	M	M	L
Ponderosa Pine	Protect/ Restore	--	--	H-M	--	--	--
Grasses (Prairie)	Protect/ Restore						
Dworshak Impacts	Restore						

* Numbers in parentheses indicate the number of subwatersheds (6th code HUCs) within the population area and PMU.

South Fork Clearwater Population Area

Productivity

Productivity modeling efforts indicate either Moderate or High potential productivity throughout the South Fork Clearwater steelhead population area (See Assessment Figure 89). Modeled high productivity areas include the uppermost portions of the drainage including the American, Crooked, and Red River watersheds, as well as the Meadow Creek watershed in the central/lower portions of the population area. All other areas within this population area were predicted to have Moderate productivity.

The modeled productivity ratings are consistent with the limited anecdotal information available about historic productivity of fish throughout this portion of the subbasin. Although information is lacking regarding the spatial variation in steelhead production, the upper half of the South Fork Clearwater drainage is believed to have maintained a historically strong population of steelhead (Nez Perce National Forest 1998; Paradis et al. 1999b) relative to other portions of the

population area. This statement is generally consistent with modeled estimates of relative productivity presented in this plan.

Alteration of Conditions (PMU summary)

Alteration of conditions within the South Fork Clearwater steelhead population area, and the relative priority for addressing these issues, is discussed in the context of PMUs developed as part of the subbasin assessment. The South Fork Clearwater steelhead population area is made up of all or portions of 6 different PMUs, with PMUs FD-1, FD-2, FD-3, FD-4, FD-5 and FD-9 comprising 8, 9, 9, 10, 4 and 5 subwatershed (6^{th} field HUCs), respectively, within this area (Table 25).

Table 25 summarizes information from Chapter 9 of the subbasin assessment to outline relevant restoration issues affecting the South Fork Clearwater steelhead population area and the relative priorities for addressing those issues. It is apparent that the highest priority (HH) concern is continued protection of existing wilderness areas and the high quality resources within inventoried roadless areas.

The most widely distributed issues of concern for fish and wildlife restoration within the South Fork Clearwater steelhead population area are water temperature, exotic species (aquatic), vegetative structure and roads, with each of these issues identified in at least 5 of the 6 PMUs (Table 25). Exotic species (brook trout) and vegetative structure are issues that, although important for subbasin planning, will likely carry little weight in NOAA Fisheries steelhead recovery planning efforts; roads and temperature are the primary widespread factors affecting steelhead populations. Road density and water temperature concerns and most commonly considered high and moderate priority issues, respectively throughout the South Fork Clearwater steelhead population area (Table 25).

Grazing impacts, mining impacts, and instream habitat condition are of concern in at least half of the PMUs within the South Fork Clearwater steelhead population area, with moderate to high priorities identified for addressing these issues where they occur. Issues of concern with more limited spatial influence (occur in only 1-2 PMUs within the South Fork Clearwater steelhead population area) include surface erosion, riparian/wetland restoration needs. The protection and restoration of ponderosa pine communities is identified as a priority issue within portions of the population area, but will not likely impact steelhead recovery planning. Restoration of riparian and wetland communities, although limited in spatial distribution, is considered to be high priority concern within PMU FD-3. Surface erosion concerns, although existent, are limited in both scope (occur in two of six PMUs) and priority (Low) where they do occur within the South Fork Clearwater steelhead population area. Issues considered during PMU delineation which are not defined as impacting the South Fork Clearwater steelhead population area include landslide prone roads, sedimentation, water use, hydrology, prairie grasses and impacts related to Dworshak Dam (Table 25).

Table 25. Summary of restoration issues and related priorities for PMUs included in the South Fork Clearwater steelhead population area.

		PMU and Relative Priority of Each Issue Within					
Restoration Issue	**Goal**	**FD-1 (8)***	**FD-2 (9)**	**FD-3 (9)**	**FD-4 (10)**	**FD-5 (4)**	**FD-9 (5)**
Wilderness	Protect	--	--	--	HH	--	HH
Roadless	Protect	--	--	--	HH	HH	--
Water Temperature	Restore	L	M	M	M	M	L
Instream Habitat	Restore	--	H	H	--	Undef.	--
Exotic Spp. (Aquatic)	Protect/ Restore	L	M	M	M	M	H
Sedimentation	Restore						
Surface Erosion	Restore	L	--	--	--	L	--
Roads	Restore	H	H	M	H	H	--
Landslide Prone Roads	Restore						
Grazing Impacts	Restore	M-H	H	--	H	L	--
Mining Impacts	Restore	M-H	H	M	--	--	--
Water Use	Restore						
Hydrology	Restore						
Riparian/Wetland	Restore	--	--	H	--	--	--
Vegetative Structure	Restore	M	H	H	H	H	L
Ponderosa Pine	Protect/ Restore	H-M	--	--	--	--	--
Grasses (Prairie)	Protect/ Restore						
Dworshak Impacts	Restore						

* Numbers in parentheses indicate the number of subwatersheds (6^{th} code HUCs) within the population area and PMU.

Selway River Population Area

Productivity

Productivity modeling efforts indicate relatively low potential productivity throughout the entire Selway River steelhead population area (See Assessment Figure 89). No anecdotal or other information is available regarding the relative production of steelhead from the Selway River drainage to support or refute the model results presented in the subbasin Assessment.

Alteration of Conditions (PMU summary)

The Selway River steelhead population area contains a large percentage of relatively unaltered aquatic systems. PMUs FD-8 and FD-9 which are made up primarily of wilderness and/or inventoried roadless area combine to account for 70 of 81-6^{th} field HUCs within this population area. Wilderness and/or roadless areas also make up portions of PMUs FD-4, FD-5 and FD-7 within this population area. Continued protection of wilderness and high quality resources within inventoried roadless areas is of the highest priority (HH; Table 26)

Naturally warm temperatures are a low priority issue within the wilderness and roadless areas; efforts to minimize this situation (e.g. through planting riparian areas following wildfires) may benefit aquatic species in these areas. The spread of exotic aquatic species (i.e. brook trout) is a moderate to high concern throughout the population area and particularly within these otherwise protected landscapes. Past fire suppression within these protected landscapes has resulted in a variable priority need for vegetative structure management, an issue important to subbasin planning but unlikely to substantially impact steelhead recovery planning efforts (Table 26).

Table 26. Summary of restoration issues and related priorities for PMUs included in the Selway River steelhead population area.

		PMU and Relative Priority of Each Issue Within					
Restoration Issue	**Goal**	**FD-4 (2)***	**FD-5 (1)**	**FD-6 (4)**	**FD-7 (4)**	**FD-8 (13)**	**FD-9 (57)**
Wilderness	Protect	HH	--	--	--	--	HH
Roadless	Protect	HH	HH	--	HH	HH	--
Water Temperature	Restore	M	M	M	L	L	L
Instream Habitat	Restore	--	Undef.	M	--	--	--
Exotic Spp. (Aquatic)	Protect/ Restore	M	M	L	M	H	H
Sedimentation	Restore	--	--	H	--	--	--
Surface Erosion	Restore	--	L	--	--	--	--
Roads	Restore	H	H	H	--	--	--
Landslide Prone Roads	Restore	--	--	H	H	--	--
Grazing Impacts	Restore	H	L	L	--	--	--
Mining Impacts	Restore						
Water Use	Restore						
Hydrology	Restore						
Riparian/Wetland	Restore						
Vegetative Structure	Restore	H	H	M	M	M	L
Ponderosa Pine	Protect/ Restore	--	--	H-M	--	--	--
Grasses (Prairie)	Protect/ Restore						
Dworshak Impacts	Restore						

* Numbers in parentheses indicate the number of subwatersheds (6^{th} code HUCs) within the population area and PMU.

Restoration issues of relatively localized importance within non-wilderness/roadless portions of this population area include moderate/high road densities (roads), grazing impacts, instream habitat conditions, surface erosion, sedimentation and landslide prone roads. Restoration of road density, landslide prone roads, and sedimentation impacts is of high priority where they occur in PMUs FD-4, FD-5, and FD-6. Restoration of grazing impacts, instream habitat conditions, and surface erosion concerns are of lesser and variable priority where they occur within the population area (Table 26).

The protection/restoration of ponderosa pine communities is of high/moderate priority (Table 26) but will likely be of little consequence to steelhead recovery planning efforts. Issues considered during PMU delineation which are not defined as impacting the Selway River steelhead population area include mining impacts, riparian/wetland conditions, water use, hydrology, impacts related to Dworshak Dam and the need for protection/restoration of prairie grasslands (Table 26).

North Fork Clearwater Historic Population Area

Productivity

Productivity modeling efforts indicate potential productivity throughout the North Fork Clearwater Historic steelhead population area ranging from Low to High, with the majority of the area predicted to be of Low productivity (See Assessment Figure 89). Modeled high productivity areas include the uppermost portions of the Elk River drainage including the Long Meadow Creek watershed. Areas predicted to have moderate potential productivity include the mainstem North Fork Clearwater River and surrounding face drainages downstream of the mouth of the Little North Fork Clearwater River, as well as the Washington and Orogrande Creek watersheds. All other areas within this population area were predicted to have Low productivity.

Anecdotal information suggests the North Fork Clearwater Historic Population area was historically a major producer of B-run steelhead, with an estimated 50 to 60 percent of the steelhead entering the Clearwater River spawning in the North Fork Clearwater River and its tributaries (Miller 1987). No information is available however regarding the productivity of this area in relation to other areas throughout the Clearwater subbasin with which to either support or refute the modeled productivity estimates presented in the subbasin Assessment.

Alteration of Conditions (PMU summary)

Although not likely to be an issue in steelhead recovery planning due to the presence of Dworshak Dam, the North Fork Clearwater historic steelhead population area will be discussed in the same context as other population areas within the subbasin. This historic population area contains all or portions of nine PMUs, with a relatively even split between those dominated by federal (53-6th field HUCs) or mixed (47-6th field HUCs) ownership (Table 27). Restoration issues defined within the PMU structure are relatively consistent between the federal and mixed ownership portions of this historic population area.

Relevant restoration issues affecting the North Fork Clearwater historic steelhead population area, and the relative priorities for addressing those issues are summarized in the context of PMUs in (Table 27). Although limited in scope, the highest priority (HH) issue within this area

is the continued protection of existing high quality resources within inventoried roadless areas which make up portions of PMU FD-5 (Table 27).

The most widely distributed issues of concern for fish and wildlife restoration in this area are restoration of water temperature, impacts of elevated road density and grazing, instream habitat conditions, exotic species (aquatic), altered vegetative structure and protection/restoration of ponderosa pine communities (Table 27). Grazing impacts are most commonly of low priority in this historic population area; priority of other commonly identified issues is highly variable and dependent on localized conditions (see Table 27).

Restoration needs for sedimentation, surface erosion, landslide prone roads, riparian/wetland conditions, and the need to restore prairie grasslands are locally important issues within this population area, identified in one to five of the nine PMUs. With the exception of riparian/wetland restoration, priorities for addressing these concerns are commonly high in many PMUs where they are identified. The priority for riparian/wetland restoration in PMU FD-7 is undefined due to a lack of information regarding the current conditions of these resources (Table 27).

Table 27. Summary of restoration issues and related priorities for PMUs included in the North Fork Clearwater Historic steelhead population area.

		PMU and Relative Priority of Each Issue Within								
Restoration Issue	**Goal**	**MX-1 (11)***	**MX-2 (22)**	**MX-3 (5)**	**MX-4 (3)**	**MX-5 (4)**	**FD-5 (6)**	**FD-6 (6)**	**FD-7 (13)**	**FD-8 (28)**
Wilderness	Protect									
Roadless	Protect	--	--	--	--	--	HH	--	--	--
Water Temperature	Restore	M	H	M-H	M-H	M	M	M	H	M
Instream Habitat	Restore	H	L	--	M	--	Undef.	M	L	H
Exotic Spp. (Aquatic)	Protect/Restore	M	M	L	L	H	M	L	--	M
Sedimentation	Restore	H	H	--	--	L	--	H	--	H
Surface Erosion	Restore	--	--	--	H	--	L	--	H	--
Roads	Restore	M-H	L	L-M	H	M	H	H	--	M-H
Landslide Prone Roads	Restore	H	H	--	--	--	--	H	--	H
Grazing Impacts	Restore	M	L	L	L	--	L	L	L	M
Mining Impacts	Restore									
Water Use	Restore									
Hydrology	Restore									
Riparian/Wetland	Restore	--	--	--	--	--	--	--	Undef.	--
Vegetative Structure	Restore	M	L	L	M	M	H	M	--	M
Ponderosa Pine	Protect/Restore	H-M	H-M	H-M	H-M	--	--	H-M	H-M	H-M
Grasses (Prairie)	Protect/Restore	--	--	--	--	--	--	--	H	--
Dworshak Impacts	Restore									

* Numbers in parentheses indicate the number of subwatersheds (6^{th} code HUCs) within the population area and PMU.