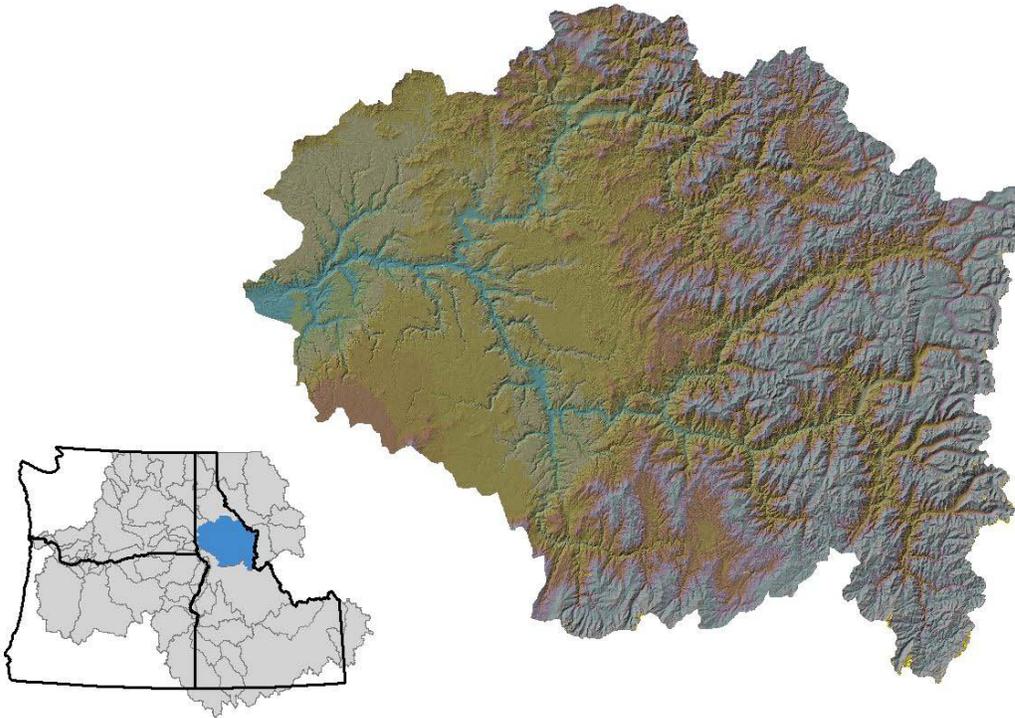


Final Draft Clearwater Subbasin Inventory

October 2002



Compiled by
Ecovista

Contracted by
Nez Perce Tribe Watershed Division

In Cooperation with
Clearwater Policy Advisory Committee

PREAMBLE

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

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

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

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

Table of Contents

1	Introduction.....	1
2	Management Programs and Policies.....	6
2.1	Programs.....	6
2.2	Policies.....	8
3	Existing Management Plans.....	10
3.1	Tribal Plans.....	10
3.2	Federal Plans.....	11
3.3	State Plans.....	14
3.4	Other Plans.....	18
3.5	Hatchery and Genetic Management Plans (HGMP's).....	18
4	Watershed Assessments, Watershed Scale Plans, Biological Assessments, and TMDLS ...	20
4.1	Watershed Assessments and Watershed Scale Plans.....	20
4.2	Biological Assessments.....	24
4.3	TMDLs.....	26
5	Planned Assessments.....	27
6	Existing, Past and Planned Project Efforts.....	28
7	Research Monitoring, and Evaluation Activities.....	46
7.1	BPA Funded M&E.....	46
7.2	Non-BPA Funded M&E.....	52
8	References.....	57

1 Introduction

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

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

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

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

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

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

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

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

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

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

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

Aquatic Assessment and Subbasin Management Plan

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

Terrestrial Assessment

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

Please address comments to
Darin Saul sauld@pullman.com

The Nez Perce Tribe Executive Committee passed a resolution on October 8, 2002 approving the motion to forward the Clearwater Assessment and Plan to the Council for review. The members of the Clearwater PAC endorsed the Final Draft Clearwater Subbasin Plan on October 8, 2002.¹

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

Table 1. Acronyms used in the Clearwater Subbasin Inventory

Acronym	Definition
Agencies or Groups	
APAC	Artificial Production Advisory Committee
BLM	U.S. Bureau of Land Management
BPA	Bonneville Power Administration (Bonneville)
CBFWA	Columbia Basin Fish and Wildlife Authority
CSWCD	Clearwater Soil and Water Conservation District
CNF	Clearwater National Forest
Council	Northwest Power Planning Council
EDT	Ecosystem Diagnosis and Treatment Method
EPA	U.S. Environmental Protection Agency
FSA	USDA Farm Services Agency
HUC	Hydrologic Unit Code
IASCD	Idaho Association of Soil Conservation Districts
ICSWCD	Idaho County Soil and Water Conservation District
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
LHTAC	Local Highway Technical Assistance Council
LSCD	Lewis Soil Conservation District
LSWCD	Latah Soil and Water Conservation District
NMFS	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
RMEF	Rocky Mountain Elk Foundation
SCC	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 (Associated with BAG)
Terms	
BiOp	Biological Opinion
BMP	Best Management Practice
BURP	Beneficial Use Reconnaissance Program
CCRP	Continuous Conservation Reserve Program (FSA)
CRFMP	Columbia River Fish Management Plan
CRP	Conservation Reserve Program (FSA)
CWA	Clean Water Act
EQIP	Environmental Quality Incentive Program (NRCS)
FCRPS	Federal Columbia River Power System
GAP	Gap Analysis Program
FPA	Forest Practices Act
HGMP	Hatchery Genetic Management Plan

Table 1. continued

Acronym	Definition
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.
RHCA	Riparian Habitat Conservation Area
RRWMA	Red River Wildlife Management Area
SPZ	Stream Protection Zone
STIP	State Transportation Improvement Program
TMDL	Total Maximum Daily Load
WAG	Watershed Advisory Group (IDAPA 39-3615)
WQPA	Idaho Water Quality Program for Agriculture (ISCC)
WHIP	Wildlife Habitat Incentive Program (NRCS)
WRP	Wetland Reserve Program (NRCS)

2 Management Programs and Policies

2.1 Programs

Clearwater Focus Program and Policy Advisory Committee

In 1980, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act, which authorized the states of Idaho, Montana, Oregon, and Washington to create the Northwest Power Planning Council (Council). The Act directs the Council to prepare a program to protect, mitigate, and enhance fish and wildlife of the Columbia River Basin that have been affected by the construction and operation of hydroelectric dams while also assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The Act also directs the Council to inform the public about fish, wildlife, and energy issues and to involve the public in its decision-making. In late 1996, the 9,645 square mile Clearwater River subbasin was designated a Focus Program under the Council's Columbia River Basin Fish and Wildlife Program.

The purpose of the Clearwater Focus Program is to coordinate projects and interagency efforts to enhance and restore aquatic and terrestrial habitats in the Clearwater River subbasin to meet the goals of the Council's fish and wildlife program. The Idaho Soil Conservation Commission and the Nez Perce Tribal Watershed Division co-coordinate the program on behalf of Idaho State and the Nez Perce Tribe.

The Focus Program convened the Clearwater Policy Advisory Committee (PAC) in September 1999 to provide guidance in the development of a subbasin assessment and plan. The PAC adopted the Clearwater Policy Advisory Committee Charter January 2000. The charter includes a mission statement, goals and objectives, operating protocols, and membership. Membership to the PAC was established by the charter, new membership is accomplished by amendment to the charter. Work on the Clearwater Subbasin Summary, Provincial Review, Clearwater Subbasin Assessment and Plan have been coordinated through the Focus Program and the PAC.

Restoration projects have been conducted on private, state, federal, and tribal lands, partnerships have been developed for all projects. In addition to the ISCC and NPT, project partners have included the U.S. Forest Service, U.S. Natural Resources Conservation Service, soil and water conservation districts, private landowners, Idaho Department of Fish and Game, Idaho Department of Lands, and the Bureau of Land Management.

The Clearwater Focus Program of the 1994 Columbia Basin Fish and Wildlife Program will continue under the 2000 Columbia Basin Fish and Wildlife Program. The Focus Program will coordinate projects and interagency efforts to enhance and restore aquatic and terrestrial habitats in the subbasin to meet the goals of the Council's fish and wildlife program. The Focus Program co-coordinators will prepare an annual report on activities in the subbasin including a summary analysis of the efficacy of each habitat project by contract to be presented at the winter quarter PAC meeting. Subbasin reviews (Provincial Reviews) and scheduled reviews and amendment to the Clearwater Subbasin Plan will be coordinated by the Focus Program. The Clearwater Subbasin Plan will be reviewed and amended as necessary every five years after adoption by the Council into the 2000 Columbia Basin Fish and Wildlife Program. The Focus Program co-

coordinators will present a schedule for the Clearwater Subbasin Plan review and amendment to the PAC at the winter quarter PAC meeting of the review year.

The Focus Program co-coordinators will provide the PAC with administrative and management support and maintain records of activities; the Nez Perce Tribe Focus Program co-coordinator will be a designated alternate PAC member. The PAC will operate under the Charter, which will be amended to include a review function of project proposals submitted through the Council program for Bonneville funding during Provincial Review.

USDA Natural Resources Conservation Service Programs

The NRCS administers several cost sharing programs on private lands. The Environmental Quality Incentive Program (EQIP) and the Public Law (P.L.) 566 Small Watershed Program can be leveraged with other federal, state, or local program funds. The Wildlife Habitat Incentives Program (WHIP) and the Wetland Reserve Program (WRP) restrict the sources of cost-share funding on projects to non-mitigation funds. (Richard Sims, NRCS, letter to Janet Hohle, May 31, 2002) Landowners work with technical staff of the NRCS to use these programs for implementing conservation practices on their lands. Soil and water conservation districts using other project funding sources leverage NRCS program resources in combination to concentrate conservation within watersheds of concern.

Conservation Reserve Program and Continuous Conservation Reserve Program

The Conservation Reserve Program (CRP) and the Continuous Conservation Reserve Program (CCRP) are protection programs implemented on croplands and riparian areas respectively by the USDA Farm Services Agency (FSA). These two programs are managed through the U.S. Department of Agriculture Farm Service Agency with technical assistance provided by the USDA Natural Resources Conservation Service. These programs are voluntary and include some combination of the following: incentive payments (CCRP), cost-sharing with plantings, and rental payments. A request for a determination by the National FSA office has been requested by the Idaho State FSA office to establish cost-sharing between these programs and Bonneville funds where watershed projects exist.

NOAA Restoration Center's Community-Based Restoration Program

The NOAA Restoration Center's Community-Based Restoration Program's objective is to bring together citizen groups, public and nonprofit organizations, industry, corporations and businesses, youth conservation corps, students, landowners, and local government, state and federal agencies to restore fishery habitat across Coastal America. The program partners with national and regional organizations to solicit and co-fund proposals for locally-driven, grass roots restoration projects that address important habitat issues within communities. Several restoration projects in the Clearwater subbasin have been funded through various components of this program, particularly with the Nez Perce Tribe.

Idaho Nonpoint Source Management Program

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. The program is responsible for administering grants awarded annually on a competitive basis and for providing technical support to watershed implementation activities. Funding projects must focus primarily on improving the water quality of lakes, streams, rivers, and aquifers. Projects must be

consistent with the Idaho Nonpoint Source Management Plan for which there are seven project sectors: agriculture, urban stormwater runoff, transportation, silviculture, mining, ground water activities, and hydro-habitat modification. Projects located in watersheds with an approved TMDL are priorities in this program.

Idaho Water Quality Program for Agriculture

This is a state program administered by the Idaho Soil Conservation Commission to assist rural landowners and farmers with implementation of agricultural best management practices. The program is delivered through the soil and water conservation districts and is often combined with federally funded programs where they exist, for example, the CWA §319 and Bonneville watershed projects. Projects are prioritized first by water quality concerns and second by listed species considerations.

2.2 Policies

Nez Perce Tribe Treaty Rights

The Nez Perce People have inhabited the Clearwater subbasin for millennia. The first Indian groups may have occupied the area as early as 10,000 years ago (Paradis et al. 1998). Prior to the treaty of 1855, the Nez Perce used the Clearwater area for hunting, fishing, gathering food, horse pasturing and other cultural uses. The Clearwater subbasin is a part of the over 13 million acres in central Idaho, northeastern Oregon and southeastern Washington included in the pre-treaty area of tribal use.

The Tribe reserves the right of its members to hunt and fish within and outside of the Nez Perce Reservation, and treaty rights apply to areas beyond current reservation boundaries. The treaty rights are based on the Treaties of 1855 and 1863 which maintained and protected the Nez Perce Tribe's historic rights to fish, hunt, and gather roots and berries and other resources on the reservation and at usual and accustomed places:

- 1855 Treaty, Article 3: "The exclusive right of taking fish in all streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land."
- 1863 Treaty, Article 8: "The United States also agrees to reserve all springs or fountains not adjacent to, or directly connected with, the streams and rivers within the lands hereby relinquished, and to keep back from settlement or entry so much of the surrounding land as may be necessary to prevent the said springs or fountains being enclosed; and, further, to preserve a perpetual right of way to and from the same, as watering places, for the use in common of both whites and Indians"

Federal Water Pollution Control Act of 1972 Section 404

Department of Army permits are required under §404 of the Clean Water Act for discharges of dredged or fill material into waters of the United States, including wetlands. This includes excavation activities that result in the discharge of dredged material that destroy or degrade waters of the United States. Department of Army permits are also required under §10 of the rivers and Harbors Act of 1899 for work or structures waterward of the ordinary high water mark of or affecting, navigable waters of the United States. In the Clearwater subbasin these waters include the Clearwater River upstream to River Mile 40 and the North Fork of the Clearwater River upstream to River Mile 57.9 (USACE et al. 2000).

PACFISH and InFish

These federal strategies were developed to be interim strategies to protect populations and habitats of fish species of concern on lands managed by the U.S. Forest Service and the Bureau of Land Management. The strategies restrict actions in Riparian Habitat Conservation Areas, most notably by defining the standard width of the four categories of RHCAs. The categories include fish-bearing streams, permanently flowing nonfish bearing streams, ponds, lakes, and wetlands greater than one acre and intermittent streams, wetlands less than one acre, landslides, and landslide-prone areas. Deviation from the defined RHCA width requires consultation with NOAA Fisheries and USFWS.

Analysis to determine the effectiveness of PACFISH and InFish has not been done or the results of that analysis are not widely known (Scott Russell, E-mail to Janet Hohle, July 2, 2002).

Forest Practices Act, Title 38, chapter 13, Idaho Code

The Idaho Forest Practices Act (FPA) was passed by the state Legislature in 1974 and amended by the Legislature in 1980, 1986, 1987, 1989, 1990, 1991, 1992, 1995 and 2001 (Idaho Department of Lands 1996). These rules constitute the minimum standards for the conduct of forest practices on forest land and describe the administrative procedures necessary to implement those standards. In this act, forest land is defined as federal, state, and private land growing forest tree species which are, or could be, at maturity, capable of furnishing raw material used in the manufacture of lumber or other forest products. Although the FPA rules apply to activities on Federal and private lands within the state of Idaho, the State does not hold management authority over these lands. Standards are established for Stream Protection Zones (SPZ) around streams. These standards condition or limit practices within the SPZs. Skidding logs in or through streams is prohibited. There is no prohibition against slash burning within SPZs. The FPA also addresses large organic debris (LOD) functions, harvest practices must retain at least 75% of existing shade, and leave trees are designated by distance from stream, stream width, tree diameter, and number of trees. Class I streams, including lakes, are those used for domestic water supply and/or are important for spawning, rearing or migration of fish. The Class I SPZ is the area encompassed by a slope distance of 75 feet on each side of ordinary high water marks. The Class II SPZ is the area encompassed by a slope distance of 30 feet on each side of ordinary high water marks. Class II streams that do not contribute flow to Class I streams have minimum Stream Protection Zones of 5 feet (Belt et al. 1992).

The Idaho Forest, Wildlife, and Range Policy Analysis Group prepared an analysis of scientific literature on forest riparian buffers (Belt et al. 1992). The fixed minimum width and use-dependent approach used in Idaho has the virtue of simplicity in application, but has greater potential for providing either not enough or too much protection. The analysis compared Idaho practices with California, Oregon and Washington and reported that using stream classification with additional site-specific factors adds operational complexity, but has greater potential sensitivity to local stream protection needs.

3 Existing Management Plans

Information presented here highlights some of the most recent or relevant plans guiding land and resource management within the Clearwater subbasin as a whole. Where information was available, plans currently under development or slated for development in the near future are also described. Plan descriptions are organized according to the primary management entity responsible for their development and/or implementation. Planning and assessments focused on finer scale watershed level are described in the following section, watershed assessments and watershed scale plans.

3.1 Tribal Plans

The Nez Perce Tribe (NPT) is a major natural resource manager with a number of departments and divisions responsible for protecting, enhancing, and restoring tribal resources both on the reservation and within the Tribe's treaty territory. Tribal departments contributing to this document include Department of Fisheries Resource Management (with 7 divisions) and the Department of Natural Resources comprised of Wildlife, Forestry, Water Resources Division, and Cultural Resources. A number of planning processes are currently under way as a result of interagency coordination (e.g., Dworshak semi-annual coordination and Hatchery Annual Operating Plans). These types of documents and forums are aware of the larger subbasin planning process and work to ensure their programs are recognized within the overall subbasin planning program being developed by the Council. Data collection and development regarding water, land, and aquatic and terrestrial populations occurs at a base level within the individual projects. This processes provide most of the current information for this subbasin plan, and most likely future modifications to this plan will result from continued data collection from individual projects. In addition, the following plans developed by the NPT are currently being implemented

1998 Unified Watershed Assessment and Watershed Restoration Priorities

This plan was prepared by the NPT in response to the Clean Water Action Plan of 1998. It identifies watersheds containing tribal fee and trust lands and tribal usual and accustomed fishing places, and sets out priorities for restoration. The prioritization list of watersheds is similar to that of applicable Clean Water Act Section 303(d) lists of water quality impaired streams. The Nez Perce Tribe Water Resources Division implements restoration work in watersheds within the Reservation upon completion of TMDLs that have been developed under a tri-party agreement between the Nez Perce Tribe, U.S. Environmental Agency, and the Idaho Department of Environmental Quality (Nez Perce Tribe 1998).

Wy-Kan-Ush-Mi Wa-Kish-Wit

This is the Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes (CRITFC 1996). This plan includes adult return targets for each subbasin in the Columbia Basin.. Wy-Kan-Ush-Mi Wa-Kish-Wit recommends habitat restoration actions that focus on limiting, restricting, or eliminating land uses and enhancing populations with implementation of new broodstock, release and production programs. The plan was published in 1996, and habitat restoration projects emphasizing implementation of forest, range, and agricultural best management practices have been initiated in priority watersheds since 1997 through the Council's program.

In addition, various programs have been implemented by the NPT as part of the plan, including the fall chinook acclimation program, the coho reintroduction program, and construction of the Nez Perce Tribe's hatchery scheduled to be completed in the fall of 2002. The NPT has also garnered a greater cooperative role in the management of Dworshak and Clearwater anadromous production facilities operated by the USFWS since Wy-Kan-Ush-Mi Wa-Kish-Wit was developed. The NPT hatchery (NPTH) will add to and coordinate its production along with three other hatcheries in the subbasin in providing artificial production programs focused on mitigating for commercial development impacts. Lyons Ferry Hatchery Complex, managed by WDFW, will provide fall chinook broodstock for the NPTH and IDFG Oxbow supplementation programs in the Clearwater subbasin and the mainstem Snake River to Hells Canyon Dam.

3.2 Federal Plans

Clearwater and Nez Perce National Forest Plans

The U.S. Forest Service land allocation, management standards, and guidelines for the Clearwater subbasin are specified in the Clearwater and Nez Perce National Forest Plans (U.S. Forest Service 1987a, 1987b). PACFISH (anadromous fish) and the Inland Native Fish Strategy (resident fish) interim strategies are measures designed to protect habitats and populations of fish. PACFISH was adopted as an amendment to the Clearwater and Nez Perce forest plans in 1995. InFish does not apply to the Nez Perce National Forest (Scott Russell, E-mail to Janet Hohle, July 2, 2002).

The Clearwater and Nez Perce National Forests are scheduled to receive funding Fiscal Year 2003 to begin revision of their forest plans. The two forests will use the same planning team for this project, although each forest will have a separate plan (Pat Murphy, CNF, personal communication, June 27, 2002).

Monitoring is required in both forest plans and the Idaho State Water Quality Standards. The format for the monitoring plans is that agreed upon by the Northern and Intermountain Regions of the U.S. Forest Service and the Idaho Department of Environmental Quality. Annually each forest publishes a compilation of monitoring projects and releases it at the Clearwater Interagency Monitoring Coordination meeting held each spring.

Interior Columbia Basin Ecosystem Management Project

The Interior Columbia Basin Ecosystem Management Project (ICBEMP) was conducted from 1993 to 1997 to develop and implement a scientifically sound, ecosystem-based management strategy for lands administered by the U.S. Forest Service and U.S. Bureau of Land Management for lands administered in Idaho, Montana, Wyoming, Nevada, and Utah. An important goal of ICBEMP was to provide longterm direction to replace PACFISH and InFish. The Draft Environmental Impact Statement for ICBEMP was released in June 1997. A strategy is being worked on now to conclude the project (ICBEMP 2002).

Idaho Bull Trout Recovery Plan

The USFWS has drafted the Idaho Bull Trout Recovery Plan in cooperation with 22 recovery teams from throughout the state, one of which is the Clearwater Bull Trout Recovery Team. First, the USFWS Regional Office will review the draft, then the USFWS Washington Office will review it. The plan is scheduled for public review and comment in fall 2002. (Johnna Roy, USFWS, letter to Janet Hohle dated May 20, 2002)

Lower Snake River Fish and Wildlife Compensation Plan

The USFWS administers the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP). This plan was authorized by the Water Resources Development Act of 1976, Public Law 94-587 to mitigate and compensate for fish and wildlife losses caused by the construction and operation of the four lower Snake River dams and navigation lock projects. The fishery resource compensation plan identified the need to replace adult salmon and steelhead and resident trout fishing opportunities. The size of the anadromous program was based on estimates of salmon and steelhead adult returns to the Snake River basin prior to the construction of the four lower Snake River dams. In the Clearwater, the LSRCP funds Clearwater Hatchery operated by Idaho Department of Fish and Game and the chinook salmon production portion of the Dworshak NFH operated by the USFWS. A summary document describing the LSRCP and its role in individual subbasins (including the Clearwater) has been compiled and submitted under separate cover to the ISRP and CFWA (U.S. Fish and Wildlife Service 2001).

Endangered Species Act Implementation Plan for the FCRPS

The three action agencies have prepared the implementation plan (Bonneville Power Administration et al. 2001) in acknowledgement of responsibilities for fish protection under the Northwest Power Act and water quality protection under the Clean Water Act, and their obligations to Indian tribes under law, treaty, and Executive Order. The plan responds to the December 2000 Biological Opinions issued by the U.S. Fish and Wildlife Service and the NOAA Fisheries on the effects to listed species from operations of the Columbia River hydropower system.

The plan is a five-year blueprint that organizes collective fish recovery actions by the three agencies. The plan looks at the full cycle of the fish, also known as “gravel to gravel” management or an “All-H” approach (hydro, habitat, hatcheries, and harvest). However, it describes only commitments connected to the FCRPS, not the obligations of other federal agencies, states, or private parties. The plan describes the three agencies’ goals; the performance standards to gauge results over time; strategies and priorities for each H; detailed five-year action tables for each H; research, monitoring, and evaluation plan (RM&E); and expectations for regional coordination.

The plan identifies priority watershed actions and assigns responsibilities for the Middle Fork Clearwater River to the Bureau of Reclamation. This work is scheduled to begin in Fiscal Year 2003. Work in the Middle Fork will include actions to correct passage barriers, stream flow and screen deficiencies on privately owned agricultural lands (Joseph Spinazola, USBR, Presentation to PAC January 30, 2002). Bureau of Reclamation staff has been coordinating with the Clearwater Focus Program and Clearwater Policy Advisory Committee.

FCRPS Biological Opinion and the Basinwide Salmon Recovery Strategy

NOAA Fisheries has recently developed several documents and initiatives for the recovery of Endangered Species Act listed Snake River steelhead, chinook and sockeye. The Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp) and the Basinwide Salmon Recovery Strategy issued at the end of 2000 contain actions and strategies for habitat restoration and protection for the Columbia River Basin. Action agencies are identified that will lead fast-start efforts in specific aspects of restoration on nonfederal lands. Federal land management will be implemented by current programs that protect important aquatic habitats (PACFISH,

ICBEMP). Actions within the FCRPS BiOp are intended to be consistent with or complement the Council's amended Fish and Wildlife Program and state and local watershed planning efforts.

NOAA Fisheries has also initiated recovery planning with the establishment of a Technical Recovery Team for the Interior Columbia, which includes Snake River stocks. The Technical Recovery Team will identify delisting criteria and viability criteria for populations within ESUs, identify factors that limit recovery, and identify early actions for recovery among other things. A stakeholder-based forum will develop a formal recovery plan from these products.

Under the 2000 FCRPS BiOp, NOAA Fisheries expects the Bonneville Power Administration, the Corps of Engineers, and the Bureau of Reclamation to meet their ESA obligations in part through offsite mitigation (Lohn 2002). Subbasin plans will become local recovery plans or will become a substantial component of NOAA Fisheries recovery planning. The BiOp relies on subbasin plans to identify and prioritize specific actions needed to recover listed salmon and steelhead in tributary habitats. NOAA Fisheries expects subbasin plans to include implementation of the BiOp's offsite mitigation actions in the Reasonable and Prudent Alternative (RPA). Specifically, subbasin planning should provide for RPA habitat actions 149 through 163 and harvest and hatchery RPA actions 164 through 178 that pertain to and require local planning and management. NOAA Fisheries also expects subbasin plans to incorporate the research, monitoring, and effective strategies and actions, particularly those described in RPA action 179, 180, and 183 (See Appendix C for summary of RPAs).

The USFWS issued a biological opinion in December, 2000 to the U.S. Army Corps of Engineers, Bonneville Power Administration, and the Bureau of Reclamation on the effects of the FCRPS on listed species and their critical habitat. In the Clearwater River bull trout was the only listed species included in the consultation. The document outlined reasonable and prudent measures directing the action agencies to implement monitoring and studies to provide critical information on bull trout entrainment and distribution, timing, and usage of Dworshak Reservoir for modifying facilities and/or operations. The USFWS also included a term and condition recommending that the action agencies estimate annual population size of bull trout migrating to and from Dworshak Reservoir, and develop abundance trends over time.

Columbia River Fish Management Plan

The Columbia River Fish Management Plan (CRFMP) is an agreement resulting from the U.S. District Court case of U.S. V. Oregon (Case No. 68-513). This agreement between federal agencies, Indian tribes and state agencies (except Idaho) set guidelines for the management, harvest, hatchery production, and rebuilding of Columbia River Basin salmonid stocks. Appropriate harvest levels and methods were established for various levels of attainment of interim population goals for spring chinook, summer chinook, sockeye, fall chinook, summer steelhead, and coho salmon. The plan guaranteed the treaty Indian fisheries a minimum of 10,000 spring and summer chinook annually, not dependent on run size. The original CRFMP terminated in 1998; it is currently being renegotiated, with completion anticipated by December 2003. In the interim, seasonal fish management plans have been drafted and agreed to by relevant parties.

U.S. Army Corps of Engineers Master Plan and Supplemental EIS

The USACE manages over 30,000 acres of land surrounding Dworshak Reservoir. Their policies and regulations for fish and wildlife describe three management concepts: stewardship, mitigation, and enhancement. Project goals and objectives reflecting these concepts are currently being revised as a new Master Plan and Supplemental Environmental Impact Statement. Completion of these is expected within the next two years (Russell Davis, USACE, E-mail to Janet Hohle, July 2, 2002).

3.3 State Plans

Idaho Department of Environmental Quality 2002-2007 Strategic Plan

The following three priorities from the Idaho Department of Environmental Quality 2002-2007 Strategic Plan are relevant to protecting and restoring ecosystem resources (Jim Bellatty, IDEQ, personal communication, March 28, 2001):

- Improve ground water quality in degraded areas and protect all ground water
- Improve the surface water quality in areas identified as not supporting their beneficial uses or where the state believes threatened or endangered species exist
- Improve environmental quality in areas subject to past or present mining activities

The IDEQ is the lead agency to produce Total Maximum Daily Load (TMDL) assessments for streams on the Idaho Clean Water Act (CWA) §303(d) list. The court-approved schedule for completion of these TMDLs has recently been amended. TMDLs for all streams listed in the Clearwater are scheduled to be completed by the end of calendar year 2006. TMDLs for streams within the exterior boundaries of the Nez Perce Indian Reservation are completed via a three party agreement between the Nez Perce Tribe, the IDEQ, and the U.S. Environmental Protection Agency. TMDL implementation plans have been developed by local watershed advisory groups (WAGs) and are available through IDEQ. The plans are important for CWA §319 funding that is directed towards improving water quality.

Idaho Department of Fish and Game Plans

Under Title 36 of the Idaho Code, the Idaho Department of Fish and Game is responsible to preserve, protect, and perpetuate fish and wildlife in the state of Idaho and provide continued supplies of fish and wildlife to the citizens of the state for hunting, fishing, and trapping. IDFG works to preserve, protect, perpetuate, and manage all wildlife. IDFG management plans and policies relevant to fish and wildlife and their habitat in the Clearwater subbasin include the *A Vision for the Future: Idaho Department of Fish and Game Policy Plan, 1990-2005* (Idaho Department of Fish and Game 1990); the *Idaho Department of Fish and Game Strategic Plan* (Idaho Department of Fish and Game 2001a); the *Idaho Department of Fish and Game Five Year Fish Management Plan: 2001-2006* (Idaho Department of Fish and Game 2001b); *White-tailed Deer, Mule Deer and Elk Management Plan* (Idaho Department of Fish and Game 1999a); the *Black Bear Management Plan 2000-2010* (Idaho Department of Fish and Game 1998); the *Nongame Plan 1991-1995* (Idaho Department of Fish and Game 1991a); the *Upland Game Plan 1991-1995* (Idaho Department of Fish and Game 1991b); the *Waterfowl Plan 1991-1995* (Idaho Department of Fish and Game 1991c); the *Moose, Sheep and Goat Plan 1991-1995* (Idaho Department of Fish and Game 1991d); the *Mountain Lion Plan 1991-1995* (Idaho Department of Fish and Game 1991e) and the *Furbearer Plan 1991-1995* (Idaho Department of Fish and Game 1991f).

Comprehensive State Water Plan for the North Fork Clearwater Basin

The Idaho Water Resource Board, through the Idaho Department of Water Resources, prepared the Comprehensive State Water Plan for the North Fork Clearwater Basin (IWRB 1996). The North Fork Clearwater Basin Plan was adopted by the Water Resource Board in January 1996, and was ratified by the Idaho Legislature in that same year. As such, it carries the effect and force of Idaho State law.

The plan provides guidance for the development, management, and protection of water and related resources in the North Fork Clearwater subbasin in compliance with provisions of the Idaho State Constitution and Idaho State Code. This document describes and evaluates the water resources and related economic, cultural, and natural resources of the basin. It recognizes past actions, addresses present issues and opportunities, and seeks to ensure that uses of the water will complement state goals of achieving a high quality of life in Idaho.

Protected river designations were made to maintain the primitive character and aesthetic quality of valuable fish and wildlife habitat and to maximize recreational opportunities. The following North Fork Clearwater River waterways are designated as State Natural or Recreational Rivers.

- North Fork Clearwater River, headwaters to Dworshak Reservoir
- Isabella Creek, headwaters to mouth HUC 17060308
- Weitas Creek, headwaters to mouth HUC 17060307
- Kelly Creek, headwaters to mouth HUC 17060307
- Cayuse Creek, headwaters to mouth HUC 17060307
- Little North Fork Clearwater River, headwaters to Dworshak Reservoir HUC 17060308
- Reeds Creek, Calhoun Creek to mouth HUC 17060308
- Beaver Creek, Charlie Creek to mouth HUC 17060308
- Elk Creek, headwaters to Deep Creek HUC 17060308

The Board further recommended that the Council's Protected Areas Designations be modified to reflect plan actions and recommendations.

Other State Water Plans

The IDWR is currently preparing a state water plan for the South Fork Clearwater River. This effort is being done in cooperation with the IDEQ's TMDL development for the South Fork Clearwater River. IDWR's schedule for other state water plans in the Clearwater include Lower Clearwater Basin in 2004-2005 and the Upper Clearwater Basin in 2006-2007 (Thomas Grant, IDWR, email to Janet Hohle, January 17, 2002). IDWR staff has been coordinating with the Clearwater Focus Program and Clearwater Policy Advisory Committee.

Minimum Instream Flows

Idaho Code gives the Water Resource Board the authority to hold instream flow water rights for the purpose of maintaining minimum streamflows to protect a variety of instream uses. Minimum streamflows have been established on rivers within the Clearwater subbasin to protect fish habitat, recreation, aquatic life, and wildlife habitat. The Idaho Water Resource Board holds minimum streamflow water rights on several streams within the Clearwater River subbasin:

- Clearwater River – three water rights on three segments HUC 17060306
- North Fork Clearwater River – two water rights on two segments
- Lochsa River HUC 17060303
- Selway River HUC 17060301+17060302
- Elk Creek HUC 17060308
- Cayuse Creek HUC 17060308
- Little North Fork Clearwater River HUC 17060308
- Kelly Creek HUC 17060307

The Dworshak Operation Plan

The Dworshak Operation Plan was adopted by the Idaho Water Resource Board in 2000 and ratified by the 2001 Idaho Legislature as an amendment to the Comprehensive State Water Plan for the North Fork Clearwater Basin. The objective of this plan is to implement procedures that optimize the use of Dworshak water for all beneficial uses including flood control, power production, recreation, commercial navigation, fish and wildlife and water quality. The plan, among other things, analyzes the impacts of current Dworshak operations and contains eight recommendations made by the Idaho Water Resource Board regarding the future operation of the Dworshak Project. The plan requires that Dworshak be operated using an integrated rule curve that would manage operations to maximize all five of the congressionally authorized management purposes, which are flood control, hydropower, navigation, recreation, and fish and wildlife. The Nez Perce Tribe Fisheries Department is completing a Bonneville funded contract to develop an integrated rule curve for Dworshak operations.

Idaho Agricultural Pollution Abatement Plan

The ISCC is the lead state agency to implement the Idaho Agricultural Pollution Abatement Plan. The plan details how agricultural nonpoint source pollution is to be managed by addressing five primary agricultural activities: nonirrigated cropland systems, irrigated cropland systems, grazing, riparian/wetlands, and animal waste management. The Abatement Plan is part of Idaho State’s overall program to manage nonpoint source pollution and to meet federal water quality requirements. The goal of the plan is to restore and maintain waters of Idaho. The Idaho Agricultural Pollution Abatement Plan is currently being revised and should be available for public review and comment fall 2002.

State Transportation Improvement Program

The Idaho Department of Transportation develops project plans through the State Transportation Improvement Program (STIP) which includes a five-year project implementation phase and a one-year project development phase. Corridor planning is conducted in more urban areas of Idaho in addition to STIP, but has not been implemented as a planning methodology in the Clearwater (IDT District 2) (Idaho Department of Transportation District 2 and Boise office, personal communications, July 24, 2002). Projects planned for implementation in the Clearwater subbasin by the Idaho Department of Transportation are listed in Table 5 in the existing, past and planned effort section of this document.

After a few small projects on U.S. Highway 12 in early Fiscal Year 2003, the IDT has committed to refraining from work during the Lewis and Clark celebration period. Past projects on U.S. Highway 12 for which biological assessments are available include those completed on Ahsahka Bridge, Orofino Bridge, Kamiah Bridge, Kooskia Bridge, and Lawyer Creek Bridge.

Revegetation designs for projects are site specific based on local conditions such as annual precipitation, slope, soil, aspect, riparian zone, and upland zone. Grass, forbs, shrub, and tree species are prescribed emphasizing native species, although “nurse crops” which are usually not native are used for quick vegetation establishment to prevent erosion.

Local Highway Technical Assistance Council

The Idaho Legislature created the Local Highway Technical Assistance Council (LHTAC) in 1994 to assist local government road districts to secure federal road funds for qualifying projects. The Idaho Association of Counties, Idaho Association of Cities, and Association of Highway Districts appoint members to the council, which is comprised of three members from each organization. The Clearwater subbasin includes the following road districts: Clearwater County--Clearwater Road District and Clearwater County; Idaho County--County Road Department, Cottonwood, Deer Creek, Dumecq, Fenn, Ferdinand, Good Roads, Grangeville, Green Creek, Keuterville, Kidder-Harris, Union-Independent, and Winona; Latah County--North County and South County; Lewis County--Central Evergreen, Kamiah, North Highway, and Prairie; Nez Perce County has only one, which is managed by the county (Joe Haynes, Local Highway Technical Assistance Council, personal communication, July 24, 2002).

Bridge projects in a preliminary development phase include the Southeast Elk River Bridge and the Lolo Creek Bridge to be worked on by the Clearwater County and Idaho County road departments respectively.

Land Use Ordinances

The Clearwater subbasin encompasses all or most of Clearwater, Idaho, Latah, Lewis, and Nez Perce Counties. Four of the five counties in the Clearwater subbasin have adopted land use ordinances pursuant to the authority granted in Title 67, Chapter 65, of the Idaho Code and Article 12, Section 2, of the Idaho Constitution. Land use ordinances are adopted and implemented to achieve the following goals: 1) promote the health, safety, and general welfare of the people of the respective county; 2) insure that the goals and purpose of the Idaho Local Planning Act are accomplished and facilitated; 3) fulfill the statutory mandate of Idaho Code 67-6503; 4) control construction and uses of land which may do irreparable harm to existing buildings, uses of land, and the economic and social stability of the county. Idaho County does not have a land use ordinance but does have a subdivision ordinance.

Each county has a flood plain ordinance that regulates the lowest allowable elevation for construction within the flood plain. Latah County is revising the land use ordinance and if adopted as drafted will provide for setbacks from intermittent and perennial streams for winter animal feeding areas and a riparian area protection zone that will prohibit construction within 100 feet of a stream. Nez Perce County is drafting a development standards ordinance, which if adopted as drafted will require a site improvement permit if construction is to be within 100 feet of a perennial stream.

Soil and Water Conservation Districts Management Plans

Each of the five soil and water conservation districts in the Clearwater subbasin operates under a five year management plan, all of which include specific goals for natural resources (CSWCD 2001, ICSWCD 2001, LSWCD 2001, LSCD 2000, NPSWCD 2001). The SWCDs are all engaged in program delivery and project development funded through federal, state, and local sources. These organizations are important linkages between conservation program implementation and private landowners.

3.4 Other Plans

Clearwater Basin Weed Management Area (CBWMA)

The purpose of the CBWMA is to bring together those responsible for weed management within the Clearwater River subbasin to develop common management objectives, set realistic management priorities, facilitate effective treatment, and coordinate efforts along logical geographic boundaries with similar land types, use patterns, and problem species. Cooperators of the CBWMA include private landowners, county government, tribal government, university, state and federal land management agencies, and interested organizations and individuals. A coordinating committee meets periodically to develop the annual operating plan, monitor accomplishments, maintain a subbasin-wide inventory, assess effectiveness of control strategies and tactics, and make necessary adjustments (CBWMT 1999).

The latest plan was completed for 2002. Operating plans divide the Clearwater into seven areas and propose treatment for first and second priority species, describes treatment methodology, and identifies educational activities. The Clearwater treatment areas are the mainstem Clearwater, Potlatch River, North Fork, Lolo Creek, Lochsa River, Selway River, and South Fork. The Natural Resources Conservation Service Rural Conservation and Development program coordinates the CBWMA.

Clearwater Elk Initiative

The Clearwater Elk Initiative mission is to increase the Clearwater subbasin elk herds by improving and restoring elk habitat using fire and harvest management (CEI 2002). Membership of the CEI includes major landowners, agencies, and organizations. There are three active committees: information and education, monitoring and research, and fund raising. CEI direction comes from the management team whose responsibilities include identifying priorities, approving projects, and locating funding.

3.5 Hatchery and Genetic Management Plans (HGMP's)

Artificial production facilities found within the Clearwater subbasin were primarily built as mitigation for federal dams. Specific planning documents associated with each facility (ranging from a single Master Plan to multiple associated documents addressing genetics, habitat and life history relationships)may be obtained from the relevant management agency. Key hatchery development agencies are U.S. Fish and Wildlife Service (USFWS), Northwest Power Planning Power Council (Council), Idaho Department of Fish and Game (IDFG), and the Nez Perce Tribe (NPT). Funding sources include the Bonneville Power Administration (BPA) and U. S. Army Corps of Engineers (USACE) through legislated programs such as the Council's Fish and Wildlife Program and the Lower Snake River Compensation Program (LSRCP). These agencies coordinate extensively with other governmental land and water management agencies (e.g., USACE and NOAA Fisheries). A complete list of production programs associated with the

Clearwater subbasin, and detailed descriptions of each can be found in the Clearwater Subbasin Assessment (Table 52).

During the last decade, hatchery managers have participated in three major planning efforts directed by the Council: Subbasin Planning (1990), Integrated Hatchery Operations (1996), and the Artificial Production Review (2001). Under the Endangered Species Act additional review and planning has also been required of hatchery operations titled Hatchery Genetic Management Plans (HGMPs). The 2000 Federal Columbia River Power System Biological Opinion, RPA 169, calls for HGMPs to be completed for all production facilities in the Columbia River by autumn 2003. The Council is working to complete this task by autumn 2002 (CBFWA Draft Action Notes – Meeting June 20, 2002).

Artificial production programs, whether hatchery mitigation releases or supplementation efforts, for both anadromous and resident fish are following the HGMP process as prescribed by NOAA – Fisheries. This process is coordinated through the Council’s Artificial Production Advisory Committee (Council/APAC), with the two agencies being co-stewards of the HGMP development process. The HGMPs will represent artificial production in relation to the Council’s Provincial Review process and any future NOAA Fisheries Endangered Species Biological Opinions regarding artificial production programs. The focus is on federally funded programs.

Tribal, state, and federal managers are working to develop HGMPs for each facility to coordinate management within and between hatchery programs. This type of plan will assist in setting the baseline data for these efforts and their associated research programs. This data is critical to the overall subbasin planning process as it provides guidance and relays information regarding the past, present and future of fishery populations within the subbasin, and within the overall Columbia and Snake River basins.

Sponsors doing project HGMPs are as follows:

- USFWS for Dworshak Hatchery and Kooskia Hatchery as a single managed complex.
- USFWS and IDFG for Clearwater Hatchery and its satellite facilities.
- NPT for Nez Perce Tribal Hatchery and its satellite facilities.
- NPT for Fall Chinook Acclimation Project; Big Canyon Satellite (this will also cover the Pittsburg Landing and Captain John Rapids satellites on the Snake River).
- NPT for Coho Restoration Master Plan and Experimental Production.
- NPT for Resident Fish Substitution (Trout Ponds).
- IDFG for Clearwater Hatchery and its satellite facilities
- IDFG for LSRCP resident fish mitigation

4 Watershed Assessments, Watershed Scale Plans, Biological Assessments, and TMDLS

Four primary types of documents are addressed in this section: watershed assessments, watershed scale plans, biological assessments, and TMDLS. Watershed assessments provide information for planning and implementation. Biological assessments most often address potential impacts of proposed land use activities on sensitive species. TMDLS are required water bodies listed as impaired on the §303(d) list. The TMDL process includes a watershed assessment, and potentially a load allocation and implementation plan. Planned assessments are listed at the end of this section in Table 2 (Watershed Assessments) and Table 3 (TMDLS).

4.1 Watershed Assessments and Watershed Scale Plans

Clearwater Soil and Water Conservation District. (1986). *Bedrock Creek and the North Corridor of the Clearwater Watershed*. The plan identifies critical areas for treatment, outlines specific BMPs, and estimates costs and environmental impacts for improving water quality and fish habitat.

Clearwater Soil and Water Conservation District. (1993). *Agricultural Pollution Abatement Plan Lolo/Ford's Creek Watershed- Final Planning Report*.

Clearwater National Forest. (2000). Eldorado Creek – Ecosystem Assessment at the Watershed Scale (EAWS). Lochsa Ranger District.

Clearwater National Forest. (1999). Lower North Fork of the Clearwater Subbasin Ecosystem Analysis at the Watershed Scale: Elk Creek and Long Meadow Watersheds. This analysis characterizes the human, aquatic, riparian, and terrestrial conditions, processes, and interactions on National Forest lands to estimate impacts of management activities and provide guidance for potential activities. It describes cumulative watershed conditions, trends, potential project areas, and potential amendments to Forest plans.

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.

Clearwater National Forest and Nez Perce Tribe. (1998). A Watershed Analysis for the Area from Squaw to Papoose Creeks. Lochsa Ranger District, Powell Unit. Pertains to Papoose Creek, Wendover Creek, Badger Creek, and Squaw Creek.

Clearwater National Forest. (1997). Lost Postman Planning Area – Watershed Analysis. Lochsa Ranger District. Pertains to Post Office Creek, Weir Creek, Indian Grave Creek and Lost Creek.

Clearwater National Forest. (1997). Clearwater Subbasin Ecosystem Analysis at the Watershed Scale. Orofino, ID. Pertains to Lolo Creek, Orofino Creek, and the Potlatch River watersheds

- Clearwater National Forest. (1997). Potlatch River Above Bovill Ecosystem Analysis at the Watershed Scale. Palouse Ranger District.
- Clearwater National Forest. (1996). North Lochsa Face Landscape and Watershed Assessment – draft. June 27, 1996. Lochsa Ranger District.
Pertains to Pete King Creek, Canyon Creek, Deadman Creek, and Fish Creek
- Clearwater National Forest. (1998). *West Fork Potlatch Draft Environmental Impact Statement*.
- Jones, R. M.; J. Mital and P.K. Murphy. (1997). Watershed Sensitivity: Clearwater National Forest. Clearwater National Forest. Orofino, Idaho.
- Jones, R. M. and P. K. Murphy. (1997). Watershed Condition: Clearwater National Forest. This report determines watershed conditions for 278 roaded and unroaded watersheds with Forest Plan water quality objectives. Orofino, Idaho.
- Latah Soil and Water Conservation District. (1987). Little Potlatch Creek Planning Phase Final Report.
This report contains the findings and recommendations of the Little Potlatch Creek Water Quality Planning Project. Information gathered during the study indicated that erosion within the watershed, especially from agricultural lands, is degrading water quality.
- Lewis Soil Conservation District. (1986). Mission-Lapwai Watershed Planning Project Final Report. This report summarizes results of the watershed planning efforts made through the Idaho Agriculture Water Quality Program.
- Lewis Soil Conservation District. (1988). Idaho State agricultural water quality program for Little Canyon Creek. Nezperce, ID
- Maiolie, M., D. Statler, and S. Elam. (1993). Dworshak Dam Impact Assessment and Fish Investigation of Trout, Bass, and Forage Species.
- Natural Resources Conservation Service. (1994). Bedrock Creek Watershed Assessment. Lewiston, Idaho.
- Natural Resources Conservation Service. (2000). Lapwai Creek Watershed Assessment. Lewiston, Idaho.
- Natural Resources Conservation Service (2001). Cottonwood Creek Preliminary Investigation Lewiston, Idaho
- Nez Perce National Forest. (1998). South Fork Clearwater River Landscape Assessment Vol. I and II. Grangeville, Idaho.
This assessment characterizes the historic and current ecological and social conditions in the South Fork Clearwater to provide context for future forest management decisions on national forest lands.

Nez Perce National Forest. (2001). Meadow Face Ecosystem Analysis at the Watershed Scale. Clearwater Ranger District. Grangeville, Idaho.

Nez Perce National Forest. (2002). Selway and Middle Fork Landscape Assessment. Grangeville, Idaho.

This assessment characterizes the historic and current ecological and social conditions in the Selway and Middle Fork Clearwater, and provides a context for future forest management decisions on national forest lands. The assessment focuses on the diversity, distribution, and abundance of plant and animal species, watershed conditions, transportation systems, and human uses and trends.

Nez Perce Soil and Water Conservation District. (1986). Pine Creek Watershed Planning Project report. Lewiston, Idaho.

The report outlines general treatment needs and resource concerns within the watershed

Nez Perce Soil and Water Conservation District. (1998). Confined Animal Feeding Operation Inventory and Analysis. Lewiston, Idaho.

Animal feeding operations were inventoried on all watersheds in the lower Clearwater subbasin. Each watershed was ranked for the potential for water quality impacts from livestock. Parameters evaluated included access to water, livestock density, numbers of livestock, waste management practices, buffers, and soil types.

Nez Perce Soil and Water Conservation District (2002). Hatwai Creek Watershed Preliminary Investigation. Lewiston Idaho.

Nez Perce Tribe. (1998). Unified Watershed Assessment and Watershed Restoration Priorities. Clean Water Action Plan. Lapwai, Idaho.

Schriever, E. and D. Nelson. 1996. Potlatch River basin Fisheries Inventory. Latah, Clearwater and Nez Perce Counties, Idaho. Report to Latah Soil and Water Conservation District. IDFG. Lewiston, Idaho.

This report summarizes the distribution and abundance of fish species in the Potlatch River drainage. It is a companion document to the Potlatch River basin habitat surveys conducted by the NRCS and other agencies for the Latah Soil and Water Conservation District.

USDA-Natural Resources Conservation Service. (1995). Cottonwood Creek Initial Assessment – Nez Perce County, Idaho. Moscow, Idaho.

The report summarizes information obtained through literature reviews and reconnaissance level inventories. The report recommends further study.

USDA-Natural Resources Conservation Service. (1994). Preliminary Investigation Report for the Potlatch River – Latah, Clearwater and Nez Perce Counties, Idaho. Moscow, Idaho.

This assessment identifies and assesses watershed resource problems, develops potential solutions, and evaluates their relative impacts and cost efficiency.

- USDA – Natural Resources Conservation Service. (1992). Middle Potlatch Creek Initial Assessment. Moscow, Idaho.
The report summarizes information obtained through literature reviews and reconnaissance level inventories.
- USDA – Natural Resources Conservation Service. (1992). Lewiston Orchards Irrigation District Initial Assessment. Lewiston, Idaho.
The report summarizes information obtained through literature reviews and reconnaissance level inventories. Further study is recommended.
- USDA – Natural Resources Conservation Service. (1992). Orofino Creek Initial Assessment. Orofino, Idaho.
The report summarizes information obtained through literature reviews and reconnaissance level inventories.
- USDA-Natural Resources Conservation Service. (1992). Bedrock Creek Watershed Plan – Environmental Assessment. Orofino, Idaho.
This report outlines resource problems and treatments needed for water quality and fisheries habitat improvement.
- USDA – Natural Resources Conservation Service, Nez Perce and Clearwater Soil and Water Conservation Districts. (1989). Preauthorization Report for the Bedrock Creek Watershed. Lewiston, ID.
The plan contains a summary of the resource data collected during 1985. Conclusions identify a significant sediment load in the stream.
- USDA – Natural Resources Conservation Service. (1988). Preauthorization Report for the Mission-Lapwai Creek Watershed. Lewiston, Idaho.
The report contains a summary of resource data collected during 1988. Conclusions indicate improvements needed for fish habitat.
- Washington State University. 2001. Big Canyon Aquatic Assessment. Center for Environmental Education. For Nez Perce Tribe as part of Northwest Power Planning Council's Fish and Wildlife Program.
- Washington State University. 2001. Lapwai Creek Aquatic Assessment. Center for Environmental Education. For Nez Perce Tribe as part of Northwest Power Planning Council's Fish and Wildlife Program.
- Wertz, L. and J. Kinney. (1994). Beneficial use reconnaissance project: Potlatch River watershed. Water quality summary report no. 31. Idaho Department of Environmental Quality. Lewiston, Idaho.

4.2 Biological Assessments

Bransford, S. (2001). *Newsome Creek Watershed Improvement Project (Draft)*. Nez Perce Tribe and Nez Perce National Forest. Grangeville, ID.

This draft biological assessment has been prepared in compliance with section 7 of the ESA and National Forest Regulations. It includes determinations for Newsome Creek threatened, endangered and sensitive plant, wildlife and fish species and the effects of activities on these species.

Bureau of Land Management. (2000). *Clearwater River, North Fork Clearwater River, and Middle Fork Clearwater River Subbasins: Biological Assessment of Ongoing and Proposed Bureau of Land Management Activities on Fall Chinook Salmon, Steelhead Trout, Bull Trout, and BLM Sensitive Species*. Cottonwood, ID:

National Marine Fisheries Service and U.S. Fish and Wildlife Service. (2000). *Unlisted Species Analysis and Section 10 findings for issuance of an ESA Section 10 Incidental Take Permit to the Plum Creek Timber Company for the Native Fish Habitat Conservation Plan*.

Natural Resources Conservation Service. (1995). *Big Canyon Creek Environmental Assessment Final Planning Report*.

Nez Perce Soil and Water Conservation District. (1988). *Pine Creek Project for the Idaho State Water Quality Program*.

The plan identifies treatment to reduce sheet/rill erosion on non-irrigated cropland.

Nez Perce Soil and Water Conservation District. (1995). *Big Canyon Creek Environmental Assessment*. Lewiston, Idaho.

The plan identifies treatment and costs for problems involving stream temperature, nutrients, sediment, low summer flows, and bacteria.

Nez Perce Soil and Water Conservation District. (2000). *Resource Conservation Plan*.

This plan identifies conservation problems and needs within the Nez Perce Soil and Water Conservation District. Resource concerns addressed include water quality and fish habitat.

Paradis, W. J.; Lentz, H. S.; Blair, S.; Lake, L. and Cochrane, A. (1999). *Clear Creek Biological Assessment*. Nez Perce National Forest.

This document assesses the effects of ongoing and proposed Forest Service activities on Snake River steelhead, bull trout, and fall chinook salmon as required under Section 7 of the ESA. It also examines impacts on westslope cutthroat trout, spring chinook salmon, and interior redband trout. It includes discussion of the biology, status, and effects of activities on Clear Creek gray wolf, bald eagle, lynx, and federally listed plants.

Paradis, W. J.; Lentz, H. S.; Blair, S.; Lake, L. and Cochrane, A. (1999a). *Middle Fork Clearwater River Face Drainages Biological Assessment*. Nez Perce National Forest. This Section 7 biological assessment examines status and potential impacts for threatened and endangered plant and wildlife species, including westslope cutthroat trout, fall chinook salmon, spring chinook salmon, and Pacific lamprey in the Middle Fork Clearwater.

Paradis, W. J.; Lentz, H. S.; Mays, D.; Blair, S. and Lake, L. (1999b). *South Fork Clearwater River Biological Assessment*. Nez Perce National Forest. This Section 7 biological assessment examines status and potential impacts on threatened and endangered plant and wildlife species, including westslope cutthroat trout, fall chinook salmon, spring chinook salmon, and Pacific lamprey in the South Fork Clearwater.

Schoen, D.; Jones, R. M. and Murphy, P. K. (1999). *Section 7 Watershed Biological Assessment Lochsa River Drainage Clearwater Subbasin: Determination of Effects of Ongoing Activities Based on the Matrix of Pathways and Indicators of Watershed Condition for Steelhead Trout, Fall Chinook Salmon and Bull Trout*. Clearwater National Forest. This Section 7 assessment outlines Forest Service activities and potential impacts on stream morphology, fish habitat, and riparian condition for all Lochsa River tributaries.

Thompson, K. L. (1999). *Biological Assessment: Lower Selway 4th Code HUC. Fish, Wildlife and Plants*. Nez Perce National Forest, Moose Creek Ranger District.

USDA – Natural Resources Conservation Service. (1996). *Supplemental Watershed Protection Plan-Environmental Assessment – Bedrock Creek Watershed – Clearwater and Nez Perce Counties, Idaho*. Lewiston, Idaho. This plan describes accelerated implementation of best management practices (BMPs) to improve water quality and fisheries habitat on non-irrigated cropland and riparian zones adjacent to Bedrock Creek. It includes discussion of hydrology, riparian zones, threatened and endangered species, erosion and sedimentation, water quality, wildlife, identified problems, and pollutant sources.

USDA – Natural Resources Conservation Service. (2000). *Supplemental Watershed Protection Plan – Environmental Assessment for the Lapwai Creek Watershed*. The plan identifies treatment and costs for problems involving stream temperature, nutrients, sediment, low summer flows, and bacteria.

4.3 TMDLs

Bugosh, N. (1999). *Lochsa River Subbasin Assessment*. Lewiston, ID: Idaho Department of Environmental Quality.

This assessment of available habitat, fish, and temperature data for the Lochsa River concludes that water quality supports designated beneficial uses. It reports that subbasin fish and other aquatic biota are adapted to naturally high stream temperatures, and recommends delisting upper Canyon Creek and the Lochsa River from the 303(d) list of water quality impaired streams.

Dechert, T.; Baker, K. and Cardwell, J. (2000). *The Upper North Fork of the Clearwater River Subbasin Assessment and TMDL*. Lewiston: Idaho Department of Environmental Quality.

Idaho Department of Environmental Quality; Nez Perce Tribe, and Environmental Protection Agency. (2000). *Cottonwood Creek Total Maximum Daily Load (TMDL) and Implementation Plan* (Implementation plan prepared by the WAG).

Idaho Department of Environmental Quality. (1999). *Jim Ford Creek Total Maximum Daily Load (TMDL) and Implementation Plan* (Implementation Plan prepared by the WAG).

Idaho Department of Environmental Quality. (2002) *Draft Lower North Fork Clearwater Total Maximum Daily Load and Implementation Plan* (Implementation Plan prepared by the WAG).

Winchester Lake Watershed Advisory Group. (1999). *Winchester Lake and Upper Lapwai Creek Total Maximum Daily Load (TMDL) and Implementation Plan* (Implementation Plan prepared by the WAG).

5 Planned Assessments

Table 2. Planned watershed assessments within the boundaries of the Clearwater subbasin

Assessment Area/Name	Agency	Anticipated Completion
Lower Clearwater AU		
Potlatch River Basin Study	USDA - NRCS	2003
Lindsay Creek Initial Resource Assessment	Nez Perce SWCD	2002
Jacks Creek Initial Resource Assessment	Nez Perce SWCD	2002
Pine Creek Final Project Report	Nez Perce SWCD	2002
Lolo/Middle Fork AU		
Lolo Creek	NPT	2002-2004
Lochsa AU		
Crooked Fork Drainage-EAWS (Crooked to Colt Killed Creeks)	Clearwater National Forest/NPT	2003
South Fork AU		
Newsome Creek-EAWS	Nez Perce National Forest/NPT	2002
Red River-EAWS	Nez Perce National Forest/NPT	2003
Crooked River-EAWS	Nez Perce National Forest/NPT	2005

Table 3. TMDLs scheduled for completion by the Idaho Department of Environmental Quality

Watershed	Anticipated Completion
South Fork Clearwater River	2003
Lower North Fork Clearwater River	2004
Clearwater River	2006

6 Existing, Past and Planned Project Efforts

Information presented in Table 4 describes ongoing projects within the Clearwater subbasin related to fish and wildlife restoration activities. Project information is organized according to the Assessment Unit in which the work occurs, with a separate category for subbasin-wide projects. Projects were described as subbasin-wide if they applied to more than one Assessment Unit. Within each AU, BPA funded projects are listed first in numerical order. Non-BPA funded projects follow with projects sorted alphabetically by the responsible agency.

Table 5 describes projects planned for implementation by the Idaho Department of Transportation over the next several years. Biological Assessments are available through the Idaho Department of Transportation for some of these projects, and in progress, pending, or not required for others (Idaho Department of Transportation District 2 and Boise office, personal communications, July 24, 2002).

Table 4. Ongoing projects within the Clearwater subbasin related to fish and wildlife restoration activities

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower Clearwater Assessment Unit				
IDFG	97BI31259	1995-99	Gas Bubble Trauma Monitoring in the Clearwater River Drainage, ID	This project assessed the extent of gas bubble trauma on resident fish species downstream of Dworshak Dam during late spring and summer months. During the five years of the study, over 30,000 individual fish were examined for GBT. The incidence of GBT was never greater than 1.0% in any given year and 95% of incidences occurred in the two sections nearest to Dworshak Dam.
USFWS	199801003	1997-ongoing	Spawning distribution of Snake River fall chinook salmon	This monitoring and evaluation study is designed to determine the spawning distribution of fall chinook salmon released at three acclimation sites (one of which is located in the Clearwater River), and document redd distribution in portions of the Snake River basin. In 2001-2002, we intend to collect data from fish released at the last release site to go on line, and complete the project by November 2002.
NPT	199801004	1998 to ongoing	Monitoring and Evaluation Of Yearling Snake River Fall Chinook Released Upstream Of Lower Granite Dam	Monitor and evaluate the yearling fall chinook pre- and post-release from the acclimation facilities. The project evaluates yearling size, condition, and post-release emigration characteristics (survival, timing, behavior, etc.) using passive integrated transponder (PIT) tagging and radio telemetry technology to assist in management decisions to maximize smolt-to-adult survival and supplementation program success. The project also helps monitor adult fall chinook migration and spawning distribution in the Snake and Clearwater rivers.
NPT	199801008	1996 to ongoing	Fall Chinook Acclimation Project, Big Canyon Satellite	Hatfield Amendment directed acclimation and release of fall chinook smolts at three sites above Lower Granite Dam. Big Canyon satellite, as one of the three sites, acclimates 150,000 age-1 smolts and two groups of age-0 smolts; 400,000 to 500,000 per group each year since 1997.
NPT	199501300	1995 to ongoing	Nez Perce Tribe Resident Fish Substitution Program	Provide resident fishery to partially mitigate for the loss of anadromous fisheries. 2001 activities focus on two existing ponds and a newly constructed third pond. As of FY 2000, all three ponds were stocked with rainbow trout and operational. Fishing effort and harvest are estimated. Monitoring of water quality and collection of physical pond data, are conducted to assess aquatic environmental health and to determine optimal stocking densities.
USFWS,	199901800	1995-ongoing	Characterize & quantify residual steelhead in the Clearwater River, Idaho	The study goals are to minimize impacts to wild fish in the basin and to maximize efficacy of hatchery reared smolts by reducing residuals. Successful and unsuccessful smolts are characterized and compared.. Very few of the residuals captured were later seen emigrating toward the ocean and most had not traveled far from their original capture site. Analysis indicates very little piscivory has occurred in residual steelhead.
Clearwater County, CEDA		2002 – ongoing	Orofino Creek Flood Mitigation /Stream Restoration	County sponsored flood mitigation/stream restoration project guided by a thirty member, local stakeholder group and managed by CEDA. Clearwater County and the Project Impact Flood Committee finalizing contract with consulting firm to develop a Master Plan to provide recommendations for restoring the lower 4.5 miles of the Orofino Creek main stem. The comprehensive plan will be aimed at safely restoring the form, function, habitat and recreation opportunities offered by Orofino Creek. The plan will include potential project benefits including habitat improvements and flood mitigation as well as conceptual design for stream restoration project options.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower Clearwater Assessment Unit (continued)				
City of Kamiah, Lewis County, Idaho County CEDA		2000 – ongoing	Restore Lawyer Creek targeting steelhead and chinook salmon	Implement both active and passive restoration techniques to improve aquatic and riparian habitat condition, stream floodplain connectivity, instream habitat diversity, channel stability, sediment transport and floodplain functions with the goal of improving fish habitat and water quality for anadromous A-run steelhead, spring/summer and fall chinook salmon and resident west slope cutthroat trout inhabiting the lower seven miles of the Lawyer Creek watershed. Project design is complete.
CNF		1995- Ongoing	Sediment Discharge Station	The Forest operates one gaging station and automatic sediment sampler in the Potlatch River to measure stream discharge, suspended sediment, turbidity, particle size distribution, channel cross-section survey and gradient are monitored.
CNF		1990 - Ongoing	Water Temperature Monitoring	12 sites on eight streams; water temperatures (primarily during May through September) are recorded on an hourly basis to determine baseline conditions in undeveloped watersheds and recovery trends in developed watersheds.
CNF		1994 - Ongoing	Stream Channel Morphology	Five sites on four streams; three riffles where Wolman pebble counts, stream gradient, and cross-sectional surveys are done.
CSWCD, SCC\$, NRCSS\$		1993-1998; 2000- ongoing	Bedrock Cr WQPA & PL566	Idaho Ag Program & NRCS - Riparian restoration, agriculture BMP implementation – 12,031 acres treated.
CSWCD, SCC\$, EPAS\$, NRCSS\$		2000- ongoing	Jim Ford Creek, WQPA, 319, EQIP	TMDL implementation plan agricultural and forestry BMP treatments and monitoring, 1500 acres treated to date and 104 acre riparian buffer (CCRP & WQPA)
IDL		1999	Jim Ford Creek	Cumulative Watershed Effects survey for TMDL
CSWCD, SCC\$, NRCS		1991-1998	Lolo Creek WQPA	Idaho Ag program. 8,215 acres treated to date with BMP implementation.
IDFG, LSRCPS\$		1996- Ongoing	Evaluation of Introduced Rainbow Trout into the lower Clearwater River	Rainbow trout are stocked in the lower Clearwater and Salmon rivers as part of the mitigation for the Lower Snake River Compensation Program. Because of the potential impacts to ESA listed steelhead trout and chinook salmon juvenile, diet analysis of the stocked fish is mandated. Since 1996, diet analysis revealed minimum (<1% stomach content) predation.
IDFG, EPAS\$, Winchester WAG		2002-	Winchester Lake Project (Lapwai watershed)	Installation of oxygenation system to treat lower stratified layer of lake to increase water quality and prevent fish kills under lake stratification. CWA 319 projectProposal for oxygenation of lower stratified layer of lake to increase water quality and prevent fish kills under lake stratification.
LSCD, SCC, EPAS\$, NRCS		1991-2003	Winchester Lake (Lapwai subwatershed) –	TMDL implementation agriculture and forestry BMP implementation, road culvert replacements, and road buffers installed in upper Lapwai Creek watershed, CWA Section 314 and 319 funding. 1,655 acres treated.
IDL		2002	Lapwai Creek survey	Cumulative Watershed Effects survey TMDL development
LSCD, SCC\$		1988- ongoing	Lapwai Creek WQPA	Idaho Ag program -15,280 acres treated to date with BMPs in Lapwai-Mission Creek watersheds.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower Clearwater Assessment Unit (continued)				
NPSWCD, NRCS \$,	28059	1994-1998; 2001-ongoing	Lapwai Creek program PL566	Riparian restoration, fish habitat improvement, agriculture BMP implementation. FY02 funding from BPA.
NPT Fisheries/Watershed	199901700	1999-ongoing	Lapwai Creek Watershed	Completed watershed assessment. FY02 funds for forest BMP implementation and culvert replacement practices.
NPT, EPA\$, NRCS		2000-2002	Lapwai/Winchester Lake 319 project	Riparian restoration, road obliteration upper watershed.
NPSWCD SCC\$, NRCSS\$		1991-ongoing	Mission Creek WQPA & PL566 (Lapwai watershed)	Idaho Ag program with Nez Perce SWCD and NRCS PL566 program. Riparian restoration and agricultural BMP implementation. To date 11,130 acres treated.
LSCD, SCC\$		1990-ongoing	Mission Creek WQPA (Lapwai subwatershed)	Idaho Ag program with Lewis SCD, 14,777 acres treated to date with agricultural BMPs.
NRCSS\$, NPT, NPSWCD		2000-ongoing	Soldiers Meadow EQIP (Lapwai subwatershed)	Upper Webb Creek project area tree planting.
ISWCD, SCC\$, EPA\$, NRCS		2001-ongoing	South Fork Cottonwood WQPA & 319	TMDL implementation plan agricultural BMPs, 1,444 acres treated & septic tank replacement & monitoring.
LSWCD, SCC\$, NRCS		1988-2001	Lenville & Aspendale WQPA (Little Potlatch Creek)	Idaho Ag program. Agricultural BMP implementation, Aspendale (7555 acres treated) & Lenville (5580 acres treated) subwatersheds in Potlatch River system, stream de-listed on 1998 303(d) list, 14,000 acres treated.
LSWCD, NRCSS\$, SCC, IDFG	28025	1994-ongoing	Potlatch River Basin	Project focuses on fish habitat restoration, multi-agency participation. Beneficial Uses Reconnaissance Program conducted 1994. Surveyed fish habitat and populations, 1995-1996. In implementation planning state received FY02 funds from BPA to complete plan.
SCC\$ IDEQ\$,		2000 - ongoing-	Potlatch River - Water Quality Monitoring	Potlatch River Temp and flow data collected in 8 tributaries that have been identified as steelhead bearing streams. IDEQ in other tribs for TMDL development.
LSWCD, NPSWCD, NRCSS\$		2000-ongoing	Palouse New Technology EQIP project	Agricultural BMP implementation; Hatwai, Catholic, Coyote, Middle Potlatch, Little Potlatch Creeks.
NPSWCD, SCC\$, NRCSS\$		2001-	riparian and livestock feeding area	Animal feeding operation treatments including riparian restoration, Idaho ag program WQPA and NRCS EQIP; Bedrock Creek, Lapwai Creek.
NPSWCD, IASCD\$,		2001 -2002	Lindsay Creek Water Quality Monitoring Project	Collecting stream temperature, nitrates, phosphorus, and bacteria samples.
LSCD, NRCS	199901400	1999-2004	Restore anadromous fish habitat in Little Canyon Creek subwatershed	Agriculture BMP implementation to reduce sediment delivery to steelhead stream, approx. 240,000 tons sediment reduction to date. Lt Canyon main tributary to Big Canyon Creek.
LSCD, SCC\$, NRCS,		1996-1998; 2000-ongoing	Holes & Long Hollow Creeks	Idaho Ag program, agricultural BMP implementation in upper Little Canyon Creek watershed, 10,523 acres treated to date.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower Clearwater Assessment Unit (continued)				
NPSWCD, NRCS	199901500	1999-2004	Restore anadromous fish habitat in the Nichols Canyon subwatershed	Upland land use treatment on private lands to decrease nonpoint pollution to steelhead stream. Lowest subwatershed Big Canyon Creek.
NPT Fisheries/Watershed	199901600	1999-ongoing	Big Canyon Creek	Completed watershed assessment. FY02 funds to begin forestry BMP implementation and culvert replacement practices.
NPSWCD, SCCS,		1996-1998; 2000-ongoing	Big Canyon WQPA	Idaho Ag Program, agricultural BMP implementation in upper watershed.
IDL		2002	Big Canyon Survey	Cumulative Watershed Effects survey for TMDL preparation.
NPSWCD, Nez Perce County, FEMA \$, NRCS		1998-ongoing	Lower Big Canyon FEMA Project	Flood mitigation FEMA, land purchased in 1998, bank stabilization/floodplain Work initiated in 1999
NPT Wildlife	28021	2002-ongoing	Lower Clearwater habitat enhancement project	FY2002 BPA funding to acquire important upland and riparian habitats for fish and wildlife.
Lower North Fork Assessment Unit				
IDFG	8709900	1987-ongoing	Dworshak Dam Impacts Monitoring and Evaluation	Examine effects of the operation of Dworshak Dam on resident fishes in Dworshak Reservoir. Assessed reservoir limnology and angler use. Conducts annual monitoring of the kokanee population and entrainment. Current research focuses on minimizing kokanee entrainment which may benefit other species. Strobe light effectiveness at reducing entrainment will be evaluated and appropriate recommendations for their use made.
NPT	198740700	1993 to 2001	Dworshak Impacts/M&E and Biological/Integrated Rule Curves	Develop biological and integrated rule curves for Dworshak Dam and Reservoir. Monitor/evaluate rule curve implementation. New Rule Curves is a modeling tool to integrate operations and estimate impacts of various operations on the physical and biological characteristics of Dworshak Reservoir. Applies Dworshak data to modify rule curve model developed for Hungry Horse and Libby Reservoirs. Conversion from a FORTRAN to Visual Basic is complete.
CNF		1981-Ongoing	Sediment Discharge and Bedload Station	The Forest operates one gaging station and automatic sediment sampler within Elk Creek to measure stream discharge, suspended sediment, turbidity, particle size distribution, channel cross-section survey and gradient are monitored. In addition, bedload sediment is measured approximately 15 times per year.
CNF		1994 - Ongoing	Water Temperature Monitoring	Four streams; water temperatures (primarily during June through September) are recorded on an hourly basis to determine baseline conditions in undeveloped watersheds and recovery trends in developed watersheds.
IDFG, USACE		1972-ongoing	Dworshak Mitigation Resident Fish Stocking	Program to provide hatchery fish to replace lost fishery when Dworshak Reservoir inundated the North Fork Clearwater River. Goal of 50,000 pounds of fish at 3 fish/pound of sterile triploid rainbow are stocked in the lower half of the reservoir annually. During most years this target is not reached.
IDL		2001	Lower North Fork	Cumulative Watershed Effects survey for TMDL development.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower North Fork Assessment Unit (continued)				
IDFG, USFS, IDL, USACE		2000- Ongoing	North Fork Clearwater River Bull Trout Investigations	To better understand bull trout population dynamics in Dworshak Reservoir and the North Fork Clearwater River drainage, 54 bull trout were captured in upper Dworshak Reservoir and 22 were outfitted with radio transmitters. All but five of these fish migrated out of the reservoir into the North Fork Clearwater River drainage. Radio tagged bull trout were monitored by fixed site receivers and frequent aerial and ground surveys. Bull trout spawning grounds were documented. Genetic samples taken.
IDFG, USFS		1992- Ongoing	North Fork Clearwater River Fisheries Investigations	Transects for establishing fish population status are snorkeled in tributaries of the North Fork Clearwater River. The information collected has developed a baseline informational base to determine long-term trends in various fish species populations.
IDFG		1997- Ongoing	North Fork Clearwater River Westslope Cutthroat Trout Investigations	For management purposes, the relative abundance of westslope cutthroat trout, rainbow trout, and their hybrids were assessed in the main stem river. Future sport fishing management may be based on identification of trout species caught as the goal is to reduce genetic introgression between westslope cutthroat and rainbow trout. Cutthroat trout were tagged and exploitation was determined based on tag returns from sport anglers.
IDFG		1995-2001	North Fork Clearwater River Angler Use Survey	In 1995, a year-long creel census was conducted on Dworshak Reservoir and North Fork Clearwater River. Angler use was estimated at 95,700 hours on the reservoir and 64,500 hours on the main stem North Fork Clearwater River. The survey is being repeated on Dworshak Reservoir on a smaller scale in 2001.
IDFG		2001	Zooplankton Monitoring	Sample zooplankton populations using ZPR and ZQI methodology to determine the effect of kokanee density on food availability.
IDFG, USACE		March 2000 - ongoing	Dworshak Terrestrial Resources Inventory Project	Compile flora and wildlife species lists, locate special status species, and identify important habitats of target species on USACE and adjacent land surrounding Dworshak Reservoir. Develop management strategies on USACE land and incorporate data in the USACE's Dworshak Master Plan Update and Supplemental EIS. Surveys have been conducted for flora, herpes, small mammals, bats, migratory land birds, shorebirds, waterfowl, forest owls, northern goshawks, woodpeckers, furbearers, elk and deer. Preliminary findings include over 200 fungi species (16 rare), 624 plant species (29 rare or sensitive in Idaho), and 132 wildlife species (7 Idaho State and/or Federal special status species).
IDFG, USFS		1996- Ongoing	Fish Lake Bull Trout Investigations	Investigations into the life history of bull trout in Fish Lake were initiated in 1996. Genetic relationships with adfluvial and resident bull trout in the N.F. Clearwater River and tributaries will be addressed. Season-long creel census will determine exploitation of bull trout as incidental mortalities to the sport cutthroat trout fishery.
USACE		Annually	Big Game Browse Rejuvenation - Slashing	USACE slashing pruning to 2' in height, old decedent browse fields to enhance big game forage on Dworshak Reservoir. Last 5 years 50 acres per year have been slashed. Surveys and established photo points available forage and big game use has increased dramatically.
USACE		Annually	Big Game Browse Rejuvenation - Prescribed burning	Prescribed burning to enhance browse conditions in the Grandad Mitigation Area with adequate seed sources. Poor browse conditions have resulted in some areas from past treatments and severe winters. In past two years approximately 180 acres were treated. Indications are that the project will greatly increase browse abundance.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lower North Fork Assessment Unit (continued)				
IDFG, USACE\$	198709900	1987 ongoing	Kokanee entrainment	Kokanee losses through entrainment were estimated at 95% of the total population during the 1996 flood event. To minimize entrainment losses and stabilize the kokanee population in Dworshak Reservoir, IDFG is currently conducting research to test the effectiveness of strobe lights as a deterrent. Tests conducted during the 2001 winter resulted in a marked avoidance of the strobe lights and consequently the outlets.
USACE, IDFG		1/00 to 12/01	Bull trout study	Research to determine the spatial and temporal distribution, the migration patterns, the spawning sites and life history information of bull trout within Dworshak. In 2000 they radio-tagged 21 adult bull trout and documented their distribution and migration.
USACE		Variable since 1970s	Big game surveys	Aerial surveys of ungulate winter use of Dworshak Reservoir conducted in numerous winters over the past 30 years. Last conducted in 2001.
USACE		4/00 to 9/04	Little Bay Stewardship Project	Project to enhance ecosystem integrity to the lower montane forests near Little Bay. Many wildlife species are becoming scarce or absent on the landscape as a result of a drastic loss of ponderosa pine communities throughout the Clearwater Basin. Project incorporates tree thinning and prescribed under-burning to emulate the natural effects of wildfires. Project is a multi-agency effort.
USACE		4/01 to 9/05	Elk Creek Meadows Stewardship Project	Similar in purpose to the Little Bay project, this stewardship project encompasses 1100 acres and will solicit partners with adjacent land owners as well.
USACE		Ongoing	Wildlife habitat protection	In 2000 a gate and 7 barricades were installed and 10 miles of fence line maintenance in Elk Creek Meadows and the Grandad Mitigation Area. Additional gates at Magnus Bay and barricades in the mitigation area are planned.
USACE		2000-ongoing	Terrestrial resource inventory	Through a cooperative agreement, IDFG is conducting a comprehensive baseline investigation of fungi, plants and wildlife occurring on the reservoir, delineate important habitats, develop GIS layer. Final report is due fall of 2002.
USACE		2002	Osprey Surveys	Survey to document osprey nest attempts and successes near Dworshak reservoir
USACE		Annually	Eagle surveys	USACE annually conducts aerial surveys for wintering bald eagles. First documented bald eagle nest in Clearwater found in Dworshak Reservoir in 1999. No offspring yet produced.
Upper North Fork Assessment Unit				
NPT	9501600	1996-2000	Genetic Inventory of Westslope Cutthroat Trout in the N F Clearwater Basin	Document the extent of hybridization among native westslope cutthroat trout and introduced rainbow trout, and evaluate the effects of Dworshak resident fish mitigation on wild trout in the North Fork Clearwater basin. Findings indicated widespread introgression in 2/3 of the sites sampled. Non-introgressed populations of westslope cutthroat trout were detected at several locations. Follow-up recommendations include investigating local broodstock development to replace the stocking of exotic rainbow trout for fishery mitigation.
CNF		1981-Ongoing	Quartz and Cold Springs Creeks monitoring stations	Two gaging stations and automatic sediment sampler stream discharge, suspended sediment, turbidity, particle size distribution, channel cross-section survey and gradient are monitored.
CNF		1993 - Ongoing	Stream Channel Morphology	Sixteen sites on 15 streams; three riffles where Wolman pebble counts, stream gradient, and cross-sectional surveys are done.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Upper North Fork Assessment Unit (continued)				
CNF		1990 - Ongoing	Water Temperature Monitoring	Approximately 105 sites on 86 streams; water temperatures (primarily during June through September) are recorded on an hourly basis to determine baseline conditions in undeveloped watersheds and recovery trends in developed watersheds.
CNF		2000 - Ongoing	Moose Creek – Bull Trout	Assess spawning trends in selected reaches; (10 stations).
CNF		1995 - Ongoing	Bull Trout Spawning Monitoring	Assess spawning trends in selected reaches; approximately 27 miles in 11 streams.
IDFG		1993-ongoing	Smallmouth Bass Population Trend Monitoring	Annual electrofishing monitoring of smallmouth bass population indices. Calculate Proportional stock density, Catch per unit effort, average size, length-weight relationship and growth rates.
IDFG, USFS, IDL, USACE		2000-Ongoing	North Fork Clearwater River Bull Trout Investigations	To better understand bull trout population dynamics in Dworshak Reservoir and the North Fork Clearwater River drainage, 54 bull trout were captured in upper Dworshak Reservoir and 22 were outfitted with radio transmitters. All but five of these fish migrated out of the reservoir into the North Fork Clearwater River drainage. Radio tagged bull trout were monitored by fixed site receivers and frequent aerial and ground surveys. Bull trout spawning grounds were documented. Genetic samples taken.
IDFG, USFS		1992-Ongoing	North Fork Clearwater River Fisheries Investigations	Baseline data collected to establish variety of fish species population and trend status in tribs. Transects for establishing fish population status are snorkeled in tributaries of the North Fork Clearwater River. The information collected has developed a baseline informational base to determine long-term trend in various fish species populations.
IDFG		1997-Present	North Fork Clearwater River Westslope Cutthroat Trout Investigations	The relative abundance of westslope cutthroat trout, rainbow trout, and their hybrids were assessed in the main stem North Fork Clearwater. Cutthroat trout were tagged and exploitation was determined based on tag returns from sport anglers.
IDFG		1994	North Fork Clearwater River Angler Use Survey	In 1995, a year-long creel census was conducted on Dworshak Reservoir and North Fork Clearwater River. Angler use was estimated 64,500 hours on the main stem North Fork Clearwater River.
Lolo / Middle Fork Assessment Unit				
NPT Fisheries/Watershed	199607702	1996-ongoing	Protect and Restore Lolo Creek Watershed	Project to restore stream habitat for anadromous & resident fish. Accomplishments include eliminating grazing from 10 miles of stream, allowing riparian habitat to regenerate, reduced stream temperatures and sedimentation, and channel morphology to return to equilibrium. 50+ miles of roads have been obliterated, reducing risk of mass failures and sedimentation. Heavily eroding stream banks (100 feet) have been stabilized through bioengineering techniques and revegetation. M&E is being completed to analyze the effectiveness of this restoration project.
CNF		1980 - Ongoing	Sediment Discharge Station	The Forest operates two gaging stations and three automatic sediment samplers within this AU (Lolo Creek and Eldorado Creek). To measure stream discharge, suspended sediment, turbidity, particle size distribution, channel cross-section survey and gradient. In addition, bedload sediment is measured approximately 15 times per year.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lolo / Middle Fork Assessment Unit (continued)				
CNF		1990 - Ongoing	Water Temperature Monitoring	Approximately 16 sites on 18 streams; water temperatures (primarily during June through September) are recorded on an hourly basis to determine baseline conditions in undeveloped watersheds and recovery trends in developed watersheds
CNF		1988 - Ongoing	Fish Population Monitoring	Assess fish population trends in Lolo Creek via snorkeling at 15 established stations.
CSWCD, SCC\$, NRCS		1994-ongoing	Lolo Creek WQPA	Idaho Ag program, 8,215 acres treated to date with agricultural and forestry BMPs
CNF In conjunction with NPT		2001 - 2003	Aquatic Resource Access Restoration	Four existing culverts within upper Lolo Creek tributaries (Mox Creek, Chamook Creek, Gold Creek and Musselshell Creek) are scheduled to be replaced in the next three years. These culverts are inadequately sized to handle a 100-year flood event and are limiting or preventing the upstream migration of fish and other aquatic organisms.
Lochsa Assessment Unit				
NPT Fisheries/ Watershed, CNF	199607703	1996-ongoing	Protecting and Restoring the Waw'aatamnima Ck to Imnaamatnoon Cr Area	This project identifies sedimentation and fish barriers at road crossings as major limiting factors in fish habitat. This project has obliterated 140 miles of road, stabilizing a total of 62,041 cubic yds. of fillslope material, in which 20,371 cubic yds. were from stream crossings with failing structures. Three barrier culverts were replaced for fish passage, returning access to 10 miles of spawning, rearing and overwintering habitat.
NPT Fisheries/ Watershed, CNF	200003400	2000-ongoing	Protect and Restore the North Lochsa Face Analysis Area.	CNF activities on appeal consequently this project has not been implemented.
NPT Fisheries/ Watershed, CNF	28048	2002-ongoing	Protect and Restore Crooked Fork Creek to Colt Killed Analysis Area	
CNF		1976- Ongoing	Sediment Discharge Station	The Forest operates seven gaging stations and automatic sediment sampler within this AU to measure stream discharge, suspended sediment, turbidity, particle size distribution, channel cross-section survey and gradient..
CNF		1994 - Ongoing	Stream Channel Morphology	Nine streams, each with three riffles where Wolman pebble counts, stream gradient, and cross-sectional surveys are done.
CNF		1982 - Ongoing	Stream Substrate Monitoring	Substrate conditions within two streams (Pete King Creek and Deadman Creek) are monitored via coring to assess conditions in steelhead trout spawning areas.
CNF		1990 - Ongoing	Water Temperature Monitoring	Approximately 103 sites on 84 streams; water temperatures (primarily during June through September) are recorded on an hourly basis to determine baseline conditions in undeveloped watersheds and recovery trends in developed watersheds.
CNF		1978 - Ongoing	Fish Population Monitoring	Assess fish population trends in Pete King Creek, Deadman Creek, Fish Creek, and Hungary Creek via snorkeling approximately 70 stations.
CNF		1994 - Ongoing	Bull Trout Spawning Monitoring	Assess spawning trends in selected reaches; approximately 25 miles in 13 streams.
IDEQ		2000-2001	Lochsa Water Temperature Model	Develop temperature model for Lochsa River and selected tributaries for TMDL.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Lochsa Assessment Unit (continued)				
IDFG, LSRCP\$		1990-ongoing	Powell Satellite Facility	Operate chinook weir and acclimation pond for chinook salmon in conjunction with the Lower Snake River Compensation Plan Clearwater Hatchery.
Lower Selway Assessment Unit				
IDFG		1976-Ongoing	Selway River Drainage stream surveys	Transects for establishing fish population status are snorkeled on the main stem Selway River and most of the tributaries. The information collected has developed a baseline informational base to determine long-term trend in various fish species populations.
IDFG		1999-2000	Steelhead Trout Usage of Selway Falls fish passage tunnel	The Selway Falls fish tunnel has deteriorated. To study steelhead use, radio transmitters were attached to 32 migrating adults caught below the falls. 18 adults used the tunnel to move above; 5 fish did not use tunnel; 13 fish did not migrate above the falls.
Upper Selway Assessment Unit				
IDFG		2000	Assessment of fish migration barriers	Three known water diversions in Goat, Running and North Star creeks were assessed as to their impediment to migrational passage for anadromous fish. The Goat Creek water diversion is the only one of concern, but because of wilderness issues, the issue is being resolved internally within the USFS.
IDFG		1976-Ongoing	Selway River Drainage stream surveys	Transects for establishing fish population status are snorkeled on the main stem Selway River and most of the tributaries. The information collected has developed a baseline informational base to determine long-term trend in various fish species populations.
South Fork Assessment Unit				
IDFG, NFWF, BLM, RMEF, TU, IFWF	9303500	1994-ongoing	Red River Wildlife Management Area (RRWMA) (previously known as the Little Ponderosa Ranch)	The RRWMA was purchased to 1) maintain and/or enhance quality wildlife, fisheries, scenic values and overall biodiversity, 2) Provide a setting for natural resource-oriented educational, research and study opportunities, 3) Provide a meeting facility for natural resource-oriented agencies and organizations, and the local community, and 4) Promote continued use of the RRWMA for recreational purposes consistent with other goals. Used by University of Idaho, National Science Foundation and local schools. Interpretive sites being developed. Various monitoring surveys conducted as funding permits.
IDFG, USGS	199005200 (partial funding)	1994-ongoing	Production impacts of Various Hatchery Stocks and Evaluate Selway Steelhead as Alternate Broodstock for South Fork Clearwater River	Prior to ESA listing, progeny of Selway steelhead were raised in a paired test with Dworshak and hybrid crosses. Unfed fry, marked parr and smolts were released into Crooked River. Migrants were PIT-tagged, age and genetic samples taken. Adult returns are evaluated for tags/marks, genetic composition, and radio-tagged to determine spawning activity/pairing. Progeny are evaluated for genetic composition and will be monitored until adults. Selway fish grew slower and smolted later. Adult returns have been low for both groups.
,ISWCD NPNF, IDFG, SCC, NPT, NRCS	199303501	1993 - ongoing	Enhance Fish, Riparian, and Wildlife Habitat Within the Red River Watershed	A natural channel design is used to restore physical and biological processes to improve the quantity and quality of fish and wildlife habitat. Reconnecting historic meanders and reshaping channel cross sections have increased sinuosity by 60 percent, decreased gradient by 40 percent, decreased width to depth ratios, enhanced floodplain function, and improved soil moisture conditions for 91,000 native riparian/wetland plantings. Long-term monitoring of the 2.5-mile stream reach is documenting changes in ecosystem structure and function.
NPT Fisheries/Watershed	28047	2002-ongoing	Restore and Protect Red River Watershed	Complete watershed analysis using USFS protocol to select restoration priorities.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
South Fork Assessment Unit (continued)				
NPT	199607705	1996-present	Restore McComas Meadows/Meadow Creek Watershed	Assess stream habitat and restore to support anadromous & resident fish. Grazing from 2.5 miles of stream was eliminated. . Survey indicates natural regeneration of riparian plants has increased 900% increase over 7 years, although diversity is low,. streambanks are less than 75 % stable, and cobble embeddedness is high (50%). M&E of this project is ongoing.
NPT Fisheries/ Watershed, NPNF	200003600	2000-ongoing	Protect and Restore Mill Creek Watershed	This project will restore stream habitat to support anadromous & resident fish. Grazing has been eliminated from 1+ miles of stream within meadow.. Restoration is aimed at restoring riparian vegetation to reduce stream temperatures and sedimentation. M&E is ongoing.
NPT Fisheries/ Watershed, NPNF	200003500	2000-ongoing	Newsome Creek	147 miles of road have been condition inventoried, approximately six miles has been decommissioned by abandonment, and 5.8 miles of road have been scheduled for road treatment.
IDEQ		2001-ongoing	South Fork TMDL development	Water quality monitoring, assessment, load analysis, WAG created. Scheduled to be completed 2003.
IDFG, LSRCPS		1987-ongoing	Crooked River and Red River Satellite Facilities	Operate chinook weir and acclimation ponds for chinook salmon in conjunction with Lower Snake Compensation Plan Clearwater Hatchery. Monitor adult steelhead and bull trout return to Crooked River.
IDFG, USFS, BLM		1994-Ongoing	Bull Trout investigations in the S.F. Clearwater River	The status and distribution of bull trout in the S.F. Clearwater River have been documented since 1994. Snorkel surveys, spawning ground counts, radio tagging, and trap collections have added to the information regarding this species. Locations of prime juvenile rearing areas and suspected spawning sites have been documented, as well as wintering areas and migration patterns. Genetic and age samples have been taken and cataloged for future analysis.
Subbasin-wide Projects or Programs				
IDFG, LSRCPS		1982-Ongoing	Steelhead & salmon angler use surveys: Lolo, Lochsa, Lower Clearwater, South Fork	Creel census of steelhead trout and chinook salmon sport fisheries are conducted during open seasons for each. The results of the surveys included estimated angler participation (hours fished) and harvest. Harvest can be cataloged by specific hatchery contribution (marked fish only). Angler use and harvest vary from year.
USFWS	8909801	1991-Ongoing	Salmon Supplementation Studies in Idaho Rivers	The goal of this multi-agency effort is to evaluate the usefulness of supplementation as a recovery/restoration strategy for depressed stocks of spring and summer chinook. We expect this research to demonstrate the best methods for supplementing existing natural populations of chinook salmon and reestablishing natural populations where they have been extirpated.
IDFG	198909800 or	1992-ongoing	Idaho Supplementation Studies	Evaluate the usefulness of supplementation as a recovery/restoration strategy for depressed stocks of spring and summer chinook salmon in Idaho. Supplementation effects are monitored and evaluated by comparing juvenile production and survival, fecundity, age structure, and genetic structure and variability in treatment and control streams. Operate 5 smolt traps in Clearwater subbasin, conduct spawning surveys and carcass recovery, PIT-tag parr and smolts to determine timing and extent of downstream migration and evaluate adult returns.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Subbasin-wide Projects or Programs (continued)				
IDFG	199107300	1985-ongoing	Idaho Natural Production Monitoring and Evaluation	Collect, manage, analyze and communicate data directly related to anadromous salmonid production, productivity, structure, survival, and stock identification across all production areas and habitat qualities. Techniques include redd counts, carcass recovery, emigrant trapping, and mask and snorkel counts. Established long-term basin-wide database of anadromous and resident salmonid distribution and abundance at over 860 sites in the Clearwater and Salmon subbasins. Identified limiting factors affecting survival. Evaluation of chinook SAR's with production areas and migration route.
NPT	198335000	Master Plan 1990; NEPA/Preliminary Design 1997; Construction 2000; Start production 2002; First releases in year 2003.	Nez Perce Tribal Hatchery	Includes the central facility and following satellites: <u>Yoosa/Camp Satellite</u> ; Spring Chinook Presmolt Rearing and Release <u>Lukes Gulch Satellite</u> ; S.F. Clearwater: Age-0 Fall chinook smolt rearing and release February thru June. <u>Newsome Satellite</u> ; Spring Chinook Presmolt Rearing and Release May thru October. <u>Cedar Flats Satellite</u> ; Site on lower Selway River: Age-0 Fall chinook smolt acclimation and release <u>Meadow Creek Satellite</u> ; Selway tributary North Lapwai Valley Satellite: Age-0 Fall chinook smolt rearing. Potential future site for coho restoration program. Central hatchery site to produce 625,000 spring chinook parr and presmolts, and 400,000 "early-type" fall chinook, and 1,000,000 Snake River fall chinook age-0 smolts with acclimation and release at 6 satellite facilities. On-site releases of 500,000 age-0 fall chinook smolts will occur along with adult broodstock capture, holding and spawning. Natural spawning of adults is a key feature of supplementation program; hence, facilities are strategically located throughout habitat to attract adults to key reproduction areas. Natures rearing strategies are being used with the intent of increasing juvenile post-release survival wherein juveniles will experience prolonged natural in-stream conditioning prior to emigration. Anticipate minimum adult responses upward of 2,000-spring chinook and upwards of 4,000-fall chinook. Planning for coho Master Plan in progress.
NPT	1983350-00	1994 to ongoing	Coho Restoration Experiment; Planning & Design for Master Plan	Initial egg take in 1994 of 800,000 and release of 635,000 parr resulted in recognition of 100 adults returned over Lower Granite Dam in 1997 and 1998. Advancement of the program to releasing upwards of 1.0 million juveniles saw recognition of 2,000 adults at Ice Harbor Dam and over 1,450 adults at Lower Granite Dam in year 2001. Natural spawning is occurring in Tucannon and Clearwater Rivers; over 600 fish were trapped for broodstock in 2001. Master Plan scheduled for completion in 2002.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Subbasin-wide Projects or Programs (continued)				
NPT	198335003	1993 to ongoing	Nez Perce Tribal Hatchery Monitoring And Evaluation	This project has been developed to monitor the results of the NPTH to optimize hatchery and natural production, sustain harvest, and minimize ecological impacts. Activities and sub-activities have been designed to provide data for resolving nine main management questions and critical uncertainties relating to supplementation of spring, early-fall, and fall chinook. Seven primary data collection activities and four small-scale experiments are associated with quantification of performance criterion.
NPT	28020	2002-ongoing	NPT Harvest Monitoring Program	
NPT	19899802	1992 to ongoing	Evaluate Salmon Supplementation Studies in Idaho Rivers	This project evaluates the usefulness of supplementation as a recovery/restoration strategy for spring and summer chinook salmon through (1) large-scale population production and productivity studies designed to provide Snake River basin-wide inferences, (2) using study streams to evaluate specific supplementation programs, (3) small-scale studies designed to evaluate specific hypotheses.
IDFG	19005500	1993-ongoing	Steelhead Supplementation Studies	Evaluate the feasibility of using artificial production to increase natural steelhead populations and to collect life history and genetic data from wild steelhead populations. We evaluated parr and smolt production from hatchery fish stocked in streams as adults, fingerlings, and smolts. We monitored juvenile abundance, adult escapement, calculated growth rates, determined the age of parr, smolts and adults, and documented emigration characteristics from wild populations. We determined the genetic population structure of Idaho's steelhead assemblage.
NPT	199403400	1994 to ongoing	Assessing Summer And Fall Chinook Restoration In The Snake River Basin	The goal of this project is to collect life history, spawning escapement and locations, juvenile emergence, growth rates, emigration timing, survival to dams, and smolt-to-adult survival information on wild Snake River fall chinook and evaluate supplementation strategies favorable for recovery and restoration of summer and/or fall chinook salmon in the last remaining mainstem habitats of the Snake River Basin above Lower Granite Dam.
SCC/NPT	199608600 199706000	1997-onggong	Clearwater Focus Program	Coordination program to implement NWPPC Fish and Wildlife Program; implementation projects ongoing in Idaho, Lewis, Nez Perce SWCD and Clearwater & Nez Perce Nat'l Forests; facilitate subbasin-wide Policy Advisory Group; initiated assessment in 1999.
NPT	19973800	1997 to ongoing	Preserve Salmonid Gametes	Preserve male salmonid gametes through cryogenic techniques in order to maintain genetic diversity in populations with low levels of abundance and at high risk of localized extinction. Strives to ensure availability of a representative genetic sample of the original male population by maintaining a salmonid germplasm repository. Our approach is to sample and cryopreserve gametes thereby preserving salmonid genetic diversity within the major subbasins in the Snake River basin.
IDFG	200002800	2000-Ongoing	Evaluation of Pacific Lamprey in Clearwater River Drainage, ID	This project was initiated in 2000 with objectives of determining status and distribution of Pacific lamprey in Clearwater River drainage, focusing primarily in the S.F. Clearwater River drainage for the first two years. During 2000, a total of 262 juvenile Pacific lamprey were captured, but are not numerous or widely distributed. Location of captured ammocoetes suggests slow flowing water with sand/silt substrate is preferred in lateral scour or alcove habitats.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Subbasin-wide Projects or Programs (continued)				
NPT Fisheries/Watershed	28045	2002-ongoing	Evaluate stream habitat using NPT M&E Plan	Develop protocol to monitor and evaluate habitat projects conducted by NPT Fisheries/Watershed Division.
NPT		2001, 00, 99, 97 and anticipated in future	Surplus Adult Outplant Scenarios for Steelhead and Chinook Salmon	Supplementation strategy using surplus adult steelhead and chinook to provide natural production restoration. Fishery management agencies agreed to target streams and release numbers. In year 2001, nearly 5,000 adult steelhead and 14,000 adult spring/summer chinook were outplanted to Lochsa, S.F. Clearwater, lower and upper Selway, and Potlatch rivers and Lolo Creek. This management scenario provides viable option when adult populations are abundant beyond broodstock and harvest needs.
IASCD, EPA\$, SCC\$, NRCS		2001-2003	Division II AFO Implementation Project	Animal feeding operation treatment, 319 & WQPA cost-share project.
IDEQ		2000-2001	Maximum Water Temperatures and their Relationship to Biological Communities in Streams in the Clearwater and Salmon Subbasins	Evaluate natural water-temp variations; relate subbasin characteristics and stream temp regimes to aquatic life.
IDEQ		1994-ongoing	Beneficial Uses Reconnaissance Program	Survey work to identify attainment of beneficial uses in streams, used w/ TMDL. New Waterbody Assessment Guide II protocol adopted 2002.
IDFG, Potlatch Corporation		2000-2005	Native Fish Enhancement	Watershed Monitoring. Physical removal of exotic brook trout. Monitor response of native westslope cutthroat.
IDFG, USFS		1986-Ongoing	Mountain Lake investigations: Upper & Lower North Fork, Lochsa, Upper & Lower Selway, and South Fork	Over the past 16 years, all mountain lakes in the S.F. Clearwater River drainage have been surveyed to develop baseline information on fish and aquatic resources. Information has been used to develop a hatchery-reared trout stocking program for lakes that could not otherwise sustain fishable populations. In addition, amphibian populations were surveyed.
IDFG		1966-ongoing	Chinook and Steelhead Redd Counts in Trend Areas	The IDFG has monitored chinook salmon returns through redd count surveys within the Clearwater subbasin since 1966. Similar redd counts monitoring of steelhead trout has been conducted since 1990. Redd counts are obtained for each species annually through a combination of aerial and ground surveys and provide both baseline and population trend information as well as some potential for future predictions of population trends based on spawner-recruit theory.
IDFG		1996-ongoing	Wildlife Investigations	Long-term projects to explore the effects of cow elk harvest rates and elk density on recruitment rates, examine the various factors influencing calf elk recruitment including cow elk pregnancy rates and body condition, calf elk mortality causes and rates, and predation rates.
IDFG		1990-ongoing	Wildlife Population Monitoring	Annual wildlife surveys conducted to monitor trends in elk, deer, moose, bighorn sheep, mountain goat (aerial surveys), upland game (roadside brood surveys), chukars (aerial surveys) and waterfowl.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Subbasin-wide Projects or Programs (continued)				
IDFG		1975-ongoing	Wildlife Harvest Monitoring	Annual surveys of hunters to obtain estimates of harvest statistics by conducting game check stations, telephone surveys, and hunter harvest reports.
IDFG		1975-ongoing	Wildlife Trap and Transplants	Annual trapping efforts to establish new populations or augment existing populations through transplants.
IDFG		1995-ongoing	Nongame Wildlife Surveys	Trend surveys of harlequin ducks, salamanders, bald eagles, peregrine falcons, raptors, and species identification of bats, migratory songbirds.
IDFG		1984 to ongoing	Conservation Data Center (CDC) Rare Plant and Animal Surveys	Idaho Conservation Data Center (CDC) conducts varied inventories and monitoring involving rare plants, rare animals, plant communities, and natural areas. These projects include distribution of rare species; distribution and condition of old growth forest stands; selection, inventory, and monitoring of established ecological reference areas; mapping of vegetation and wildlife habitat; and conservation of high priority wetland and riparian sites. Results produce recommendations for species conservation, site-specific conservation action, assessments of conservation status, rankings of statewide and global rarity, and classifications and descriptions of plant communities.
IDFG, USFS		1998-ongoing	Experimental Brook Trout Removal	A variety of methods are being tested for their efficacy in removing brook trout from mountain lakes and their inlet/outlet streams. Overwinter gill net sets and tiger muskie outplants have been used in conjunction with intensive electrofishing removal. Both methods have been effective at reducing brook trout populations, and monitoring is continuing with tentative plans for expansion.
IDFG, USGS		1994-ongoing	Evaluate Selway Steelhead as Alternate Broodstock for South Fork Clearwater River	Prior to ESA listing, progeny of Selway steelhead were raised in a paired test with Dworshak and hybrid crosses. Unfed fry, marked parr and smolts were released into Crooked River. Migrants were PIT-tagged, age and genetic samples taken. Adult returns are evaluated for tags/marks, genetic composition, and radio-tagged to determine spawning activity/pairing. Progeny are evaluated for genetic composition and will be monitored until adults. Selway fish grew slower and smolted later. Adult returns have been low for both groups.
Landscape Dynamics Lab (Univ. of Idaho) and IDFG			Clearwater Vegetation and Structure Classification	Using 2000 LandSat 7 imagery, we are classifying the vegetation type, canopy cover, and structural characteristics of forests in the Clearwater Region. New techniques are being used to increase the resolution from 30m to 15m and to more accurately determine structure information. The distribution of early, mid, and late seral stage forests will be mapped as part of this project.
Landscape Dynamics Lab (Univ. of Idaho)			Latah County Habitat Conservation Plan	Funded by National GAP Analysis Program, USGS, NPS, Palouse Land Trust We are developing a conservation plan for Latah county that incorporates critical wildlife areas, wetlands, remnant Palouse prairie, occurrences of rare and/or under-protected species, and habitat connectivity. The final plan will consider social and economic factors such as threats to habitat degradation, cost of conservation, and aesthetics. Public education is a major priority.
Landscape Dynamics Lab (Univ. of Idaho)			Idaho Comprehensive Conservation Plan	Funded by National GAP Analysis Program, USGS. Our primary objective is the identification of a complimentary network of conservation opportunity areas that would capture the full range of variation found in Idaho's species and ecosystems.

Table 4 (Continued)

Responsible Agency	BPA Project # (if applicable)	Project Duration	Project Title	Project Description and Results
Subbasin-wide Projects or Programs (continued)				
Landscape Dynamics Lab (Univ. of Idaho)			Potential Impact of Habitat Management for Elk on Selected Nongame Species	Funded by IDFG For a select set of nongame species, our objectives were to 1) compile a spatially explicit database of occurrences, 2) determine the predicted, pre-treatment status of these species by evaluating 4 different wildlife habitat relationship models, and 3) estimate the impact of proposed habitat treatments on the distribution of each.
multi-agency		1999-ongoing	Idaho OnePlan	Computer-based planning program to combine regulations and BMPs into operating plan for farmers. Integrates ESA, CWA, CAA, wetland protection, nutrient, pest & waste management, etc.
USDA\$, through NRCS field offices		1996-2000	Conservation Reserve Program	(10-15 yr contract for non-crop continuous cover. Current acres under contract: Acres Enfolled in county/total Cropland Acres in County Clearwater- 4,636/24,000 Lewis-6,006/161,159 Idaho-14,608/189,000 Nez Perce- 8,947/215,400 Latah-44,829/265,900 1,139 acres in continuous CRP.

Table 5. Projects planned for implementation by the Idaho Department of Transportation

Highway	Fiscal Year	Location	Project Type
STC4745	2003	Rubens Rd; Junction US95 to Lewis Co line	Rehabilitation & resurface
STC4747	2003	Mile post 18.8-19.1, Peck	Bicycle/pedestrian path
STC4781	2004	Mile post 0.3-3.1, Clearwater Co	Pavement overlays
Local	2003	Elk River	Resurface
SH 3	2003	Mile post 4.9-9.3, Little Potlatch Cr. bridge to Juliaetta	Rehabilitation and resurfacing
SH 7	2005	Mile post 36.8-48.9, Gilbert Grade	Rehabilitation & resurface
SH 8	2003	Mile post 4.1-14	Latah Trail, Moscow-Troy
SH 8	2005	Mile post 43.7-53.5, Ruby Creek to Elk River	Resurface
SH 8	2006	Troy to Deary	Rehabilitation & resurface
SH 11	2002	Mile post 24.1-26.8, Timberline HS to Pierce Pass	Minor widening and resurface
SH 11	2002	Greer grade curves	Widening
SH 11	2002	Mile post 28.7-30, French Mtn Rd	Bicycle/Pedestrian path
SH 11	2003	Mile post 18-19 Weippe	Bicycle/Pedestrian path
SH 11	2004	Clearwater Bridge-Greer	Miscellaneous Improvement
SH 11	2005	Mile post 35.3 – 42.3, Grangemont Rd to Headquarters	Rehabilitation and resurface
SH 13	2003	Mile post 113	Guardrail update
SH 13	2005	Mile post 1.1-6.6 Grangeville to top of Harpster grade	rehabilitation & resurface
SH 14	2003	Mile post 17.9-18.7, Weippe	Bicycle/pedestrian path
U.S. 12	2002	Lochsa at Lolo Pass adjacent to Crooked Fork	Construction of passing lane
U.S. 12	2002	Spalding Bridge	Bridge deck rehabilitation
U.S. 12	2003	Memorial Bridge - Lewiston	Bridge deck rehabilitation
U.S. 12	2003	Mile post 26.6, Nez Perce Co.	Construction of passing lane
U.S. 12	2003	Mile post 30.6, Nez Perce Co.	Construction of passing lane
U.S. 12	2003	Mile post 53, Lewis Co.	Construction of passing lane
U.S. 12	2003	Mile post 66.8-79, Kamiah	Major widening
U.S. 12	2003	Mile post 75.2-113.8, Junction SH13B to MP113.8 Idaho Co.	Metal guard rail
U.S. 12	2004	Mile post 126	Guardrail update
U.S. 12	2004	73.7-73.8, Kooskia	Port of Entry improvement
U.S. 12	2004	43.3-44.4, Jct SH7, Orofino	Minor widening & resurface
US 12	2004	Mile post 2.2-2.6, Clearwtaer Mem Bridge to Rose Garden	Reconstruction & realignment
U.S. 12	2006	Orofino city limits to Orofino Bridge	Surface overlay
U.S. 95	2003	Mile post 306, Nez Perce Co.	Rockfall Stabilization
U.S. 95	2003	Mile post 316-316.1, Nez Perce Co.	Flatten Slopes
U.S. 95	2004	Mile post 312-319, Lewiston hill	Rehabilitation & resurface
U.S. 95	2005	Craigmont to Culdesac	Overlay and CRABS*
U.S. 95	2005	Chain-up area to White Bird Pass summit	Construction of climbing lane
U.S. 95	2006	Culdesac Canyon adjacent to Lapwai Creek	Connection of all short passing lanes into one
U.S. 95	2006	Mile post 300.3-304.7, Lapwai to Spalding	Rehabilitation & resurface
U.S. 95	2006	Craigmont to Culdesac	rehabilitation and resurface
U.S. 95	2006	Mile post 253-280, Camas Prairie RA, Idaho Co	Rest area being studied
U.S. 95	2007	Lapwai to Spalding	Overlay
U.S. 95	PD**	Lapwai to Spalding	Construction of passing lane
U.S. 95	PD**	Lawyer Creek bridge to Craigmont	Overlay

Table 5 (Continued)

Highway	Fiscal Year	Location	Project Type
U.S. 95	PD**	Grangeville to concrete surface	Overlay and CRABS
U.S. 95	PD**	Chain-up area to Grangeville	Resurfacing
U.S. 95	PD**	Spalding Mile post 301-302	Widening and resurfacing
SH 11	PD**	26.8-29.5, top of Pierce Pass to Pierce	minor widening and resurface
U.S. 12	PD**	Mile post 40.3-44, Orofino	Riverside lighting
US 12	PD**	Mile post 107-107.1, Idaho Co	Rest Area
offsystem	PD**	Watson St bridge, Culdesac	Bridge replacement
STC4713	PD**	Lolo Cr Bridge	Bridge replacement
	PD**	SE Elk river Bridge, Clearwater Co.	Bridge replacement
FH 67	PD**	16-19.8, Grangemont Rd; Hot Den to Rainey Cr	Rehabilitation and resurface
offsystem	PD**	Pine Cr bridge at River Rd	Bridge replacement

*CRABS: cement, recycle, asphalt based stabilization

**PD: Preliminary development

7 Research Monitoring, and Evaluation Activities

7.1 BPA Funded M&E

Idaho County Soil and Water Conservation District

Implementation and effectiveness monitoring of the Lower Red River Meadow Restoration Project (BPA 199303501) has been ongoing since 1997. The program evaluates revegetation success, construction-related turbidity impacts, stream channel response, floodplain hydroperiod, ground and surface water elevations, riparian/greenline community composition, summer water temperatures, fish habitat area and diversity, spawning substrate quality, fish populations and densities, chinook redd counts, wildlife habitat values, and bird species numbers and diversity.

Idaho Department of Fish and Game

Idaho Natural Production Monitoring and Evaluation Program

The Idaho Natural Production Monitoring and Evaluation program (BPA number 199107300) is a long-term project designed to monitor trends in juvenile spring and summer chinook salmon and steelhead trout populations in the Salmon, Clearwater, and lower Snake River drainages (Hall-Griswold and Petrosky 1996). The monitoring approach consists of three integrated levels including parr density monitoring, parr standing stock evaluations, and estimation of survival rates between major freshwater life stages of chinook salmon and steelhead trout. Annual general monitoring of anadromous fish densities is being used to follow population trends and define seeding levels over a broad geographic area, but generally with a small number of sections per stream. Intensive studies estimate spawning escapements, standing stocks of parr and outmigrant yields for a limited number of streams. A comprehensive database has been developed that includes resident and anadromous fish species and amphibians observed while monitoring. It is the most requested data by other agencies and consultants. Data from the Idaho Supplementation Studies project and regional data is being added to provide a more complete picture of anadromous and resident fish population status in Idaho.

Idaho Natural Production Monitoring and Evaluation project

The Idaho Natural Production Monitoring and Evaluation project (Project No. 199107300) funded the Spring/Summer Chinook Salmon Population Viability Assessment initiated in 1999. Population viability analyses use biologically-based models combined with statistical time-series driven methodologies to quantify the extinction risks to a population. Risk of extinction was assessed for 14 core subpopulations of Snake River spring/summer chinook originating in the Selway River and the South Fork, Middle Fork, and mainstem Salmon River of Idaho. Model development and populations viability analyses are still ongoing. The models will be used to estimate population persistence for the specific stocks and to help prioritize potential population conservation intervention actions. The results developed to date are preliminary. Only point estimates of parameter values and point estimates of extinction probabilities have been developed. Confidence intervals, from which inferences on persistence can be made, will follow. In general, extinction-time distributions varied over the populations under study. Models predicted relatively high probabilities of extinction for the populations in the Selway drainage (Bear Creek and mainstem Selway

River), the Middle Fork Salmon River (Camas Creek, Loon Creek, Marsh Creek, and Sulphur Creek), and the mainstem Salmon River (Valley Creek and Yankee Fork Salmon River). A relatively high probability of persistence through the next 100 years was predicted for populations of the South Fork Salmon River (Johnson Creek, Secesh River, and mainstem South Fork Salmon River) and the Middle Fork Salmon River (Big Creek and Bear Valley Creek).

Idaho Supplementation Studies

In 1991, the Idaho Supplementation Studies (ISS, BPA project # 198909800) project was implemented to address critical uncertainties associated with hatchery supplementation of chinook salmon populations in Idaho. The project encompasses most anadromous production waters in the Clearwater Salmon River subbasins and was designed to address questions identified in the Supplementation Technical Work Group Five-Year Workplan (Supplementation Technical Work Group 1988). Cooperators include the Idaho Cooperative Fish and Wildlife Research Unit, Idaho Department of Fish and Game, Nez Perce Tribe, Shoshone-Bannock Tribes, and United States Fish and Wildlife Service. Two goals of the project were identified: 1) assess the use of hatchery chinook salmon to increase natural populations in the Salmon and Clearwater river drainages, and 2) evaluate the genetic and ecological impacts of hatchery chinook salmon on naturally reproducing chinook salmon populations. Four objectives to achieve these goals were developed: 1) monitor and evaluate the effects of supplementation on presmolt and smolt numbers and spawning escapements of naturally produced fish; 2) monitor and evaluate changes in natural productivity and genetic composition of target and adjacent populations following supplementation; 3) determine which supplementation strategies (brood stock and release stage) provide the quickest and highest response in natural production without adverse effects on productivity; and 4) develop supplementation recommendations. The complete study design is found in Bowles and Leitzinger (1991). Smolt trapping, parr and smolt PIT-tagging, snorkeling and intensive redd and carcass surveys are used to monitor population parameters in control and treatment streams. Resident fish abundance, distribution and movements are documented, adding to our knowledge of these species. Amphibians are noted as well. Small-scale studies addressing specific hypotheses of the mechanisms of supplementation effects (e.g., competition, dispersal, and behavior) have been completed (Peery and Bjornn 1993, 1994, 1996). Baseline genetic data have also been collected (Marshall 1992, 1994).

Steelhead Supplementation Studies

The Steelhead Supplementation Study (SSS, BPA project # 190005500) was initiated in 1992 to help determine the utility of supplementation as a potential recovery tool for steelhead, primarily in areas where the native stock was extirpated or reduced to very low abundance. This project has estimated smolt production from hatchery adult outplants, monitored wild steelhead escapement in Fish Creek, estimated smolt production in Fish Creek, and PIT-tagged juvenile steelhead to obtain migration characteristics, growth rates, and smolt-to-adult survival. Additionally, the project estimated age of adult and juvenile steelhead, monitored juvenile abundance in tributaries of the Selway and Lochsa rivers, and monitored stream temperature in 40 streams. Distribution and abundance of resident fish species are documented as well.

In 2000 the project collected fin samples from wild juvenile steelhead in 70 streams and from the five hatchery stocks raised in Idaho in 2000. These data will be used to determine the evolutionary significance and genetic population structure of Idaho's steelhead assemblage in relationship to the recent listing of steelhead under the Endangered Species Act, and to judge their genetic relationship with other coastal and interior steelhead trout and hatchery populations.

Dworshak Dam Impacts Monitoring and Evaluation

Dworshak Dam Impact Assessment and Fishery Investigation Project (BPA project number 8709900) examines the effects of the operation of Dworshak Dam on resident fishes in Dworshak Reservoir. Past research concentrated on assessing reservoir limnology, conducting creel surveys, monitoring the kokanee population through annual mid-water trawling and/or hydroacoustic surveys, conducting annual kokanee spawning escapement estimates, and monitoring entrainment.

Current research is focused on improving kokanee densities in the reservoir by reducing entrainment. Reducing entrainment losses of kokanee may also benefit other species by: lessening entrainment of other sportfish, providing more prey (small kokanee) for bull trout, and allow nutrients (in the form of kokanee spawners) to move upstream into the tributaries.

Evaluation of Pacific Lamprey in the Clearwater River Drainage, Idaho

An evaluation of Pacific lamprey life history, distribution and status in the Clearwater drainage was initiated in 2000 under BPA project # 2000-028-00. Objectives of the project are to 1) Determine life history characteristics of Pacific lamprey ammocoetes and macrothemia in the Clearwater River drainage, 2) Determine habitat requirements of Pacific lamprey in the Clearwater drainage and 3) Determine distribution of Pacific lamprey in the South Fork Clearwater River drainage. The project started in the South Fork Clearwater River drainage because lamprey ammocoetes have been incidentally caught in the Idaho Supplementation Studies smolt trap in Red River since 1993. Randomly selected transects in 1 km sections were electrofished using shockers designed specifically for sampling ammocoetes. Transects were located in Red River. Spot sampling also occurred in the mainstem South Fork, American River and Newsome Creek. Ammocoetes were located in sand/fine gravel substrate located behind large boulders in Red River and the South Fork mainstem. Elastomer tags were used to mark ammocoetes for identification if recaptured. Prior to this project, ammocoetes were sent to the USGS lab at Cook, WA for positive identification, transformation, aging and subsequent genetic sampling as part of a Columbia Basin lamprey project. Ammocoetes were also provided for genetic analysis to researchers at the CRITFC. Future sampling will increase the number of sites both within drainages already sampled and in new tributaries within the South Fork Clearwater drainage.

Production impacts of Various Hatchery Stocks and Evaluate Selway Steelhead as Alternate Broodstock for South Fork Clearwater River

This combined study was initiated in 1993 by the Idaho Department of Fish and Game and the National Biological Survey (NBS). The NBS portion was funded by BPA Project # 9005200. The purposes of the study were twofold. First, the study was designed to

compare growth, survival and reproductive success of fish from established hatchery stocks and from wild stocks, both reared in natural streams and in hatcheries. Dworshak (North Fork Clearwater) B-run and wild Selway B-run fish were collected in Brood Years 1993, 1994 and 1995, and their progeny raised and released as unfed fry, one and two year old smolts into Crooked River (South Fork AU). The smolts were differentially marked, a portion PIT-tagged, and all monitored through juvenile migration and adult return. Returning adults were identified to broodstock when possible, radiotagged and spawning activity documented. The study is ongoing with the last of the adults expected to return in 2002. A final report will then be written. The second purpose was to evaluate whether Selway fish would be a more suitable broodstock for the South Fork Clearwater River. Since the removal of Harpster Dam in the 1970's, restoration of steelhead trout in the South Fork Clearwater River has been slow, even with extensive outplants of Dworshak broodstock steelhead, both juveniles and adults. Selway River steelhead were chosen for the donor stock because of the similarities to the South Fork Clearwater River drainage and the presence of the Selway fish tunnel which facilitated capture. Progeny of naturally spawning research and wild/natural fish returning to Crooked River are being sampled for genetics, marked with a PIT-tag, and their downstream migration and return as adults followed. Genetic samples are currently backlogged without funding to analyze.

Red River Wildlife Management Area

The 314 acre Little Ponderosa Ranch near Red River, Idaho, was purchased in September 1993 and renamed the Red River Wildlife Management Area (RRWMA). Funds to purchase the area came from BPA mitigation funds (Project 9303500), the Rocky Mountain Elk Foundation and Trout Unlimited, sponsored by the Bureau of Land Management (BLM) for a "Bring Back the Natives" grant through the National Fish and Wildlife Foundation. The management goals for the area are 1) Manage the area to maintain and/or enhance quality wildlife, fisheries, scenic values, and overall biodiversity through ecosystem-based management, 2) Provide a setting for natural resource-oriented educational, research and study opportunities through cooperative efforts with federal, state, and private groups or individuals, 3) Provide a meeting facility for natural resource-oriented agencies and organizations, and the local community, and 4) Promote continued use of the RRWMA for recreational purposes consistent with wildlife, fisheries, and educational goals. The Red River Wildlife Management Area Plan (IDFG 1999a) outlines specific objectives and strategies for the RRWMA. A plan was also developed in 1996 to outline opportunities for potential educational programs at the RRWMA.

The RRWMA was the site of phases 1-4 of the Red River Restoration Project (BPA Project 199303501). Monitoring and evaluation activities for that project are ongoing. Grants obtained through BLM have enabled the construction of a watchable wildlife platform, interpretive signs, nature trail, and other educational endeavors. The RRWMA is one of four sites used by the National Science Foundation (NSF) and University of Idaho (UI) for a stream restoration summer course. Participants are at risk/low income students (two from local communities, two from California) that show academic promise and community involvement. A combined grant from BPA, NSF and Communities Creating Connections funded two remote cameras, one from the ranch house and one in Red River. The cameras are linked to a computer in the ranch house, and live images can

be viewed from the Internet. Local schools and the UI also regularly use the RRWMA as an outdoor classroom. To date all operating costs associated with other wildlife surveys and habitat improvements, as well as facilities upkeep, has come from facility user fees and grants. Since these monies are limited, there is a need for funding to develop and maintain the facilities, conduct monitoring surveys and fully realize the educational plan.

Lewis Soil Conservation District

BPA Project No. 199901400. BMP effectiveness monitoring on practices that have been installed on upland agricultural lands. Visual and photo point inspection. Water quality monitoring in coordination with Idaho Association of Soil Conservation Districts and the Nez Perce Tribe which are nonBPA funded projects.

National Oceanic and Atmospheric Association Fisheries

NOAA Fisheries has directed a genetic monitoring and evaluation project since 1989 (BPA project number 8909600). The program examines the effects of genetic mixing of hatchery and wild salmon and steelhead at the Dworshak hatchery in quantifiable terms through genetic analysis of released and returning fish populations.

Nez Perce Soil and Water Conservation District

BPA Project No. 199901500. BMP effectiveness monitoring on practices that have been installed on upland agricultural lands. Visual and photo point inspections. Water quality monitoring in coordination with Idaho Association of Soil Conservation Districts and the Nez Perce Tribe's Water Resources Department, which are nonBPA funded projects.

Nez Perce Tribe

NPT Ongoing Fisheries Research Projects

- Nez Perce Tribal Hatchery M&E Monitoring and Evaluation (8335003)
- Idaho Salmon Supplementation Studies (8909802)
- Evaluate Potential Means of Rebuilding Sturgeon Populations in the Snake River Between Lower Granite and Hells Canyon Dams (9700900)
- Listed Stock Gamete Preservation Project (9703800)
- Assessing Summer and Fall Chinook Salmon Restoration (9403400)
- Fall Chinook Yearling Monitoring and Evaluation (9801004)

New Fisheries Research Projects

- Adult Steelhead Abundance Monitoring and Quantification of Smolt-to-Adult Survival through Use of PIT Tag Technology in Big Canyon Creek.

Monitoring and Evaluation - Fish

Monitoring and evaluation programs evaluate the performance and status of Hatchery M&E, natural fish (abundance and distribution), genetic structure, life history diversity, ecological interactions, habitat capacity, effectiveness of management actions (reintroduction/supplementation), and sustainability of harvest. These are currently being addressed through five major research projects: Idaho's Salmon Supplementation Studies, Nez Perce Tribal Hatchery M&E, Steelhead Supplementation Studies in Idaho Rivers, Fall Chinook Salmon Reintroduction Feasibility Study, and Hatchery M&E programs.

Approaches to monitoring population status and the benefits and impacts from supplementation actions for spring and fall chinook salmon have been developed by Bowles and Leigtzinger 1991, Steward 1996, and Hesse and Cramer 2000, and Byrne 1992.

Treatment and control streams have been established as part of ongoing programs conducted by the Nez Perce Tribe, Idaho Department of Fish and Game and U.S. Fish and Wildlife Service for spring chinook, fall chinook and B-run steelhead. Treatment and control streams within the Clearwater subbasin and the responsible cooperator are

Nez Perce Tribal Hatchery

- Lolo Creek, M&E treatment, NPT: ongoing
- Meadow Creek (Selway), M&E treatment, NPT: ongoing
- Yoosa Creek, M&E treatment, NPT: ongoing
- Eldorado Creek, M&E control, NPT: ongoing
- Newsome Creek, M&E treatment, NPT: ongoing
- Clearwater River, M&E treatment for fall chinook salmon, NPT: ongoing
- Selway River, M&E treatment for early fall chinook salmon, NPT: proposed
- Lower Lochsa River, M&E control for early fall chinook salmon, NPT: proposed
- South Fork Clearwater River, M&E treatment for early fall chinook salmon, NPT: proposed

Idaho Supplementation Studies

- Crooked River, M&E treatment, IDFG: ongoing
- American River, M&E control, IDFG: ongoing
- Red River, M&E treatment, IDFG: ongoing
- Clear Creek, M&E treatment, USFWS: ongoing
- White Cap Creek, M&E control, IDFG: ongoing
- Pete King Creek, M&E treatment, USFWS: ongoing
- Fishing (Squaw) Creek, M&E treatment, NPT: ongoing
- Bear (Papoose) Creek, M&E treatment, NPT: ongoing
- Colt Killed Creek, M&E treatment, IDFG: ongoing
- Big Flat Creek, M&E treatment, IDFG: ongoing
- Crooked Fork Creek, M&E control, IDFG: ongoing
- Brushy Fork Creek, M&E control, IDFG: ongoing

Steelhead Supplementation Studies

- Fish Creek, M&E, control, IDFG: ongoing
- Clear Creek, M&E, control, IDFG/USFWS: ongoing
- Red River, M&E, treatment, IDFG: ongoing
- Gedney Creek, M&E, control, IDFG: ongoing

Hatchery Monitoring and Evaluation

- Crooked River, M&E, treatment, IDFG: ongoing

- Red River, M&E, treatment, IDFG: ongoing
- Walton Creek, M&E, treatment, IDFG: ongoing

The Nez Perce Fisheries/Watershed Program has an existing M&E strategy for ongoing projects, and is finalizing development of a more comprehensive watershed-scale M&E plan. The plan currently being developed will be incorporated into each watershed where restoration projects are ongoing or proposed, and will establish baseline and trend data related to ecosystem function in these areas.

In addition, each on-the-ground project has an M&E plan that determines if the project is successful in meeting its objective(s), how it contributed to the overall health of the ecosystem, and is used as a feedback loop into future project development. On-the-ground project M&E has been developed for the following ongoing BPA projects:

- Protect and Restore Bear to Fishing Creek Watersheds (199607709)
- Protect and Restore Big Canyon Creek Watershed (199901600)
- Protect and Restore Lapwai Creek (199901700)
- Protect and Restore Lolo Creek Watershed (199607702)
- Protect and Restore Mill Creek Watershed (200003600)
- Protect and Restore North Lochsa Face Analysis Area Watersheds (200003400)
- Restore McComas Meadows/Meadow Creek Watershed (199607705)
- Rehabilitate Newsome Creek Watershed (00004494)

7.2 NonBPA Funded M&E

Clearwater National Forest

The Clearwater National Forest develops annual monitoring and evaluation plans (Murphy et al. 2000). The primary goal of monitoring is to determine if land management activities are meeting Forest Plan standards and objectives (Murphy et al. 2000).

The CNF divides monitoring strategy into two major areas, including on-site and instream monitoring. On-site monitoring includes baseline, implementation, BMP effectiveness and PACFISH and INFISH compliance. Instream monitoring addresses the relationship between land disturbance activities and water quality and fisheries habitat. It includes baseline, effectiveness, and validation monitoring (Murphy et al. 2000).

Clearwater Soil and Water Conservation District

Water quality monitoring in Water Quality Program for agriculture projects, Lolo Creek and Jim Ford Creek watersheds.

Idaho Association of Soil Conservation Districts

Water quality monitoring throughout subbasin on agricultural lands located in watersheds with streams on the 1998 Section 303(d) TMDL list, in cooperation with conservation districts. Streams include Big Canyon, Cottonwood (Idaho County), Lindsay, Little Canyon, and upper Lapwai creeks.

Idaho Department of Fish and Game

The IDFG has monitored chinook salmon returns through redd count surveys within the Clearwater subbasin since 1966, and intermittently for steelhead trout since 1990. Redd counts through aerial and ground surveys provide both baseline and population trend information, as well as some potential for future predictions of population trends based on spawner-recruit theory.

An extensive monitoring and evaluation program documents hatchery practices and evaluates the success of hatchery programs at meeting LSRCP mitigation objectives and IDFG management objectives, and monitored and evaluated the success of supplementation programs. The IDFG-LSRCP hatchery monitoring and evaluation program identifies hatchery rearing and release strategies that will allow the LSRCP program to meet its mitigation requirements and improve the survival of hatchery fish while avoiding negative impacts to natural (including listed) populations. Continuous coordination between the Hatchery Evaluation Study and IDFG's BPA-funded supplementation research project is required because these programs overlap in several areas including juvenile outplanting, broodstock collection, and spawning (mating) strategies.

Selway Falls Fish Tunnel Rehabilitation

The Selway River anadromous fish passage tunnel was constructed in the 1960s and has provided an alternative route for movement above Selway Falls, particularly during periods of drought or extremely high flows originating in the Selway River drainage. Species of particular concern include steelhead trout, chinook salmon, bull trout, and Pacific lamprey. The infrastructure of the passage tunnel has deteriorated over the past 40 years and no longer provides optimum passage conditions. The interior baffles no longer function to slow water movement and the upper headgate facility does not operate effectively to control flows through the tunnel.

Based on radio telemetry in 1999, Idaho Department of Fish and Game personnel found that less than 60% of steelhead trout, staging at the entrance to the tunnel, eventually migrated above the falls. The fish that did not move above the falls apparently did not enter tributaries below the falls for spawning purposes either.

In 1999 the Idaho Department of Fish and Game contracted with Nicholls Engineering, Spokane, WA., to determine the extent of the deterioration and develop estimates for renovating the facility. The lack of optimum passage conditions could delay or deter some portion of the fish runs to move above the falls. Reconstruction would result in better passage conditions above Selway Falls into pristine anadromous and resident fish habitat, which at this time is underseeded. Better passage conditions can translate into more fish utilizing the excellent spawning and rearing habitat available. The overwhelming bulk of the habitat above Selway Falls lies within the Selway-Bitterroot Wilderness area.

Bull Trout Investigations in the North Fork Clearwater River Drainage

The completion of Dworshak Dam in 1971 eliminated anadromous fish runs, and the impacts on resident fish species in the drainage are not clear. It is assumed that the

construction of Dworshak Dam significantly reduced the distribution, abundance and population viability of native resident fish populations above the dam, but information to support this assumption does not exist. Dworshak Dam has possibly isolated and fragmented the Clearwater River bull trout populations(s). The impact(s) of severing the migratory corridor between the North Fork Clearwater River (NFCR) and mainstem Clearwater River could be critical in sustaining a viable bull trout population upstream of Dworshak Dam. While direct assessment of the change in bull trout population dynamics is not feasible, assessment of current viability in the North Fork is possible. This study, which began in 2000, attempts document and assess bull trout populations in the NFCR drainage, and to assess the bull trout population in Fish Lake, and its relationship to the rest of the North Fork. This study is a cooperative project between IDFG and the Clearwater National Forest. Objectives of the study include 1) determine migration patterns of bull trout within the NFCR, 2) determine spatial and temporal distribution of bull trout within Dworshak Reservoir and the North Fork Clearwater drainage, 3) identify bull trout spawning sites within the NFCR and 4) obtain basic life history information on bull trout within Dworshak Reservoir and the NFCR. In 2000, 59 bull trout were captured in Dworshak Reservoir, and 21 of those were implanted with radio transmitters. Within this group, 44% migrated into Black Canyon, 25% migrated into Kelly Creek drainage, 6% migrated into Weitas Creek, and 25% remained in the North Fork Clearwater River downstream of Skull Creek. Redd surveys were conducted in six drainages, with the majority of redds found in Lake Creek, the outlet of Fish Lake. Research continues in 2001.

Dworshak Terrestrial Resources Inventory Project

In early 2000, IDFG entered in a contract with the USACE to perform surveys along the Dworshak Project and adjacent lands. The objectives of this study are to compile fungi, plant, and wildlife species lists, locate special status species, and identify important habitats of special status species and target species (raptors, deer and elk). Data from this study will be used to develop resource objectives for the USACE's Dworshak Master Plan Update and Supplemental Environmental Impact Statement. Preliminary findings from 2000 include

- >200 fungi species, sixteen of which are classified as "Survey and Manage Species" by the US Forest Service. 81 lichen species, 11 ranked "rare" by McCune (1994). 103 bryophyte species, 5 ranked "rare" by Christy and Harpel (1997). 440 vascular plant species, 13 with Federal special status.
- 6 amphibian species, 3 with Idaho State and Federal special status.
- 4 reptile species, 1 with Federal special status.
- 100 bird species, 1 with Idaho State and Federal special status.
- 22 mammal species, 2 with Idaho State and/or Federal special status.

Surveys will continue through 2001, and results will be incorporated into a final report prepared by IDFG and the USACE in 2002. Additionally, IDFG will identify management concerns and provide recommendations for managing Dworshak Project lands. Management topics currently identified include

- potential impacts of prescribed burning on rare plant species,
- protection of rare plant populations,

- impacts of water level fluctuations on amphibians, waterfowl, and vegetation and creation of wetland pools in the reservoir's draw-down zone,
- impacts of stray cattle and introduced bullfrogs on the integrity of existing wetlands and Columbia spotted frogs populations,
- construction of a bat gates at adits/caves known to host bats,
- protection of active bald eagle and goshawk nests,
- review and adjust elk and deer mitigation management objectives to reflect changing needs and landscape level opportunities.

Idaho Department of Environmental Quality

The Beneficial Use Reconnaissance Project (BURP), and the Water Body Assessment Guidance (WBAG) program monitor and assess the physical, chemical, and biological integrity of water bodies in Idaho. Waters identified as potentially impaired undergo a more rigorous water quality subbasin assessment that incorporates all available information and focuses on the cause and extent of impairments for development of a Total Maximum Daily Load (TMDL) if necessary.

BURP relies heavily on macroinvertebrate sampling, habitat evaluation and measurement, bacterial sampling, and fish sampling. The BURP protocol closely follows USEPA's *Rapid Bioassessment Protocols for Use in Streams and Rivers*. BURP data also documents existing uses, which must then be designated and protected under Idaho's water quality standards. It is the goal of the state to remonitor water bodies on a rolling five year schedule.

The WBAG was designed to use BURP data to answer questions about stream integrity, water quality, and beneficial use support status. It originally consisted of multi-metric indexes for macroinvertebrates and habitat, qualitative and quantitative fisheries assessments, and evaluation of criteria exceedances. Assessments of BURP data collected from 1994 through 1996 were conducted to generate the 1998 list of impaired waters required under section 303(d) of the CWA. Revisions to the assessment methodology are currently underway that would allow the use of more types of data, revise the macroinvertebrate and habitat indexes, add a multimetric fish index, revise the salmonid spawning beneficial use assessment, and add an interpretation of criteria exceedances in the assessments. The revised water body assessment methodology is expected to be completed in 2001 for use in the next 303(d) and 305(b) reporting cycles, and in ongoing TMDL subbasin assessments.

The Idaho Department of Environmental Quality also manages databases related to a coordinated temperature monitoring program within the Clearwater subbasin, which began in 2000. Approximately 300-400 locations in the Clearwater subbasin are monitored by one of nine different agencies including Idaho Department of Environmental Quality, Idaho Department of Fish and Game, Nez Perce Tribe, Clearwater and Nez Perce National Forests, National Biological Survey, U.S. Geologic Survey, Bureau of Land Management, and the Soil Conservation Commission (Dan Stewart, Idaho Department of Environmental Quality, personal communication, April 6,

2001). The program will ensure consistent data collection and handling and minimize duplication of effort.

Idaho Soil Conservation Commission

Water quality monitoring in the Potlatch River based on priority watersheds identified in Schriever and Nelson. 1999. *Potlatch River Basin Fisheries Inventory*.

Nez Perce National Forest

The Nez Perce National Forest annual monitoring plans for soil, air, water and fisheries on an annual basis. Annual monitoring plans attempt to meet the requirements of both the Forest Plan and Idaho State water quality standards.

Monitoring activities within the NPNF plan are categorized as baseline, trend, implementation, effectiveness or validation, with many projects including elements of multiple categories. Baseline monitoring includes information which characterize existing conditions and may also serve as indicators of long-term trends. Implementation monitoring determines if plans have been constructed or put into effect as designed. Effectiveness monitoring determines whether and to what degree implemented practices were effective at accomplishing their objectives. Validation monitoring is used to test assumptions in the Forest Plan or predictive models (Howard 2000).

Nez Perce Soil and Water Conservation District

Water quality monitoring in Big Canyon Creek and Hatwai Creek.

U.S. Bureau of Land Management

The Bureau of Land Management, Cottonwood Field Office, annually monitors baseline conditions, long-term trends, BMP/mitigation implementation, and BMP/mitigation effectiveness. Fisheries and water quality objectives have been identified in the BLM Management Framework Plan. Annual monitoring has also been identified in Section 7 consultation (Endangered Species Act) for listed fish for various proposed and ongoing BLM projects/activities. The primary goal of monitoring is to address the relationship of land use activities effects on fish, aquatic habitats, riparian habitats, and water quality.

Monitoring efforts are conducted to determine if land management activities are meeting Management Framework Plan standards and objectives, compliance with Section 7 consultation (ESA), PACFISH compliance, and meeting state water quality/Clean Water Act requirements (e.g., management effects/303(d) streams).

8 References

- Belt, G., O'Laughlin, J., Merrill, T. 1992. *Design of forest Riparian Buffer Strips for the Protection of Water Quality: Analysis of Scientific Literature*.
- Bonneville Power Administration, U.S. Bureau of Reclamation and U.S. Army Corps of Engineers. 2001. Endangered Species Act Implementation Plan for the Federal Columbia River Power System.
- Bowles, E. C. and E. Leitzinger. (1991). Salmon supplementation studies in Idaho rivers: experimental design. Idaho Department of Fish and Game, prepared for U.S. Department of Energy, Bonneville Power Administration, Contract DE-BI79-89BP01466, Project 89-098. 167 pp.
- Christy, J. A. and J. S. Harpel. (1997). Rare bryophytes of the interior Columbia River basin and northern Great Basin, U.S.A. *Journal Hattori Botanical Laboratory* 82:61-75
- Cichosz, T.A., and eight others. 2001. *Draft Clearwater Subbasin Summary*. Prepared for the Northwest Power Planning Council.
- Clearwater River Basin Weed Management Team. 1999. A Strategy for Vegetation Management.
- Clearwater Elk Initiative. 2002. Web site, <http://www.fs.fed.us/r/Clearwater/cei.htm>
- Clearwater Soil and Water Conservation District. (2001). Five-year resource conservation plan. Orofino, ID.
- Columbia River Inter-Tribal Fish Commission. 1996. *Wy-Kan-Ush-Mi Wa-Kish-Wit: Spirit of the Salmon. Vol. II: Subbasin Plans*.
- Hall-Griswold, J. A. and Petrosky, C. E. (1996). *Idaho Habitat/Natural Production Monitoring Part I*. Idaho Department of Fish and Game.
- Idaho County Soil and Water Conservation District. (2001). Annual work plan and five year resource conservation plan. Grangeville, ID.
- Idaho Department of Fish and Game. 1990. A Vision for the Future. Idaho Department of Fish and Game Policy Plan 1990-2005. Boise, Idaho. 33 pp.
- Idaho Department of Fish and Game. 1991a. Nongame Species Management Plan, 1991-1995. Boise, Idaho. 163 pp.
- Idaho Department of Fish and Game. 1991b. Upland Game Plan 1991-1995. Idaho Department of Fish and Game. Boise, ID.
- Idaho Department of Fish and Game. 1991c. Waterfowl Plan 1991-1995. Idaho Department of Fish and Game. Boise, ID.
- Idaho Department of Fish and Game. 1991d. Moose, Sheep and Goat Plan 1991-1995. Idaho Department of Fish and Game. Boise, ID.
- Idaho Department of Fish and Game. 1991e. Mountain Lion Plan 1991-1995. Idaho Department of Fish and Game. Boise, ID.
- Idaho Department of Fish and Game. 1991f. Furbearers Species Management Plan, 1991-1995. Boise, Idaho. 67 pp.
- Idaho Department of Fish and Game. 1998. Black Bear Management Plan, 2000-2010. Idaho Department of Fish and Game. Boise, ID.
- Idaho Department of Fish and Game. 1999a. White-tailed Deer, Mule Deer and Elk Management Plan. Idaho Department of Fish and Game. Boise, ID.

- Idaho Department of Fish and Game. 1999b. Red River Wildlife Management Plan. Idaho Department of Fish and Game, Lewiston, ID.
- Idaho Department of Fish and Game. 2001a. Idaho Department of Fish and Game Strategic Plan.
- Idaho Department of Fish and Game. 2001b. IDFG Fisheries Management Plan 2001-2006. Idaho Department of Fish and Game, Boise, Idaho.
- Idaho Department of Lands. 1996. Rules Pertaining to the Idaho Forest Practices Act Title 38, Chapter 13, Idaho Code.
- Idaho Water Resources Board 1996. *Idaho Comprehensive State Water Plan: North Fork Clearwater Basin*.
- Interior Columbia Basin Ecosystem Management Project. 2002. web site: <http://www.icbemp.gov>
- Latah Soil and Water Conservation District. (2001). Strategic five-year plan. Moscow, ID.
- Lewis Soil Conservation District. (2000). Five-year plan and annual report. Nezperce, ID.
- Marshall, A.R. (1992). Genetic analysis of 1991 Idaho chinook salmon baseline collections. Attachment B *in* Leitzinger, E. J., K. Plaster, and E. Bowles. 1993. Idaho supplementation studies annual report 1991-1992. Fisheries Research Section, Idaho Department of Fish and Game annual report to U.S. Department of Energy-Bonneville Power Administration, Portland, Oregon.
- Marshall, A.R. (1994). Genetic analysis of 1993-94 Idaho chinook salmon baseline collections, and a multi-year comparative analysis. Appendix A *in* Nemeth, D., K. Plaster, K. Apperson, J. Brostrom, T. Curet, and E. Brown. (1996). Idaho supplementation studies annual report 1994. Idaho Department of Fish and Game annual report to U.S. Department of Energy-Bonneville Power Administration, Portland, Oregon.
- McCune, B. (1994). Lichen species groups in the Columbia Basin-ecosystem functions and indicator values. Unpublished report, East-side Ecosystem Management Project, Washington, USA. McElhany, P.; Ruckelshaus, M. H.; Wainwright, T. C; Ford, M. J. and Bjorkstedt, E. P. (2000). *Variable Salmonid Populations and the Recovery of Evolutionarily Significant Units*. Seattle: National Marine Fisheries Service: Northwest Fisheries Science Center: Southwest Fisheries Science Center.
- Murphy, P. K.; Jones, R. M. and Mital, J. (2000). *Clearwater National Forest Watershed and Fisheries Monitoring Plan*. Clearwater National Forest.
- Nez Perce Soil and Water Conservation District. (2000). Resource conservation plan. Lewiston, ID.
- Nez Perce Tribe. 1998. Unified Watershed Assessment and Plan.
- Northwest Power Planning Council. (2001). Technical Guide for Subbasin Planners. Council document 2001-20.
- Paradis, W. J.; Lentz, H. S.; Mays, D.; Blair, S. and Lake, L. 1998. *South Fork Clearwater River Biological Assessment*. Nez Perce National Forest.
- Peery, C. A., and T. C. Bjornn. (1993). Ecological effects of hatchery reared chinook salmon on naturally produced chinook salmon, 1992 annual report. Attachment A *in* Leitzinger, E. J., K. Plaster, and E. Bowles. (1993). Idaho supplementation studies annual report 1991-1992. Fisheries Research Section, Idaho Department of Fish and Game annual report to U.S. Department of Energy-Bonneville Power Administration, Portland, Oregon.

- Peery, C. A., and T. C. Bjornn. (1994). Ecological effects of hatchery reared chinook salmon on naturally produced chinook salmon, 1993, 1993 annual report. Appendix I in Leitzinger, E. J., K. Plaster, P. Hassemer, and P. Sankovich. (1996). Idaho supplementation studies annual progress report 1993. Idaho Department of Fish and Game annual report to U.S. Department of Energy-Bonneville Power Administration, Portland, Oregon.
- Peery, C. A., and T. C. Bjornn. (1996). Small-scale Investigations into chinook salmon supplementation strategies and techniques: 1992-1994-emigration of chinook salmon fry from the upper Salmon River, 1991. Technical Report 96-3, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho.
- Supplementation Technical Work Group. 1988. Supplementation research-proposed five-year work plan. Northwest Power Planning Council, Portland, Oregon.
- U.S. Army Corps of Engineers, Idaho Department of Lands, Idaho Department of Water Resources. 2000. Joint Application for Permits: Applicants Information.
- U.S. Fish and Wildlife Service. (2001). Lower Snake River Compensation Plan Program Summary for the Independent Science Review Panel, April 2001. Compiled by the USFWS, LSRCP, Boise, ID
- U.S. Forest Service. (1987a). *Clearwater National Forest Plan*. Orofino, ID.
- U.S. Forest Service. (1987b). *Nez Perce National Forest Plan*. Grangeville, ID.