

Snake Hells Canyon Subbasin Inventory

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Prepared for the Northwest
Power and Conservation Council

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The following is a list of acronyms used in this Hells Canyon subbasin inventory or its appendix tables, along with the agency, group, or term to which these acronyms refer.

Agencies or Groups:

BLM	Bureau of Land Management (within the U.S. Department of the Interior)
BPA	Bonneville Power Administration
CBFWA	Columbia Basin Fish and Wildlife Authority
DOE	Washington Department of Ecology
FSA	Farm Service Agency
ICIE	Idaho Council on Industry and the Environment
IDFG	Idaho Department of Fish and Game
IDEQ	Idaho Department of Environmental Quality
ISDA	Idaho State Department of Agriculture
NOAA Fisheries (formerly NMFS)	National Marine Fisheries Service (within the National Oceanic and Atmospheric Administration, within the U.S. Department of Commerce)
NOAA	National Oceanic and Atmospheric Administration
NPCC (formerly NPPC)	Northwest Power and Conservation Council (formerly Northwest Power Planning Council or NPPC)
NPT	Nez Perce Tribe
NRCS	Natural Resources Conservation Service (within the U.S. Department of Agriculture)
ODFW	Oregon Department of Fish and Wildlife
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service (within the U.S. Department of Agriculture)
USFWS	U.S. Fish and Wildlife Service (within the U.S. Department of the Interior)
WDFW	Washington Department of Fish and Wildlife

Terms:

BiOp	biological opinion
BMP	best management practice
CRFMP	Columbia River Fish Management Plan
CRP	Conservation Reserve Program
CWA	Clean Water Act
EQIP	Environmental Quality Incentive Program
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FCRPS	Federal Columbia River Power System
HGMP	Hatchery Genetic Management Plan
HUC	hydrologic unit code
INFISH	interim strategies for managing fish-producing watersheds in Eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada
LFH	Lyons Ferry Hatchery
LOD	large organic debris

LSRCP	Lower Snake River Compensation Plan
MOU	memorandum of understanding
PACFISH	interim strategies for managing anadromous fish-producing watersheds in eastern Oregon and Washington, Idaho, and parts of California
SPZ	streamside protection zone
RM	river mile
TMDL	total maximum daily load
USEPA	U.S. Environmental Protection Agency
WCRP	Wildlife Conservation and Restoration Program
WDFW	Washington Department of Fish and Wildlife
WMA	Wildlife Management Area

1 Introduction

1.1 The Subbasin Inventory and the Subbasin Planning Process

This Hells Canyon Subbasin Inventory has been organized into four major categories as suggested by the *Technical Guide for Subbasin Planners* (NPPC 2001): 1) existing protection—description of existing protection related to fish and wildlife habitats and species within the Imnaha subbasin, 2) existing plans—description of existing fish and/or wildlife management plans and water resource management plans that affect fish and wildlife within the Imnaha subbasin, 3) management programs—description of ongoing or planned management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas in the Imnaha subbasin, and 4) restoration and conservation projects—description of existing restoration and conservation projects related to fish and wildlife habitats and species within the Imnaha subbasin.

The information within the inventory was voluntarily provided by individuals and entities participating in the subbasin planning process. In some cases brief information was taken directly from agency web sites while in other instances the agencies worked closely with our staff to provide more in depth information. In all cases, the best information available was used and efforts were made to represent all information in a consistent manner. The information within the inventory should not be considered to be an all-inclusive list of activities related to fish and wildlife within the Hells Canyon subbasin, but only the information currently available during this process.

The Northwest Power and Conservation Council's (NPCC, formerly the Northwest Power Planning Council or NPPC) website (<http://www.nwcouncil.org/fw/subbasinplanning/displayprojects.asp?id=27>) also provided a list of current and past BPA-funded projects.

The inventory is set up to identify the target area, key ecological functions addressed, project duration, funding, and management of past or current activities within the subbasin. The inventory serves as a useful tool for identifying whether fish and wildlife issues have or have not been adequately addressed. A gap analysis was conducted to determine issues and areas in the subbasin in need of further action..

The inventory is provided under separate cover as Volume 2 of the *Hells Canyon Subbasin Plan*. This plan will help direct Bonneville Power Administration's (BPA) funding of projects that mitigate for damage to fish and wildlife caused by the development and operations of the Columbia River basin's hydropower system. An adopted subbasin plan is intended to be a living document that increases analytical, predictive, and prescriptive ability to restore fish and wildlife. The *Hells Canyon Subbasin Plan* will be updated every three years to include new information to be integrated in a revision of the biological objectives, strategies, and implementation plan. The NPCC views plan development as an ongoing process of evaluation and refinement of the region's efforts through adaptive management, research, and evaluation. More information about subbasin planning can be found at www.nwcouncil.org.

The *Hells Canyon Subbasin Plan* includes three interrelated volumes that describe the characteristics, management, and vision for the future of the Hells Canyon subbasin:

Assessment (Volume 1)—The assessment is a technical analysis that examines the biological potential of the Hells Canyon subbasin to support key habitats and species, as well as factors limiting this potential. These limiting factors provide opportunity for restoration. The assessment describes existing and historic resources and conditions within the subbasin, focal species and habitats, environmental conditions, impacts outside the subbasin, ecological relationships, limiting factors, and a final synthesis and interpretation. A **technical team** was formed to guide development of the assessment and technical portions of the management plan. The technical team was comprised of scientific experts with the biological, physical, and management expertise to refine, validate, and analyze data used to inform the planning process.

Inventory (Volume 2)—The inventory summarizes fish and wildlife protection, restoration, and artificial production activities and programs within the Hells Canyon subbasin that have occurred over the last five years or are about to be implemented. The information includes programs and projects, as well as locally developed regulations and ordinances that protect fish, wildlife, and habitat.

Management plan (Volume 3)—This management plan defines a vision for the future of the subbasin, including biological goals and strategies for the next 10 to 15 years. The management plan includes a research, monitoring, and evaluation plan to ensure that implemented strategies succeed in addressing limiting factors and to reduce uncertainties and data gaps. The management plan also includes information about the relationship between proposed activities and the Endangered Species Act (ESA) and Clean Water Act (CWA).

1.2 Entities and Authorities for Resource Management

Multiple agencies and entities are involved in managing and protecting fish and wildlife populations and their habitats in the Hells Canyon subbasin. Federal, state, and local regulations, plans, policies, initiatives, and guidelines are part of this effort. The Nez Perce Tribe, Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), and IDFG share management authority over the fisheries resource. Federal involvement in this arena stems from ESA responsibilities and from management responsibilities for federal lands, most notably the Hells Canyon National Recreation Area. Numerous federal, state, and local land managers are responsible for multipurpose land and water use management, including the protection and restoration of fish and wildlife habitat. Major management entities involved in developing the *Hells Canyon Subbasin Plan* are outlined below.

1.2.1 Nez Perce Tribe

The Nez Perce Tribe served as lead entity for subbasin planning for the Hells Canyon subbasin. The tribe contracted with the NPCC to deliver the *Hells Canyon Subbasin Plan* while providing opportunities for participation in the process by fish and wildlife managers, local interests, and other key stakeholders, including tribal and local governments.

The Nez Perce Tribe is responsible for managing, protecting, and enhancing treaty fish and wildlife resources and habitats for present and future generations. Tribal government headquarters are located in the Clearwater River subbasin in Lapwai, Idaho, with offices in Kamiah and Orofino, Idaho. The NPT has treaty-reserved fishing, hunting, and gathering rights pursuant to the 1855 Treaty with the United States. Fish and wildlife activities relate to all aspects of management, including recovery, restoration, mitigation, enforcement, and resident fish programs.

1.2.2 Northwest Power and Conservation Council

The NPCC has the responsibility to develop and periodically revise the Fish and Wildlife Program for the Columbia Basin (NPCC 2000). In the 2000 revision, the NPCC proposed that 62 locally developed subbasin plans, as well as plans for the mainstem Columbia and Snake rivers, be adopted into its Fish and Wildlife Program. The NPCC will administer subbasin planning contracts pursuant to requirements in its Master Contract with BPA (NPCC 2003). The NPCC will be responsible for reviewing and adopting each subbasin plan, ensuring that it is consistent with the vision, biological objectives, and strategies adopted at the Columbia Basin and province levels.

1.2.3 Bonneville Power Administration

The BPA is a federal agency established to market power produced by the federal dams in the Columbia River basin. As a result of the Northwest Power Act of 1980, BPA is required to allocate a portion of power revenues to mitigate the damages caused to fish and wildlife populations and habitat from federal hydropower construction and operation. These funds are provided and administered through the Lower Snake River Compensation Plan (LSRCP). BPA provided the funds for subbasin planning contracts administered by the NPCC.

1.2.4 Project Team

The Nez Perce Tribe subcontracted with Ecovista to facilitate the planning process and write plan documents. The Nez Perce Tribe subcontracted with the Idaho Council on Industry and the Environment (ICIE) to organize the public involvement and public relations tasks for the Hells Canyon subbasin. Representatives of these entities made up the project team (Table 1).

Table 1. Members of the Hells Canyon project team, including their affiliation and roles.

Name	Affiliation	Role
Darin Saul	Ecovista	project coordinator, technical writer, and editor
Amy Owen	Ecovista	planner, technical writer
Tom Cichosz	Ecovista	fisheries biologist, technical writer
Anne Davidson	Ecovista	wildlife biologist, GIS specialist, technical writer
Angela Sondenaa	Nez Perce Tribe	Biologist, technical writer
Felix McGowen	Nez Perce Tribe	Nez Perce Tribe project coordinator
Pat Barclay	Idaho Council on Industry and the Environment	public involvement coordinator

1.2.5 Planning Team

The Hells Canyon Planning Team was composed of representatives from government agencies with jurisdictional authority in the subbasin, fish and wildlife managers, county, industry, and user group representatives, and private landowners. The Planning Team guided the public involvement process, developed the vision statement, helped develop and review the biological objectives, and participated in prioritizing subbasin strategies. Regular communication and input among team members occurred throughout the planning process. The planning team met monthly throughout the project period. The people listed in Table 2 were directly involved on the Planning Team or requested to receive communications and be allowed to provide input on project documents.

Table 2. Members of the Hells Canyon Planning Team.

Name	Affiliation
Brad Johnson	Asotin County Conservation District
Greg Yuncevich	Bureau of Land Management
Don Scheibe	County Commissioner
Tim Johnson	Fishhawk Guides
Art Seamans	Hells Canyon Alliance
Craig Shepard	Idaho Department of Environmental Quality
Nathan Brindza	Idaho Department of Fish and Game
Jim Chandler	Idaho Power Company
Jerry Hendrickson	Landowner
Charley Rains	National Oceanic and Atmospheric Administration
Angela Sondena	Nez Perce Tribe
Felix McGowen	Nez Perce Tribe
Ira Jones	Nez Perce Tribe
Brad Smith	Oregon Department of Fish and Wildlife
David Ward	Oregon Department of Fish and Wildlife
Phil Graeve	The Nature Conservancy
Howard Burge	U.S. Fish and Wildlife Service
Scott Springer	U.S. Forest Service
Chad Adkins	Washington Department of Ecology

1.2.6 Technical Team

The technical team included scientific experts who guided the development of the subbasin assessment and plan. This team had the biological, physical, and management expertise to refine, validate, and analyze data used to inform the planning process. The technical team also guided and participated in developing the biological objectives, strategies and research, and monitoring and evaluation sections of the plan, and the team reviewed all project documents. The Hells Canyon technical team met monthly or bimonthly throughout the process and participated in day or multi-day workshops focused on filling data gaps. People listed in Table 3

were directly involved on the technical team or requested to receive communications and be allowed to provide input on technical team documents.

Table 3. Members of the Hells Canyon technical team, including their affiliation and e-mail address.

Name	Affiliation	E-mail
Angela Sondena	Nez Perce Tribe	angelas@nezperce.org
Brad Smith	Oregon Department of Fish and Wildlife	gofish@oregontrail.net
Chad Adkins	Washington Department of the Environment	catk461@ecy.wa.gov
Charley Rains	National Oceanic and Atmospheric Administration	charley.rains@noaa.gov
Craig Johnson	Bureau of Land Management	craig_johnson@blm.gov
Craig Shepard	Idaho Department of Environmental Quality	cshepard@deq.state.id.us
Ed Schriever	Idaho Department of Fish and Game	edschriever@idfg.state.id.us
Felix McGowan	Nez Perce Tribe	felixm@nezperce.org
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Vince Kozakiewicz	National Oceanic and Atmospheric Administration	Vince.Kozakiewicz@noaa.gov

1.3 Public Outreach and Government Involvement

As the *Hells Canyon Subbasin Plan* was developed, four methods of outreach and participation were used: technical team meetings, planning team meetings, public meetings, and a website.

1.3.1 Technical Team Participation

The technical team was composed of members having technical expertise in fish, wildlife, and habitat resources in the Hells Canyon subbasin. Meetings were held afternoons of the third Thursday of every month in Lewiston, Idaho, at the Brammer Addition Building conference room in Lewiston, Idaho, and were open to the public. This information was posted on the Ecovista website (2003) and provided at public meetings. The technical team reviewed and gave input on the technical aspects of the subbasin plan, and this input is in large part documented in the subbasin assessment and plan. .

1.3.2 Planning Team Participation

The planning team was composed of members with expertise and knowledge of the management of natural resources and socioeconomic issues in the Hells Canyon subbasin. Meetings were held mornings of the third Thursday of every month at the Brammer Addition Building conference room in Lewiston and were open to the public. This information was posted on the Ecovista website (2003) and provided at public meetings. The planning team reviewed and gave input on the management aspects of the subbasin plan, and this input is in large part documented in the subbasin management plan. .

1.3.3 Public Meeting Outreach

Two public meetings were held in order to introduce the subbasin plan and provide an opportunity for input from local people and resource managers. Pat Barclay of the Idaho Council on Industry and the Environment coordinated public meeting announcements and logistics for the Snake Hells Canyon subbasin.

Public Meeting #1: The purpose of the first public meeting was to introduce subbasin planning to local people who live, work, and utilize land for various purposes within the subbasin. In addition, the comment and opinions on the subbasin plan were sought and documented. The comments were taken to the Planning Team and considered in management plan development.

The first public meeting was held in Lewiston on November 4. It was well publicized, with 20 attendees, not including the Project and Planning Team members. A discussion followed a short PowerPoint presentation outlining the planning process. There were good comments regarding concerns in the following three areas:

1. The potential for increased regulation to land and business owners in the area.
2. The use of the planning process to further land use agendas and gain funding.
3. The relationship to the Federal Energy Regulatory Commission's relicensing process.

Ira Jones and Felix McGowen of Nez Perce Tribe assisted in answering questions and helping to alleviate concerns. It was stressed that the subbasin planning process is a voluntary process geared toward providing funding to projects that would help mitigate some of the effects from hydropower. It was also explained that this is not a regulatory process in itself, nor is it intended to increase hardship among land and business owners.

Public Meeting #2: The purpose of the second public meeting was to present the *Snake Hells Canyon Subbasin Plan* (assessment, management plan, and inventory) and solicit comments and ideas from local land and natural resource users. The comments were documented and presented to the Planning Team for incorporation into the draft subbasin plan.

The second public meeting was held in Lewiston on March 18. The meeting was poorly attended, but did provide an opportunity to inform a legislative staff person about the process.

1.3.4 Ecovista Website Information

As the *Snake Hells Canyon Subbasin Plan* was developed, draft documents, information on meetings, and information about subbasin planning were posted on the website starting in November of 2003 (Ecovista 2003). Updated drafts and additional information were posted on the website throughout the process, normally on a monthly basis.

1.4 Review Process

The Snake Hells Canyon Subbasin Assessment, Inventory and Management Plan were disseminated for review throughout the development phase using e-mail lists compiled by the Project Team and posting on the website. The Hells Canyon Subbasin Inventory was posted on the Ecovista website starting in September 2003, with new drafts being posted regularly. The Inventory was also distributed to technical and planning team members via email for review and as part of requests for additional information. The final review draft of the inventory was posted April 2004. Documents were posted on the Ecovista website (www.ecovista.ws) and presented at Planning and Technical Team meetings. In addition, the assessment and preliminary outcomes of the plan were presented at the second round of public meetings. Through this review process, representatives of local, state, tribal, and federal governments, as well as landowners and other stakeholders in the subbasin, were given an opportunity to interact with project staff as they reviewed and offered comments on the subbasin planning effort.

The next step in the process after May 28th, is for public and independent scientific review. The summer schedule for the independent scientific review of subbasin plans has been developed. For a majority of the subbasin plans, the ISRP/ISAB review process will begin immediately following the May 28 deadline and conclude with submittal of final reports to the Council by August 12, 2004. The Hells Subbasin Plan will be reviewed during Week 7: July 19th-July 23rd (NWPPC 2004).

To complete the review, about ten review teams, and one basin-wide umbrella committee have been established. The review teams are organized to review sets of subbasin plans grouped by province. Each team consists of six or more reviewers and includes a mix of ISRP, ISAB, and Peer Review Group members. The umbrella group will help ensure a consistent level of review scrutiny and comment quality (NWPPC 2004).

A review checklist and comment template is being developed for the ISRP/ISAB review of subbasin plans based on the Council's Subbasin Planning Technical Guide and will include the Council's review questions. Reviewers must evaluate: 1) whether the subbasin plans are complete, scientifically sound, and internally consistent following a transparent and defensible logic path; and 2) whether the subbasin plans are externally consistent with the vision, principles, objectives, and strategies contained in the Council's 2000 Fish and Wildlife Program. The checklist also asks reviewers to evaluate whether the plan satisfactorily provides the assessment, inventory and management elements requested by the Council and, to recommend the level of need to further treat a specific element of the subbasin plan before the plan meets the criteria of completeness, scientific soundness, and transparency.

Subbasin Plan Adoptability Framework

The Council's Legal Division is organizing a framework that the Council members may use to make the determinations required by the Power Act relative to subbasin plan amendment recommendations. The framework is essentially a way of organizing the review around the Act's standards that apply to program amendments for the Fish and Wildlife Program measures found in section 4(h), and the standards set in the 2000 Fish and Wildlife Program in the unique context of subbasin plans.

2 Existing Protection

This section lists and briefly describes existing management programs and policies that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas in the Hells Canyon subbasin.

2.1 Existing Protection

2.1.1 Land Ownership

The majority of the Snake Hells Canyon subbasin is publicly owned, with more than half under USFS management (Table 4, Figure 1). The Wallowa-Whitman National Forest manages the majority of the USFS land but portions on the Idaho side of the river are managed by the Payette and Nez Perce National Forests. Private land accounts for 32% of the subbasin and is concentrated in the agricultural and urban areas of the lower subbasin and in the area surrounding Wolf and Dry Creeks. The Craig Mountain area (Captain John Creek, Corral Creek and Cottonwood Creek) is cooperatively managed by the Bureau of Land Management, Idaho Department of Fish and Game, Idaho Department of Lands, Nez Perce Tribe, and the Nature Conservancy.

Table 4. Land management agencies of the Snake Hells Canyon subbasin.

Land management agency	Acres	Percent of total subbasin area
Forest Service	287,006	52.4
Private	176,685	32.3
State of Idaho	45,006	8.2
Bureau of Land Management	31,369	5.7
State of Washington	3,068	0.6
Nez Perce Tribe	2,799	0.5
The Nature Conservancy	1,354	0.2
State of Oregon	112	0.02
Water	2,852	0.5

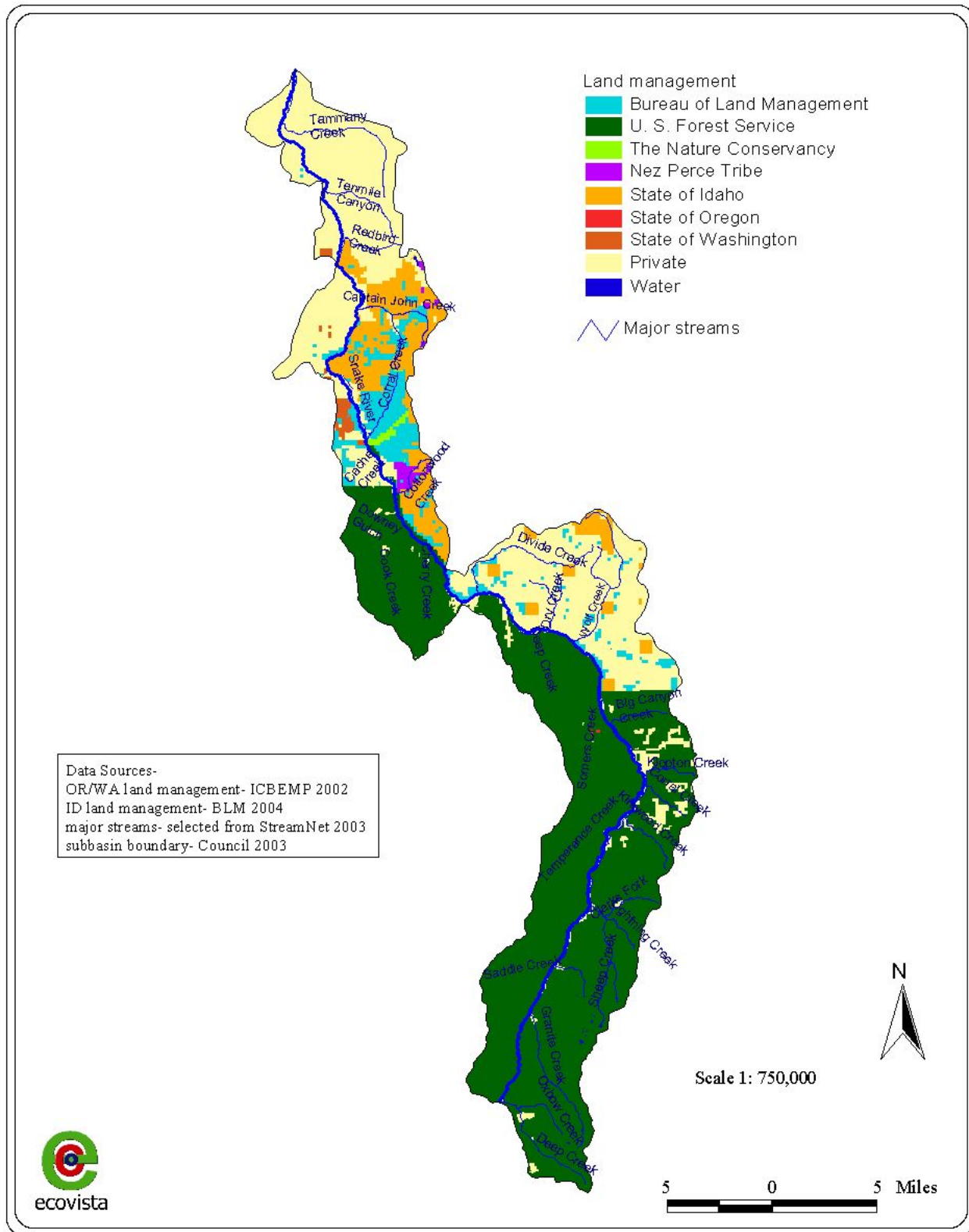


Figure 1. Land management in the Snake Hells Canyon subbasin.

2.1.2 Protected Areas

Much of the Snake Hells Canyon subbasin is protected and/or managed using a conservation-based strategy (Figure 2). The following areas in the Snake Hells Canyon subbasin are protected in this manner.

Hells Canyon National Recreation Area

Forty-six percent (298,270 acres) of the 652,488-acre Hells Canyon National Recreation Area (HCRNA) lie within the Snake Hells Canyon subbasin. The HCRNA was created by an act of Congress in 1975. Although the HCNRA includes portions of the Nez Perce, Payette, and Wallowa-Whitman National Forests, it is managed by the Wallowa-Whitman National Forest. The Hells Canyon Wilderness comprises nearly 215,000 acres within the HCNRA (USFS 2003a).

The act that created the HCNRA states that “to assure that the natural beauty, and historical and archaeological values of the Hells Canyon area and the seventy-one-mile segment of the Snake River between Hells Canyon Dam and the Oregon-Washington border, together with portions of certain of its tributaries and adjacent lands, are preserved for this and future generations, and that the recreational and ecologic values and public enjoyment of the area are thereby enhanced, there is hereby established the Hells Canyon Recreation Area (USFS 2003a).”

A Comprehensive Management Plan (CMP) was approved in 1982 and incorporated into the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan) in 1990. Adjustment of the existing (1982) CMP was initiated in 1993 and the *Draft Environmental Impact Statement* (DEIS) was released in 1996. The Forest Supervisor re-initiated the process in 1998 with a revised DEIS (RDEIS). The Record of Decision for the Hells Canyon National Recreation Area Comprehensive Management Plan was released July 22, 2003 and was implemented August 29, 2003. The appeal period on the decision ended October 6, 2003. Six appeals were received and are currently under review by the Regional Forester. A decision on the appeals is anticipated sometime in early spring 2004 (USFS 2003a). The HCRNA CMP is a valuable reference on the area and contributed to the construction of this document.

Hells Canon National Wilderness Area

Eighty-four percent (182,370 acres) of the Hells Canyon National Wilderness Area lies within the most upstream portion of the subbasin (Figure 2). The area is protected under the Wilderness Act of 1964.

Wild and Scenic Snake River

In 1975, approximately 67.5 miles of the Snake River in the HCNRA were designated as a component of the National Wild and Scenic Rivers System. In this reach, the river is managed to preserve its free-flowing character and unique environment while providing for continued public use (USFS 2001).

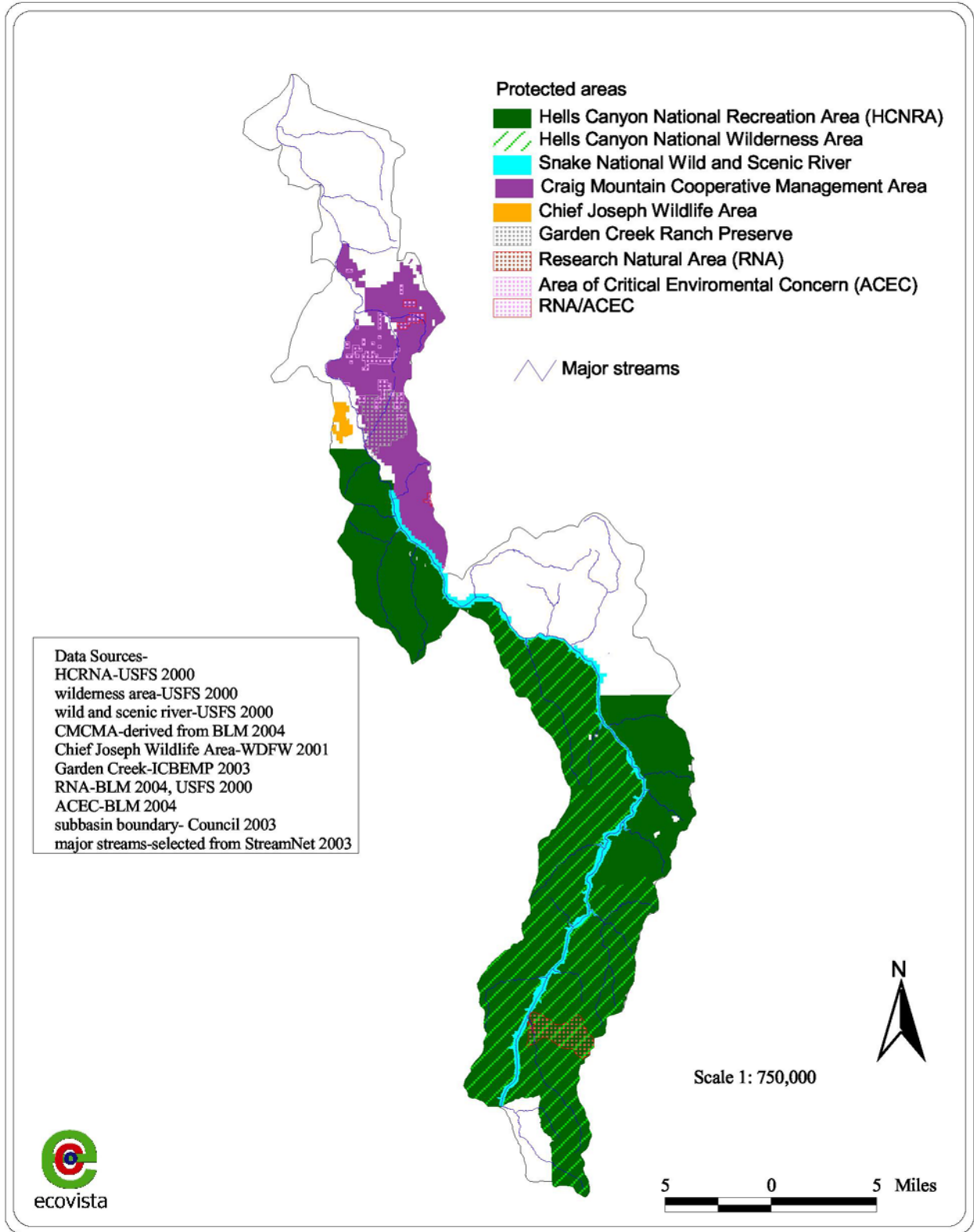


Figure 2. Areas in the Snake Hells Canyon subbasin managed and/or protected under a conservation-based strategy.

The 31.5-mile section of the river between Hells Canyon Dam and Upper Pittsburg Landing is designated as wild under the Wild and Scenic Rivers Act. This act defines wild as “free of impoundments and generally accessible only by trail” and representing “vestiges of primitive America.” The 36-mile section of river downstream of Upper Pittsburg Landing to RM 180.2 is designated as scenic, which is defined as “free of impoundments with shorelines and watershed still largely primitive, and shorelines largely undeveloped, but accessible in places by roads.” An additional 4.2 miles of the river from RM 180.2 north to the HCNRA boundary at the Oregon–Washington line is recommended for scenic designation (USFS 2001). The Wild and Scenic Snake River corridor extends approximately one-quarter mile back from the high-water mark on each shore. The river corridor itself is not wilderness and wilderness regulations do not apply (USFS 2001).

Craig Mountain

The majority of the Craig Mountain Cooperative Management Area lies within the subbasin. The area has multiple managers including the Nez Perce Tribe, Bureau of Land Management (BLM), Idaho Department of Lands, The Nature Conservancy, and private landowners. The Craig Mountain Cooperative Management Area contains the 60,000-acre Craig Mountain Wildlife Mitigation Area purchased by the Bonneville Power Administration (BPA) in 1992 as partial mitigation for wildlife habitat losses resulting from construction of Dworshak Dam on the Clearwater River. The Nez Perce Tribe, Idaho Department of Fish and Game (IDFG), and BPA agreed to provide for the protection and enhancement of wildlife habitat through management of the area (Cassirer 1995). The pileated woodpecker, yellow warbler, black-capped chickadee, river otter, elk, and white-tailed deer are species that have been identified as having been negatively affected by construction of Dworshak Dam in the Clearwater subbasin, so they are given special management attention on the Craig Mountain Wildlife Mitigation Area (Cassirer 1995).

Chief Joseph Wildlife Area

The Chief Joseph Wildlife Area is 2,065 acres in size and located in Asotin County, Washington. Elevations range from 825 to 4,913 feet at Mt. Wilson, the highest point in the vicinity. The area is made up primarily of bluebunch wheatgrass grasslands with riparian woodlands surrounding streams and springs. The area provides important elk, mule deer, bighorn sheep, game bird, and nongame habitat (WDFW 2001a).

Research Natural Areas

Research natural areas (RNAs) are natural ecosystems that provide benchmarks for comparison with areas influenced by humans. They facilitate research for ecological studies and help preserve gene pools for threatened and endangered plants and animals. Two established RNAs occur in the subbasin, the Lightning Creek and Wapshilla Ridge RNAs; these areas cover 8,555. Seven areas are proposed for designation as RNAs in the Snake Hells Canyon subbasin. These areas were selected to represent particular plant associations, geological formations, or other needs outlined in state natural heritage plans. According to the Wallowa-Whitman Forest Plan, proposed RNAs will be protected from uses that would reduce their suitability for RNA designation. Since their designation, no logging has occurred in the proposed RNAs. Once

officially established, an RNA management plan will be written and integrated into the Forest Plan (USFS 1999).

Areas of Critical Environmental Concern

The designation of Areas of Critical Environmental Concern (ACECs) is authorized in Section 202 (c)(3) of the Federal Land Policy and Management Act of 1976 (FLPMA, P.L. 94-579). ACECs include public lands where special management attention and direction is needed to protect and prevent irreparable damage to important historic, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards (BLM 2003a). The Wapshilla Ridge RNA/ACEC, the Captain John Creek RNA/ACEC, the Lower Salmon ACEC and the Craig Mountain ACEC cover 4,394 acres in the Craig Mountain Area of the subbasin (Figure 2; BLM 2002).

Garden Creek Preserve

The Garden Creek Preserve is part of the Craig Mountain Wildlife Management Area, supporting Rocky Mountain bighorn sheep, elk, mountain lion, wolverine, black bear, ruffed grouse, partridge and quail. To date, nine rare plant species have been identified in the vicinity, including Spalding's silene, western ladies tress and stalk-leaved monkey flower (TNC 2004). The area is managed by the Cooperative managers of the Craig Mountain Area and covers 8,023 acres in the subbasin (Figure 2).

Additional Protection

Additional programs or management protection affecting the subbasin are listed in Table 5.

Table 5 Description of existing protection related to fish and wildlife habitats and species within the Hells Canyon subbasin

Location	Type of Protection	General Description of Protection	Project Duration	Funding Source and ID Number (BPA number if applicable)	Management Entity/ Responsible Agency	Type of Area Protected	Scale of Protection	Key Ecological Functions Addressed	Goal of Protection	Results of Protection: Accomplishments and Failures (include a quantitative assessment)
Asotin County	Conservation Reserve Program (CRP)	eliminates cultivation and provides direct seeding of marginal cropland and pastureland		USDA, Environmental Quality Incentives Program (EQIP)	private, USDA, EQIP	marginal cropland and pastureland, as well as agricultural uplands	26,793 acres	sediment transport and wildlife habitat	decrease field erosion, decrease stream turbidity, and increase wildlife habitat	26,793 acres of marginal cropland and pastureland taken out of production and an additional 1,522 acres provided with direct seeding over 5 years. Other EQIP-implemented projects include grassed waterways, sediment basins, and pasture/hay and planting
Asotin County Conservation District (ACCD)	Best Management Practices (BMPs)	reduces amount of soil that leaves upland agricultural areas and enters the Snake River by using sediment basins, terraces, grassed waterways, filter strips, strip cropping, and direct seeding of crops		WA state funding	ACCD	agricultural uplands	ACCD	improved water quality and fish habitat	reduce the amount of soil leaving agricultural uplands to improve water quality and fish habitat	\$142, 376 of WA state funds targeted to upland practices from 1996-2000 through the ACCD; reduction of summer-fallow acres and reduction of erosion by 95% on those acres
Designated Critical Habitat: Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in		Designates critical habitat for listed species for protection.	From 2000 until affected species are delisted		NOAA Fisheries	Steelhead and salmon habitat	Listed anadromous species habitat in the Northwest.		To protect habitat necessary for the protection and recovery of listed salmon and steelhead populations	

Washington, Oregon, Idaho and California										
Proposed Designation of Critical Habitat for Klamath River and Columbia River Distinct Populations of Bull Trout		Proposes critical habitat for bull trout in the Columbia Basin, including areas in Hells Canyon subbasin.	Until delisting of bull trout.		USFWS	Bull trout habitat	Klamath and Columbia River systems		To protect bull trout habitat as means of protecting and recovering bull trout in the Columbia Basin	
Ten Mile Creek and Couse Creek in WA District	Best Management Practices (BMPs)	works with landowners in the headwaters of Ten Mile and Couse creeks to reduce sedimentation through BMPs		WCC, SRFB, USDA	Asotin County Conservation District (ACCD)	private lands in the headwaters of Ten Mile and Couse creeks (outside Asotin Creek watershed boundary)	Ten Mile Creek and Couse Creek in WA District	reduced sedimentation, improved habitat	reduce sedimentation in the headwaters of Ten Mile and Couse creeks	Only 14% (\$176,000) of the dollars received by ACCD have been spent outside the Asotin Creek watershed (compared with \$1,098,960 available for projects inside the watershed).
WA portion of subbasin	riparian protection	fences off streams and plants trees	1996-present	WA state funding	ACCD	riparian areas	WA portion of subbasin	reduced sedimentation and temperature, improved bank stability	fence off stream areas to reduce animal pressure on streambanks	\$33,099 in WA state funding to install 26,410 ft of riparian fencing; identification of alternative water developments; and implementation of riparian revegetation projects in 2001

3 Existing Plans

This section combines lists of plans in two formats. First a list drawn from the subbasin summary (Saul et al. 2001). This list also includes a section listing assessments, TMDLs and APREs. The second list results from information submitted by participants in the subbasin planning process and is presented as Table 6 at the end of the chapter.

3.1 Existing Plans

3.1.1 Endangered Species Act Implementation Plan for the Federal Columbia River Power System

This implementation plan (BPA et al. 2001) was prepared in acknowledgement of responsibilities for fish protection under the Northwest Power Act and water quality protection under the CWA and of obligations to Indian tribes under law, treaty, and Executive Order. The plan responds to the biological opinions issued in December 2000 by the USFWS (2000) and NOAA Fisheries (NMFS 2000) on the effects to listed species from operations of the Columbia River hydropower system.

The plan (BPA et al. 2001) is a five-year blueprint that organizes collective fish recovery actions by the three action agencies. It 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, the plan describes only commitments connected to the Federal Columbia River Power System, not the obligations of other federal agencies, states, or private parties.

3.1.2 Hells Canyon National Recreation Area Comprehensive Management Plan

Although the Hells Canyon National Recreation Area includes portions of the Nez Perce, Payette, and Wallowa-Whitman National Forests, it is managed by the Wallowa-Whitman National Forest. The Record of Decision for the Hells Canyon National Recreation Area Comprehensive Management Plan (USFS 2004) was released July 22, 2003, and implemented August 29, 2003.

3.1.3 Bull Trout Draft Recovery Plan

The USFWS has drafted the Bull Trout Recovery Plan in cooperation with 24 local recovery unit teams and with collaboration of federal, state, tribal and private biologists working with representatives of local watersheds, private landowners and industry and conservation organizations. The plan (USFWS 2002) was released for public review and comment in January 2003. A final decision is pending.

3.1.4 Idaho Department of Environmental Quality 2004–2008 Strategic Plan

The following three priorities from the Idaho Department of Environmental Quality’s (IDEQ) *2004–2008 Strategic Plan* are relevant to protecting and restoring ecosystem resources (IDEQ 2003):

- Improve groundwater quality in degraded areas and protect all groundwater
- Improve the surface water quality in areas that have been 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 Idaho's 303(d) list. 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 (USEPA). TMDL implementation plans have been developed by local watershed advisory groups (WAGs) and are available through the IDEQ. The plans are important for CWA §319 funding directed toward improving water quality.

3.1.5 Idaho Agricultural Pollution Abatement Plan

In March 2003, the fourth revision of the Idaho Agricultural Pollution Abatement Plan (Ag Plan) (ISCC 2003) was certified by Governor Dirk Kempthorne. The Ag Plan is Idaho's response to §208 of the federal CWA (P.L. 92-500) and represents the agricultural portion of the State Water Quality Management Plan. The Ag Plan is the implementing action plan for all nonpoint source agricultural sector activities in the state. The implementation strategy contains six actions items:

1. Identify waters where beneficial uses are threatened or impaired by agricultural activities.
2. Prioritize waters to determine implementation effort needed.
3. Identify management strategies for implementation.
4. Define authorities, regulations, and commitments to ensure that implementation occurs.
5. Implement feedback loop process.
6. Communicate evaluation results, conclusions, and recommendations.

3.1.6 Nez Perce Tribe Salmon Habitat Recovery Plan with Multi-Species Habitat Strategy

This recovery plan outlines habitat recommendations for salmonids and other vertebrate species. It analyzes Imnaha River water quantity, water quality, stream structure, substrate, and habitat features. Appendices to the plan include information about social and economic infrastructure, land use history, and vegetation (Wallowa County and NPT 1999).

3.1.7 Washington Department of Fish and Wildlife Plans

Wildlife plans and programs of the WDFW include the Bald Eagle Recovery Plan, Bighorn Sheep Herd and Statewide Management Plan, Black Bear Management Plan, Blue Mountain Elk Herd Management Plan 2000, State Ferruginous Hawk Recovery Plan, Statewide Elk

Management Plan, and the WDFW's Priority Habitats and Species Program (<http://www.wdfw.wa.gov/hab/phspage.htm>).

Fish plans and policies include the *Statewide Strategy to Recover Salmon—Extinction Is Not an Option* (WSJNRC 1999), *Bull Trout and Dolly Varden Management Plan* (WDFW 2000), Draft Snake River Wild Steelhead Recovery Plan, Draft Steelhead Management Plan, WDFW Snake River Fishery Management and Evaluation Plan, Hydraulic Code (RCW 75.20.100-160), and Wild Salmonid Policy for Washington (WDFW 1997).

3.2 Assessments

3.2.1 Lower Snake River BLM Biological Assessment of Sockeye Salmon, Fall Chinook Salmon, Spring/Summer Chinook Salmon, Steelhead Trout, and Bull Trout

The BLM is required by the ESA to identify and evaluate its ongoing and proposed activities and programs within the subbasin. This biological assessment is at the 4th level hydrologic unit code (HUC) for the lower Snake River subbasin and provides a comprehensive examination of the current and historic status of various fish species at that HUC level. BLM programs are assessed in relation to the listed fish species that they may potentially disturb (BLM 2000a).

3.2.2 Lower Snake River Ecosystem Analysis at the Watershed Scale

This analysis documents ecological structures, functions, processes, and interactions occurring at the watershed scale. It is intended to provide guidance for management actions to sustain or improve the health and productivity of natural resources within the Lower Snake River subbasin. The six components of this watershed analysis are 1) watershed characterization, 2) identification of issues and key questions, 3) description of current conditions, 4) description of reference conditions, 5) synthesis and interpretation, and 6) recommendations.

3.2.3 Snake River BLM Biological Assessment of Sockeye Salmon, Fall Chinook Salmon, Spring/Summer Chinook Salmon, Steelhead Trout, and Bull Trout

The BLM is required by the ESA to identify and evaluate its ongoing and proposed activities and programs within the subbasin. This biological assessment is at the 4th level hydrologic unit code (HUC) for the Snake River subbasin (from the confluence of the Salmon River upstream to Hells Canyon Dam). The BLM programs are assessed in relation to the flora and fauna they may potentially disturb (BLM 2000b).

3.2.4 Lower Snake, Snake, Lower Salmon, and Little Salmon River Subbasins Problem Assessment for Bull Trout

In 1995, Idaho Governor Phil Batt initiated development of a conservation plan (State of Idaho 1996) to restore bull trout populations in Idaho. The resulting problem assessment (IDEQ 1998) and conservation strategy for the Lower Snake and Snake River subbasins is consistent with the first phase of the Governor's conservation plan (State of Idaho 1996). The goal of the assessment is to provide Watershed Advisory Group (WAG) members with a scientific framework on bull trout ecology, threats to bull trout, bull trout distribution and abundance,

habitat conditions, and watershed characteristics in the subbasins. The assessment provides the WAG with lists of important sub-watersheds and priority management actions to maintain or enhance bull trout populations and habitats.

3.2.5 Tammany Creek P.L.-566 Supplemental Watershed Protection Plan/Environmental Assessment

Implemented in 1986, the Tammany Creek Assessment and Plan is a combined effort of the NRCS, Nez Perce Soil and Water Conservation District, Nez Perce County Commissioners, Nez Perce Tribe, IDFG, IDEQ, and Idaho Soil Conservation Commission. The plan provides P.L. 566 financial and technical assistance to allow for the implementation of land treatment measures on private nonirrigated cropland, county roads, and riparian zones along Tammany Creek and its tributaries. Implemented on 34,160 acres in Nez Perce County, the plan seeks to 1) reduce the maximum midsummer stream temperature in Tammany Creek by 2 °C to help maintain the optimum temperature for anadromous and resident coldwater fish and 2) provide treatment necessary to remove Tammany Creek (17060103-021) from the Idaho 303(d) list. Ecological functions addressed are protecting riparian vegetation, reducing stream temperature, reducing streambank erosion, increasing fish cover, and filtering and retaining sediments and associated nutrients and bacteria. Plan efforts have resulted in reductions of the maximum midsummer stream temperature in Tammany Creek by 2° C and reductions of off-site sediment yields by 67% (from 169,940 to 56,080 tons per year).

3.2.6 Washington State Salmonid Stock Inventory: Bull Trout/Dolly Varden

This report on bull trout (WDFW 1998) identifies wild salmonid stocks, assesses their current status, and describes limiting factors.

3.3 Total Maximum Daily Loads

Water quality standards are set by states, territories, and tribes. They identify the uses for each water body—for example, drinking water supply, contact recreation (swimming), and aquatic life support (fishing)—and the scientific criteria to support those uses. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the water body can be used for the purposes that the state has designated. The calculation must also account for seasonal variation in water quality. The CWA, section 303, establishes parameters for water quality standards and TMDL programs.

3.3.1 Tammany Creek Sediment TMDL

This Tammany Creek assessment and TMDL analysis (IDEQ 2001) has been developed to comply with Idaho's court ordered TMDL schedule and was approved by U.S. EPA in February 2002. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions, and is an important first step in developing the TMDL. The subbasin assessment portion of this document examines the current status of this 303(d) listed water body, and defines the extent of impairment and causes of water quality limitation throughout the subbasin. In the TMDL portion of this document, the loading

analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

3.3.2 Snake River–Hells Canyon TMDL

The states of Idaho, Oregon, and Washington and the U.S. Environmental Protection Agency (USEPA) worked in coordination with the Columbia Basin Tribes to develop TMDLs for temperature and total dissolved gas on the Columbia River and the Snake River mainstem.

The Snake River from its confluence with the Salmon River (RM 188) to its confluence with the Columbia River has been included on the 303(d) list of impaired waters for temperature and total dissolved gas by Idaho, Oregon, or Washington, as appropriate. Oregon and Washington included all of the Columbia River on their 303(d) lists for total dissolved gas and most of the Columbia River on their lists for temperature. The water quality standard of the Colville Confederated Tribes for temperature and total dissolved gas is also exceeded in the Columbia River. The Spokane Tribe of Indians has developed water quality standards for the Columbia River that have been adopted by the tribe but not yet approved by the USEPA, and these standards are also exceeded in the Columbia River (IDEQ and ODEQ 2001).

A work group consisting of staff from the IDEQ, Oregon Department of Environmental Quality, Washington Department of Ecology, and USEPA developed the temperature and total dissolved gas TMDLs. A number of Columbia Basin Tribes also participated. The release of the Draft Columbia/Snake Mainstem Temperature TMDL (USEPA 2004) has been delayed to allow necessary discussions and information exchange. The total dissolved gas TMDL was approved by the USEPA in September 2003.

3.4 HGMPs and APREs

Hatchery Genetic Monitoring Plans (HGMPs) and Artificial Production and Review Evaluations (APREs) have been completed for six hatchery programs within the Snake Hells Canyon subbasin: Captain John Integrated Fall Chinook, IPC Integrated Fall Chinook, Oxbow Fall Chinook, Pittsburg Landing Integrated Fall Chinook, Hatchery Spring Chinook and Hatchery Summer Steelhead. APRE summary reports for each program are provided here.

Complete HGMPs and APRE reports for each facility are available online at <<http://www.apre.info/APRE/home.jsp>>. Existing Plans important to subbasin planning identified by participants in subbasin planning are listed in Appendix A.

Table 6 Existing fish and/or wildlife management plans and water resource management plans that affect fish and wildlife within the Hells Canyon subbasin.

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
A Vision for the Future: Idaho Department of Fish and Game Policy Plan, 1990-2005	1990	1990-2005	IDFG		Idaho			
Asotin Creek Model Watershed Plan			Asotin County Conservation District (ACCD)		Asotin County			
Bald Eagle Recovery Plan			WDFW		Washington		wildlife populations, wildlife habitat	
Bighorn Sheep Herd and Statewide Management Plan			WDFW		Washington		wildlife populations, wildlife habitat	
Black Bear Management Plan			WDFW		Washington		wildlife populations, wildlife habitat	
Black Bear Management Plan 2000-2010	1998	2000-2010	IDFG		Idaho		wildlife populations, wildlife habitat	
Blue Mountain Elk Herd Management Plan 2000	2000		WDFW		Washington		wildlife populations, wildlife habitat	

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Columbia River Fish Management Plan	1987		federal agencies, Indian tribes, and state agencies	provides a framework within which the United States and OR can exercise their sovereign powers in a coordinated and systematic manner to protect, rebuild, and enhance upper Columbia River fish runs while providing harvests for both treaty Indian and non-Indian fisheries	upper Columbia River	rebuild weak runs through habitat protection, enhancement, artificial production, and harvest management to fairly share the harvest	protection, rebuilding, and enhancement of upper Columbia River fish runs	
Fishery Resource Compensation Plan			USFWS	identifies the need to replace adult salmon and steelhead and resident trout fishing opportunities			salmon, steelhead, and resident trout fishing populations	identification of the need to replace adult salmon and steelhead and resident trout fishing opportunities
Furbearer Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	
Idaho Conservation Data Center	1984		IDFG	collects and maintains information on the status of rare, threatened, and endangered plant and animal species, as well as on exemplary ecological reference and natural areas, terrestrial and aquatic habitats, and plant communities, using standardized methods and protocols in the framework of an integrated, relational data management system	Idaho	maintain biodiversity information within the Idaho portion of the subbasin; assist with conservation actions within the subbasin	rare, threatened, and endangered animal and plant species	
Idaho Department of Fish and Game Five Year Fish Management Plan: 2001-2006	2001	2001-2006	IDFG		Idaho			

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Idaho Department of Fish and Game Strategic Plan	2001		IDFG		Idaho			
Idaho SWCD Annual Work Plan/Five Year Resource Conservation Plan, 2001	2001		Idaho SWCD		Idaho	encourage and promote best management practices (BMPs) to reduce soil erosion and enhance water quality, improve water quality on §303(d)-listed streams, and improve fish and wildlife habitat	soil erosion, water quality, fish and wildlife habitat	
Lower Snake River Fish and Wildlife Compensation Plan (LSRCP)	1986		BPA, USFWS	establishes facilities and lands to compensate for the loss of wildlife habitat and anadromous and resident fisheries caused by the construction of the four lower Snake River dams (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite)	facilities and lands located in the upper, middle, and lower subbasins of the Snake River drainage in WA, OR, and ID (also, Upper Columbia, Yakima, and Mid-Columbia subbasins, east of the Cascade Range in WA and OR)	compensate for the loss of wildlife habitat and anadromous and resident fisheries caused by the construction of the four lower Snake River dams	wildlife habitat, protection of anadromous fish populations	establishment of fish hatcheries, satellite fish facilities, a fish laboratory, wildlife habitat areas and development areas, and lands with fishing and hunting access
Moose, Sheep and Goat Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	
Mountain Lion Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Natural Resources Conservation Service Strategic Plan 2000-2005	2000	2000-2005	USDA, NRCS			enhance natural resource productivity to enable a strong agricultural and natural resource sector, reduce unintended adverse effects of natural resource development and use to ensure a high-quality environment, reduce risks from drought and flooding to protect individual and community health and safety, and deliver high-quality services to the public to enable natural resource stewardship	natural resource productivity, natural resource stewardship	
Nez Perce Fish and Wildlife Code			NPT					
Nez Perce Tribe Executive Committee Resolutions			NPT					
Nongame Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	
NRCS Tammany Creek PL-566 Supplemental Watershed Protection Plan/Environmental Assessment	1986		NRCS, Nez Perce Soil and Water Conservation District, Nez Perce County Commissioners, NPT, IDFG, IDEQ, Idaho Soil Conservation Commission	provides P.L. 566 financial and technical assistance to allow for the implementation of land treatment measures on private nonirrigated cropland, AFOs, county roads, and riparian zones along Tammany Creek and its tributaries	34,160 acres in Nez Perce County, ID	reduce the maximum midsummer stream temperature in Tammany Creek by 2° C to help maintain the optimum temperature for anadromous and resident coldwater fish; provide treatment necessary to remove Tammany Creek (17060103-021) from the Idaho §303(d) list	riparian vegetation protection, stream temperature reduction, streambank erosion reduction, increased fish cover, filtering and retaining sediments and associated nutrients and bacteria	reduction of maximum midsummer stream temperature in Tammany Creek by 2° C; reduction (by 67%) of off-site sediment yields (from 169,940 to 56,080 tons per year)

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
OAR 635 Division 008- Department of Wildlife Lands			ODFW	sets forth management goals for each State Wildlife Area	Oregon		wildlife habitat	
OAR Division 100-Wildlife Diversity Plan			ODFW	sets outlines for wildlife diversity program goals and objectives, identifies species listings, establishes survival guidelines, and creates other wildlife diversity policies	Oregon		wildlife diversity and populations	
OAR Division 400-Instream Water Rights Rules			ODFW	provides guidelines for inflow measurement methodologies, establishes processes for applying for instream water rights, and sets forth other instream water rights policies	Oregon			
OAR Division 415-Fish and Wildlife Habitat Mitigation Policy			ODFW	establishes mitigation requirements and recommendations, outlines mitigation goals and standards, and provides other mitigation guidelines	Oregon		fish and wildlife habitat	
OAR Divisions 068-071			ODFW	sets deer and elk seasons	Oregon			
Oregon Administration Rule (OAR) 635 Division 07-Fish Management and Hatchery Operation			ODFW	sets forth policies for general fish management goals, the Natural Production Policy, and other fish management policies	Oregon		fish populations	
Oregon Bighorn Sheep Management Plan	1992		ODFW	summarizes the history and status of Oregon's bighorn sheep and presents a means by which the species will be restored to remaining suitable habitat	Oregon		wildlife populations, wildlife habitat	

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Oregon Black Bear Management Plan	1987		ODFW	summarizes the life history of the black bear and its management in OR, lists concerns and the strategies to be used in addressing identified problems, and provides direction for informing the interested public of how black bear will be managed	Oregon	recognize the black bear as an important part of OR wildlife fauna, valued by many Oregonians; maintain healthy black bear populations within the state and into the future; and conduct a management program that maintains healthy populations of black bear and recognizes the desires of the public and the statutory obligations of ODFW	wildlife populations, wildlife habitat	
Oregon Cougar Management Plan	1993		ODFW	summarizes the life history of the cougar and its management in OR, lists concerns and the strategies to be used in addressing identified problems, and provides direction for informing the interested public about how cougar will be managed	Oregon	recognize the cougar as an important part of OR wildlife fauna, valued by many Oregonians; maintain healthy cougar populations within the state and into the future; and conduct a management program that maintains healthy populations of cougar and recognizes the desires of the public and the statutory obligations of ODFW	wildlife populations, wildlife habitat	
Oregon Elk Management Plan	1992		ODFW	summarizes the life history of the elk and its management in OR, lists concerns and the strategies to be used in addressing identified problems, and provides management direction for informing the interested public about how elk will be managed	Oregon	protect and enhance elk populations to provide optimum recreational benefits to the public and to be compatible with habitat capability and primary land uses	wildlife populations, wildlife habitat	
Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources	1997		ODFW		Oregon			

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Oregon Migratory Game Bird Program Strategic Management Plan	1993		ODFW	describes strategies that assist in developing specific operational plans that will achieve the program mission and integrate with other state and federal agencies and private organizations	Oregon	protect and enhance populations and habitats of native migratory game birds and associated species at prescribed levels as determined by national, state, and flyway plans throughout natural geographic ranges in OR and the Pacific Flyway to contribute to OR wildlife diversity and the uses of those resources	wildlife populations, wildlife habitat	
Oregon Mule Deer Management Plan	1990		ODFW	summarizes the life history of the mule deer and its management in OR, lists concerns and the strategies to be used in addressing identified problems, and provides management direction for informing the interested public about how mule deer will be managed	Oregon	manage mule deer populations to provide optimum recreational benefits to the public and to be compatible with habitat capability and primary land uses	wildlife populations, wildlife habitat	
Oregon Plan for Salmon and Watersheds	1997		ODFW	outlines a statewide approach to ESA concerns based on watershed restoration and ecosystem management to protect and improve salmon and steelhead habitat in OR	Oregon		watershed restoration, ecosystem management, salmon and steelhead habitat	
Oregon Senate Bill 1010			Oregon Department of Agriculture	identifies county-specific agricultural water quality issues and addresses them through a committee process; encourages landowners to develop a farm plan to meet the integrity of the strategy	Oregon	reduce water pollution from agricultural sources and protect beneficial uses of watersheds		

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Oregon Trout Plan			ODFW	attempts to achieve and maintain optimum populations and production of trout to maximize benefits and to insure a wide diversity of opportunity for present and future citizens	Oregon	maintain the genetic diversity and integrity of wild trout stocks throughout OR; protect, restore, and enhance trout habitat; provide a diversity of trout angling opportunities; and determine the statewide management needs for hatchery trout	trout population, genetic diversity, and habitat	
Oregon Warmwater Game Fish Plan			ODFW	identifies the public's needs and expectations for angling opportunity; chooses management alternatives for individual waters or groups of waters	Oregon	provide optimum recreational benefits to the people of OR by managing warmwater game fishes and their habitats	fish habitat and populations	
Oregon Wildlife Diversity Plan	1993		ODFW	provides policy direction for the maintenance and enhancement of the vertebrate wildlife resources in OR; identifies goals and objectives for maintaining a diversity of activities for nongame wildlife for the benefit of all species	Oregon	maintain OR wildlife diversity by protecting and enhancing populations and habitats of native nongame wildlife at self-sustaining levels throughout natural geographic ranges	wildlife populations, habitat, and diversity	
Reports to General Council			NPT					
State Ferruginous Hawk Recovery Plan			WDFW		Washington		wildlife populations, wildlife habitat	
State of Idaho Wildlife Conservation and Restoration Program Comprehensive Program	2001		IDFG		Idaho			
Statewide Elk Management Plan			WDFW		Washington		wildlife populations, wildlife habitat	

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Steelhead Supplement to the Oregon Plan	1997		ODFW	outlines a statewide approach to ESA concerns based on watershed restoration and ecosystem management to protect and improve salmon and steelhead habitat in OR	Oregon	sustain healthy and abundant wild populations of steelhead	watershed restoration, ecosystem management, and salmon and steelhead habitat	
Strategy to Recover Salmon (Part of Extinction is not an Option)		1999-2001	WDFW	as a guide, articulates the mission, goals, and objectives for salmon recovery and identifies specific activities related to salmon recovery that state agencies will undertake in the 1999-2001 biennium	Washington	restore salmon, steelhead, and trout populations to healthy harvestable levels and improve those habitats on which these fish rely	salmon, steelhead, and resident trout populations and habitat	
The Bull Trout and Dolly Varden Management Plan			WDFW	describes the goal, objectives, and strategies to restore and maintain the health and diversity of self-sustaining bull trout and Dolly Varden stock and their habitats	Washington		bull trout and Dolly Varden populations and habitat	
The Draft Snake River Wild Steelhead Recovery Plan			WDFW	assesses problems associated with the continuing decline in natural steelhead populations within the Snake River basin and includes recommendations to reverse the decline	Washington		steelhead populations and habitat	
The Draft Steelhead Management Plan			WDFW	describes the goals, objectives, policies, and guidelines to be used to manage the steelhead resource	Washington		steelhead populations and habitat	
The WDFW Snake River Fishery Management and Evaluation Plan			WDFW	assesses the effect of fisheries on listed anadromous salmonids	Washington		salmon populations and habitat	
The Wild Salmonid Policy for Washington			WDFW	describes the direction that the WDFW will take to protect and enhance native salmonid fish	Washington		salmon populations and habitat	

Plan Title	Date Started	Project Duration	Responsible Agency	Description	Scale of Plan	Goal of Plan	Key Ecological Functions Addressed	Results of Plan: Accomplishments and Failures (include a quantitative assessment)
Upland Game Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	
Vision 2006	2000	2000-2006	ODFW	provides guidance up to 2006 as a six-year strategic operational plan	Oregon			
Washington Priority Habitats and Species			WDFW	guides management of "critical areas" habitat for fish and wildlife on all state and private lands as they relate to the growth of the Management Act of 1990	Washington		fish and wildlife habitat	
Water Quality Program for Agriculture Program			ISCC		Idaho			
Waterfowl Plan 1991-1995	1991	1991-1995	IDFG		Idaho		wildlife populations, wildlife habitat	
White-tailed Deer, Mule Deer and Elk Management Plan	1999		IDFG		Idaho		wildlife populations, wildlife habitat	
Wy-Kan-Ush-Mi Wa-Kish-Wit; Spirit of the Salmon	1996	1996-	NPT	increase adult return targets for each subbasin by gravel to gravel management	all subbasins in the Columbia Basin	salmon recovery through institutional, technical, and watershed actions	enhanced anadromous fish populations	

4 Management Programs and Policies

This section presents the information on existing management programs in two formats. The first presents a list drawn from the *Snake Hells Canyon Subbasin Summary* (Saul et al. 2001). This is supplemented by Table 7, which presents additional programs and information submitted by managers and other participants in the Subbasin Planning process. The last portion of this section presents a list of federal, state and tribal policies affecting the Hells Canyon subbasin.

4.1 Management Programs

4.1.1 Asotin County Shorelines Master Program

Program objectives are to protect the classification called shorelines of statewide significance, protect and restore the valuable natural resources that shorelines represent, and plan for and foster all reasonable and appropriate uses that depend on a waterfront location or that offer opportunities for the public to enjoy the state's shorelines.

4.1.2 Conservation Reserve Program and Environmental Quality Incentives Program

The Conservation Reserve Program (CRP) is implemented on marginal cropland and pastureland, as well as on agricultural uplands in Asotin County. The program is managed by the U.S. Department of Agriculture (USDA) and funded under the USDA's Environmental Quality Incentives Program (EQIP). This voluntary program involves incentives to take crops out of production by eliminating cultivation and providing direct seeding of marginal cropland and pastureland. Program goals are to decrease field erosion, decrease stream turbidity, and increase wildlife habitat. Within Asotin county, 26,793 acres of marginal cropland and pastureland were taken out of production and an additional 1,522 acres were provided with direct seeding over a 5-year period. Other EQIP-implemented projects include developing grassed waterways and sediment basins.

4.1.3 Forestry Incentives Program

The USDA's Natural Resources Conservation Service (NRCS) implemented a program called the Forestry Incentives Program (FIP) for improving privately owned forested lands. Authorized in 1978, the program shared up to 65% of the costs of tree planting, timber stand improvements, and related practices on non-industrial private forest lands. On May 13, 2002, the 2002 Farm Bill de-authorized this program, and funds remaining on that date were to be exhausted through FIP closeout, primarily funding the existing contractual backlog (NRCS 2004a).

4.1.4 Harvest Mitigation Programs

The LSRCP program was authorized to mitigate losses caused by the construction and operation of the four lower Snake River dam and navigation lock projects. The program goals are unique in that they focus on replacing losses of returning adult salmon and steelhead rather than on releasing a given number of smolts or pound of smolts. The LSRCP adult return goals were allocated to the project area (above Ice Harbor Dam for fall chinook and above Lower Granite

Dam for spring/summer chinook and steelhead) and not simply to the hatcheries. The measure of success in meeting LSRCP adult return goals is an estimate of the sum of adult returns to the various Snake River Basin fisheries, to the hatcheries of origin, and to natural spawning areas within the Snake River Basin. An extensive monitoring and evaluation program in the basin documents hatchery practices and evaluates the success of the hatchery programs at meeting LSRCP mitigation and cooperator objectives. The LSRCP hatchery monitoring and evaluation program identifies hatchery rearing and release strategies that allow LSRCP programs to meet their mitigation, ESA, and Tribal Trust responsibilities.

4.1.5 Idaho Agricultural Water Quality Program

The Idaho State Department of Agriculture (ISDA) manages a groundwater protection program throughout Idaho. The Agricultural Water Quality Program implements agricultural monitoring and protection programs with public and private partners to protect surface- and groundwater quality (ISDA 2004). Implementation of this program is through the Agricultural Ground Water Coordination Committee. Water program staff lead the pesticide water quality portion of a cooperative agreement with the U.S. Environmental Protection Agency (USEPA). ISDA groundwater monitoring and protection projects are related to pesticides, nutrients, and animal waste impacts. Water program staff evaluate water quality concerns related to dairies and beef feedlots. The ISDA works with the Idaho Soil Conservation Commission and Idaho Association of Soil Conservation Districts to implement an Agricultural Total Maximum Daily Load Implementation Monitoring Program that is related to the Clean Water Act (CWA) and state laws and rules. The ISDA works with Soil Conservation Districts to evaluate sources of agricultural contaminants and best management practices (BMPs). Information dissemination and local coordination with the agriculture community and the general public are key to the success of the water quality programs.

4.1.6 Idaho Noxious Weed Programs

The Idaho State Department of Agriculture (ISDA) implements the Noxious Weed Control and Noxious Weed Free Forage and Straw Certification Program to control noxious weeds across Idaho.

4.1.7 Idaho Wildlife Conservation and Restoration Program

This program was federally initiated and funded. In fiscal year 2001, the federal government provided the first substantial funding for state work on nongame wildlife conservation and wildlife-related recreation and education (State of Idaho 2004). As part of appropriations from the Departments of Commerce, Justice, and State, a new program called the Wildlife Conservation and Restoration Program (WCRP) distributed \$50 million among the 50 states, District of Columbia, U.S. Territories, and Commonwealth of Puerto Rico through a subaccount of the Wildlife Restoration Fund (Pittman-Robertson). Funds were distributed through a formula based upon one-third land area and two-thirds population size and required a 25% nonfederal match for conservation planning projects and a 50% state or program match for implementation projects. The WCRP program closely followed the language developed by the Teaming with Wildlife coalition for Title III of the Conservation and Reinvestment Act, an act that was

designed to provide local, state, and federal programs with funding for wildlife and other conservation programs but that was not passed by Congress. Also, \$50 million was made available to states through Department of the Interior appropriations for State Wildlife Grants (SWG), a competitive program designed to fund state-level projects to benefit wildlife and their habitats.

4.1.8 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 USFS and BLM in Idaho, Montana, Wyoming, Nevada, and Utah. An important goal of ICBEMP was to provide long-term direction to replace PACFISH and InFish (see above). The Draft Environmental Impact Statement for the ICBEMP was released in June 1997, as well as a strategy to conclude the project (ICBEMP 2002).

The program is to be implemented on over 63 million acres of federal land over the interior Columbia Basin. Activities would include restoration of federal lands, landscape health, aquatic and terrestrial habitats, and human needs, products, and services. The strategy affects how federal agencies prioritize actions and undertake and fund restoration activities, and it replaces the interim management strategies, providing for longer-term management of lands east of the Cascade Range.

Several assessments derived from this program and conducted by the project's science integration team include *Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-Scale Trends and Management Implications* (Wisdom et al. 1998), *An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins* (Quigley and Arbelbide 1997a,b), and *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basins* (Quigley et al. 1996). These assessments characterize historical and current conditions and associated trends, as well as document accelerated changes in vegetation patterns, fish and wildlife distributions, and terrestrial and aquatic ecosystem processes that have occurred in the past century.

4.1.9 PACFISH and INFISH

PACFISH and INFISH are federal interim strategies to protect populations and habitats of fish species of concern on lands managed by the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) in watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada. These strategies restrict actions in Riparian Habitat Conservation Areas, most notably by defining the standard width of four categories of waterways: fish-bearing streams, permanently flowing, non fish-bearing streams; ponds, lakes, and wetlands greater than 1 acre; and intermittent streams, wetlands less than 1 acre, and landslide-prone areas. Deviation from the defined width requires consultation with NOAA Fisheries and the USFWS.

4.1.10 USDA Wildlife Habitat Incentives Program

Funded by the USDA, the Wildlife Habitat Incentives Program is a voluntary program for people who want to develop and improve wildlife habitat, primarily on private land. The NRCS

provides both technical assistance and up to 75% cost-share assistance to establish and improve fish and wildlife habitat. Agreements between NRCS and a participant generally last from 5 to 10 years from the date the agreement is signed. This program has proven to be highly effective and widely accepted across the country. By targeting wildlife habitat projects on all lands and aquatic areas, assistance is given to conservation-minded landowners who are unable to meet the specific eligibility requirements of other USDA conservation programs. The Farm Security and Rural Investment Act of 2002 reauthorized this program as a voluntary approach to improving wildlife habitat in our nation (NRCS 2004c).

4.1.11 Wallowa County Weed Control District

The Wallowa County Weed Board manages a county weed control program. The purpose of this program is to promote and implement noxious weed control in Wallowa County, contain existing weed populations, eradicate new invaders, raise the economic and biological value of the land, improve the health of the community, promote stewardship, and preserve natural resources. Program activities include inventorying weeds, reviewing yearly herbicide application records, prioritizing weed control efforts, coordinating control efforts, seeking funding for weed control efforts, controlling weeds along road shoulders, and providing weed control education and an annual weed tour.

4.1.12 WDFW Enforcement Program

The Washington Department of Fish and Wildlife's (WDFW) Enforcement Program enforces state laws concerning illegal harvest, fish passage, water surface screening requirements, and stream hydraulics permitting.

4.1.13 Wetlands Reserve Program

The Wetlands Reserve Program is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property (NRCS 2004b). The NRCS provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program, which helps establish long-term conservation and wildlife protection.

Table 7 Description of ongoing or planned management programs or initiatives affecting the Snake Hells Canyon subbasin

Program or Document Title	Project Duration	Funding Source/ID Number	Management Entity/ Responsible Agency	Scale of Program	Key Ecological Functions Addressed	Goal of Program	Results of Program/Publications
Asotin County Noxious Weed Control Program		local county tax revenues	Asotin County Noxious Weed Board	Asotin County	habitat restoration	develop and maintain an accurate and comprehensive noxious weed control inventory, with a special emphasis toward locating and destroying new invading species; develop an effective educational program; and be current with latest techniques in noxious weed control methods	since 1986, use of more than \$100,000 from both state and county funds for control measures for yellow star-thistle
Asotin Creek Information and Education Program			Asotin County Conservation District (ACCD)	Asotin County			
Basinwide Salmon Recovery Strategy			NMFS	Columbia Basin	salmon recovery	prevent the extinction of 12 species and lead to their recovery by halting the decline in salmon populations within 5 to 10 years and by establishing increasing trends in abundance within 25 years	identification of strategies for harvest management, hatchery reform, habitat restoration, and hydropower system operations; outlining of specific actions to be taken by the federal government and additional actions for tribal, state, and local governments. Published as Conservation of Columbia Basin Salmon: A Coordinated Federal Strategy for the Recovery of the Columbia-Snake River Basin Salmon (all-H-paper)
Conservation Reserve Program (CRP)			USDA-Farm Services Agency (FSA), NRCS		soil erosion, wildlife habitat		

Program or Document Title	Project Duration	Funding Source/ID Number	Management Entity/Responsible Agency	Scale of Program	Key Ecological Functions Addressed	Goal of Program	Results of Program/Publications
Environmental Quality Incentives Program (EQIP)			USDA-Farm Services Agency (FSA), NRCS				
FCRPS Biological Opinion			NMFS, FWS	Columbia River			concluded that off-site mitigation in tributaries is necessary to continue to operate the hydropower system. Published as the FCRPS Biological Opinion
Forestry Incentive Program			NRCS				
IDFG Chinook Salmon Captive Rearing program			IDFG	Mid Snake subbasin	population dynamics, population persistence, maintenance of genetic diversity, and maintenance of high-risk populations	avoid demographic and environmental risks of cohort extinction	collection of only enough juveniles or eggs from target populations to provide an adequate number of spawners, about 20, to ensure that acceptable genetic diversity can be maintained without additional natural escapement
Lower Snake River Compensation Plan	early 1980s-		ESA, WDFW, NPT	lower Snake River	protection of fish populations	mitigate for losses of steelhead, trout, and salmon caused by construction and operation of the four lower Snake River Dams and reservoirs	rearing and releasing of fish to compensate for 18,300 Snake River fall chinook; 1,152 Tucannon River spring chinook; 4,656 Snake River summer steelhead; and 67,500 angler days of recreation on resident fish

Program or Document Title	Project Duration	Funding Source/ID Number	Management Entity/ Responsible Agency	Scale of Program	Key Ecological Functions Addressed	Goal of Program	Results of Program/Publications
Oregon House Bill 3609				Oregon	anadromous fish populations and habitat	direct the development of plans for fully seeded, sustainable production of natural anadromous fish runs in OR river subbasins above Bonneville Dam through consultation among state and tribal entities	
Public Law 566 (Small Watershed Program)			NRCS				
River Basin Studies			NRCS				
Supplementation Programs		BPA		Hells Canyon subbasin	maintenance of anadromous populations	create tier 1 supplementation consisting of intensive research projects approved within the NPPC Fish and Wildlife Program and tier 2 supplementation consisting of action not associated with the ongoing intensive evaluations	
Wildlife Laboratory			ISDA	Idaho			

4.2 Policies

4.2.1 Oregon House Bill 3609

This Oregon state policy directs the development of plans for fully seeded, sustainable production of natural anadromous fish runs in Oregon river subbasins above Bonneville Dam through consultation among state and tribal entities.

4.2.2 Oregon Administration Rules

The Administrative Rules Unit, Archives Division, Secretary of State publishes the *Oregon Administrative Rules Compilation* and the *Oregon Bulletin* (both online at <http://arcweb.sos.state.or.us>). The *Oregon Administrative Rules Compilation* is an annual publication containing the complete text of the Oregon Administrative Rules at the time of publication. The *Oregon Bulletin* is a monthly publication that updates rule text found in the annual compilation and provides notice of intended rule action, Executive Orders of the Governor, and Opinions of the Attorney General.

Oregon Administrative Rules that involve fish and wildlife planning include OAR 635 Division 008-Department of Wildlife Lands, OAR Division 100-Wildlife Diversity Plan, OAR Division 400-Instream Water Rights Rules, OAR Division 415-Fish and Wildlife Habitat Mitigation Policy, OAR Divisions 068-071, and Oregon Administration Rule (OAR) 635 Division 07-Fish Management and Hatchery Operation.

4.2.3 Public Law 566 (Small Watershed Program)

The NRCS administers the Small Watershed Program (including River Basin Operations) under Public Law (P.L.) 566. The Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis (NRCS 2004d). Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

4.2.4 Nez Perce Tribe Treaty Rights

The Hells Canyon subbasin is a part of the over 13 million acres in central Idaho, northeastern Oregon, and southeastern Washington included in the Nez Perce Tribe pre-treaty area of tribal use. Although the Hells Canyon subbasin is outside of the Nez Perce Reservation, the tribe reserves the right of its members to hunt and fish 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, berries, and other resources both 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.”

4.2.5 Federal Water Pollution Control Act of 1972 Section 404

Department of Army permits are required under §404 of the CWA for discharges of dredged or fill material into waters of the United States, including wetlands. Activities requiring permits include any excavations that discharge dredged material that could potentially impact U.S. waters. 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.

4.2.6 FCRPS Biological Opinion and the Basinwide Salmon Recovery Strategy

NOAA Fisheries has recently developed several documents and initiatives for the recovery of ESA-listed Snake River steelhead, chinook, and sockeye. The Federal Columbia River Power System (FCRPS) biological opinion (NMFS 2000) and the Basinwide Salmon Recovery Strategy (Federal Caucus 2000) 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 biological opinion (NMFS 2000) are intended to be consistent with or complement the NPCC’s amended Fish and Wildlife Program, as well as 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 Basin, which includes Snake River stocks. The technical recovery team will identify delisting criteria and viability criteria for populations within evolutionarily significant units (ESUs), factors that limit recovery, and early actions for recovery, among other things. A stakeholder-based forum will develop a formal recovery plan from these products.

Subbasin plans will become local recovery plans or a substantial component of NOAA Fisheries recovery planning. The biological opinion (NMFS 2000) 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 biological opinion (NMFS 2000) 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 actions 179, 180, and 183.

4.2.7 Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code

The Idaho Forest Practices Act was passed by the state Legislature in 1974 and amended by the Legislature in 1980, 1986, 1987, 1989, 1990, 1991, 1992, 1995, and 2001 (IDL 1996). These rules constitute the minimum standards for conducting 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 that, at maturity, are or could be capable of furnishing raw material used in manufacturing lumber or other forest products. Although the rules of this act apply to activities on federal and private lands within Idaho, the state does not hold management authority over these lands. Standards are established for stream protection zones (SPZ) around streams, and 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 Forest Practices Act 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, the 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 migrating 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 SPZs 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 than other approaches do for providing either not enough or too much protection. The analysis compared Idaho practices with practices in 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.

5 Restoration and Conservation Projects

5.1 Implementation Projects

The following list of projects in Table 8 was drawn from the subbasin summary (Saul et al. 2001), from agency websites and from information collected from subbasin planning participants.

Table 8 Description of existing restoration and conservation projects related to fish and wildlife habitats and species within the Snake Hells Canyon subbasin

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Craig Mountain WMA Grass Planting, Food (lots, irrigation improvements for wildlife)	1994 - ongoing	IDFG, BPA 920570 0 trust fund	IDFG	plants grass	Craig Mountain		wildlife habitat enhancement			
Craig Mountain WMA Grassland and Forest Restoration-Prescribed Burning	2002 - ongoing	IDFG, BPA 920570 0 trust fund	IDFG	uses prescribed burning	Craig Mountain		habitat enhancement	restore grasslands and forests		
Craig Mountain WMA Noxious Weed Spraying and Bio-Control	1994 - ongoing	IDFG, BPA 920570 0 trust fund	IDFG	sprays and uses bio-control for noxious weeds	Craig Mountain		habitat enhancement			
Craig Mountain WMA Tree and Shrub Plantings	1994 - ongoing	IDFG, BPA 920570 0 trust fund	IDFG	plants trees and shrubs	Craig Mountain		habitat enhancement			

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Creel Census of Steelhead Trout Sport Fisheries (conducted during open seasons for each)	1982 - present	IDFG, LSRCP /WDFW		conducts surveys to learn estimated angler participation (hours fished) and harvest. Harvest can be cataloged by specific hatchery contribution (marked fish only).			steelhead trout populations		conclusion that angler use and harvest vary from year to year	
Dworshak Wildlife Mitigation Trust	1992 - present	BPA 9205700	IDFG	conducts surveys of baseline wildlife and wildlife habitat conditions on the Craig Mountain Wildlife Management Area; enters data into the IDFG GIS	Idaho		wildlife populations and habitat	restore habitats impacted by past logging and grazing activities, provide biologically diverse plant and wildlife communities, and provide opportunities for wildlife-associated recreation and solitude		

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Evaluate Rebuilding the White Sturgeon Population in the Lower Snake Basin	1997 - present	BPA 199700900	NPT	evaluates the need for and identifies potential measures to protect and restore white sturgeon between Hells Canyon and Lower Granite dams to obtain a sustainable annual harvest	Snake River: Lower Granite Dam, WA; Salmon River: mouth of Salmon River, ID; Salmon River: confluence of Vinegar Creek and Salmon River, ID; Clearwater River: mouth of Clearwater River (Lewiston), ID; Clearwater River: Orofino, ID	46N39'40" /117W25'44"; 45N14'35" /45N14'35"; 45N51'19" /116W47'38"; 45N27'35" /115W54'09"; 46N25'28" /117W02'11"; 46N28'47" /116W15'36"	white sturgeon population and habitat	coordinate with fisheries comanagers and funding entities and disseminate information, develop an adaptive management plan, and restore white sturgeon population to provide an annual sustainable harvest of 5 kg/ha/yr	a draft estimate of white sturgeon population abundance from Lower Granite Dam to Hells Canyon Dam, verification of white sturgeon spawning attempts in Snake and Salmon rivers by recovery of white sturgeon eggs, description of age and growth of Hells Canyon white sturgeon population, and radio-tagging of first gravid female white sturgeon	White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers; Assessing Genetic Variation among Columbia Basin White Sturgeon Populations; Kootenai River White Sturgeon Studies and Conservation Aquaculture; Kootenai River Fisheries Recovery Investigations :Oxbow/Hells Canyon Reservoirs Consumptive Sturgeon Fishery

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Forest Inventory- Peter T. Johnson Wildlife Mitigation Unit-Craig Mountain, Idaho	1993 - 1994	BPA 199206 900	IDFG		Craig Mountain					
Hells Canyon Initiative	ongoing	multiple/IDFG	multiple/IDFG	includes an assessment of the background and current conditions of the bighorn sheep, as well as goals and objectives for restoring the species				to restore Rocky Mountain bighorn sheep to Hells Canyon		
Idaho Natural Production Monitoring and Evaluation	1984 - present	BPA 199107 300	IDFG	monitors trends in spring/summer chinook salmon and steelhead trout populations in the Salmon, Clearwater, and lower Snake river drainages	Idaho		spring/summer chinook salmon and steelhead trout population and habitat	establish a long-term parr monitoring database, estimate adult escapement in key tributaries, evaluate egg-to-parr survival in streams treated with habitat improvement structures, monitor stock-recruitment trends, and estimate smolt-to-adult survival		
IPC Fall	2001	IPC	IPC	mitigates for fall			artificial			

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Chinook Mitigation	ongoing			chinook salmon			production			
LSRCP Fall Chinook Acclimation and Releases	1995 - ongoing	NPT	NPT	uses acclimation and release for fall chinook salmon	lower Snake River		artificial production			
LSRCP Steelhead and Fall Chinook Production	1985 - ongoing	WDFW	WDFW	produces steelhead trout and fall chinook salmon	lower Snake River		artificial production			
Monitor and Evaluate the Spawning Distribution of Snake River Fall Chinook	1998 - ongoing	BPA 199801003	USFWS	Long-term monitoring and evaluation of spawning numbers and distribution of fall chinook salmon to determine progress towards run rebuilding	Free flowing Snake River from Asotin to Hells Canyon Dam	45N48'25.6"/116W 41'21.5"; 45N46'6.6"/116W 45'0.7"; 46N2'3.5"/117W 15'10.4"; 45N37'54.0"/116W 28'23.3"; 46N8'27.6"/116W 56'3.5"; 46N30'17.4"/116W 33'4.0"	Snake River fall chinook salmon populations	Consistently monitor the annual spawn timing, numbers, and distribution of returning fall chinook salmon to track population trends and habitat usage	The monitoring has proven the deep water spawning of fall Chinook salmon and standardized the survey for year to year comparison. Since 1990 there has been an upward trend that greatly increased in 1999. This increase is tied to an increase in returning hatchery fall Chinook salmon.	monitoring and evaluation of yearling Snake River fall chinook; Life History and Survival of Fall Chinook Salmon in the Columbia River Basin; Evaluating Restoration Potential of Mainstem Habitat for Anadromous Salmonids in the Columbia and Snake Rivers; Evaluating

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
										adult fall chinook salmon fallback at Priest Rapids Dam, Columbia River; etc.

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Monitoring and Evaluation of Yearling Snake River Fall Chinook Released Upstream of Lower Granite Dam	1998 - present	BPA 199801004	NPT	monitors and evaluates survival and performance of yearling fall chinook salmon from Pittsburg Landing, Big Canyon, and Captain John acclimation facilities (Project 199801005) to maximize success of the fall chinook supplementation program above Lower Granite Dam	Big Canyon Acclimation Facility-Clearwater R.; Captain John Rapids Acclim. Facility-Snake R; Pittsburg Landing Acclimation Facility-Snake River; Fixed Telemetry site at Asotin, WA-Snake R; Fixed Telemetry Site at Potlatch Mill (Lewiston, ID)-Clearwater R.; L. Granite Dam; Snake R. at confluence with Columbia R.	46N29.81/116W26.261; 46N8.416/116W55.976; 45N37.969/116W28.624; 46N20.576/117W2.255; 46N26.126/116W57.576; 46N39.593/117W25.743; 46N11.221/119W1.721	fall chinook populations and habitat	monitor, evaluate, and compare pre-release and release conditions of yearling hatchery fall chinook released; monitor, evaluate, and compare migration timing and survival of yearling fall chinook; and monitor and compare contribution and distribution of adult returns and smolt-to-adult survivals of yearling fall chinook	monitoring and tagging data since 1994; in 2001, PIT-tagging of 7,503 yearling chinook at Pittsburg Landing, 7,499 at Big Canyon, and 2,518 at Captain John Rapids facilities in cooperation with the WDFW (at Captain John Rapids)	fall and summer chinook salmon; monitoring of passage of juvenile salmonids through dams and reservoir

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Pittsburg Landing (199801005), Captain John Rapids (199801007), Big Canyon (199801008) Fall Chinook Acclimation Facilities	1998 -	BPA 199801005	NPT	supplements natural production of Snake River fall chinook above Lower Granite Dam through acclimation and final rearing of Lyons Ferry yearlings and subyearlings at two sites on the Snake River and one site on the Clearwater River	Pittsburg Landing; Captain John Rapids; and Big Canyon	45N37'58" / 116W28'37"; 46N08'23" / 116W56'09"; 46N29'52" / 116W26'11"		supplement natural production of Snake River fall chinook above Lower Granite Dam through acclimation and final rearing of fish from Lyons Ferry Hatchery	monitoring and data collection since 1996; in 2001, assembly and operation at Pittsburg Landing, Big Canyon, and Captain John Rapids facilities, with 327,000 yearlings and 1.732 million subyearlings acclimated and released	monitoring and evaluation of Snake River fall chinook smolts; monitoring and evaluation of adult Snake River fall chinook returning to the Clearwater River drainage; monitoring of spawning distribution of Snake R fall chinook above L Granite D
Projects That Address Temperature and Sedimentation in Agricultural Lands in WA	1996 - ongoing	Asotin County Conservation District (ACCD)	ACCD	addresses temperature and sedimentation in agricultural lands	agricultural lands in WA		habitat enhancement, temperature, and sedimentation	reduce temperature and sedimentation in agricultural lands		

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Spawning Distribution of Fall Chinook Salmon in the Snake River	1998 - 2003	BPA 199801003	USFWS	Track the status and distribution of hatchery Snake River fall chinook salmon, to determine whether yearling-released supplemented hatchery fish spawn where intended, and gather information on the spawning distribution of fish released as subyearlings and natural fish	Snake River (middle) near Dug Bar; Imnaha River at Cow Creek; Grande Ronde River at Bogans; Pittsburg Landing Acclimation Facility (upper Snake River); Captain John Acclimation Facility (lower Snake River); Big Canyon Creek Acclimation Facility (Clearwater River)	45N48'25.6"/116W41'21.5"; 45N46'6.6"/116W45'0.7"; 46N2'3.5"/117W15'10.4"; 45N37'54.0"/116W28'23.3"; 46N8'27.6"/116W56'3.5"; 46N30'17.4"/116W33'4.0"	fall chinook populations and habitat	determine whether the current use of two acclimation-and-release facilities in the Snake River distribute spawners to the area near the acclimation facilities and throughout the habitat normally used by Snake River fall chinook salmon	captured and radio-tagged returning adults at Lower Granite Dam (the last dam they encountered prior to reaching their release reaches), monitored their movements, and assessed the performance of acclimation facilities in terms of their ability to distribute adults to their corresponding release reaches. The upper Snake River acclimation facility distributed spawners to the river intended at the highest rate observed. Though differences in water flow and temperature during immigration were possible explanations for these findings, acclimation facility location provided the most plausible explanation. Conclude acclimation facility location can affect pre-spawning movement and the spawning distribution	Life History and Survival of Fall Chinook Salmon in the Columbia River Basin; Evaluating Restoration Potential of Mainstem Habitat for Anadromous Salmonids in the Columbia and Snake Rivers; Evaluating adult fall chinook salmon fallback at Priest Rapids Dam, Columbia River; etc.

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
									of hatchery fall chinook salmon in the Snake River basin.	

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
The effects of summer flow augmentation on the migratory behavior and survival of juvenile Snake River fall chinook salmon	1991 — Present	BPA 199102900	USFWS, USGS	Monitors and evaluates the effect of summer flow augmentation on rate of seaward movement and survival of Snake River fall chinook salmon to help restore a sustainable population.	Hells Canyon Dam to Lower Granite Dam	46N39'40"/117W25'44; 45N14'35"/45N14'35; 45N51'19"/116W47'38; 45N27'35"/115W54'09; 46N25'28"/117W02'11; 46N28'47"/116W15'36	Coordinate with fisheries managers to restore water temperatures to historical levels	Increase fall chinook salmon smolt survival and restore the population to levels required for ESA de-listing	Annual inseason briefings to managers to help plan and evaluate summer flow augmentation. Annual reports to BPA. Over 20 peer-reviewed journal manuscripts.	Provides data and analyses to the Fish Passage Advisory Committee, Technical Management Team, Independent Scientific Advisory Board, and the Northwest Power Planning Council.
Upstream Passage, Spawning, and Stock Identification of Fall Chinook in the Snake River, 1991-1993	1991 - 1993	BPA 199204600	WDFW		Snake River					

Project Title	Project Duration	Funding Source and ID Number	Responsible Agency	Description	Scale of Project	X/Y UTM or Lat/Long	Key Ecological Functions	Goal of Project	Results of Project	Relationship to Other Activities in Subbasin
Vegetative Description, Rare Plant Inventory, and Vegetation Monitoring for Craig Mountain, Idaho	1993	BPA 199206900	IDFG		Craig Mountain		plant populations and habitat			
Wildlife Habitat Improvements -Forest Restoration	1993 - ongoing	IDFG	IDFG	restores forests	Idaho		habitat enhancement	restore forests		
Wildlife Inventory, Craig Mountain, ID	1993 - 1994	BPA 199206900	IDFG		Craig Mountain		wildlife populations and habitat			

6 Gap Analysis

This section attempts to assess the ability of existing projects to address the prioritized needs identified in the subbasin plan.

Aquatic concerns in mainstem habitats are collectively considered a high priority for protection and improvement of current conditions to enhance fish and wildlife status in the subbasin (*Snake Hells Canyon Management Plan* Section 8). Mainstem habitats are used by all focal aquatic species and are the primary habitats used by all life history stages of two focal aquatic species (fall chinook and white sturgeon). All opportunities to improve mainstem habitats in the Snake Hells Canyon subbasin should be viewed as high priority for implementation. No mainstem habitat projects were identified as part of this process and the potential for future projects will largely be decided as part of the FERC relicensing process for the Hells Canyon Complex. A number of research projects for the mainstem have been identified in Table 8.

Prioritization of aquatic concerns in tributary habitats in need of protection and/or restoration is summarized from the Qualitative Habitat Assessment (QHA) presented in the subbasin assessment (See assessment section 4.1 and assessment Appendix H).

In tributaries prioritized for restoration, the factors of greatest concern (limiting factors) are riparian condition, fine sediment, and channel stability (Table 10 in the Management Plan). Localized limiting factors prioritized for restoration in lesser numbers of tributaries include high and low flow, pollutants (associated with grazing activities), high and low temperature, channel form, and oxygen. Inherent in the definition of all restoration needs is the interim need to protect from further degradation those same issues until restoration activities can occur. The only programs identified actively addressing tributary restoration needs are USDA programs that work with private landowners. The number of problems identified in the assessment point towards the needs to develop more projects and programs directly addressing small tributary problems in Hells Canyon.

In tributaries prioritized for protection, priority issues include fine sediment, riparian condition, channel stability, and high flow (Table 11 of the Management Plan). In those streams, prioritized for both protection (Table 11 of the Management Plan) and restoration (Table 10 of the Management Plan) actions, prioritized factors often overlap. In these cases, measures should be implemented to protect against worsening of the current situation, with a longer-term goal of restoration of the necessary conditions. The Snake Hells Canyon Subbasin contains significant portions of tributary habitat in protected status, as reflected in the protections outlined in Section 2 of this inventory. At the same time, the prioritization for protection exercise developed as part of QHA in the assessment indicates that numerous small tributary reaches are in need of additional protections. Further projects need to be developed through the USDA programs currently available working on private lands and additional projects need to be developed to address the needs identified in the Hells Canyon Assessment and Management Plan.

Protecting and restoring terrestrial habitats—particularly riparian areas and wetlands, grasslands and mature ponderosa pine and late seral stage habitats. Of these, the priorities in forested habitats will most likely be addressed primarily through changes in management by federal agencies. Riparian areas, wetlands, and grasslands currently have few actual implementation

projects identified in this inventory, except for projects addressing noxious weeds and USDA projects focus on water quality or riparian habitat. Many projects need to be developed to address these priority needs.

The second tier of needs focus on projects addressing land use derived limiting factors. The first priority problem identified is noxious weeds. Several programs and projects have been identified in this assessment (Sections 2, 3, and 5 of this Inventory) and while efforts to address problems with noxious weeds are growing in scale and coordination, a consensus existed in the Planning and Technical Teams that these efforts need to be dramatically grown as soon as possible if they are to match the scale of the current and potential problems faced by habitats in the subbasin. A number of programs (Section 3) address the second priority land use, livestock grazing. While this problem has been improved dramatically since historic times, much work remains to be done on private and some federal lands. More projects, especially in riparian areas supporting anadromous fish, need to be developed and completed to address problems associated with this land use. Much more work needs to be completed addressing road associated problems in the subbasin as well. No programs or project specifically addressing road problems was identified, although federal management has ongoing management of road related problems as part of more general management implementation.

The species specific priorities identified in Section 8.2.3.3 of the management plan have no corresponding projects identified in the inventory. Much about the terrestrial species of the subbasin is unknown projects should be developed to fill these data gaps and to address known species level problems.

Current or ongoing RM&E programs (as described in the inventory) incorporate many of the RM&E needs identified in Section 6.2, 6.3 and 6.4 of the management plan. Development of new projects in the subbasin will therefore need to be coordinated with existing programs to maximize effectiveness, reduce redundancy, and enhance spatial and temporal data comparability. The broad nature of identified strategies will likely result in the delineation of multiple focused restoration or implementation projects that, when results are combined, will address the overall need identified in the subbasin plan. For this reason, short- and long-term indicators of success described in Table 8 in the subbasin plan should be considered as guidance for future project development rather than as rigidly defined indicators to be used in RM&E project components. Future projects should delineate RM&E strategies and indicators appropriate to the scale and intent of the individual project while considering the overall guidance/direction provided in Section 6 of the plan to ensure that small-scale project goals and outcomes are consistent with broader-scale (subbasinwide or basinwide) goals and direction. Research programs have been identified in Section 2.5 of this inventory, but as Table 8 in the *Snake Hells Canyon Subbasin Management Plan* reflects existing research efforts fall far short of what the Technical Team thinks adequate to meet the information needs of planning and implementation in the subbasin.

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U.S. Department Agriculture, Forest Service, Pacific Northwest Research Station, Portland,
OR.

8 Appendices

Appendix A APRE Summaries for Hells Canyon Subbasin

8.1.1 Captain John Integrated Fall Chinook APRE Summary

Program name:	Fall Chinook (Captain John)- Integrated	
Subbasin:	Snake Hells Canyon	
ESA status:	Threatened	
Operator: WDFW	Co-operators	Role
	U.S. Fish & Wildlife Service	Lower Snake River Compensation Plan- Program Funding & Oversight
	Nez Perce Tribe	Co-Manager
	Confederated Tribes of the Umatilla Indian Reservation	Co-Manager
	National Marine Fisheries Service	Co-Operator/Operator of Adult Trap at Lower Granite Dam
	Idaho Power Company	Co-Operator/Mitigation Funds for Hells Canyon Dam
	Idaho Department of Fish & Game	Co-Operator/Rears Idaho Power Company Mitigation Fish
Funding Source(s)	Lower Snake River Compensation Plan Mitigation Funds- U.S. Fish & Wildlife Service	
Annual Operating Cost*	\$ 1,125,217	

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

The purpose of this program is to contribute to: Harvest, Conservation/recovery and Research and/or education, **as mitigation for:** Hydro impacts

This is an integrated program.

Program description:

Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Fingerling	800000	65 (Mid April release) and 55 (early)	June 1 and June	Snake River (17 miles south of	263	Snake Hells Canyon	Blue Mountain

		June release)					
Yearling	150000	10	April 15	Snake River (17 miles south of Asotin, WA)	263	Snake Hells Canyon	Blue Mountain

Comment:

Broodstock holding and spawning facilities:

Broodstock are derived from on-station volitional adult returns, and adult trapping at the Lower Granite Adult Trapping Facility. Fall chinook collected at Lower Granite Dam are held separately from those that voluntarily enter the hatchery. Adults are held, matured, and spawned at the LFH facility.

Incubation facilities:

The incubation room at LFH is designed to accept and incubate eggs from individual females through the eyed stage. Each stack of Heath trays has its own water source. Water is single use flow through. Each female will be kept separate until eye-up. After eyeing is complete and ELISA and virus sample results are received, eggs will be combined, according to sample results, and placed in trays with substrate. Eggs with positive ELISA results will be kept separate or destroyed, according to fish health/production protocol. Eggs will hatch in the incubation trays and fry will be ponded in raceways at LFH.

Rearing facilities:




Initial fish rearing will occur in the south raceways (100 X 10 X 2.8 ft). Fish are separated into yearling and subyearling production groups. The yearling production is retained in the south raceway units, and the subyearling production are transferred to large raceways (18 ft wide x 150 ft long x 4.3 ft deep).





Acclimation/release facilities:

Yearling fall chinook will be transported to Capt. John Rapids by early February to allow rearing space for sub-yearling fish at Lyons Ferry. Acclimation on river water will occur for 6 weeks prior to a volitional release. Sub-yearlings are transported to the acclimation facility between early May and early June, and are volitionally released approximately three weeks later. Two groups of sub-yearlings (early June and late June release groups) are acclimated, and released from Capt. John Rapids.

Broodstock source	Snake River Fall Chinook (Threatened Species/Stock)
Broodstock collection location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Snake Lower
Adult holding location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Snake Lower
Spawning location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Snake Lower
Incubation location (facility name, stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Snake Lower
Rearing location (facility name, stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Snake Lower

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Snake River Fall Chinook	N	1976	U

Status and goals for target stock:			
 = Low	 = Medium	 = High	
	Now	10-15 years	30-50 years

Biological Significance			
Viability			
Habitat			

Hatchery program performance indicators for the target stock:			
Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The goal for this stock is to maintain its biological significance and improve its viability. The program has primary mitigation goals of (1) recovery/supplementation and conservation of Snake River fall chinook and (2) harvest supplementation of fall chinook for fisheries in the lower/mid Snake River, Columbia River/Estuary, and Pacific Ocean. The program is consistent and compatible with management, conservation, and research goals of the stock and other stocks within the Snake Hells Canyon Subbasin.

The program is tailored to address and perform according to stipulations and objectives set forth in the Lower Snake River Compensation Plan for Lower Snake River hydroelectric projects and research/M&E activities. The Annual Lower Snake River Compensation Plan agreement sets forth specific program performance indicators (fish size & release numbers, survival, etc.) that are explicitly monitored and evaluated. The program is adaptively managed to adhere to stated program performance standards

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

Broodstock Collection

- If the wild population has 150 fish or more, collection of wild broodstock should be limited to 30% of the population.

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Incubation

- IHOT species-specific incubation recommendations should be followed for density parameters.
- Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
- Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

- The water used for rearing should provide natural water temperature profiles that result in fish similar in size to naturally produced fish of the same species.
- The program should use a diet and growth regime that mimics natural seasonal growth patterns.
- IHOT juvenile rearing standards should be followed for predator control measures to provide the necessary security for the cultured stock.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Fish produced should be qualitatively similar to natural fish in behavior.

M&E

- Goals for the program should be documented so that results can be adequately evaluated.
- Results of program evaluation should be reported/documentated so that they can be taken into consideration when determining whether hatchery operations should be changed.
- Adults from this program should not make up more than 30% of the natural spawning escapement (for the species/race) in the subbasin.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Fall Chinook (Captain John)- Integrated in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H
Fall Chinook (Captain John)-Integrated	Threatened	M	H
Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC)-Integrated	Threatened	M	H

Additional reviewer comments:

The program uses broodstock that is derived from fall chinook adults captured at the Lyons Ferry Hatchery and Lower Granite Dam adult collection facilities.
 The program fish are marked at a 100% rate.
 Adult monitoring at the Lyons Ferry Hatchery and Lower Granite Dam adult trapping/monitoring facilities provide a mechanism for discriminating returning program adults from Non-Snake River origin fall chinook. The discrimination of program adult returns at the Lyons Ferry and Lower Granite Dam provides the ability to monitor and evaluate program adherence to the integrated stock criteria, the integrity of Snake River fall chinook strain, and program performance standards.

Manager/operator response:

Per CTUIR: Program fish are not 100% marked. See other comments for Lyons Ferry.

8.1.2 IPC Integrated Fall Chinook APRE Summary

Program name:	Fall Chinook (IPC)- Integrated	
Subbasin:	Snake Hells Canyon	
ESA status:	Threatened	
Operator: WDFW	Co-operators	Role
	U.S. Fish & Wildlife Service	Lower Snake River Compensation Plan- Program Funding & Oversight
	Nez Perce Tribe	Co-Manager
	Confederated Tribes of the Umatilla Indian Reservation	Co-Manager
	National Marine Fisheries Service	Co-Operator/Operator of Adult Trap at Lower Granite Dam
	Idaho Power Company	Co-Operator/Mitigation Funds for Hells Canyon Dam
	Idaho Department of Fish & Game	Co-Operator/Rears Idaho Power Company Mitigation Fish
	Oregon Department of Fish and Wildlife	Co-Manager/Rears fish at Umatilla Hatchery
Funding Source(s)	Idaho Power Company per Hells Canyon Settlement Agreement	
Annual Operating Cost*	\$ 173,000	

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

The purpose of this program is to contribute to: Harvest, Conservation/recovery and Research and/or education (Provide research fish for NOAA Fisheries survival studies), **as mitigation for:** Hydro impacts and Habitat loss.

This is an integrated program.

Program description:

Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs							
Unfed Fry							
Fry							
Fingerling	500,000	40-50	May 15-June 1	Snake River below Hells Canyon Dam	397	Blue Mountain	Mountain Snake
Yearling							

Comment:

PROGRAM DESCRIPTION: Based on a 1980 settlement agreement, Idaho Power Company is committed to release 1,200,000 fall chinook subyearlings as mitigation for hydroelectric development impacts/losses.

Lyons Ferry Hatchery Complex Broodstock holding and spawning facilities:
 Broodstock are derived from on-station volitional adult returns, and adult trapping at the Lower Granite Adult Trapping Facility. Fall chinook collected at LGR Dam are held separately from those that voluntarily enter the hatchery. Adults are held, matured, and spawned at the LFH facility.

Lyons Ferry Hatchery Complex Early Incubation facilities (Eyed Eggs):
 The incubation room at LFH is designed to accept and incubate eggs from individual females through the eyed stage. Each stack of Heath trays has its own water source. Water is single use flow through. Each female will be kept separate until eye-up. After eyeing is complete and ELISA and virus sample results are received, eggs will be combined, according to sample results, and placed in trays with substrate. Eggs with positive ELISA results will be kept separate or destroyed, according to fish health/production protocol.

Oxbow Hatchery (IDFG) and Umatilla Hatchery (ODFW) Incubation facilities (Eyed Egg-Swimup stages):
 Eyed eggs are transferred to Oxbow and Umatilla Hatcheries for egg incubation (eyed to swimup)

Oxbow Hatchery (IDFG) and Umatilla Hatchery (ODFW) Rearing facilities:
 Swimup fry are ponded and reared to fingerling stage (60 - 75 fpp)

Direct Fish Releases Below Hells Canyon Dam:
 Subyearling fall chinook (60 - 75 fish/lb) are transported from Oxbow and Umatilla Hatcheries and directly released into the Snake River.

Broodstock source	Snake River Fall Chinook (Threatened Species/Stock)
Broodstock collection location (stream, Rkm, subbasin)	Lyons Ferry Hatchery/Snake River/Rkm 95/Lower Snake
Adult holding location (stream, Rkm, subbasin)	Lyons Ferry Hatchery/Snake River/Rkm 95/Lower Snake
Spawning location (stream, Rkm, subbasin)	Lyons Ferry Hatchery/Snake River/Rkm 95/Lower Snake
Incubation location (facility name, stream, Rkm, subbasin)	Lyons Ferry Hatchery/Snake River/Rkm 95/Lower Snake; Umatilla Hatchery/Offstream of Columbia R./Columbia Lower Middle; and Oxbow Hatchery/Snake River/Lower Middle Snake
Rearing location (facility name, stream, Rkm, subbasin)	Umatilla Hatchery/Offstream of Columbia R./Columbia Lower Middle; and Oxbow Hatchery/Snake River/Lower Middle Snake

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Snake River Fall Chinook	N	1976	U

Comment:

text from HGMP:

The Snake River fall chinook ESU consists of fall chinook which spawn in the Snake, Clearwater, Salmon, Imnaha, and Grande Ronde river basins.

After adaptation of the LSRCP program in 1976, WDFW initiated a fall chinook egg bank development program for the Snake River. WDFW initiated adult trapping at IHR Dam between 1977 and 1993. In addition, fish have been trapped on-site at LFH since 1984. Over time the program has changed to a supplementation program to enhance fall chinook production in the Snake River using Snake River stock. The incidence of stray fish in the broodstock at Lyons Ferry began increasing until 1989 when it was determined after spawning that 41% of fish used for broodstock were strays. It was decided that maintaining the genetic integrity of Snake River fall chinook was paramount. More over, the management agencies were concerned that strays were spawning in the wild with natural Snake River stock and the integrity of the natural population was being compromised. The 1989 brood year were not used as broodstock. In 1990, trapping also began at LGR Dam to monitor and remove strays from the Snake River

and to supplement broodstock for LFH. As of 1990 WDFW began reading coded wire tags to determine origin of fish prior to spawning. To benefit the integrity of natural populations, any fish of unknown origin were to be removed at LGR Dam and excluded from the broodstock used for supplementation. We continue to mate only known Snake River origin fish reared at the hatchery, in an effort to benefit the integrity of fall chinook in the Snake River. Genetic sampling and characterization has been done and results indicate that Snake River stock reared at Lyons Ferry Hatchery are indeed closer to the original natural spawning population in the Snake River, than the Columbia River stocks or the Snake River population during high stray rate years. In 1993 trapping ceased at Ice Harbor dam because of the high number of strays from the Columbia River that were detected during a three year radio telemetry project. We plan to continue trapping at LFH and supplementing the broodstock with fish trapped at LGR Dam. Once stray rates have decreased to below 5% in the Snake, managers desire to include up to 10% naturally produced Snake River stock fall chinook in LFH broodstock annually.

Status and goals for target stock:			
	Now	10-15 years	30-50 years
Biological Significance	●	●	●
Viability	◐	●	●
Habitat	○	○	○

Hatchery program performance indicators for the target stock:			
Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The goal for the stock is to maintain biological significance and improve viability over time. The program has primary mitigation goals of (1) recovery/supplementation and conservation of Snake River fall chinook and (2) harvest supplementation of fall chinook for fisheries in the lower/mid Snake River, Columbia River/Estuary, and Pacific Ocean. The program appears to be consistent and compatible with management, conservation, and research goals of the stock and other stocks within the Snake Hells Canyon Subbasin.

The program is tailored to address and perform according to stipulations and objectives set forth in the Idaho Power Company Agreement and Plan for IPC Snake River hydroelectric projects and research/M&E activities. The IPC Plan/Agreement sets forth specific program performance indicators (fish size & release numbers, survival, etc.) that are explicitly monitored and evaluated. The program is adaptively managed to adhere to stated program performance standards.

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

Broodstock Collection

- If the wild population has 150 fish or more, collection of wild broodstock should be limited to 30% of the population.

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Incubation

- IHOT species-specific incubation recommendations should be followed for density parameters.
- Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- Rearing water should have a chemical profile significantly different from natural stream conditions to provide adequate imprinting of hatchery fish and minimize the attraction of naturally produced fish into the hatchery.
- The water used for rearing should meet or exceed the recommended Integrated Hatchery Operations Team (IHOT) water quality standards for the following compounds: ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
- Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- The water used for rearing should provide natural water temperature profiles that result in fish similar in size to naturally produced fish of the same species.
- The program should use a diet and growth regime that mimics natural seasonal growth patterns.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Volitional releases during natural out-migration timing should be practiced.
- Fish should be released at an optimum time and size that has been determined by a site-specific survival study.
- Fish produced should be qualitatively similar to natural fish in behavior.

M&E

- Adults from this program should not make up more than 30% of the natural spawning escapement (for the species/race) in the subbasin.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Fall Chinook (IPC)- Integrated in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H

Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC)-Integrated	Threatened	M	H

Additional reviewer comments:

The program uses broodstock that is derived from fall chinook adults captured at the Lyons Ferry Hatchery and Lower Granite Dam adult collection facilities.
The program fish are marked at a 100% rate.
Adult monitoring at the Lyons Ferry Hatchery and Lower Granite Dam adult trapping/monitoring facilities provide a mechanism for discriminating returning program adults from non-Snake River origin fall chinook. The discrimination of program adult returns at the Lyons Ferry and Lower Granite Dam provides the ability to monitor and evaluate program adherence to the integrated stock criteria, the integrity of Snake River fall chinook strain, and program performance standards.

Manager/operator response:

Per CTUIR: Believe the fingerling goal is 400,000 at Pittsburg Landing. Program fish are not 100% marked. See other comments for Lyons Ferry.

8.1.3 Oxbow Fall Chinook APRE Summary

Program name:	Fall Chinook (Oxbow)		
Subbasin:	Snake Hells Canyon		
ESA status:	Threatened		
Operator: IDFG	Co-operators		Role
	Idaho Power		Funding source
Funding Source(s)	Idaho Power		
Annual Operating Cost*	\$ 173,000		

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

The purpose of this program is to contribute to: harvest (to provide consistent fishing opportunity, consistent with ESA needs), conservation/recovery, and research and/or education, **as mitigation for:** hydro impacts and habitat loss.

This is an integrated program.

Program description:

Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs							
Unfed Fry							
Fry	200,000	42	5/21/02	Snake River	397	Snake River	Mountain Snake
Fingerling							
Yearling							

Comment:

Fall chinook adults are collected at Lyons Ferry and eggs sent to Oxbow.

Broodstock source	Lyons Ferry
Broodstock collection location (stream, RKm, subbasin)	Lyons Ferry Hatchery, 397RKm, Snake River
Adult holding location (stream, RKm, subbasin)	Lyons Ferry Hatchery, 397RKm, Snake River

Spawning location (stream, Rkm, subbasin)	Lyons Ferry Hatchery, 397Rkm, Snake River
Incubation location (facility name, stream, Rkm, subbasin)	Snake River (Oxbow Hatchery), 397Rkm, Snake River
Rearing location (facility name, stream, Rkm, subbasin)	Snake River (Oxbow Hatchery), 397Rkm, Snake River

Comment:

Fall chinook adults are collected at Lyons Ferry and eggs sent to Oxbow.

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Lyons Ferry	H	2000	2003

Status and goals for target stock:			
	Now	10-15 years	30-50 years
Biological Significance	●	●	●
Viability	◐	●	●
Habitat	○	○	○

Hatchery program performance indicators for the target stock:			
Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The goals for the target stock are to maintain a high biological significance and increase viability from medium to high in the next 10-15 years for Fall Chinook (Oxbow). These goals are in place even though the habitat is currently limiting and is believed to remain so over the next 30-50 years. The purpose of this program is to contribute to harvest, conservation/recovery and research/education as mitigation for hydroelectric impacts and habitat loss, and the strategy in place to accomplish these goals is through an integrated program. The strategy of the program appears to be consistent with the conservation and recovery goals, though it is unclear if this is the priority for this stock.

This program is designed as an integrated program, but no wild broodstock are collected. Not incorporating wild broodstock into an integrated program poses the risk of divergence of the hatchery component of the stock from its natural component. However, this program does allow for contribution of hatchery fish to natural spawning by letting all hatchery fish escape to the spawning grounds. The broodstock source for this stock is from the Snake River, and the program does avoid stock transfers from out-of-basin, which helps to minimize disease transfers into the basin as well as the possibility of straying.

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

Broodstock Collection

- Representative samples of natural and hatchery population components should be collected with respect to size, age, sex ratio, run and spawn timing, and other traits important to long-term fitness.
- If the wild population has 150 fish or more, collection of wild broodstock should be limited to 30% of the population.

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Incubation

- Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- The water used for rearing should meet or exceed the recommended Integrated Hatchery Operations Team (IHOT) water quality standards for the following compounds: ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
- Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- The water used for rearing should provide natural water temperature profiles that result in fish similar in size to naturally produced fish of the same species.
- The program should use a diet and growth regime that mimics natural seasonal growth patterns.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Volitional releases during natural out-migration timing should be practiced.
- Fish produced should be qualitatively similar to natural fish in size.

M&E

- Goals for the program should be documented so that results can be adequately evaluated.
- Results of program evaluation should be reported/documented so that they can be taken into consideration when determining whether hatchery operations should be changed.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Fall Chinook (Oxbow) in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

Given the large numbers of fall chinook that are released into the subbasin, this program should take into account the carrying capacity of the habitat available to the stock (from freshwater to marine and back).

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H
Fall Chinook (Captain John)-Integrated	Threatened	M	H
Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC) Integrated	Threatened	M	H
Fall Chinook (Oxbow)	Threatened	M	H

Additional reviewer comments:

This program is the only one of four fall chinook programs in the Snake Hells Canyon subbasin that releases fry into the Snake River, though all four programs originate at Lyons Ferry Hatchery. While the program is designed as an integrated program, it does not incorporate wild fish into the hatchery broodstock, which increases the risk of divergence between the hatchery and natural components. There appear to be inconsistencies between the goals and operations and it would perhaps benefit the program to prioritize the goals for the stock with respect to harvest, conservation and research.

Manager/operator response:

- Text that will be added by manager/operator.
1. Hatchery fall chinook in Snake Basin ARE NOT listed – that goes for Oxbow, Lyons Ferry, NPTH, and the acclimation ponds (Captain John, Pittsburg Landing, and Big Canyon).
 2. Objective of program to provide fishing opportunity, consistent with ESA needs.
 3. Program does not provide research fish for NOAA.
 4. Suggest stock names in goals consistency section be natural summer steelhead (as shown) and natural fall chinook.

8.1.4 Pittsburgh Landing Integrated Fall Chinook APRE Summary

Program name:	Fall Chinook (Pittsburg Landing)-Integrated	
Subbasin:	Snake Hells Canyon	
ESA status:	Threatened	
Operator: WDFW	Co-operators	Role
	U.S. Fish & Wildlife Service	Lower Snake River Compensation Plan- Program Funding & Oversight
	Nez Perce Tribe	Co-Manager/Operator of Acclimation Facilities Above Lower Granite Dam
	Confederated Tribes of the Umatilla Indian Reservation	Co-Manager
	National Marine Fisheries Service	Co-Operator/Operator of Adult Trap at Lower Granite Dam
	Idaho Power Company	Co-Operator/Mitigation Funds for Hells Canyon Dam
	Idaho Department of Fish & Game	Co-Operator/Rears Idaho Power Company Mitigation Fish
Funding Source(s)	Lower Snake River Compensation Plan Mitigation Funds- U.S. Fish & Wildlife Service	
Annual Operating Cost*	\$ 1,125,217	

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

The purpose of this program is to contribute to: Harvest, Conservation/recovery and Research and/or education (Provide research fish for NOAA Fisheries survival studies), **as mitigation for:** Hydro impacts and Habitat loss.

This is an integrated program.

Program description:

Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs							
Unfed Fry							
Fry							
Fingerling	400,000	65	June 1	Snake River (31 miles downstream of Hells Canyon Dam)	346	Snake Hells Canyon	Blue Mountain
Yearling	150,000	10	April 15	Snake River (31 miles downstream of Hells Canyon)	346	Snake Hells Canyon	Blue Mountain

				Dam)			
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Comment:

Broodstock holding and spawning facilities:

Broodstock are derived from on-station volitional adult returns, and adult trapping at the Lower Granite Adult Trapping Facility. Fall chinook collected at LGR Dam are held separately from those that voluntarily enter the hatchery. Adults are held, matured, and spawned at the LFH facility.

Incubation facilities:

The incubation room at LFH is designed to accept and incubate eggs from individual females through the eyed stage. Each stack of Heath trays has its own water source. Water is single use flow through. Each female will be kept separate until eye-up. After eyeing is complete and ELISA and virus sample results are received, eggs will be combined, according to sample results, and placed in trays with substrate. Eggs with positive ELISA results will be kept separate or destroyed, according to fish health/production protocol. Eggs will hatch in the incubation trays and fry will be ponded in raceways at LFH.

Rearing facilities:

Initial fish rearing will occur in the south raceways (100 X 10 X 2.8 ft). Fish are separated into yearling and subyearling production groups. The yearling production is retained in the south raceway units, and the subyearling production are transferred to large raceways (18 ft wide x 150 ft long x 4.3 ft deep).

Acclimation/release facilities:

Yearling fall chinook will be transported to the acclimation facilities in early March by both WDFW and NPT. Acclimation on river water occurs for 6 weeks prior to a volitional release. Sub-yearlings will be transported to the acclimation facilities between early May and early June, and are volitionally released approximately three weeks later.

Broodstock source	Snake River Fall Chinook (Threatened Species/Stock)
Broodstock collection location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Lower Snake
Adult holding location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Lower Snake
Spawning location (stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Lower Snake
Incubation location (facility name, stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Lower Snake
Rearing location (facility name, stream, RKm, subbasin)	Lyons Ferry Hatchery/Snake River/RKm 95/Lower Snake

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Snake River Fall Chinook	N	1976	U

Status and goals for target stock:			
	Now	10-15 years	30-50 years
Biological Significance	●	●	●
Viability	◐	●	●

○ = Low ◐ = Medium ● = High

Habitat	○	○	○
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Hatchery program performance indicators for the target stock:

Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The program has primary mitigation goals of (1) recovery/supplementation and conservation of Snake River fall chinook and (2) harvest supplementation of fall chinook for fisheries in the lower/mid Snake River, Columbia River/Estuary, and Pacific Ocean. The program goals appear to be consistent and compatible with management, conservation, and research goals of the stock and other stocks within the Snake Hells Canyon Subbasin.

The program is tailored to address and perform according to stipulations and objectives set forth in the Lower Snake River Compensation Plan for Lower Snake River hydroelectric projects and research/M&E activities. The Annual Lower Snake River Compensation Plan agreement sets forth specific program performance indicators (fish size & release numbers, survival, etc.) that are explicitly monitored and evaluated. The program is adaptively managed to adhere to stated program performance standards.

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

- Broodstock Collection**
- If the wild population has 150 fish or more, collection of wild broodstock should be limited to 30% of the population.
- Adult Holding**
- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- Incubation**
- IHOT species-specific incubation recommendations should be followed for density parameters.
 - Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- Rearing**
- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
 - Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
 - The water used for rearing should provide natural water temperature profiles that result in fish similar in size to naturally produced fish of the same species.
 - The program should use a diet and growth regime that mimics natural seasonal growth patterns.

- IHOT juvenile rearing standards should be followed for predator control measures to provide the necessary security for the cultured stock.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Fish produced should be qualitatively similar to natural fish in behavior.

M&E

- Adults from this program should not make up more than 30% of the natural spawning escapement (for the species/race) in the subbasin.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Fall Chinook (Pittsburg Landing)-Integrated in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H
Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC)-Integrated	Threatened	M	H

Additional reviewer comments:

The program uses broodstock that is derived from fall chinook adults captured at the Lyons Ferry Hatchery and Lower Granite Dam adult collection facilities. The program fish are marked at a 100% rate. Adult monitoring at the Lyons Ferry Hatchery and Lower Granite Dam adult trapping/monitoring facilities provide a mechanism for discriminating returning program adults from Non-Snake River origin fall chinook. The discrimination of program adult returns at the Lyons Ferry and Lower Granite Dam provides the ability to monitor and evaluate program adherence to the integrated stock criteria, the integrity of Snake River fall chinook strain, and program performance standards.

Manager/operator response:

Per CTUIR: Believe the fingerling goal is 400,000 at Pittsburg Landing. Program fish are not 100% marked. See other comments for Lyons Ferry.

8.1.5 Hatchery Spring Chinook APRE Summary

Program name:	Spring Chinook - Hatchery		
Subbasin:	Snake Hells Canyon		
ESA status:	Not listed and not a candidate for listing		
Operator: IDFG	Co-operators		Role
	Idaho Power		Funding source
Funding Source(s)	Idaho Power		
Annual Operating Cost*	\$239,000 (FY 2004)**		

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

**including the summer steelhead and not including feed costs directly paid by IPC.

The purpose of this program is to contribute to Harvest as mitigation for Hydro impacts and Habitat loss.

This is a segregated program.

Program description:










Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs							
Unfed Fry							
Fry							
Fingerling							
Yearling	500,000	20	3/16/2003	Snake River	397	Snake Hells Canyon	Blue Mountain

Broodstock source	Snake River spring chinook
Broodstock collection location (stream, RKm, subbasin)	Snake River trap, Snake River, RKm?, Snake River
Adult holding location (stream, RKm, subbasin)	Oxbow Hatchery, Snake River, 429RKm, Snake River
Spawning location (stream, RKm, subbasin)	Oxbow Hatchery, Snake River, 429RKm, Snake River
Incubation location (facility name, stream, RKm, subbasin)	Oxbow Hatchery, Snake River, 429RKm, Snake River; Rapid River Hatchery, Rapid River, 4RKm, Snake River
Rearing location (facility name, stream, RKm, subbasin)	Rapid River Hatchery, Rapid River, 4RKm, Snake River

Comment:

The Oxbow Hatchery traps Snake River spring chinook and incubates eggs that are reared and released at the Rapid River Hatchery. The Oxbow Fish Hatchery is at River Mile 594 and the Hells Canyon Trap is at River Mile 570.

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Oxbow and Rapid River spring chinook	H	1962	2003

Status and goals for target stock:			
	Now	10-15 years	30-50 years
Biological Significance			
Viability			
Habitat			

Hatchery program performance indicators for the target stock:			
Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The goals for the target stock are to maintain the current medium biological significance and high viability of the Snake River hatchery spring chinook, as well as provide annual harvest. The purpose of this program is to provide harvest as mitigation for loss of sport angling opportunity from hydroelectric development in the Columbia and Snake River basins. The strategy employed to accomplish these goals is through a segregated harvest program, which is consistent with the goals for this stock.

All hatchery spring chinook are marked and are available for harvest. Using marking/tagging techniques that allow for distinguishing fish by non-lethal means allows selective fisheries for hatchery fish to occur and facilitates program evaluation. **The managers have provided no information on the program's contribution to harvest, therefore it is not possible to determine if harvest goals are being met.**

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- Rearing water should have a chemical profile significantly different from natural stream conditions to provide

adequate imprinting of hatchery fish and minimize the attraction of naturally produced fish into the hatchery.

Release

- Volitional releases during natural out-migration timing should be practiced.
- Fish should be released at an optimum time and size that has been determined by a site-specific survival study.
- Marking/tagging techniques should be used to distinguish among segments of the hatchery population.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Spring Chinook - Hatchery in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

There are no other natural spring chinook stocks in the subbasin. The managers are not aware if the carrying capacity of the subbasin has been taken into consideration when sizing this program. There is a risk that fish from this program will have competitive interactions with other naturally produced stocks. Potential predation from program spring chinook on other natural stocks and other adverse ecological interactions are minimized by ensuring the migratory status of the spring chinook through ATPase sampling and volitional release.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H
Fall Chinook (Captain John)-Integrated	Threatened	M	H
Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC)-Integrated	Threatened	M	H

Additional reviewer comments:

This is a segregated hatchery program. The program uses in-basin rearing of hatchery-origin broodstock returning to Oxbow Hatchery, increasing the likelihood of long term survival, maintaining among population diversity, and reducing the likelihood of unexpected ecological interactions. Genetic diversity of the stock is maintained with a large effective population and by randomly mating a representative sample of the entire run.

The feeding regime mimics natural seasonal growth patterns, promoting proper smoltification and age-structure of the population. Rearing density and loading rates are based on standardized agency guidelines, and survival studies conducted on-site and at other facilities. Release size and time are determined by juvenile production goals. The majority of program fish are volitionally released. ATPase subsampling is used to determine the migratory status of the fish prior to release.

The managers indicate that there are specific goals for in-culture performance (IHOT) of fish from this program, which are attained. Post-release performance standards, as indicated in annual reports, HGMP, and PIT tag evaluations, are met most years depending on flow conditions. It is not clear if a formal adaptive management plan is associated with the program, which incorporates the elements needed to make informed changes to this program when necessary. All new relevant information is available to hatchery staff on a realtime basis and is used for attaining goals. All hatchery fish are marked, facilitating program evaluation. However, smolt-to-adult survival, total catch, escapement and spawning data were not

provided and are assumed to not be readily available.

Specific Recommendations:

1. Consider the carrying capacity of the subbasin in sizing this program.
2. Evaluate use of enriched environments.
3. Produce fish that are qualitatively similar to natural fish in growth rate and size.
4. Volitionally release all program fish.
5. Conduct site-specific studies to determine optimal release size and time.
6. Improve hatchery intake structures to meet current NMFS standards.

Manager/operator response:

1. Annual operating costs should be \$239,000 (FY 2004) including the summer steelhead and not including feed costs directly paid by IPC.
2. Oxbow production is reared at Rapid River Fish Hatchery and is generally never over a 500k-smolt release at Hells Canyon Dam, not the 3,000,000 as stated in the APRE Summary in the program description.
3. Rapid River and Oxbow Spring Chinook are not considered separate stocks, and are intermingled at Rapid River. A portion is returned to Hells Canyon if full production goals are met. Higher return rates to Rapid River Fish Hatchery may preclude releases at Hells Canyon during low return years.
4. The Oxbow Fish Hatchery is at River Mile 594 and the Hells Canyon Trap is at River Mile 570.
5. **Comment:**
The Oxbow Hatchery traps Snake River spring chinook and incubates eggs that are reared and released at the Rapid River Hatchery. See Comment 2. Oxbow releases are reared at Rapid River Fish Hatchery, and generally do not exceed 500k. The remaining 2.5 (or more) million smolts are released at Rapid River.
6. Under "Guidelines for Improving key operational elements to increase the likelihood of meeting goals for the target stock", rearing water does not have to be significantly different from natural stream water since Rapid River is within 1 mile of the confluence of the Little Salmon River and all fish are trapped regardless of origin. Hatchery fish are sorted out and only naturally produced fish are released above a velocity barrier. Under the release section, all fish are marked as to hatchery origin already. I am not sure there are segments of the hatchery population; so differential marking is not needed.
7. Smolt to adult survival rates for hatchery-produced fish are available from annual brood year reports, which were available at the interviews. The survival rates are based upon length frequency to determine year class. IPC does not have an M and E program or budget to look at coded wire tag information.

8.1.6 Summer Steelhead APRE Summary

Program name:	Summer Steelhead - Hatchery	
Subbasin:	Snake Hells Canyon	
ESA status:	Not listed and not a candidate for listing	
Operator: IDFG	Co-operators	Role
	Idaho Power	Funding source, co-manager
	IDFG	co-manager
Funding Source(s)	Idaho Power Company	
Annual Operating Cost*	\$239,000 (FY 2004)**	

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

**including the spring chinook and not including feed costs directly paid by IPC.

The purpose of this program is to contribute to Harvest as mitigation for Hydro impacts and Habitat loss.

This is a segregated program.

Program description:							
Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (Rkm)	Major Watershed	Ecoprovince
Eggs							
Unfed Fry							
Fry							
Fingerling							
Yearling	550,000	4.5	03/20-05/12/2001	Snake River		Snake Hells Canyon	Blue Mountain

Broodstock source	Snake River A-run Steelhead returning to Oxbow Hatchery
Broodstock collection location (stream, Rkm, subbasin)	Snake River, 429Rkm, Snake River
Adult holding location (stream, Rkm, subbasin)	Snake River, 429Rkm, Snake River
Spawning location (stream, Rkm, subbasin)	Snake River, 429Rkm, Snake River
Incubation location (facility name, stream, Rkm, subbasin)	Oxbow Hatchery, Snake River, 429Rkm, Snake River
Rearing location (facility name, stream, Rkm, subbasin)	Niagara Springs Hatchery, Niagara Springs Creek, NA, Snake River

Comment:

The Oxbow Hatchery takes Snake River A-run steelhead eggs that are incubated for the Niagara Hatchery. Eggs are

taken at Oxbow hatchery and incubated. Niagara Springs Hatchery receives about half of the production as eyed eggs. The other half of Oxbow's eggs are incubated on chilled water to fry stage, then transported to Niagara Springs Hatchery as swimup fry. This practice reduces vat densities at NSH and delays development of fry so smolts will not be too large.

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Oxbow Hatchery A-run steelhead	H	1962	2003

Status and goals for target stock:

○ = Low ◐ = Medium ● = High

	Now	10-15 years	30-50 years
Biological Significance	◐	◐	◐
Viability	●	●	●
Habitat	●	●	●

Hatchery program performance indicators for the target stock:

Recruits per Spawner	Smolt-to-Adult Survival	Escapement and Hatchery Spawning	Total Catch

Consistency of hatchery program with the goals for the target stock:

The goals for the target stock are to maintain the current medium biological significance and high viability of the Snake River hatchery summer steelhead, as well as provide annual harvest. The purpose of this program is to provide harvest as mitigation for loss of sport angling opportunity from hydroelectric development in the Columbia and Snake River basins. The strategy employed to accomplish these goals is through a segregated harvest program, which is consistent with the goals for this stock.

All hatchery winter steelhead are marked and are available for harvest. Using marking/tagging techniques that allow for distinguishing fish by non-lethal means allows selective fisheries for hatchery fish to occur and facilitates program evaluation. Surplus hatchery fish are recycled to provide fishing opportunity. **The managers have provided no information on the program's contribution to harvest, therefore it is not possible to determine if harvest goals are being met.**

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock:

- Broodstock Collection**
- Sufficient broodstock should be collected to maintain an effective population size of 1000 fish per generation.

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- Rearing water should have a chemical profile significantly different from natural stream conditions to provide adequate imprinting of hatchery fish and minimize the attraction of naturally produced fish into the hatchery.
- The water used for rearing should meet or exceed the recommended Integrated Hatchery Operations Team (IHOT) water quality standards for the following compounds: ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Volitional releases during natural out-migration timing should be practiced.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Summer Steelhead - Hatchery in the Snake Hells Canyon*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

There is one Threatened summer steelhead stock in the subbasin with high biological significance and low viability. The managers indicate that the carrying capacity of the subbasin has been taken into consideration when sizing this program although it is unclear as to how this was accomplished. If this program has, in fact, been sized based on this consideration, the risk that fish from this program will have competitive interactions with other naturally produced steelhead stocks is reduced.

Fish from this program pose a risk of negative competitive interactions with natural summer steelhead and predation to naturally produced fall chinook stocks in the subbasin. Program fish are directly released, without determining their migratory status, from March 25 through May 9. The release window is dictated by the program size and transportation limitations. It currently takes 45 days to release 200,000 smolts at 4.5 fpp. Site-specific survival studies have found higher residualism in fish released prior to April 9.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Steelhead - Natural	Threatened	L	H
Fall Chinook (Captain John)-Integrated	Threatened	M	H

Fall Chinook (Pittsburg Landing)-Integrated	Threatened	M	H
Fall Chinook (IPC)-Integrated	Threatened	M	H

Additional reviewer comments:

This is a segregated hatchery program. The program uses in-basin rearing of hatchery-origin broodstock returning to Oxbow Hatchery, increasing the likelihood of long term survival, maintaining among population diversity, and reducing the likelihood of unexpected ecological interactions. Genetic diversity of the stock is currently maintained by randomly mating a representative sample of the entire run. However, the small effective population poses a risk to the genetic diversity and long-term viability of the stock.

The feeding regime mimics natural seasonal growth patterns, promoting proper smoltification and age-structure of the population. Managers intentionally select slow-sinking feed and avoid the use of floating feed. Rearing density and loading rates are based on standardized agency guidelines, IHOT, Piper *et al.*, staff experience and site-specific survival studies. Program fish are directly released, without determining their migratory status, from March 25 through May 9. The release window is dictated by the program size and transportation limitations. It currently takes 45 days to release 200,000 smolts at 4.5 fpp. Site-specific survival studies have found low incidence of residualism in smolts released after April 9. Hatchery staff would change release timing to coincide with optimal release window if sufficient transportation was provided.

The managers indicate that there are specific goals for in-culture performance of fish from this program, which are attained. There are no post-release performance standards. It is not clear if a formal adaptive management plan is associated with the program, which incorporates the elements needed to make informed changes to this program when necessary. All new relevant information is available to hatchery staff on a realtime basis and is used for attaining goals. All hatchery fish are marked, facilitating program evaluation. However, smolt-to-adult survival, total catch, escapement and spawning data were not provided and are assumed to not be readily available.

Specific Recommendations:

7. Evaluate use of enriched environments.
8. Produce fish that are qualitatively similar to natural fish in growth rate.
9. Volitionally release all program fish.
10. Provide adequate transportation equipment for juvenile production goals.
11. Improve hatchery intake structures to meet current NMFS standards.

Manager/operator response:

Per IDFG:

- The Oxbow Fish Hatchery is at River Mile 594 and the Hells Canyon Fish Trap is at River Mile 570. Spawning and incubation location is the Oxbow hatchery. Brood stock collection is at the Hells Canyon fish trap.
- The water utilized for incubation is well water, not the same water as returning adults home in on, thus the rearing comments of having the same chemical profile are not pertinent. Hatchery screening comments are also not pertinent to this facility since all water is pumped from above the Hells Canyon Dam and no anadromous fish are present except for hatchery releases into steelhead harvest areas.
- Under Release guidelines, these summer steelhead are reared under a one-year rearing regime, and cannot be qualitatively similar to natural fish growth rates. These fish are utilized for harvest mitigation purposes, and not in a recovery program for naturally produced fish. Some adult out plants do occur in the Little Salmon River, which are available for both harvest and natural spawning.
- Only statewide harvest numbers are tracked, as IPC has no M and E program to determine the IPC hatchery contribution to harvest.