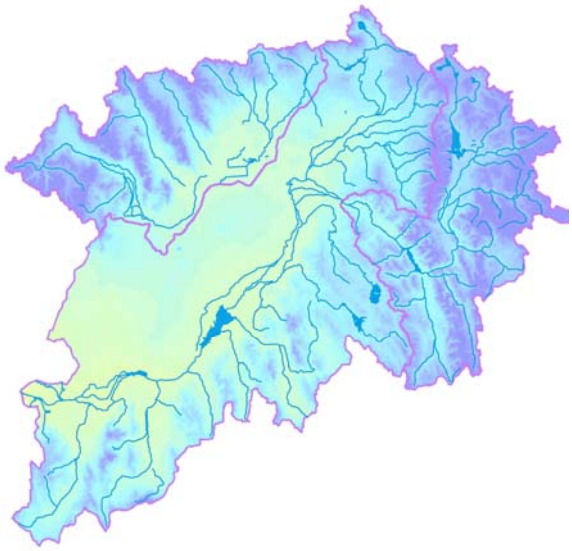
Draft Inventory
Upper Snake Province

Submitted To

The Northwest Power and Conservation Council
Portland, Oregon



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Inventory

This is an inventory of past and present management plans and restoration and conservation plans, programs, and projects within the Upper Snake Province (USP) (Figure 1). It constitutes the second step in the development of a subbasin plan that will be reviewed and eventually adopted as part of the Northwest Power and Conservation Council's (NPCC) Columbia River Basin Fish and Wildlife Program (FWP). The purpose of the inventory is to see what types and how well recent and ongoing work is addressing limiting factors (Appendix A) identified in the Assessment, which is part of the USP Plan. The information presented here was collected from Technical and Planning Team participants through the project inventory web site, through direct submission. Additional information was collected from web sites of funding and implementation agencies and through interviews of nonparticipants. Because of the size of the USP Subbasin and the number of agencies, nonprofit organizations, and private parties actively engaged in fish and wildlife restoration activities, it is unlikely that all activities implemented within the last 5 years have been included here. The information provided here covers the broad scope of most of the current types of activities taking place.

Existing Protection

Federal regulations that protect aquatic focal species habitat in the USP include the Clean Water Act (including Sections 401 and 404 permits), which regulates discharge or placement of dredged or fill material into waters of the U.S.; the Federal Land Management Protection Act (FLPMA); and internal agency management guidelines and policies, such as National Forest Management Plans. In 1993, the Shoshone-Bannock Tribe (SBT) passed the Water Quality Standards Act to provide protection to both surface and ground waters within the Fort Hall Reservation. All activities that may affect focal species on Federal lands will continue to undergo review under the National Environmental Protection Act (NEPA) and may thus be modified, when necessary, to minimize adverse effects on these species.

The Inland Native Fish Strategy (INFISH), adopted by the U.S. Forest Service (USFS) in 2001, amended National Forest Plans and Regional Guides to include interim direction for riparian management objectives, standards, and guidelines, and monitoring in the Columbia River Basin (USFS 2001). Among other things, INFISH requires that 300-foot buffers be maintained along all streams. INFISH standards, which can only be modified following a watershed analysis or site-specific evaluation, are being implemented on USFS lands to minimize or eliminate present or potential destruction of habitat for species such as Yellowstone cutthroat trout and bull trout and other aquatic resources. The June 10, 1998, listing of bull trout in the Columbia River Basin as a threatened species under the Endangered Species Act (ESA) (63 FR 31647) has further strengthened protections for focal species habitat. In addition, the USFS and Tribe conducts habitat projects for fish and wildlife, such as prescribed burning, road closures and improvements, the installation of habitat structures, and the removal of fish passage barriers.

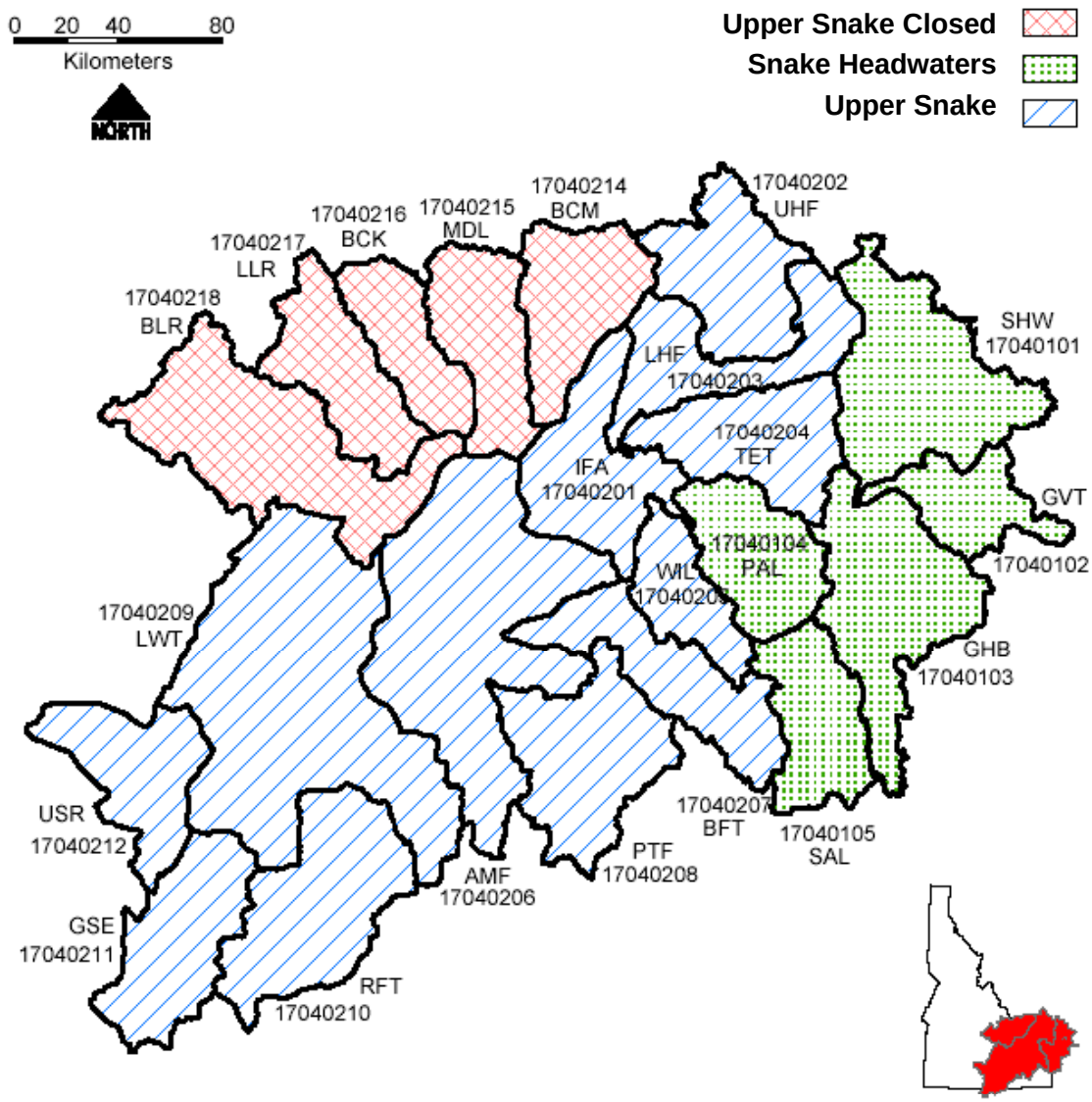

FIGURE 1
Major Hydrologic Units (22 Watersheds) Within the Upper Snake Province

The States of Idaho (http://www.idahoforests.org/bmp.htm), Nevada (http://ndep.nv.gov/bwqp/bmp03.htm), and Wyoming (deq.state.wy.us/wqd/watershed/Downloads/NPS%20Program/63225.pdf) have developed Best Management Practices (BMPs) to maintain water quality and protect aquatic resources from sources (e.g., grazing impacts) of non-point pollution. The Idaho Forest Practices Act regulates activities allowed in riparian areas, timber harvest adjacent to streams, and location of road construction. Unrestricted fish passage at road crossings is required by the Stream Projection Act and Idaho Code 36-906.

The USP contains roadless and other protected areas, including land under wilderness and National Park designations and some unique areas such as the Craters of the Moon National Monument and the Idaho National Engineering and Environmental Laboratory (INEEL). The Snake Headwaters Subbasin contains the largest amount of protected area, estimated at one-third of the total area of the subbasin. The Upper Snake Subbasin has

an estimated 10 percent of its total area protected, with the largest portion associated with the INEEL and Craters of the Moon National Monument. Protected areas in the Upper Snake Closed Subbasin are primarily inventoried roadless areas.

Land Trusts within the USP also provide protection to regional aquatic and terrestrial resources by acquiring and protecting lands from impacts such as urban sprawl. Within the USP, such trusts include The Jackson Hole Land Trust (http://www.jhlandtrust.org/), Teton Regional Land Trust (http://www.tetonlandtrust.org/), Southern Idaho Land Trust, Idaho Foundation for Parks and Lands (http://www.idaholands.org/), as well as more widespread organizations such as the Rocky Mountain Elk Foundation, and The American Farmland Trust (http://www.farmland.org/pnw/idaho.htm). Specific purposes of individual trusts, their projects, and the descriptions of lands acquired by these organizations can be found on their web sites, however they are not summarized here.

Cooperative efforts between State, Federal, Tribal, and private organizations have resulted in protected areas such as the South Fork Snake River. Partners in this effort include private parties, conservation-oriented land owners; U.S. Bureau of Land Management (BLM) (Land and Water Conservation Funds); Teton Regional Land Trust, The Conservation Fund; The Nature Conservancy of Idaho; Idaho Department of Fish and Game (IDFG); Natural Resources Conservation Service (NRCS); Idaho Conservation Data Center (ICDC); U.S. Fish and Wildlife Service (USFWS); Bonneville Power Administration (BPA) (mitigation funds); and The Trumpeter Swan Society. In combination, The Nature Conservancy, The Conservation Fund, Teton Regional Land Trust, and the BLM have protected a total of 2,620 acres along the South Fork of the Snake River in Idaho from the Palisades Reservoir to Roberts. Acquired conservation easements include 696 acres, fee acquisition includes 1,810 acres, and donated easements include 114 acres.

Additional protective measures within the USP include efforts from county weed control programs, NRCS/ Idaho Soil Conservation Commission (ISCC). Details of these programs can be found within the subbasin summaries conducted within the USP (NPPC 2002a, 2002b, 2002c).

Bonneville Power Administration Funded Projects within the Upper Snake Province

Several fish and wildlife projects within the USP have been funded through the BPA program. To date (through 2002), more than 15 projects (including new and continuing) have been funded within the USP since 1992 (Appendix B). The types of projects funded under the program have been wide ranging and a detailed description of the projects and their associated benefits can be found on the BPA web site at http://www.efw.bpa.gov/cgi-bin/efw/E/Welcome.cgi. The majority of these projects are located within the Upper Snake and Snake Headwaters Subbasins, and no projects have been funded within the Closed Subbasin (NPPC 2002a, 2002b, 2002c). Projects conducted within the Upper Snake include a habitat enhancement and restoration project for stream and riparian areas (9201000) and those funded within the Snake Headwaters Subbasin have been primarily mitigation and acquisition types of projects (NPPC 2002a, 2002b, 2002c). The combined total of the BPA obligated funds within the USP exceeds 13 million dollars, with an average obligation of more than 1.4 million

dollars per each funding cycle. In 2003, more than $540,000 has been recommended to continue the Southern Idaho Wildlife Mitigation Program (199505702), the habitat restoration/enhancement program on the Fort Hall Reservation (199201000), and the funding of the Shoshone-Bannock Fish Production Program (200302400).

Existing Management Plans and Programs

Numerous agencies participate in the management and planning of natural resource activities within the USP. Those that have primary responsibility for the resource management of lands within the USP are as follows.

Cooperative

Draft Deer Parks Management Plan

The mission of the Deer Parks Complex is to sustain an ecosystem that supports an abundant, productive, and diverse community of naturally reproducing fish and wildlife by protecting and restoring natural ecological functions, habitats, and biological diversity. Wildlife mitigation units are developed and managed within the framework of the NPPC's FWP. Funding for wildlife mitigation units is provided by BPA. Several specific agreements also provide direction regarding how mitigation units are managed including the following:

- South Fork Snake/Palisades Wildlife Mitigation Agreement between BPA and IDFG, 1997.
- Southern Idaho Wildlife Mitigation Agreement between BPA and Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, 1997.
- Cooperative Management Agreement between BLM and IDFG, 1998.

BLM is obligated by the 1997 Memorandum of Agreement with BPA to manage properties for the primary benefit of wildlife and wildlife habitat in perpetuity, following the prescriptions and proscriptions in the South Fork Snake River/Palisades Wildlife Mitigation Project Final Environmental Assessment to ensure the properties retain at least their baseline Habitat Evaluation Procedure (HEP) values. The Agreement also obligates BLM to provide public and Tribal access when access does not adversely affect the purpose of the mitigation project. Public access to wildlife mitigation units and use compatible with protection and enhancement of wildlife and wildlife habitat is encouraged, but is not required. All of the Deer Parks Complex mitigation units are within the area covered by the Snake River Activity/Operations Plan, which directs management activities on all BLM and USFS lands along the river corridor.

Upper Continental Divide Coordinated Weed Management Area Plan

The mission of the Continental Divide Cooperative Weed Management Area (CDCWMA) that covers land in Clark, Lemhi, Butte, and Jefferson Counties is to bring together all those responsible for weed control within the boundaries of the CWMA to develop common weed-control management objectives; to coordinate efforts along logical geographic boundaries based on similar land types and use patterns. Also, to prevent the introduction, reproduction, and spread of designated noxious weeds and

invasive plant species into and within the entire CWMA; and to educate land managers and the general public about noxious weeds and invasive plant species and the efforts to control them.

Southeast Idaho Wetland Focus Area Working Group

This Group has developed the southeast Idaho Wetland Focus Area Conservation Plan (Plan). The purpose of this Plan is to foster communication and partnership development to implement wetland conservation projects. The Plan is intended to be used primarily to identify potential project areas, to develop a communication network, and foster long-term partnerships that will work toward addressing and solving the myriad issues and problems facing the future conservation of southeastern Idaho's wetland ecosystems. Active partners include Ducks Unlimited, USFWS, the Nature Conservancy, Teton Regional Land Trust, IDFG, NRCS, and BLM.

Federal

U.S. Fish and Wildlife Service

Within the Upper Snake Subbasin, several branches of the USFWS are active, including Law Enforcement, Ecological Services Office, Fisheries, and National Wildlife Refuges. USFWS also shares responsibility with the National Oceanic and Atmospheric Administration (NOAA) Fisheries in the administration of ESA. The mission statement of the USFWS states, "The U.S. Fish and Wildlife Service's mission is, working with others, to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

The USFWS Ecological Services Office operates under a number of authorities and through a number of programs, including:

- **Endangered Species**. The USFWS and the National Marine Fisheries Service (NMFS) share responsibility for administration of the ESA. The ESA directs these agencies to identify species whose status warrants listing as endangered or threatened, develop and implement recovery programs for listed species, work with State resource agencies and Federal agencies to protect and recover listed species, and implement a program to permit certain activities with listed species.
- **Migratory Birds**. The USFWS administers the Migratory Bird Treaty Act.
- **Environmental Contaminants**. Contaminant specialists focus on detecting toxic chemicals, addressing their effects, preventing harm to fish, wildlife, and their habitats, and removing toxic chemicals and restoring habitat when prevention is not possible. They are experts on oil and chemical spills, pesticides, water quality, hazardous materials disposal, and other aspects of pollution biology.
- **Partners for Fish and Wildlife**. This program offers technical and financial assistance to private land owners wishing to voluntarily restore wetlands and other fish and wildlife habitats on their land. The USFWS also provides biological technical assistance to U.S. Department of Agriculture (USDA) agencies implementing key conservation programs of the Farm Bill.

- **Federal Projects**. The USFWS evaluates the impacts of water resource development projects on fish and wildlife, makes recommendations to mitigate (avoid, reduce, and compensate for) these impacts and enhance fish and wildlife, and provides technical assistance to private individuals, organizations, and businesses regarding project impacts.

The USFWS is a primary participant in the North American Bird Conservation Initiative, which is an integrated bird conservation plan for Canada, Mexico, and the U. S. This plan is coordinated by a coalition of government agencies, non-governmental organizations, and other bird interest groups and integrates the following conservation plans:

- **North American Waterbird Conservation Plan**. This plan is being developed in concert with other bird conservation initiatives. These initiatives include the North American Waterfowl Management Plan, Partners in Flight Bird Conservation Strategy, Audubon's Important Bird Areas Program, the U.S. Shorebird Plan, and the Canadian Shorebird Plan. Regional plans will contain information critical to waterbird conservation at smaller geographic scales. The Henry's Fork Subbasin lies in the Intermountain West/Southwest Desert region of this planning effort.
- **U.S. Shorebird Conservation Plan**. This plan is a partnership effort being undertaken throughout the U.S. to ensure that stable and self-sustaining populations of all shorebird species are restored and protected. The plan was developed by a wide range of agencies, organizations, and shorebird experts who helped set conservation goals for each region of the country, identified critical habitat conservation needs and key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face. The partners responsible for development of the plan are remaining active and are working to improve and implement the plan's many recommendations.
- **North American Waterfowl Management Plan**. This plan established an international committee with six representatives each from each of the three countries. Its purpose is to provide a forum for discussion of major, long-term international waterfowl issues and to make recommendations to directors of the three countries' national wildlife agencies. It approves the formation of joint venture partnerships and reviews and approves joint venture implementation and evaluation plans. The committee is responsible for updating the plan, considering new scientific information and national and international policy developments, and identifying the need to expand or diminish activities carried out on behalf of the plan.
- **Intermountain West Joint Venture**. One of the largest of the joint ventures, the Intermountain West Joint Venture stretches from Canada to Mexico, with focus areas in 11 western states. Each state has designated locations where wetland and/or riparian areas are of prime importance. This joint venture has been successfully organizing and building on the concept that broad partnerships can generate the financial resources necessary to restore thousands of acres of wetland habitat for waterfowl, shorebirds, wading birds, and songbirds.

- **Partners In Flight**. The goal of Partners in Flight conservation planning is to ensure long-term maintenance of healthy populations of native land birds.
- **Columbia Plateau Bird Conservation Plan**. Issues addressed by this plan include conversion of shrub/steppe areas and wetlands to agriculture, grazing and urban development, nonnative plant invasions, and changes in plant communities associated with fire suppression. The plan also addresses restoration of a dynamic sagebrush ecosystem, with objectives including no further net loss of healthy sagebrush habitat and restoration of fragmented and degraded areas. Protection of existing wetlands, riparian areas, and hydrologic regimes are also addressed.
- **The Idaho Bird Conservation Plan**. This plan covers in detail four habitats considered the highest priority habitats for birds in Idaho: riparian areas, non-riverine wetlands, sagebrush shrublands, and dry Ponderosa pine/Douglas fir/grand fir forests. Objectives for management of each these habitats in Idaho include:
  - **Riparian Habitat**. 1) Maintain existing distribution and extent of each riparian system. 2) By 2025, restore at least 10 percent of the historical extent of each riparian system within each ecoregion subsection to conditions that would support productive populations of designated focal species.
  - **Non-Riverine Wetlands**. Obtain a net increase in the number of acres of wetlands in Idaho, focusing on the same types and amounts that historically occurred here.
  - **Sagebrush Shrublands**. 1) By the end of the 2009 breeding season, reverse declining population trends in species associated with sagebrush habitats in Idaho while maintaining current populations of other associated species. 2) Manage for Sage-grouse numbers as outlined in each Sage-grouse Management Area in the Sage-grouse Management Plan by 2007.
  - **Dry Ponderosa Pine/Douglas Fir/Grand Fir Forests**. Restore by 2025 as much as possible but at least 10 percent of the historical range of these forests meeting the habitat conditions required for white-headed woodpeckers.
- **Implementation Plan for Trumpeter Swans**. The USFWS and the Pacific Flyway Commission are in the early stages of writing an Implementation Plan to address key problems in Trumpeter Swan management. This plan will prioritize needed management actions, habitat improvements, and research/monitoring needs. This document should be completed by July 2002 and is intended as a key reference for needed trumpeter work.

Natural Resources Conservation Service

The NRCS is an agency with professionally staffed field offices serving Bannock, Bonneville, Blaine, Camas, Cassia, Gooding, Jefferson, Jerome, Lincoln, and Power Counties. The agency's major purpose is to provide consistent technical assistance to private land users, tribes, communities, government agencies, and conservation districts. NRCS assists in developing conservation plans, provides technical field-based assistance including project designs, and encourages the implementation of conservation practices

to improve water quality and fisheries habitat. Programs include the CRP, Public Law 566 (P.L. 566 Small Watershed Program), River Basin Studies, Forestry Incentive Program (FIP), WHIP, Environmental Quality Incentives Program (EQIP), and WRP.

The Shoshone-Bannock Tribes

The SBT have off-reservation treaty rights under the 1868 Fort Bridger Treaty, 15 Stat. 673, as reaffirmed in State v. Tinno, 497 P.2d 1386, 94 Idaho 759 (1972). As set forth under this decision, the SBT have the right to hunt, fish, and gather on unoccupied lands of the U.S.

The SBT understand that the treaty-guaranteed land base is the core and integral foundation of Tribal existence and is crucial to its autonomy as a sovereign nation. Accordingly, the SBT successfully undertook a land acquisition program to purchase fee lands located within the reservation from monies received in their land claims settlement. Today, the Fort Hall Indian Reservation is composed of 96 percent Tribal/trust lands and individual Tribal members and non-Native Americans hold the remaining 4 percent in fee. The reservation population is approximately 5,500 with the Tribal resident membership at approximately 3,600. The SBT's territory forms a sizable geographic area for the exercise of jurisdiction, supports a residing population, is the basis of the Tribal economy, and provides an irreplaceable forum for cultural vitality based on religious practices and cultural traditions premised on the sacredness of land.

Since 1975, the SBT have demonstrated a long-range commitment to preserving and enhancing the air, water, open space, and quality of life for present and future generations of the tribes who reside on the Tribal homelands. The Tribal government has established environmental protection, land use, fisheries, fish and game, cultural resources, and natural resources departments funded by the EPA, BPA, and U.S. Department of Energy (DOE). Tribal programs are also funded by the Tribal license and permit fees set forth in various ordinances and codes.

Bureau of Land Management

Management actions on lands under BLM stewardship in the USP are governed by the *Snake River Activity/Operations Plan.* Statewide, the BLM are updating their land and resource management plans to reflect updated resource management issues.

USDA U.S. Forest Service

The USFS manages its lands based on goals for desired future conditions and standards and guidelines for the implementation of its activities. These conditions are outlined in the Land Resource Management Plans for each Forest.

National Park Service

Policy regarding natural resources in the National Park Service (NPS) is summed up as:

> *It is the policy of the National Park Service to assemble baseline inventory data describing the natural resources under its stewardship, and to monitor those resources forever - to detect or predict changes that may require intervention, and to provide reference points to which comparisons with other, more altered parts of the home of mankind may be made.*

Grand Teton National Park

The purpose of Grand Teton National Park (GTNP) as stated in its 1976 Master Plan is as follows:

> *Grand Teton was established as a unit of the National Park System to protect the scenic and geological values of the Teton Range and Jackson Hole, and to perpetuate the Park's indigenous plant and animal life. The Park will interpret these natural and scenic values, in association with the historical significance of the region, in a manner that preserves these resources for the benefit and pleasure of present and future generations.*

Craters of the Moon National Monument

The overall theme of the interim Craters of the Moon National Monument management strategy (2004) (http://www.nps.gov/crmo/pphtml/documents.html) is to maintain existing management policies, designations, and allocations except where changes are necessary to comply with the Proclamation and protect the objects of scientific and historic interest within the Monument.

U.S. Fish and Wildlife Service, Jackson Fish Hatchery

Propagation and Genetic Management Plan Authority—USFWS, Fisheries, Region 6, Denver, Colorado, Jackson National Fish Hatchery.

The vision for the development of a wild, native hatchery stock was derived through a cooperative effort by three separate agencies: IDFG; Wyoming Game and Fish Department (WYG&F); and USFWS. The overall goal for this stock is to maintain the wildness of this strain through planned, periodic infusions of wild trout gametes at a rate far more frequent than is described in the Inland Salmonid Broodstock Management Handbook for a wild strain. Frequent testing of mitochondrial DNA provides the background information necessary to maintain the variability of this population.

U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation's (USBR) regional goal is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. Reclamation is best known for the dams and hydroelectric plants that supply irrigation water and power. Within the Upper Snake River subbasin these include the Minidoka, American Falls, Ririe, Jackson Lake, and Palisades Dams. Flood control operations associated with these dams prevent significant property damage.

Fish and wildlife enhancement has been integrated into project management and the USBR is involved in a variety of fish and wildlife programs. Approximately 427,000 acre-feet of water are provided annually by the USBR to meet downstream salmon and steelhead flow-augmentation requirements of the 2000 biological opinion (NMFS 2000). The present Ecologically Based System Management Project (EBSM) funded by USBR extends from Palisades Dam to Heise on the South Fork of the Snake River. This model will eventually be used to assist in managing the resources of the South Fork from Palisades Dam to the confluence with the Henry's Fork of the Snake River.

USBR works with a variety of local partners to manage wildlife areas, many of which were developed as mitigation for its dams. USBR and the IDFG established the Tex Creek Wildlife Management Area (WMA) above Ririe Reservoir in Idaho to replace wildlife habitat lost to construction of Ririe and Teton Dams. Through an agreement with USBR, the U. S. Army Corps of Engineers (COE) also transferred an area 6 miles west of Rexburg to the IDFG, for establishment of the Cartier Slough WMA.

U.S. Army Corps of Engineers

Within the Upper Snake River subbasin the COE constructed flood control levees along the Snake River near Jackson Hole, Wyoming. More recently, the COE conducted a study to investigate the feasibility of restoring fish and wildlife habitat that was lost as a result of construction, operation, and maintenance of the Jackson Hole Flood Control Project levees completed in 1964. The overall goal of the recommended Jackson Hole Environmental Restoration Project supported by this study is to restore diverse and sustainable aquatic, wetland, riverside, and terrestrial habitats within the study area. Specific objectives are to investigate the feasibility of: 1) restoring river channel stability; 2) protecting remaining diverse habitats; 3) restoring diversity and sustainability to degraded habitats; and 4) restoring degraded habitats for threatened and endangered species.

Idaho National Engineering and Environmental Laboratory

The INEEL, which is operated by the DOE, is located on the eastern Snake River Plain in southeastern Idaho.

State Government

Idaho Department of Fish and Game

Idaho Code Section 36-103 contains the fish and wildlife policy of the State of Idaho.

> "All wildlife including all wild animals, wild birds, and fish, within the State of Idaho, is hereby declared to be the property of the State of Idaho. It shall be preserved, protected, perpetuated, and managed. It shall only be captured or taken at such times or places, under such conditions, or by such means, or in such manner, as will preserve, protect, and perpetuate such wildlife, and provide for the citizens of this state and, as by law permitted to others, continued supplies of such wildlife for hunting, fishing and trapping."

The IDFG was provided statutory authority via the IDFG Commission and the Director of the IDFG to fulfill this policy. A series of plans direct the management of fish and wildlife resources by the IDFG. Management directives for IDFG are contained in the management plans listed below.

- IDFG. 2001. Fisheries Management Plan 2001 – 2006.
- IDFG. 1990. A Vision for the Future: IDFG Policy Plan 1990 – 2005.
- IDFG. 1988. Wildlife Depredation Plan 1988 – 1992.
- IDFG. 1990. Furbearer Management Plan 1991 – 1995.

- IDFG. 1990. Waterfowl Management Plan 1991 – 1995.
- IDFG. 1990. Upland Game Management Plan 1991 – 1995.
- IDFG. 1997. Idaho Sage-grouse Management Plan.
- IDFG. 1990. Bighorn Sheep Management Plan 1991 – 1995.
- IDFG. 1990. Mountain Goat Management Plan 1991 – 1995.
- IDFG. 1999. Elk Management Plan.
- IDFG. 1999. Mule Deer Management Plan.
- IDFG. 1999. White-Tailed Deer Management Plan.
- IDFG. 1991. Mountain Lion Management Plan 1991 – 1995.
- IDFG. 1991. Nongame and Endangered Wildlife Plan 1991 – 1995.
- IDFG. 1998. Black Bear Management Plan.
- IDFG. 1990. Moose Management Plan 1991 – 1995.
- IDFG. 1991. Pronghorn Antelope Management Plan 1991 – 1995.
- Ullman, M.J., A. Sands, and T. Hemker. 1998. Conservation Plan for Columbian sharp-tailed grouse and its habitats in Idaho. Prepared for Idaho Conservation Effort, IDFG, Boise, Idaho.
- Patla, S., K.K. Bates, M. Bechard, E. Craig, M. Fuller, R. Howard, S. Jefferies, S. Robinson, R. Rodriguez, and B. Wall. 1995. Habitat Conservation Assessment and Strategy for the northern goshawk for the State of Idaho.
- Dolan, P.M. Saving all the pieces. Idaho Interagency Conservation/Prelisting Effort. Common Loon, *Gavia immer*, Habitat Conservation Assessment (HCA) and Conservation Strategy (CS). IDFG, USFWS, USFS.
- Cassirer, E.F., J.D. Reichel, R.L. Wallen, and E.C. Atkinson. 1996. Harlequin Duck (*Histrionicus histrionicus*) USFS/BLM Habitat Conservation Assessment and Conservation Strategy for the U.S. Rocky Mountains.
- IDFG, Nez Perce Tribe, and Sawtooth National Forest. 1995. Saving All the Pieces. The Idaho State Conservation Effort. Forest Carnivores in Idaho. Habitat Conservation Assessments (HCA) and Conservation Strategies (CS).
- Pierson, E.D., M.C. Wackenhut, J.S. Altenbach, P. Bradley, P. Call, D.L. Genter, C.E. Harris, B.L. Keller, B. Lengus, L. Lewis, B. Luce, K.W. Navo, J.M. Perkins, S. Smith, L. Welch. 1999. Species conservation assessment and strategy for Townsend's big-eared bat (*Corynorhinus townsendii townsendii* and *Corynorhinus townsendii pallescens*). Idaho Conservation Effort, IDFG, Boise, Idaho.
- Mancuso, M. 1995. Conservation strategy for *Allium aaseae* Ownbey (Aase's Onion). IDFG, ICDC, Boise, Idaho.

- Elzinga, C. 1997. Habitat conservation assessment and strategy for the Alkaline Primrose (*Primula alcalina*). Draft unpublished report. Idaho Conservation Effort, IDFG, Boise, Idaho.

Idaho Department of Water Resources

The Idaho Department of Water Resources (IDWR) is overseen by the Idaho Water Resource Board (IWRB) and is charged with administering water resources in accordance with State water law.

Idaho Department of Parks and Recreation

The Department of Parks and Recreation (IDPR) manages State parks within the USP. These parks are managed as areas of scenic beauty, recreational utility, and historic, archaeological, or scientific interest. Additionally, part of IDPR's mission is to promote the health, happiness, and recreational opportunities of park visitors.

Idaho Soil Conservation Commission

The ISCC was created in 1939 from Idaho legislation originated to deal with the soil erosion crisis of the Dust Bowl. Today, the ISCC's purpose is to provide support and service to Idaho's 51 Soil Conservation Districts (SCDs) for the wise use and enhancement of soil, water, and related resources. The ISCC consists of five members appointed to 5-year terms by Idaho's Governor. The ISCC has a 25-member staff responsible for water quality program delivery and administrative programs. Most staff work through a District in the field, providing technical assistance directly to Idaho land owners and assisting with projects. The ISCC manages the Water Quality Program for Agriculture (WQPA), Resource Conservation and Rangeland Development Loan and Grant Program (RCRDP), Agricultural Pollution Abatement Plan (APAP), and Grazing Lands Conservation Initiative (GLCI). The ISCC is the designated agency for the Natural Resources Conservation Income Tax Credit (63-3024B Idaho Code) and for Idaho Water Quality Law for grazing activities and agricultural activities (39-3602 Idaho Code).

Idaho Department of Environmental Quality

The Idaho Department of Environmental Quality (IDEQ) is engaged in ongoing research to obtain the most recent and site-specific scientific knowledge available for the purposes of refining water quality criteria. Monitoring activities in Idaho have focused on beneficial uses and ambient water quality trends. Data from IDEQ's monitoring are used to document the existence of uses, the degree of use support, and reference conditions. This monitoring is made up of primarily the collection of biological and physical data. The ambient trend monitoring network is designed to document water quality trends at the river basin and watershed scales through the collection of mainly water column constituent data.

Biological parameters are being added to this network as well. Fifty-six monitoring stations are currently sampled on a rotating basis to provide data for water quality trend assessment. IDEQ also monitors chemical, physical, and biological components of the aquatic environment through the Beneficial Use Reconnaissance Project (BURP). IDEQ continues to refine the water body assessment guidance for evaluating BURP data. The primary assessments are designed to determine the support status of the two main aquatic life beneficial uses, Cold Water Biota and Salmonid Spawning.

Local Government

Soil and Water Conservation Districts

Soil and water conservation districts (Districts) are non-regulatory subdivisions of Idaho State government authorized under Title 22, Chapter 36 Idaho Code. A board of five or seven supervisors, who are local residents, and who serve without pay, governs each. All supervisors are elected officials and must be land owners (including urban property owners located with district boundaries) or farm operators in the district to which they are elected. Districts develop and implement programs to protect and conserve natural resources, primarily on privately owned lands. Districts organize technical advisory groups for projects and call upon local, State, Tribal, and Federal agency specialists, industry representatives, and interested individuals to promote resource conservation implementation. Districts are active in the Idaho total maximum daily limit (TMDL) process and are the lead agency for TMDL implementation plans on private agriculture and grazing lands.

Each District in the subbasin receives limited funds from local (county) and State (general fund) government, and may receive other funds for local project work through the Water Quality Program for Agriculture (ISCC) and other funding agencies, institutions, or organizations. Working cooperatively with other entities, Districts provide technical assistance to agriculturists and other private land owners based on long-standing agreements with the NRCS, ISCC, Idaho Association of SCDs, and other Federal and State agencies.

Districts develop 5-year *Resource Conservation Plans* to manage conservation efforts throughout their district, updating the plan annually. Goals, objectives, and tasks are prioritized and specified for resources (e.g., erosion control, water quality, soil health, irrigation water management, fish and wildlife habitat, public outreach program), and areas of concern.

Other Planning Information

The following is a list of other planning and management efforts initiated or completed since completion of the subbasin summaries:

- *State of Idaho Strategic Plan for Management of Invasive Exotics* (ISDA 1999). This strategic plan recommends Statewide formation of cooperative weed management areas and application of integrated weed management practices to reduce ecological, economic, and social impacts of noxious weeds on the State's human and natural resources. To accomplish these objectives, supporters and cooperators incorporate resources, priorities, and strategies of Federal, State, and county agencies into a unified approach to halt or slow the spread of noxious weeds across Idaho (ISDA 1999). (http://www.agri.state.id.us/PDF/Animal/Strategic%20Plan.pdf)
- *Idaho BLM's Abandoned Mine Lands Plan (AML)* (http://www.id.blm.gov/aml/program.htm)
- *Craters of the Moon National Monument and Preserve Draft Management Plan and Environmental Impact Statement (EIS)* (http://www.nps.gov/crmo/pphtml/documents.html)

- *Great Basin Restoration Initiative* (http://www.fire.blm.gov/gbri/)
- *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Idaho* (http://www.id.blm.gov/publications/data/SGFinal.pdf)
- *Pocatello Resource Management Plan and EIS* (http://www.id.blm.gov/planning/pocrmp/brfpkt.pdf)
- *Medicine Lodge Resource Management Plan* (http://www.id.blm.gov/offices/idahofalls/mlrmp/)
- *Upper Snake River District Fire, Fuels and Related Vegetation Management Direction Plan* (http://www.id.blm.gov/planning/usrd_fmda/data/brfpkt.pdf)
- *IDFG Wolf Management Plan* (http://fishandgame.idaho.gov/wildlife/plans/wolf_plan.pdf)
- *State of Idaho, Yellowstone Grizzly Bear Management Plan*
- *Elk–Bison EIS* (http://www.nps.gov/yell/technical/planning/bison%20eis/summary.htm)
- *Fire Management Plan (FMP) and environmental assessment* (http://www.nps.gov/crmo/firemp/fmp_ea.htm)
- *Winter-use plans, Yellowstone and Grand Teton National Parks EISs* (http://www.nps.gov/grte/winteruse/intro.htm)
- *Yellowstone Wildland Fire Management Plan* (http://www.nps.gov/yell/technical/fire/FirePlan/fireplan.htm)
- *Yellowstone National Park Strategic Plan* (http://www.nps.gov/yell/publications/pdfs/strategicplan.pdf)
- *Caribou National Forest Plan Revision and EIS* (http://www.epa.gov/fedrgstr/EPA-IMPACT/2001/October/Day-09/i25190.htm)
- *Ririe Reservoir Resource Management Plan* (http://www.usbr.gov/pn/programs/ririe_rmp/pdf/EA/CH1_EA.pdf)
- *Minidoka North Side Resource Management Plan* (http://www.usbr.gov/pn/programs/minidoka_rmp/pdfs/Mndka_Cover.pdf)
- *Amended Biological Assessment for Bureau of Reclamation Operations and Maintenance in the Snake River Basin Above Brownlee Reservoir* (http://www.usbr.gov/pn/programs/UpperSnake/UpperSnakeBA.htm)
- *Idaho Drought Plan* with Federal water-related drought-response programs (http://www.idwr.state.id.us/about/issues/Drought%20Plan.pdf)
- IWRB water resources planning

Federal planning cycles typically incorporate an adaptive management scheme where pertinent objectives and strategies "evolve" as new information is collected and incorporated into the decision-making process. The information presented in this

assessment is founded on information used in existing management plans, as well as more site-specific information. This building of information should enhance future planning, prioritization, and implementation efforts.

The direction and focus of existing management plans and ongoing management programs are based on many of the same issues identified in the USP Assessment. However, lack of implementation of existing plans due to funding, legal, and political constraints inhibits the protection and restoration of fish and wildlife resources. Furthermore, habitat restoration efforts may take years before effects are fully realized.

Restoration and Conservation Projects

The inventory identified 184 projects (Appendix B) with objectives targeting a variety of species and/or habitat management issues. Of these, 31 projects were identified in the Snake Headwaters Subbasin, 127 in the Upper Snake Subbasin, and 26 in the Upper Snake Closed Subbasin. There were no habitat restoration projects reported for the Snake Headwaters Subbasin. Projects were classified into the following activity categories based on project descriptions:

- Wetland restoration
- Upland habitat protection
- Riparian fencing
- Water conservation
- Stream structure
- Road/trail work
- Access management
- Fish passage
- Grazing management
- Riparian restoration
- Diversions
- Channel restoration
- Miscellaneous

Criteria used to classify projects are summarized in Table 1-1. If a project included numerous activities, the project was credited in all applicable categories. The values represent numerical tallies of project categories. Funding summaries are based on project counts only, not on funding levels. Projects identifying multiple funding groups are classified for all organizations involved. Project information is located in Appendix C.

TABLE 1-1
Project Activity Categories and Criteria for Habitat Restoration Projects Identified in the USP

Project Activity	Criteria for Classification
Wetland restoration	Specifically mentioned purpose of "wetland restoration"
Upland habitat protection	Identified protection of habitat other than riparian or stream
Riparian fencing	Provided riparian habitat with natural (passive) recovery opportunity
Water conservation	Discussed diversion consolidation, conversion to more efficient methods, or retiring of the water right
Stream structure	Mentioned placement of structures (bank barbs, drop structures) to prevent erosion or protect/create habitat
Road/trails	Involved modification, moving, or closing of roads and trails to reduce sediment or protect habitat
Access management	Pertained to recreation access (campgrounds, boat ramps) designed to reduce sediment or protect habitat
Fish passage	Allowed or increased fish movement (culvert replacement, dam modification)
Grazing management	Designed to protect habitat while allowing limited grazing typically in riparian areas
Riparian restoration	Discussed active work on riparian areas including vegetation planting
Diversion	Modified existing water diversion structure including fish screening or consolidation
Channel restoration	Reconnected side channels or eliminated stream crossings
Miscellaneous	Included projects that were unclassifiable

Funding for projects in the Snake Headwaters Subbasin is primarily Federal, with 28 percent of reported projects Federally funded. Nonprofit (13 percent) and local (17 percent) groups also funded a substantial portion of the projects in the Snake Headwaters Subbasin (Figure 2). Funding for projects in the Upper Snake Subbasin was also primarily Federal, with 22 percent of projects reporting some type of Federal funding (Figure 3). Funding for projects in the Upper Snake Closed Subbasin was primarily through IDFG, with more than 32 percent of projects reporting some type of IDFG funding (Figure 4).

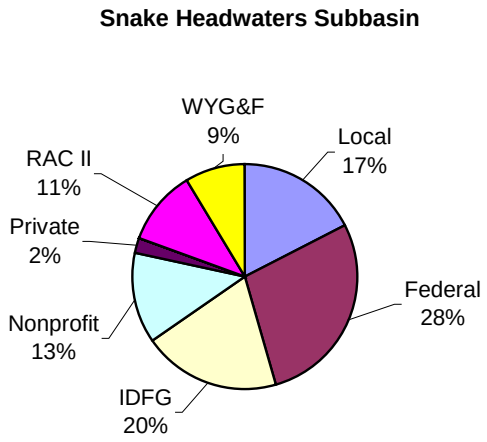

FIGURE 2
Funding breakdown for habitat restoration projects in the Snake Headwaters Subbasin identified during the assessment process. WYG&F = Wyoming Game and Fish Department; Local = City or County; Federal = U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and Bureau of Reclamation; IDFG = Idaho Department of Fish and Game; Nonprofit = not for profit and nongovernmental organizations; Private = private business or citizens, RAC II = Resource Advisory Committees.

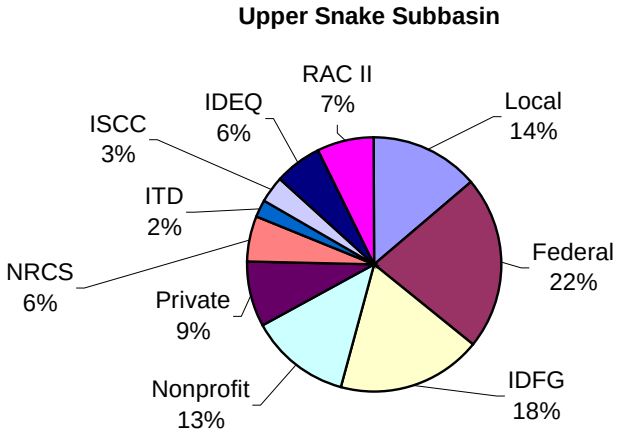

FIGURE 3
Funding breakdown for habitat restoration projects in the Upper Snake Subbasin identified during the assessment process. Local = City or County; Federal = U.S Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and Bureau of Reclamation; IDFG = Idaho Department of Fish and Game; Nonprofit = not for profit and nongovernmental organizations; Private = private business or citizens; NRCS = Natural Resources Conservation Service; ITD = Idaho Department of Transportation; ISCC = Idaho Soil Conservation Commission; IDEQ = Idaho Department of Environmental Quality; RAC II = Resource Advisory Committees.

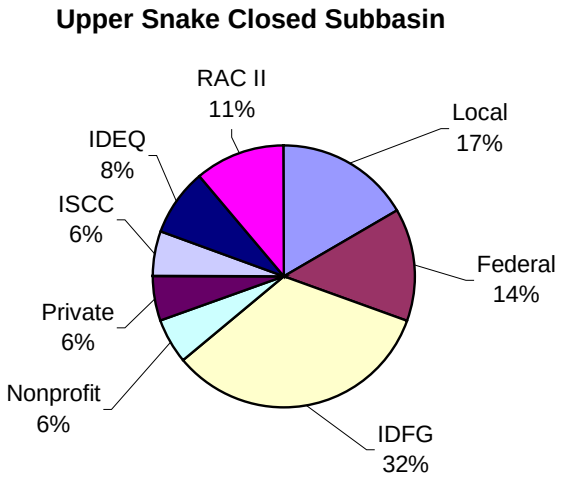

FIGURE 4
Funding breakdown for habitat restoration projects in the Upper Snake Closed Subbasin identified during the assessment process. Local = City or County; Federal = U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and Bureau of Reclamation; IDFG = Idaho Department of Fish and Game; Nonprofit = not for profit and nongovernmental organizations; Private = private business or citizens; ISCC = Idaho Soil Conservation Commission; IDEQ = Idaho Department of Environmental Quality; RAC II = Resource Advisory Committees.

Snake Headwaters Subbasin Habitat Restoration Activities

Thirty-one projects were identified that are designed to restore fish and wildlife habitat in the Snake Headwaters Subbasin (Figure 5). No habitat restoration projects were identified for the Greys-Hoback and Gros Ventre watersheds. Upland habitat protection, water diversion modification, fish passage, and water conservation were the most common restoration activities reported in the Snake Headwaters Subbasin. Eight habitat restoration activities for the Palisades watershed were identified, with grazing management the most common restoration activity reported. Habitat restoration projects categorized by watershed in the Snake Headwaters Subbasin are presented in Table 1-2.

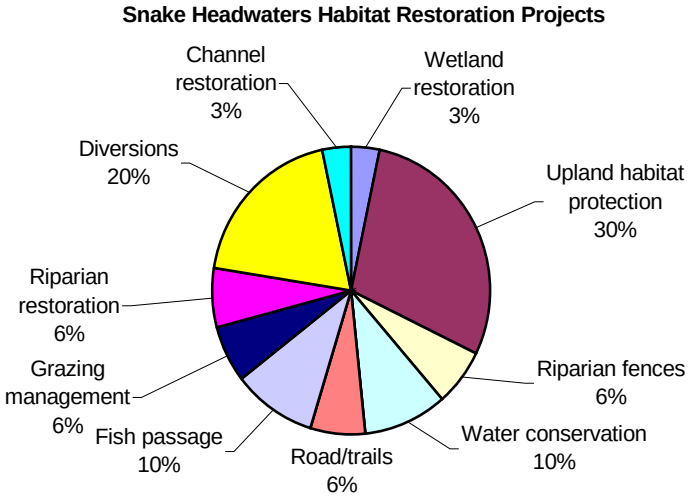

FIGURE 5
Summary of 31 habitat restoration activities in the Snake Headwaters Subbasin identified during the assessment process

TABLE 1-2
Number of Habitat Restoration Projects by Watershed in the Snake Headwaters Subbasin Identified for the 12 Project Activity Categories

	Watershed				
Project Activity Category	**Snake Headwaters**	**Gros Ventre**	**Greys-Hoback**	**Palisades**	**Salt**
Wetland restoration	1				
Upland habitat protection	3			3	3
Riparian fences				2	
Water conservation	3				
Stream structure					
Road/trails					2
Access management					
Fish passage	2			1	
Grazing management				2	
Riparian restoration	1				1
Diversions	6				
Channel restoration	1				
Totals	**17**	**0**	**0**	**8**	**6**

Upper Snake Subbasin Habitat Restoration Activities

Within the Upper Snake Subbasin, 127 projects designed to restore fish and wildlife habitat were identified (Figure 6). The Upper Snake Subbasin had a diverse list of habitat restoration projects reported, covering all 12 habitat restoration categories. Overall, upland habitat protection, riparian restoration, water conservation, and wetland restoration were the most common activities reported in the Upper Snake Subbasin (Table 1-3). In the Upper Snake-Rock watershed, one wetland restoration and one upland habitat protection project was identified. Of the five projects identified in the Goose watershed, upland habitat protection was the most common (Figure 6). Further, 12 projects are included in the Lake Walcott watershed, with diversion modification, water conservation, and upland habitat protection the most commonly reported activities (Table 1-3). All restoration projects identified for the American Falls watershed were for upland habitat protection.

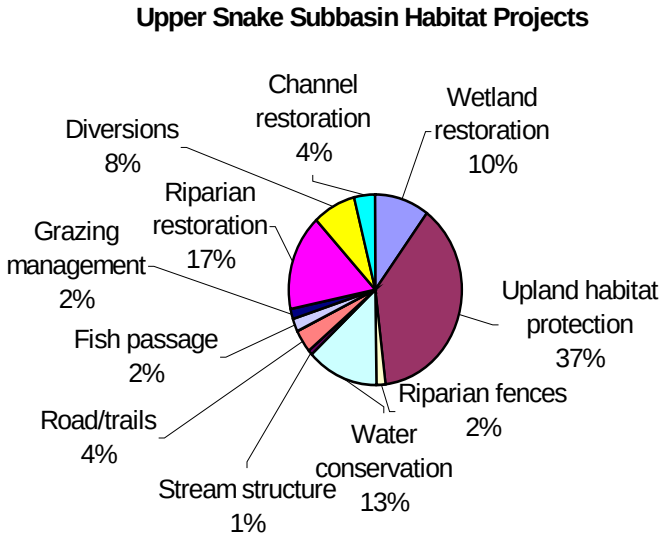

FIGURE 6
Summary of 127 habitat restoration activities in the Upper Snake Subbasin identified during the assessment process

TABLE 1-3
Number of Habitat Restoration Projects by Watershed in the Upper Snake Subbasin Identified for the 12 Project Activity Categories

	Watershed*											
Project Activity Category	**IFA**	**UHF**	**LHF**	**TET**	**WIL**	**AMF**	**BFT**	**PTF**	**LWT**	**RFT**	**GSE**	**USR**
Wetland restoration				9	1				1		1	1
Upland habitat protection	4	8	11	6	3	2	4	1	3	2	3	1
Riparian fences		2										
Water conservation	1	2	2	2			2	4	3	1		
Stream structure	1											
Road/trails	2		1				2					
Access management												
Fish passage	1	1		1								
Grazing management		2										
Riparian restoration	1		4	9			2	3	1		1	
Diversions		4						1	4	1		
Channel restoration			1				2	2				
Totals	**10**	**19**	**19**	**27**	**4**	**2**	**12**	**11**	**12**	**4**	**5**	**2**

*See Table 1-1 for watershed acronyms.

Upper Snake Closed Subbasin Habitat Restoration Activities

Twenty-six projects were designed to restore fish and wildlife habitat in the Upper Snake Closed Subbasin (Figure 7). All restoration projects identified for the Beaver-Camas and Birch Creek watersheds were for upland habitat protection (Table 1-4). Overall, stream structure and upland habitat protection and road/trail restoration were the most common activities reported in the Upper Snake Closed Subbasin (Table 1-4). In the Big Lost watershed nine habitat restoration projects were identified, mostly in upland habitat protection. Nine projects in the Medicine Lodge watershed were identified with upland habitat protection and road/trail maintenance the most commonly reported activities (Table 1-4).

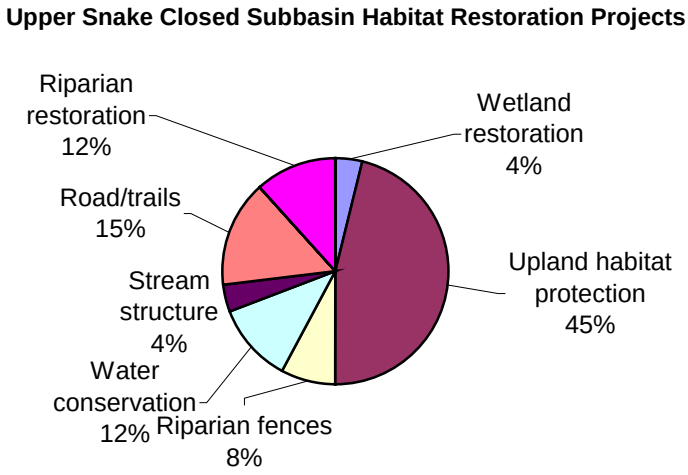

FIGURE 7
Summary of 26 Habitat Restoration Activities in the Upper Snake Closed Subbasin Identified During the Assessment Process

TABLE 1-4
Number of Habitat Restoration Projects by Watershed in the Upper Snake Closed Subbasin Identified for the 12 Project Activity Categories

	Watershed				
Project Activity Category	**Beaver-Camas**	**Medicine Lodge**	**Birch**	**Little Lost**	**Big Lost**
Wetland restoration					1
Upland habitat protection	2	3	1	2	4
Riparian fences				1	1
Water conservation		2			1
Stream structure				1	
Road/trails		3		1	
Access management					
Fish passage					
Grazing management					
Riparian restoration		1			2
Diversions					
Channel restoration					
Totals	**2**	**9**	**1**	**5**	**9**

Information Gaps and Needed Actions

Gaps in information and recommendations for projects have been identified from the technical team for the USP. The information is summarized below as a compilation of future needed actions by their respective subbasin.

Needed Future Actions within the Upper Snake Subbasin

Fisheries

- Continue to inventory native salmonids in the USP to determine current status and major factors limiting their distribution and abundance, and based on these findings, develop and implement plans and strategies for recovery where populations are at risk of extirpation.
- Use genetic markers to detect and quantify levels of hatchery-produced *O. mykiss* introgression within native Yellowstone cutthroat trout populations and to delineate genetic population structure of Yellowstone cutthroat trout throughout their historic range. This fundamental genetic information with regards to introgressive hybridization and genetic population structure is needed to identify remaining pure populations, preserve existing genetic variability, and identify population segments for the development of management plans and the designation of conservation units/management units.

- Complete a fisheries loss assessment for the construction, inundation, operation, and maintenance of the American Falls Reservoir as part of the overall Water District 1 system of integrated water storage and hydropower development.
- Compare rates of hybridization and introgression between hatchery-produced *O. mykiss* and native populations of Yellowstone cutthroat, redband trout, and westslope cutthroat trout. A greater understanding of the phenomenon of hybridization and introgression observed within *Oncorynchus* populations throughout the middle Snake River province and the USP should allow a better assessment of the impacts of past hatchery-produced *O. mykiss* introductions and allow a better evaluation of the possible future genetic risks native *Oncorynchus* populations face with regards to hybridization and introgression.
- Develop genetic DNA markers for redband trout so that the degree of introgression with introduced rainbow trout can be quantified and the degree of variability between and among populations of redband trout can be determined.
- Continue coordinated collection of water temperature data throughout the Upper Snake Subbasin.
- Perform a minimum instream flow study for winter habitat and trout production in the Snake River below American Falls Reservoir, and a conceptual plan and strategy for providing that winter flow.
- Perform a minimum fishery pool study for sustained trout production in American Falls Reservoir and a conceptual plan and strategy for providing that minimum fishery pool.
- Perform a minimum instream flow study for winter and late summer habitat and trout production in the Snake River between American Falls Reservoir and Gem State Dam, and a conceptual plan and strategy for providing those minimum flows.

Wildlife

- Complete habitat mitigation for construction and inundation of the Palisades and Minidoka Dams hydropower developments.
- Complete a loss assessment for the operations and maintenance of the Palisades and Minidoka Dams hydropower developments.
- Perform a life history study of the ecology of remnant sage-grouse populations in the Blackfoot River and Portneuf River Subbasins, including recommendations and strategy for restoring these populations.
- Complete a loss assessment for construction, inundation, operations, and maintenance of the American Falls Reservoir as part of the overall Water District 1 system of integrated water storage and hydropower development.

Above American Falls Reservoir

Insufficient information exists regarding characterization of nutrients, sediments, and dissolved oxygen (DO) loading in this river reach. However, very little is known as to the impairment of beneficial uses from these pollutants in this river reach.

Limited Biological Information

Very little information is available relative to the biology and ecology of sage-grouse in the Blackfoot River. Numbers of birds are anecdotally few, relative to local experience. Whether these birds are migratory or resident in behavior is unknown. Consequently, habitat management recommendations by wildlife managers are limited by poor understanding of basic elements of the small population units remaining in the subbasin.

Needed Future Actions within the Upper Snake Closed Subbasin

Fisheries/Aquatic Needs

USDI BLM (P. Koelsch, in lit.)

- The Little Lost Flood Control Project was constructed in 1985 through a NRCS, Resource, Conservation, and Development Grant to alleviate annual winter flooding and associated property damage. Fishery surveys conducted in 1999 documented the annual loss of the Federally threatened bull trout during winter operation. The annual operation of the Flood Control project appears to be significant to the recovery of the bull trout population in the Little Lost River Watershed. A feasibility study is necessary to develop an array of alternatives to reduce or eliminate the loss of bull trout. Funding avenues need to be explored to develop the feasibility study and ultimately construction of the preferred alternative.

USDA USFS (Gamett, in lit.) for the Little Lost River include:

- Assessing the temporal and spatial patterns of fluvial bull trout
- Determining the mechanisms by which brook trout replace bull trout
- Assessing the role of winter stream temperatures on bull trout spawning, incubation, and juvenile distribution
- Assessing the role of water temperature in determining salmonid species distribution
- Describing the genetic makeup, life history, and ecology of the shorthead sculpin

USDA USFS (Gamett, in lit.) for the Big Lost River include:

- Describing the genetic makeup, life history, and ecology of the mountain whitefish
- Describing the genetic makeup, life history, and ecology of the shorthead sculpin and Paiute sculpin.

USDA USFS, BLM, and IDFG by Gamett (1999) for the Little Lost River Drainage:

Habitat Management

1. Improve riparian habitat and reduce sediment levels in the Wet Creek subdrainage. Reaches of emphasis are Wet Creek above Basin Creek, Coal Creek, the unnamed tributary to Wet Creek below Coal Creek, Basin Creek, and Squaw Creek. This could be accomplished through riparian pastures to better regulate grazing.

2. Relocate the Mill Creek trailhead to reduce impacts to the stream associated with this development.
3. Relocate the Timber Creek trail below the confluence of Slide Creek and Timber Creek. This would involve moving the trail approximately 50 to 100 m downstream of the present location. It would result in the trail crossing only Timber Creek instead of Timber Creek and Slide Creek.
4. Assess potential culvert barriers in Moonshine Creek and Redrock Creek.
5. If there are willing sellers, acquire land or easements on private land along perennial stream reaches to prevent housing development. Emphasis should be on Wet Creek, Big Creek, Summit Creek, Badger Creek, Squaw Creek (Wet Creek drainage), and the Little Lost River.
6. Evaluate removing natural "semi-permanent" barriers that may be blocking the migration of fish into several stream reaches. These include barriers on Badger Creek 3.0 km above the Little Lost River, Bunting Creek 300 m above Badger Creek, Quigley Creek approximately 400 m above the Little Lost River, and Camp Creek immediately above Timber Creek.
7. Evaluate reconnecting Williams Creek to the Little Lost River.
8. Evaluate irrigation diversion barrier and connectivity between Badger Creek and the Little Lost River.
9. Evaluate the potential for Horse Creek to support bull trout. If it is suitable, evaluate the possibility of reconnecting the stream to the Little Lost River.
10. Relocate the Williams Creek Road (#405) above the stream crossing approximately 1 km above the Forest boundary out of the riparian area.
11. Work with cooperating land owners to improve riparian habitat on private land. Emphasis should be on the Little Lost River between Badger Creek and the private property line above Summit Creek.
12. Reduce summer stream temperatures wherever possible. Emphasis should be on the Little Lost River and tributaries above Summit Creek and the Wet Creek drainage.
13. Reduce sediment levels and stream temperatures in Bear Creek.
14. Reduce sediment levels in Deer Creek and Redrock Creek.
15. Reduce sediment levels and improve riparian conditions on Meadow Creek.

Fish Management

- Continue to monitor the Little Lost River at Iron Creek and Wet Creek at the Forest Boundary for brook trout expansion. These sites are above the upper limit of brook trout distribution in these two subdrainages and are being monitored to detect an expansion of brook trout into key bull trout streams.
- Control brook trout expansion wherever possible.

- Eradicate brook trout in Big Creek, Squaw Creek (Sawmill Canyon), Mill Creek, and the Little Lost River above Summit Creek.
- Confirm the existence of brown trout. If found, work to eradicate this species before it becomes established elsewhere in the drainage.
- Assess the loss of bull trout through irrigation diversions on Williams Creek, Wet Creek, and Sawmill Creek near Timber Creek.
- Assess the feasibility of eradicating brook trout in Meadow Creek and Dry Creek and introducing bull trout.
- Determine the degree of illegal and unintentional bull trout harvest.

Education

- Continue efforts to educate the public about the no harvest bull trout rule and identification of bull trout through annual placement of identification posters throughout the Little Lost River drainage.
- Maintain the large bull trout identification signs at the Timber Creek Campground and Sawmill Canyon at the Forest Boundary.
- Expand efforts to educate the public about the no harvest bull trout rule and identification of bull trout by placement of large bull trout identification signs at the Pass Creek/Wet Creek summit, at the Summit Creek summit, and north of Howe.
- Expand efforts to educate the public about the no harvest bull trout rule and identification of bull trout through distribution of bull trout pamphlets through USFS, IDFG, and BLM personnel and offices; local businesses; and tourism centers.
- Begin efforts, through the news media and other means, to inform the public about fish ecology, fish management, and fish management issues in the Little Lost River drainage. Emphasis should be on bull trout and bull trout recovery efforts being made by various agencies.
- Increase enforcement activities relating to the no bull trout harvest rule. Efforts should be concentrated along the Little Lost River and tributaries above Summit Creek.

The following section was developed by the members of the Little Lost River Interagency Technical Advisory Team for the Bull Trout (LLRITAT 1998). These actions are recommended until a conservation plan for these watersheds can be developed.

Barriers to Migration

- New culvert installations in migration routes must be designed and constructed so as not to be a migration barrier (short term). Concrete box culverts and bridges are recommended.
- Fish passage, including but not limited to bull trout, must be designed into replacement stream crossings (existing) when failures occur, design life has been exceeded, or are known to be barriers. Culverts listed in the watersheds below, should be inventoried and should be planned for fish passage.

- Provide for fish passage at Moonshine Creek and Redrock Creek (short term).

Roads

- Reduce road sediment production in sub-watersheds with high substrate fine sediment characteristics (greater than 35 percent). Particularly the sub-watersheds that are adjunct, are priority 1 or 2, or have road density in the riparian habitat conservation areas greater than or equal to 1 mile per square mile (short term).
- Reconstruct existing roads with effective cross-drain spacing and drain dip location to turn water to slope filtration, rather than to existing first-order streams.

Mining

- Maintain restrictions on suction dredge mining in focal and adjunct habitats (spawning and rearing) as well as nodal habitats (mainstream migration corridors) (long term).
- Continue enforcement on current mining regulations.

Forest Practices

- Reduce the risks of stand-consuming wildfires through continuation of active forest management in priority 1 and 2 sub-watersheds most at risk (short term).
- Continue enforcement on current forest practices regulations.

Threats to Lake/Reservoir Habitats

- Continue to evaluate mountain lakes to identify potential bull trout habitat, and monitor distribution of fish stocked into mountain lakes in the Little Lost River key watershed.

Fish Harvest

- Replace and increase number of fishing regulation and bull trout identification signs throughout the Little Lost River key watershed where fishing access dictates (short term).
- Continue enforcement of current fishing regulations and increase patrols in identified spawning (June through August) and wintering areas (November through March) (short term).
- Improve angler ability to identify bull trout and understand reasons for protective regulations.

Agriculture/ Livestock

- Encourage improved management techniques that address cattle dispersal, timing of use, and herding.
- Evaluate livestock allotments, and if necessary, take actions that would reduce sediment production, increase streambank/channel stability, and implement management practices that contribute to riparian vegetation integrity over a wider

area. Increase residual vegetation at the end of the grazing season in Upper Sawmill Canyon.

- Assess water rights administration and compliance with State water laws. Request a moratorium on new consumptive water rights if needed.

Exotic Species

- Reduce competition with brook trout where they overlap with bull trout in priority 1 subwatersheds through selective removal by liberalized angling and electrofishing (short-term).

Additional Information Needs

- Continue to inventory native salmonids throughout the Upper Snake Closed Subbasin where existing information is lacking, in order to determine current status and the major factors limiting their distribution and abundance.
- Use genetic markers to detect and quantify levels of hatchery-produced *O. mykiss* introgression within native Yellowstone cutthroat trout populations and to delineate genetic population structure of Yellowstone cutthroat trout throughout their historic range. This fundamental genetic information with regards to introgressive hybridization and genetic population structure is needed to identify remaining pure populations, preserve existing genetic variability, and identify population segments for the development of management plans and the designation of conservation units/management units.
- Compare rates of hybridization and introgression between hatchery-produced *O. mykiss* and native populations of Yellowstone cutthroat, redband trout, and westslope cutthroat trout. A greater understanding of the phenomenon of hybridization and introgression observed within *Oncorynchus* populations throughout the middle Snake River province and the USP should allow a better assessment of the impacts of past hatchery-produced *O. mykiss* introductions and allow a better evaluation of the possible future genetic risks native *Oncorynchus* populations face with regards to hybridization and introgression.
- Continue to gather and analyze genetic information on bull trout and Yellowstone cutthroat trout to determine the purity of populations and the degree of genetic variability between and among populations.
- Continue coordinated collection of water temperature data throughout the Upper Snake Closed Subbasin to determine water quality and areas of concern for native fishes.
- Identify culverts that need fish passage considerations. Those in priority 1 and 2 sub-watersheds are "short term" and the rest of the Little Lost River key watershed is "long term."
- Identify facilities and actions needed to prevent the loss of bull trout to irrigation diversions (short term), such as diversion fish screens.
- Monitor population responses to conservation actions (long term).

- Participate in the ongoing temperature data collection effort coordinated by U.S. Environmental Protection Agency (EPA) (short term).
- Continue studies of bull trout in Little Lost River key watershed (short term).
- Coordinate and document strategy for current and future monitoring (short term).

Recommended Priorities for Implementation

In the previous section a "short term" or "long term" was identified for each action and is listed in the parentheses. These priorities are based on recommendations of the Little Lost River Technical Advisory Team. Immediate actions are any of those actions with a "(short term)." Immediate actions are those actions deemed necessary to maintain groups of bull trout at risk in the Little Lost River key watershed, while the conservation plan for the entire basin is being developed.

Wildlife/Terrestrial Needs

Comprehensive Monitoring Program for Neo-tropical Migrant and Other Non-game Birds. Bird populations have long been recognized as a good indicator of environmental health. The INEEL is the only area within the Upper Snake Closed Subbasin with a rigorous bird monitoring program. Although the best in the region, this program is deficient in that it only examines bird presence and abundance, rather than the more telling metrics of productivity and survivorship. There is a scientific need to establish a comprehensive network across the subbasin of MAPS (Monitoring Avian Productivity and Survivorship; DeSante and Burton, 1997) stations to provide coordinated and uniform information on bird populations and, as an extension, an evaluation of environmental health.

Baseline Winter Surveying in the Upper Snake Closed Subbasin of the Upper Snake. The North American Moose Foundation (NAMF) and the IDFG are currently planning to partner together to determine the need for surveys of moose and habitat. There have been no specific moose surveys conducted in the Upper Snake Closed Subbasin of the USP. Accurate winter surveys, and seasonal as required, of moose are needed to: 1) set permit levels; 2) observe the health of the herds; and 3) identify conservation areas by determining where the moose are located. Previous survey reports were random and incidental from deer and elk surveys. Additionally, the survey process will become a resource tool to educate the public about moose and their habitat.

Combined Aquatic and Terrestrial Needs

Big Lost River Drainage

- Removal of Instream Gabions—In the 1960s, rock and wire gabions were applied to 100 to 200 feet of Big Lost streambank, for purposes of bank stabilization. Since that time, erosion has circumvented these structures, leaving them mid-stream and partially unraveling. These are large structures and need to be removed to preclude further diversion of natural instream flows and bank instability.
  - Affected Resources: Channel erosion around these structures and erosion of the streambanks nearby add sediment to the river system. Loss of riparian habitat affects shore birds, and added sediment may affect resident fish.

  - Limiting Factors: Funding is needed to remove these structures and to design and implement stream channel and bank rehabilitation.

  - Data Links: United States Department of the Interior Bureau of Land Management, July, 1999. Challis Resource Area Record of Decision (ROD) and Resource Management Plan, page 122.

- Thousand Springs/Chilly Slough Area of Critical Environmental Concern (ACEC) Fencing—Chilly Slough was fenced in the past with cattle-exclusionary fencing. These cattle exclosures are wire fence and in poor condition. The exclusion fences need to be repaired, which will offer limited returns due to the advanced deterioration of the existing fence, or replaced. Replacement of existing fence with buck and pole fencing is preferred.

  - Affected Resources: Chilly Slough wetlands are habitat for numerous wetland and shore birds. Species using these areas as breeding habitats include sandhill cranes, long-billed curlews, and numerous waterfowl. Trumpeter swans have also been documented in the slough. Some populations of the slough may be unique. The spotted frog sub-population in Chilly Slough has a high probability of significant genetic difference from other populations. The wetland vegetation and water quality are affected by access by cattle.

  - Limiting Factors: Funds are needed to renovate or replace fencing.

  - Data Links: United States Department of the Interior Source Area Record of Decision (ROD) and Resource. Management Plan, page 122. United States Department of the Interior Bureau of Land Management, October, 1998. Challis Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS). Volume 2, pages 39, 97, 144, 195, 201, 324, 341, 669, 670.

- Sage Creek Watershed—Investigation and Remediation of Causes of Scouring Debris Flow. A scouring debris flow that moved down Bradshaw Creek (Sage Creek drainage) is suspected to have initiated because of impacts from timber harvest activities on public forest lands above. Research into the physical conditions that initiated the debris flow, and rehabilitation of human-caused conditions may be able to preclude other similarly caused erosional and depositional sequences.

  - Affected Resources: Bradshaw Creek Basin hillslopes and stream channel, as well as Sage Creek below, were affected by this catastrophic sediment movement. Resident trout may have experienced disturbance due to this large sediment pulse.

  - Limiting Factors: Funds are needed to investigate the hillslope, hydrologic, geologic, climatic, vegetative, and management dynamics involved in this occurrence. Funds are also needed to complete rehabilitation of the sites of flow initiation and the eroded areas within the stream channel below.

  - Data Links: United States Department of the Interior Bureau of Land Management, October, 1998. Challis Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS). Volumes 1 and 2, page 657.

- Wildhorse Fence—Streams of a grazing allotment in the Big Lost, on both BLM and USFS lands, have experienced impacts from cattle drifting down from higher elevations later in the grazing season. The long boundary between BLM- and USFS-managed lands needs to be fenced to preclude unwanted movement of cattle down tributaries and onto the banks of the Big Lost. Cattle exclosure fencing is needed for Twin Bridges Creek.

  – Affected Resources: Streambanks of Burnt Creek, Garden Creek, and Twin Bridges Creek, as well as the Big Lost River, receive out-of-season impacts from the cattle. Riparian vegetation, and potentially, resident trout may be impacted by the extended season of use. Human recreation in the area, picnicking, dispersed camping, hunting, and hiking, are also affected by the cattle impacts.

  – Limiting Factors: Funds are needed to construct more than 6 miles of wire fence along the USFS/BLM boundary and as an exclosure along Twin Bridges Creek.

  – Data Links: United States Department of the Interior Bureau of Land Management, October, 1998. Challis Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS). Volume 2, pages 624-626, 657.

Little Lost River Drainage

- Summit Creek Fencing—Summit Creek ACEC/Resource Natural Area (RNA) was fenced with cattle-exclusionary fencing in the 1970s. These cattle exclosures are wire fence and in poor condition. The exclusion fences need to be repaired, which will offer limited returns due to the advanced deterioration of the existing fence, or replaced. Replacement of existing fence with buck and pole fencing is preferred, to protect resource values: wetland, recreation, and safe elk movement.

  – Affected Resources: Although the Little Lost has no surface connection to the Snake River, it has resident populations of cutthroat and brook trout. Habitat of these fish, as well as recreation values, will be protected by well-maintained exclusionary fencing.

  – Recreationists and elk will experience safer passage through and over buck and pole fencing.

  – Limiting Factors: Funds are needed to renovate or replace fencing. Funds are needed to inventory sage-grouse habitat.

  – Data Links: United States Department of the Interior Bureau of Land Management, July, 1999. Challis Resource Area Record of Decision (ROD) and Resource Management Plan, pages 16, 17. United States Department of the Interior Bureau of Land Management, October, 1998. Challis Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS). Volume 2, pages 195, 321, 632, 656, 658.

- Study/Redirect Summit Creek Agricultural Water back to the Pahsimeroi Drainage—Portions of flows from Big Gulch in the Pahsimeroi drainage, north of Summit Creek in the upper Little Lost, after use as agricultural water, are diverted into Summit Creek drainage in the Little Lost. The Pahsimeroi is occupied by bull

trout, and experiences extreme low flows. Currently, agricultural water is diverted from Big Gulch in the upper Pahsimeroi Subbasin, north of the divide, and returned to Summit Creek in the Little Lost Subbasin, on the south side of the divide.

- Affected Resources: Low flows are suspected to negatively affect the anadromous fish of the Pahsimeroi Subbasin. Returning the diverted flows to the Pahsimeroi, along with other measures planned for that subbasin, will help ensure adequate instream flows for Pahsimeroi fish runs.
- Limiting Factors: The water user involved may wish to continue to return water to Summit Creek rather than return it to the Pahsimeroi Subbasin. Adequate funding is needed to make returning water to the Pahsimeroi advantageous for the water user. Water right holder concurrence is not assured for this project.
- Data Links: United States Department of the Interior Bureau of Land Management / U.S. Department of Agriculture U.S. Forest Service, May 2001 (draft). Pahsimeroi River Subbasin Review, page 120.

- Donkey Hills and Summit Creek Basin Vegetative Inventories—Within the Donkey Hills ACEC, surveys are needed to determine the health and extent of vegetative ecosystems in the area, including a survey of the relative health of the forest vegetation in the area. The Summit Creek Basin provides a sage-grouse stronghold; important due to the loss of Snake River sage-grouse habitat due to wildfire. An inventory of sage-grouse habitat is needed here.
  - Affected Resources: Donkey Hills is an upland divide between the Little Lost and Pahsimeroi drainages. Critical elk wintering habitat and elk calving areas are within the ACEC borders. This area and the Summit Creek Basin are quite removed from most human impacts and, thus, have unique value for wildlife, as well as offering intact uplands that promote hydrologic stability within the Little Lost system. The Summit Creek habitat is a stronghold for sage-grouse, a potential candidate species under the ESA.
  - Limiting Factors: Funds are needed to complete the vegetative ecosystem and forest health surveys in Donkey Hills, and the sage-grouse habitat study in Summit Creek Basin.
  - Data Links: United States Department of the Interior Bureau of Land Management/U.S. Department of Agriculture U.S. Forest Service, May 2001 (draft). Pahsimeroi River Subbasin Review, page 120.

    United States Department of the Interior Bureau of Land Management, October, 1998. Challis Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS). Volume 2, page 316.

Needs identified by The Nature Conservancy for the Upper Snake Closed Subbasin drainages of the Big Lost River, Little Lost River, and Birch Creek.

- Subbasin-wide assessment of highest-quality sage-steppe habitat on public and private lands and development of conservation plans for protecting these areas.

- Development and implementation of a Federally funded conservation easement acquisition program for the preservation of working agricultural lands with significant wildlife habitat.
- Secure appropriations to fund rangeland conservation practices and compensate permittees for targeted Federal grazing allotment buy-outs and/or reductions.
- Development and implementation of land owner incentive and stewardship programs for the protection, enhancement, and restoration of key habitat areas.
- Development and implementation of "grass banks" for the enhancement and restoration of public land grazing allotments and associated wildlife habitat.
- Secure special designations for ecologically significant public lands (i.e., ACEC, RNA).
- Restoration and enhancement of sage-steppe and riparian habitats through plantings, fencing projects, seeding, weed control, and reintroduction of ecologically desirable fire regimes.

Restoration and maintenance of desired flow regimes in targeted waterways. Secure increased technical and financial support for efforts to preserve bull trout habitat through tributary reconnections, diversion enhancements, irrigation improvements, and other projects.

Needed Future Actions for the Snake Headwaters Subbasin

Ecologically Based System Management

The present Ecologically Based System Management Project (EBSM) funded by USBR (see Assessments Within the Subbasin, and Research, Monitoring, and Evaluation Activities, above) extends only from Palisades Dam to Heise on the South Fork of the Snake River. Because this stretch of the river is significantly different geologically and hydrologically from the stretch from Heise downstream to the confluence with Henry's Fork, similar data (particularly field measurements and hyperspectral imagery) need to be obtained from this lower stretch to make the EBSM fully worthwhile, and maximize the predictive power and utility of the resulting model.

Fish/Aquatic Needs

General. Continue to inventory native salmonids in the middle Snake River province and the USP to determine current status and major factors limiting their distribution and abundance, and based on these findings, develop and implement plans and strategies for recovery where populations are at risk of extirpation.

- Use genetic markers to detect and quantify levels of hatchery-produced *O. mykiss* introgression within Yellowstone cutthroat trout populations and to delineate genetic population structure of Yellowstone cutthroat trout throughout their historic range. This fundamental genetic information with regards to introgressive hybridization and genetic population structure is needed to identify remaining pure populations, preserve existing genetic variability, and identify population segments

for the development of management plans and the designation of conservation units/management units.

- Compare rates of hybridization and introgression between hatchery-produced *O. mykiss* and native populations of Yellowstone cutthroat, redband trout, and westslope cutthroat trout. A greater understanding of the phenomenon of hybridization and introgression observed within *Oncorynchus* populations throughout the middle Snake River province and the USP should allow a better assessment of the impacts of past hatchery-produced *O. mykiss* introductions and allow a better evaluation of the possible future genetic risks native *Oncorynchus* populations face with regards to hybridization and introgression.

- Continue coordinated collection of water temperature data throughout the middle Snake River province and the USP.

Jackson National Fish Hatchery

- Irrigation Diversions—Irrigation diversions on Federal and private land in the Upper Snake Subbasin may or may not have direct impacts on the native and non-native fish stocks. Many of the irrigation diversions do not have screens or other devices, which would reduce or eliminate the potential impacts on the fish populations. A study proposal has long been identified in Jackson National Fish Hatchery's (NFH) Fisheries Operational Needs System (FONS) to determine the effects on aquatic populations on Federal land but has not been funded.

- Isolation / Quarantine Facility—Jackson NFH's involvement with wild and native trout is entering its second decade. Other species, including species of concern and, to a lesser degree, amphibians, cannot be reared and propagated at this facility because it lacks an isolation / quarantine unit, which is necessary according to WYG&F Policy. Currently, replacement broodstock from the wild are brought in to the facility as fingerlings from iso-quarantine units in the State system. Multi-species propagation and broodstock development dictates that a unit is necessary at Jackson. It has been identified in the Maintenance Management System (MMS) for the station but has not been funded.

- Peterson Springs Waterline—The availability of cold, clean, and abundant pure water located on the National Elk Refuge was the primary reason for the site location of the hatchery today. The water delivery system from Peterson Springs is a ductile iron pipe, which is now approximately 50 years old. The pipeline has failed twice in previous years and is in need of replacement. The project is in the MMS system but has not been funded. Without this source of water for the facility, many of the existing propagation programs could not be attempted, nor could other species be considered as a refugia population.

Palisades Reservoir Need

- No studies have been conducted to identify a conservation minimum pool in Palisades Reservoir. Palisades has a minimum operational pool of 201,000 acre-feet for power head. According to IDFG, increased outmigrations of fish occur at levels below 500,000 acre-feet. Large fluctuations in water levels (up to 80 feet) may affect open water species such as lake trout and kokanee (IDFG 1991) (Snake River Resources Review: Aquatic Resources Parameters Manual March 2001).

Wildlife/Terrestrial Needs

Comprehensive Monitoring Program for Neo-tropical Migrant and Other Non-game Birds. Bird populations have long been recognized as a good indicator of environmental health. Although various bird surveys are conducted in the region (e.g., limited USFWS Breeding Bird Surveys, various raptor counts, etc.), there is no coordinated, rigorous bird monitoring program. Moreover, the limited efforts that do exist are deficient; the general bird surveys only record bird presence and abundance, rather than the more telling metrics of productivity and survivorship. There is a scientific need to establish a comprehensive network across the subbasin of MAPS (Monitoring Avian Productivity and Survivorship; DeSante and Burton, 1997) stations to provide coordinated and uniform information on bird populations and, as an extension, an evaluation of environmental health.

Grand Teton National Park and John D. Rockefellar, Jr., Parkway. A primary need is to develop an adequate natural resource database with which to: 1) protect natural resources from degradation by an expanding visitor population; and 2) assist management in developing project priorities. Toward this end, specific needs are:

- Funding for an additional seasonal biologist position, devoted to the Inventory and Monitoring (I&M) program.
- Additional helicopter hours, particularly for locating two "missing" bald eagles.
- Neotropical migratory bird monitoring program development and implementation.
- Vegetation specialist to develop and implement a program to manage grazing, rare plants, noxious weeds, and rehabilitation of disturbed sites and abandoned homesteads.
- Permanent funding for Geographic Information System (GIS) technology to assist resource management and research programs within the GTNP.

Management and Research Needs for Trumpeter Swans. Management and research needs for the protection and population enhancement of the Trumpeter swans include (Pacific Flyway Subcommittee on Rocky Mountain Trumpeter Swans 1998):

- Monitoring of winter distribution and abundance.
- Monitoring of nesting effort and success and abundance of breeding segment.
- Monitor/research aquatic macrophyte communities and impacts of winter flow, regimes, particularly in the Harriman State Park vicinity of the Henry's Fork (as it influences breeding populations in Grays Lake such that they are both of the Rocky Mountain Population).
- Habitat improvement to correct problems at specific nesting territories.
- Research into seasonal movements and habitat use.
- Hazing and capture/translocations out of high risk areas.

Bonneville County Weed Control Program Needs. Develop a program for the Swan Valley area on control of spotted knapweed. This will include participation with land owners,

agencies including the Idaho Department of Agriculture (IDA), and Bonneville County. A program may include an agreement whereby:

- The county applies the herbicide\bugs
- The land owner pays for product
- The State or other agencies cost share the total expense, or pay for the application and a percentage of the product
- This would be a long-term program implemented and monitored for many years.

Combined Aquatic and Terrestrial Needs

U.S. Fish and Wildlife Service—Idaho. The Columbia Plateau is an arid sagebrush steppe and grassland surrounded on the north, west, and east by moister, predominantly forested, mountainous ecological regions. It consists of arid tablelands, intermountain basins, dissected lava plains, and widely scattered low mountains. There is a more subtle transition to the Basin and Range to the south in which hotter lowlands are dissected by isolated mountain ranges (*Columbia Plateau Bird Conservation Plan Executive Summary*).

Issues in this area include conversion of shrub-steppe and wetlands to agriculture, grazing, and some urban development. To return the area to its near-natural status would require:

- Careful management and removal of invasive plant species. These have been particularly damaging, led by aggressive species such as cheatgrass and crested wheatgrass.
- Management of wild lands for fire suppression and other practices, which have greatly reduced the extent and health of open ponderosa pine habitat.
- Restore the dry, open, multi-aged ponderosa pine system. This will require careful silviculture and a regimen of prescribed fire.
- Maintain and restore a dynamic sagebrush ecosystem within the shrub-steppe, including no further net loss of healthy sagebrush, and restoration of fragmented and degraded areas.
- Protect existing wetlands and restore water regimes.
- Manage livestock grazing and restore levels of water tables. The health and complexity of riparian shrub and forest vegetation has been extensively degraded due in part to over-grazing and lowering of water tables. However, restoration activities have been shown to produce relatively good results.

Idaho Department of Fish and Game—Mule Deer Information Requirements. A comprehensive inventory of winter range quality and quantity, including the status and terms of enrollment of CRP lands would be valuable for long-range planning and management. CRP is particularly important because such a large percentage of the analysis area is privately owned. A large-scale conversion from CRP back to cultivated

crops could result in significant depredation problems by both mule deer and elk under current population objectives for both species.

Idaho Department of Fish and Game. Sagebrush steppe habitats throughout the Columbia River Basin have been degraded by human activities including conversion to agriculture, livestock grazing, invasive plant species, and altered fire regimes. Restoration of these habitats demands a reliable source of plant materials (seed and seedlings) for use in reestablishing ecosystem function to accomplish restoration and enhancement goals. Often, managers are unable to find an adequate supply of site-adapted native plant materials that will survive and prosper in local climates and soils.

Idaho Soil Conservation Commission. In order to support both aquatic and terrestrial needs, the ISCC proposes the following for the East Side Soil and Water Conservation District:

- Educating land owners in benefits of BMPs such as no-till, sub-soiling, water and sediment basins, etc. (These BMPs would reduce soil runoff, which should reduce the amount of suspended solids in streams.)
- Subsidizing installation of BMPs and cost sharing.
- Water monitoring to reassure beneficial uses are attained.

Lower Valley Energy, Inc.

- Growing osprey population is an increasing problem for Lower Valley Energy (LVE) and its customers. Assistance in planning and achieving long-term mitigation of the problem through expert advice and funding for both the ospreys and LVE's customers would be a benefit.
- Tools such as longer-reaching bucket trucks for installation of marker balls, etc., to assist in the prevention of swans colliding with high-expanse power lines.

Market Lake Wetland Complex (Southeast Idaho Wetland Focus Area Working Group, 2001). Several strategies exist for conserving existing and historic wetland areas in this complex, however:

- Acquisition of property or capital may be the best option.
- The purchase of water rights within the Snake River system and using them on the WMA may be able to supplement decreasing water levels in the marshes during the summer.
- Purchasing and installing a pumping system that will take water from the Van Leuven slough to the Snake River is one alternative. Pumping would occur when the slough backs up during times of high flows in the river so as to prevent flooding on the WMA and private property in the basin.
- An evaluation of erosion and flooding problems in the basin may be warranted.
- Installation of check dams could reduce excessive runoff and reduce or eliminate flooding problems within the basin.

- Conservation actions (acquisition and restoration) within the historic Market Lake Basin would allow for extensive restoration of these converted wetlands.
- Control of noxious weeds needs to increase throughout this complex. This effort should continue to be coordinated with local agencies, land owners, and other conservation organizations to control and/or eliminate purple loosestrife.

South Fork of the Snake Wetlands Complex (Southeast Idaho Wetland Focus Area Working Group, 2001). Protecting wildlife and habitat value in existing wetlands should be the main thrust of wetland conservation in the South Fork Wetland Complex.

- Conservation partnerships focusing on wetland protection especially on lands with high wildlife and habitat values should be a priority. Such land partnerships would be able to protect existing wetland habitat functions and values, as well as restore degraded areas to historic conditions.
- Livestock management should be addressed using several NRCS programs that are directed at improving grazing methods and protecting water quality. Additionally, the NRCS can work with land owners to develop conservation plans that would recommend strategies for continuing the farming and/or cattle operations and still protect the wetland resources.
- The IDFG and USFWS also have some cost-share funds to assist with fencing along riparian zones.
- Because of the private ownership of important wetland and riparian areas, land owner participation in wetland conservation efforts will be essential. Land owners interested in conservation should be informed about the economic and ecological advantages of participation in the various land stewardship programs that can include grazing management, waterway buffering, BMPs, water quality improvement projects, wetland restoration, and riparian fencing and re-establishment.

Willow Creek Wetland Complex (Southeast Idaho Wetland Focus Area Working Group, 2001). Conservation partnerships should be developed to focus wetland protection and restoration efforts especially on private and public lands with high wildlife and habitat values.

- Because of the private ownership of important wetland and riparian areas in the Willow Creek Complex, land owner participation in wetland conservation efforts will be essential. Interested and willing land owners should be informed about the economic and ecological advantages of participation in land stewardship programs that can include grazing management, stream and wetland restoration, and riparian fencing and re-establishment.
- Government land managers of mountainous areas should be encouraged to incorporate wetland habitat maintenance and restoration techniques in land management projects.
- This should include establishing wide stream protection zones, and facilitating growth of riparian and forested wetland vegetation near rivers, streams, and wetlands.

- Road construction across or near streams and other wetlands should be avoided or minimized and natural drainage patterns should be maintained.
- Restoration of historic wetland functions and values should be a long-term goal.
- Re-establishment of natural hydrologic regimes may be one of the few ways to benefit declining wildlife populations as well as wetland vegetation communities.

Baseline Winter Moose Surveys in the Headwaters of the Upper Snake. The NAMF and the IDFG are currently planning to partner together to develop science-based surveys for moose and habitat. There have been no specific moose surveys conducted in the Headwaters of the Upper Snake. Accurate winter surveys, and seasonal as required, of moose are needed to: 1) set permit levels; 2) observe the health of the herds; and 3) identify conservation areas by determining where the moose are located. Previous survey reports were random and incidental from deer and elk surveys. Additionally, the survey process will become a resource tool to educate the public about moose and their habitat (http://www.moosefoundation.org).

Wyoming Game and Fish Department. WYG&F combined aquatic and terrestrial needs include the following.

- Installation of a water intake structure in the levee near Tucker pit.
- Channel water into historical river channels that are currently either dry or hold only small amounts of water for a portion of the year. Improved flows will increase cutthroat trout spawning, and provide habitat for a wide diversity of amphibians, mammals, and birds. Project benefits include significant benefits to the spawning substrates.

Jackson Lake Ecology as Affected by Severe Drawdowns. During severe drought years as occurred in the summer of 2000 and 2001, Jackson Lake is drawn down to natural lake levels, which could be 40 feet below full pool level as maintained by the Jackson Dam. During these periods, vast stretches of shoreline and mud flats are exposed.

- Acquire data related to the impacts of these severe drawdowns on:
  - Waterfowl, bald eagles, herons, and other water-dependent bird species
  - Beaver, muskrats, otters, and other mammals dependent on lake levels
  - Aquatic vegetation including floating and emergent plant communities
  - Cultural resource sites that are normally submerged
  - Aquatic invertebrates
  - Hyporehic communities
  - Fish species
  - Exotic species such as the New Zealand Mud Snail (known to occur upstream of Jackson Lake) or the encouragement of invading exotics such as tamarisk and purple loostrife

  - Aquatic-born diseases such as Whirling Diseases

- A panel of experts should be established that will be charged with the responsibility of:
  - Evaluating the significance of the impact on the above resources and/or concerns
  - Establishing a priority of investigation and evaluation
  - Developing protocols for appropriate inventory, monitoring, and research projects as required
  - Developing mitigation procedures following inventory, monitoring, and research efforts if applicable and practical
  - Defining potential contractors and partners for funding and investigative efforts
  - Providing oversight of inventory, monitoring, and research

Land Protection Needs. Although substantial lands have been protected along the South Fork of the Snake River and amid the Snake River watershed in Teton County and Subbette County, Wyoming, many rich fish and wildlife habitats found near the river are still a threat to development.

- The best of these lands should be conserved through conservation easements and fee acquisition to ensure they continue to function as habitat.
- Reasonable forward-looking developments plan, based on good science and impacts to resources, needs to be developed.

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DRAFT INVENTORY APPENDIX A

Limiting Factors within the Upper Snake Province

LIMITING FACTORS WITHIN THE UPPER SNAKE PROVINCE

Focal Habitats/Focal Species	Limiting Factors	Biological Objectives
Aquatic: Yellowstone cutthroat trout Bull trout Mountain whitefish Utah valvata snail Snake River physa snail	Impoundment and dam operation: A. Altered hydrograph below dams prevents natural stream processes B. Fish passage barriers C. Low reservoir levels degrade the habitat of over-wintering focal species D. Low reservoir levels degrade reservoir and downstream water quality	A1. Restore natural river processes below dams (hydropower and irrigation), including peak flows that access the floodplain, to benefit focal species. B1. Restore upstream connectivity around dams. C1. Maintain sufficient reservoir levels to support overwintering focal species. D1. Maintain water quality downstream of dams that meets the life history needs of focal species. D2. Maintain reservoir water levels to support water quality requirements of focal species.
	Diversions/canals: E. Fish passage barriers F. Habitat connectivity – reduced natural flows G. Water quality H. Water quantity	E1. Restore upstream connectivity around diversions for fish passage. F1. Maintain flows below dams/diversions that support focal species. F2. Identify and reduce artificially blocked streams or unscreened diversions. G1. Restore water quality conditions, including stream flows, to meet focal species' needs as well as applicable water quality standards. H1. Maintain flows to support focal species needs including migration.
	Habitat alteration I. Channel bank stability J. Instream habitat K. Diking/channelization	I1. Restore or stabilize stream reaches that have become unstable (e.g., braided channels, down-cutting, etc.) from land management practices. I2. Protect, enhance, and restore riparian health and function along streams supporting focal species and to meet applicable water quality standards. J1. Protect, enhance. and restore instream structure, diversity, and complexity (e.g., riffle/pool ratio, LWD, width/depth ratio, etc.) necessary for supporting the life history functions of focal species. K1. Restore or mitigate aquatic habitats and stream banks that have been artificially diked and/or channelized (note: mitigate where restoration is not possible).

Focal Habitats/Focal Species	Limiting Factors	Biological Objectives
	Focal species stability: L. Introduced species M. Isolation/fragmentation N. Focal species recruitment N1. Survival N2. Abundance	L1. Protect, enhance, and restore genetic integrity of focal species. L2. Maintain flows to provide connectivity/migration to meet focal species' life history needs. M1. Improve connectivity of meta-populations of focal species (e.g., stream flow). M2. Remove physical barriers that prevent migration of focal species. N1. Improve survival of focal species in all life stages. N2. Increase focal species numbers to viable usable population according to the Title 36 mandate of IDFG.
II) Riparian/Wetland Western toad Yellow-billed cuckoo American beaver	A. Altered hydrograph (dams/diversions) B. Changes in land use C. Transportation impacts D. Overgrazing E. Recreation activities are damaging riparian and wetland areas F. Spring flows and associated habitats are being lost to spring capping/piping for livestock tanks G. Beaver management	A1. Protect and enhance the riparian cottonwood forests in river bottoms. A2. Restore bank-full discharge events below dams for riparian maintenance production. A3. Restore discharges below dams that activate floodplain function. A4. Conserve water within the existing legal framework and identify and develop opportunities to improve stream flows that will benefit riparian/wetland habitats and focal species. A5. Reduce the impact of invasive plant species on native species and ecosystems. B1. Prevent future loss of riparian/wetland areas. C1. Protect, enhance, and restore riparian and wetland function. D1. Protect, enhance, and restore riparian and wetland habitats where they are being impacted by grazing activities. D2. Protect, enhance, and restore springs that have been impacted by overgrazing. E1. Protect, enhance, and restore riparian and wetland habitats where they are being impacted by recreation activities. F1. Restore and protect springs at livestock watering developments. G1. Reintroduce beavers as a means of restoring and enhancing riparian and wetland habitats.

Focal Habitats/Focal Species	Limiting Factors	Biological Objectives
III) Open Water/Ponds/ Impoundments: Western grebe American white pelican Trumpeter swan Common loon	A. Water fluctuations affect loafing, feeding, nesting, and brood rearing habitat for waterfowl, colonial waterbirds, and shorebirds B. Human disturbance during nesting and brood rearing C. Lack of available or suitable habitat for waterfowl and shorebirds on ponds and impoundments	A1. Manage water levels to benefit loafing, nesting, feeding, and brood rearing habitat for waterfowl, colonial waterbirds, shorebirds, and other aquatic focal species and their habitats. B1. Protect colonial rookeries and waterfowl broods from disruptive human disturbance. C1. Protect, enhance, and restore nesting habitat for waterfowl and shorebirds on ponds and impoundments.
IV) Pine/Fir Forest: Black-backed woodpecker Great gray owl Boreal owl, Northern goshawk	A. Loss of large, late-seral stands B. Fragmentation of forest complexes C. Lack of natural fire regime D. Insect and disease damage	A1. Identify, enhance, and protect potential late-seral forest habitats to benefit focal species and achieve forest Desired Future Conditions (DFC). B1. Use forest management practices to achieve DFC of healthy forests. C1. Reduce fuel loads where appropriate. Use fire management to achieve DFC of healthy forests. D1. Use forest management practices to control the spread of insects and disease.
V) Juniper/Mahogany: Curl-leaf mountain mahogany	A. Lack of natural fire regime B. Competition with invasive plant species C. Loss of regeneration	A1. Restore natural fire regime to prevent juniper encroachment and restore mahogany stands. B1. Limit/treat exotic plants that compete with mahogany. C1. Limit livestock and elk grazing/browsing to allow successful mahogany regeneration.
VI) Whitebark Pine: Whitebark pine	A. White-pine blister rust	A1. Protect remaining stands of whitebark pine from white-pine blister rust. A2. Understand and establish conditions that support existing and new stands of whitebark pine.
VII) Aspen: Quaking aspen	A. Conifer encroachment B. Inadequate regeneration C. Insect and disease damage	A1. Manage to have 80 percent of the mixed conifer/aspen habitat complex be in 100 percent aspen stands. A2. Manage aspen stands against pine/fir encroachment. B1. Reintroduce fire to regenerate aspen in decadent/diseased aspen stands. B2. Manage livestock and big game to allow aspen regeneration after fire in decadent stands. C1. Manage insect and disease problems in aspen stands.

Focal Habitats/Focal Species	Limiting Factors	Biological Objectives
VIII) Mountain Brush: Antelope bitterbrush Green-tailed towhee Mule deer Rocky Mountain elk	A. Mountain brush regeneration B. Fire C. Invasive plant species competition D. Land use change	A1. Restore, enhance, and protect the geographic extent of remaining mountain brush habitats. B1. Manage fire to maintain mountain brush habitats. C1. Control invasive plant species such as cheatgrass from encroaching/replacing mountain brush habitats. D1. Identify and protect important mountain brush habitats that lie in winter range areas and/or are vulnerable to development.
IX) Shrub-Steppe Northern sagebrush lizard Greater sage-grouse Sage sparrow	Loss of shrub-steppe habitat Undesirable invasive plant species competition Land conversion/ development Fire Juniper encroachment	A1. Protect, enhance, and restore shrub-steppe habitats. A2. Minimize impacts to native bunch grasses and forbs from livestock grazing and maintain diverse shrub-steppe canopy cover. B1. Control undesirable invasive plant species competition. C1. Reduce or eliminate land use conversion and habitat fragmentation. C2. Restore planted crested wheatgrass areas to shrub-steppe habitats. C3. Restore shrub-steppe habitats in areas displaced by cheatgrass monocultures. D1. Prevent invasive plant species establishment. E1. Treat Utah juniper encroachment on shrub-steppe habitat.

DRAFT INVENTORY APPENDIX B

Upper Snake Province Project Inventory Master List

DRAFT INVENTORY APPENDIX B

Upper Snake Province Project Inventory Master List

The purpose of the project inventory master list is to provide a comprehensive picture of the types of fish and wildlife restoration activities that have been and are currently being conducted in the Upper Snake Province (USP), along with information as to who is responsible for funding the projects. The information presented here was collected from technical and planning team participants through the project inventory web site or through direct submission. Additional information was collected from web sites of funding and implementation agencies and through interviews of nonparticipants. Because of the size of the USP and the number of agencies, nonprofit organizations, and private parties actively engaged in fish and wildlife restoration activities, it is unlikely that all activities implemented within the last 5 years have been included here. The information provided here covers the broad scope of most of the current types of activities taking place.

One of the challenges in building the project inventory is finding summarized descriptions of the work. Some agencies have summary tables of their projects, while others have full descriptions of work proposed or to be done. The various natural forests are examples of that. Some forests have tables listing their projects, while others have pages of scoping documents.

Other projects are part of an overall work effort. Examples are Idaho Department of Fish and Game (IDFG) habitat improvement projects through the Wildlife Management Areas (WMA) and Habitat Improvement Program (HIP). The work is described in terms of regions, costs, and numbers and types of sites, but not specific watersheds. In the Wyoming watersheds, the primary activities were planning and monitoring. The State of Wyoming and the U.S. Bureau of Land Management (BLM) both had major planning projects for the water resources and land management in the Snake River watersheds.

The other side of that is in cases of small projects. Data was acquired from the BLM Challis office describing many small projects (summarized in the Tables B-1 through B-3). Many of them were low cost and low time expenditure projects such as trough or fence installations and maintenance on existing features.

There are also programs that affect the environment such as the noxious weed control programs. The weed control program is conducted by weed control districts composed of communities, counties, or regions. Other weed control projects are conducted outside of the weed control program by the other resource management agencies.

Redundancies in listings also occur because many projects are joint ventures and are listed by each organization. For some organizations, the land holdings are the projects. The Nature Conservancy is an example. Each of their lands is listed as a project. There may be some detail about the restorative or maintenance activities, but not always. The same is true of some regional organizations that establish conservation easements. One such organization is

the Teton Regional Land Trust. Their members have contributed funds and set aside properties for conservation. Sometimes there is specific work to be performed, other times, land is simply protected from development. Table B-1 presents the fish and wildlife restoration activities in the past 5 years. The restoration activities are categorized by each subbasin.

TABLE B-1
Snake Headwaters Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Comments/Results/Monitoring	Project Description	Geographic Area of Coverage				
										SHW	GVT	GHB	PAL	SAL
Rainey Creek Exclosure	Headwaters Snake	Ongoing	1958	1996	IDFG	IDFG		There is a striking difference in the shrub height and density between the two grazing treatments: *Symphoricarpos oreophilus*, *Purshia tridentate*, and *Rosa* sp. are denser and stature is twice as tall within the section where all grazing is excluded. Also, the treatment that excludes only livestock has much more hedging of Juniper; there is no hedging within the portion where all grazing is excluded.	This is a two-way exclosure erected by the USFS and IDFG in 1958 to "study big game winter range problems." The exclosure is about 5 acres; half excludes all ungulate grazing and the other half excludes only livestock. The exclosure lies on a rounded SE-facing slope and is dominated by *Juniperus scopulorum*, although shallower soil in the upper part supports *Cercocarpus ledifolius* instead of Juniper. Understory is a mixture of low shrubs and *Agropyron spicatum*.				x	
Federal Aid in Fish Restoration: Job Numbers 6--b, -c1, -c2, -d	Upper Snake	Completed	1987	1988	IDFG	IDFG							x	
Federal Aid in Fish Restoration: Project 7. Irrigation Diversion Fish Loss Reduction: Subproject 1. South Fork Snake River Canal Investigations	Headwaters Snake	Completed	1996	1997	IDFG	IDFG		The number of sample sites needs to be increased to a variety of streams with different life cycles, diversion location, and evaluation of mortality needs to be expanded to include fish of all sizes that should be uniquely marked.					x	
Sport Fish Restoration: Project 3: Wild Trout Investigations. Subproject 1. Whirling Disease Studies. Subproject 2. Evaluations of Salmonid-Restricted Harvest Regulations Permitting the Use of Bait.	Upper Snake	Ongoing	1996	1997	IDFG	IDFG		1. Conduct additional sentinel tests in other drainages testing positive for *Myxobolus cerebralis* (MC). 2. Quantify spore loading and percent of infection of salmonids in drainages testing positive for MC. 3. Surface water from Loving Creek at Hayspur Fish Hatchery is positive for MC and should not be used for rearing any trout for release in MC negative waters in Idaho. 4. Continue population estimates to monitor year class and population trends in selected positive waters.	Sport Fish Restoration: Project 3: Wild Trout Investigations. Subproject 1. Whirling Disease Studies. Subproject 2. Evaluations of Salmonid-Restricted Harvest Regulations Permitting the Use of Bait.				x	
Blue Gulch #13 Fence	Upper Snake	Ongoing	1998		BLM	BLM			Cooperative project with IDFG and Pheasants Forever. Construct 3-wire fence around perimeter of Sikes Act wildlife tract to protect upland bird habitat.				x	
Dean Site Exclosure	Upper Snake	Ongoing	1998	1999	IDFG ICDC	IDFG		The exclosure was probably heavily grazed prior to fencing. This area was first fenced in 1969 as a primitive recreation site. A pit toilet was installed in 1970. Vandalism at the site, including the outhouse being pulled over.	A pump house is within the exclosure that pumps water up over the ridge. The water is taken from the uppermost spring, but appears to be a small amount.				x	
Trail Identification Signs		Completed	2003	2003	Bonneville	RAC Title II							x	
Upper Rainey Creek Trailhead Rehabilitation		Completed	2003	2003	Bonneville	RAC Title II							x	

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										SHW	GVT	GHB	PAL	SAL
Copenhagen Basin Parking Lot Toilet		Approved	2002	2002	Bear Lake/Franklin	RAC Title II								x
Noxious Weed Control		Approved	2002	2002	Caribou	RAC Title II								x
Willow Flat Trail		Approved	2002	2002	Bear Lake/Franklin	RAC Title II								x
Idaho Habitat Management	Southeast	Ongoing	2003	2004	IDFG	IDFG			Annual budget for WMA.				x	x
Habitat Improvement Projects (HIP)	Southeast	Ongoing	2002	2003	IDFG	IDFG	Feed, cover, and riparian condition		Food plot, shrub and tree planting, fencing, and wetland creation.				x	x
IDEQ 319 projects		Ongoing	2003	2004	IDEQ	IDEQ				x	x	x	x	x
Palisades Creek	Bonneville County				IDFG, Partners for Fish and Wildlife Project	USFWS		Fish passage restoration.					x	
River at a Crossroads: Development in the 100-Year Floodplain of the South Fork Snake River	South Fork Snake River	Complete	2002	2003	Greater Yellowstone Coalition (GYC)	GYC		This study was conducted by GYC to assess the number of built structures in the 100-year floodplain of the South Fork Snake River. Using GIS technology and county land use records, GYC determined the amount of growth and development located within the floodplain in Bonneville County. The study also discusses the threats posed by floodplain development including bank stabilization projects and the removal of cottonwoods and other riparian vegetation. Recommendations are given at the end of the published study document.	The results of the study show that the South Fork is indeed threatened by development within its floodplain. The recommendations include the adoption of a new floodplain ordinance that prohibits the construction of new buildings in the FEMA-designated 100-year floodplain, prohibition of new bank stabilization and stream channelization projects, and prohibition of the clearing of mature riparian vegetation.				x	
Spring Creek Watershed Assessment	Snake Headwaters	To begin summer 2004 pending funding	2004	2006	Teton Science Schools	Awaiting EPA funding		Addressing issues of development and habitat impact.		x				
The Effects of Residential Development on Avian Community Structure Along the Snake River in Jackson Hole, Wyoming	Snake Headwaters	In progress	2000		Teton Science Schools	Federal, private, non-profit grants		Assessing impacts of human development and activities on avian habitat.		x				
U.S. Geologic Survey (USGS)—NAWQA	Snake Headwaters	Ongoing	1995		USGS	GTNP			NAWQA program sampling being done at the Snake River at Flagg Ranch and the Snake River at moose, giving an upstream/downstream snapshot of water quality.	x				

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										SHW	GVT	GHB	PAL	SAL
Cutthroat Trout Inventory	Snake Headwaters	Ongoing	1999	2005	GTNP	NPS; USFS; WYG&F; TU; JH One-Fly		The original goal was to document the geographic distributions of Snake River and Yellowstone cutthroat trout during 5 years in an estimated 2,400 km (1,500 mi) of fish-bearing streams between Palisades Reservoir and Jackson Lake, Wyoming. Approximately 2,590 km (1,609 mi) has been surveyed in 6 years. Portions of two drainages, the Salt River and Buffalo Fork River, remain to be completed. Our original concerns regarding project feasibility have been addressed; these related specifically to sampling logistics, timing of stream occupancy by fishes, capture technique, and cutthroat trout identification. Further sampling above Jackson Lake Dam will provide a continuous and seamless coverage between the NPS and USFS units.	Sampling results to date have supported the systematic approach as opposed to a random, or stratified random sample scheme. When sampling across an environmental gradient, or the logistical demands or cost of systematic sampling approaches that of random sampling, systematic sampling should be pursued (Krebs 1998). This is particularly applicable in the case of Snake River and Yellowstone cutthroat trout in the Snake River headwaters, where there is a documented elevation gradient, with Yellowstone cutthroat trout occupying the upper reaches of streams, Snake River cutthroat trout typically present throughout the occupied length of streams and an area of phenotypic overlap generally being observed at mid-elevations. One final note is the capture of cutthroat trout in GTNP exhibiting spotting and coloration similar to Bonneville cutthroat trout, O. c. Utah, in streams with no documentation of historical stocking. Surveys indicate trout occupy approximately 60 percent of the perennial stream length sampled, and cutthroat trout are present in 92 percent of the perennial stream length occupied by trout. Yellowstone cutthroat trout were present in approximately 16 percent of perennial stream length, whereas Snake River cutthroat trout were present in 78 percent; unidentifiable juvenile cutthroat trout occupied 12 percent of perennial streams. Yellowstone cutthroat trout occur almost exclusively in sympatry with Snake River cutthroat trout. Allopatric Yellowstone cutthroat trout were present in four streams (total 1.35 km or <1 percent of the total stream length occupied by trout). In addition, the systematic sampling scheme has documented the introduction of fathead minnow, *Pimephalas promelas*, in the Snake River Canyon, the first recorded collection of leatherside chub, *Gila copei*, in GTNP and the Bridger-Teton National Forest (BTNF) since the 1950s, and confirmation of the spatial extent of non-native trout (e.g., brook trout and rainbow trout). Furthermore, range expansion of non-native trout, as well as their natural extirpation has been documented. Rainbow trout were captured in <1.0 km of one stream throughout the survey area, although rainbow-cutthroat trout hybrids were present in approximately 13.1 km (<1 percent of the total stream length occupied by trout) of four streams; rainbow trout nor rainbow-cutthroat hybrids are known to have displaced cutthroat trout within the surveyed area. Brook trout were present in approximately 15 percent of the perennial stream length occupied by trout. Brook trout have displaced cutthroat trout from 14 streams that comprise 7.5 percent total stream length occupied by trout. Eight of the 14 streams are lower elevation (<2,500 m) tributaries of the Snake River. Two of these streams are located in GTNP, three traverse the BTNF and National Elk Refuge boundary, two are located on the BTNF, and two traverse BTNF and private land (Table 6). In most cases, these 14 streams likely represent the loss of resident, and either fluvial (stream dwelling) or adfluvial (combination stream/lake dwelling) migratory populations. An additional four streams in GTNP were occupied only by brook trout and unidentifiable juvenile cutthroat trout. These streams may represent cases where resident cutthroat trout have been displaced by brook trout and fluvial or adfluvial migrants are sustaining declining populations.	x				

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										SHW	GVT	GHB	PAL	SAL
Eagle and Sage-grouse Inventory	Snake Headwaters	Ongoing	2002	2005	Greater Yellowstone I&M Network	NPS			Science and Resource Management (S&RM) at GTNP (GRTE) received funding from the I&M program to conduct two sets of bald eagle and sage-grouse surveys. These surveys were to identify new bald eagle nest sites and active sage-grouse leking areas within the park. In spring 2001, high-priority eagle nesting habitat was surveyed by helicopter. Eight historical eagle nests and one new nest were located. Also during that spring, suitable sage-grouse breeding sites were searched from a fixed-winged airplane, however no new sites were found. Although using fixed-winged aircraft is an economical and effective means for surveying sage-grouse, they cannot fly as low as helicopters and hovering over areas of suitable habitat is not possible. In spring 2003, funding for the second eagle flight was used to cover the cost of contracting a helicopter for grouse surveys. One new breeding site was located with six males actively strutting. Both new eagle nest and sage-grouse breeding sites identified during this project will be monitored in the future as part of S&RM's monitoring program.	x				
Wilson Ditch	Snake Headwaters	Ongoing	2002	2005	GTNP	NPS; RM-CESU; GYCC	Large irrigation diversion removes SRC from the Snake River and strands them when irrigation ceases.		Project is working on design for fish screens on the diversion.	x				
Bar BC Spring Creek Restoration	Snake Headwaters	Complete	2003	2003	GTNP	NPS; JH One-Fly; WYG&F	Area impacted by old fish hatchery.	Fish populations need to be monitored in the future to determine whether there is the expected increase in cutthroat trout spawning	Prior to the dedication of GTNP, a fish hatchery was constructed on the East Fork of Upper Bar B C Spring. Dams were constructed on the East Fork, near the hatchery site, to provide rearing ponds. There is evidence that some of the channel above and below the rearing ponds was widened for some unknown purpose. After the hatchery was abandoned, the dams were left intact and sediment continued to accumulate in the ponds. In 1984, in cooperation with GTNP, WYG&F personnel used a backhoe to remove three of the dam structures, excavate sediments, and expose gravels to a limited extent. The work was accomplished on the section of the creek adjacent to and below the hatchery site. The WYG&F recommended the project be continued on the East and Main Forks in an attempt to establish a spawning run similar to that in the lower reach of the West Fork. Breeching of the last dam structure was accomplished by hand approximately 10 years ago. This project consisted of removal of sediments; narrowing of the channel to a natural width; reclamation of natural gravels or replacement using commercial washed gravels where natural gravels cannot be reclaimed; and placement of overhead cover (trees) for protection of spawning fish and escape cover for fry.	X				

TABLE B-1
Snake Headwaters Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Comments/Results/Monitoring	Project Description	Geographic Area of Coverage				
										SHW	GVT	GHB	PAL	SAL
Jackson Lake Fisheries Evaluation	Snake Headwaters	Complete	2003	2004	GTNP	NPS; USGS; WYG&F			Personnel from the WYG&F have entered historical field data into a database and have completed their summary of Jackson Lake Fisheries. “ABSTRACT: Jackson Lake provides a unique angling resource in the Snake River Drainage of Wyoming and management has varied considerably over time. Trend netting, trophy lake trout (LAT) *Salvelinus namaycush* nett, LAT tagging, programmed and spot creel, and productivity data were summarized for Jackson Lake from 1971-2003. The decrease in relative weight for LAT less than 20 in., low numbers of stocked LAT in the creel, and no apparent correlation between numbers stocked and trend netting catch per unit effort for ALT indicates that LAT stocking in Jackson Lake should be phased out.” Reconnaissance of Jackson Lake was also performed by boat in August 2003. USGS personnel were accompanied by Rob Gipson, WYG&F. He identified the locations of annual netting operations currently being performed by the WYG&F, and the locations of historical netting operations. The USGS personnel drafted multiple research strategies to accomplish the goals of this project and met with the WYG&F personnel again to discuss questions related to specific techniques used during netting operations.	X				
Map and Measure Diversions	Snake Headwaters	Ongoing	2003	2005	GTNP	NPS; TU	Several headwater drainages (Gros Ventre, Spread Creek) dry out during the summer due to extensive irrigation withdrawals.		Existing irrigation ditches have been mapped and matched with existing water rights as adjudicated by the State Engineer. An interactive database has been created. Flow will be measured in ditches this summer.	x				
Snake River Hydrology/ Geomorphology	Snake Headwaters	Ongoing	2003	2007	GTNP; USU	NPS; JH One-Fly; USGS	Jackson Lake Dam has had unknown impacts on the Snake River due to changes in flow regimes.	Will be installing field studies to further evaluate the mechanisms involved in sediment and bedload transport and to make recommendations for adaptive management of the dam.	Dr. Jack Schmidt, Utah State University, has completed a draft report that includes an analysis of the hydrologic change and variability that have occurred on the Snake River near Moran during the last century, using daily USGS stream-flow data and synthetic natural stream-flow data representative of unregulated conditions that has been compiled by the USBR. “ABSTRACT: The hydrologic regime of the modern Snake River is substantially different from the estimated natural flow regime and from the regulated flow regime that existed prior to 1957, based on analysis of the record of stream flow near Moran, immediately downstream from Jackson Lake Dam, and comparison with the unregulated flow regime, as estimated by the Bureau of Reclamation. Today’s late spring floods are much lower and late summer flows are much higher than if the dam did not exist. Today’s fall and winter flows are approximately what they would be if there were no dam, and they are much higher than prior to 1957 when base flows were very low. Today’s flood regime is much lower than those prior to 1957 but occur in a more “natural” season. Analyses were based on three techniques: traditional comparison of mean daily and instantaneous stream flow, continuous wavelet analysis, and analysis using the Indicators of Hydrologic Alteration software. The utilization of mean daily discharge data and the Bureau of Reclamation’s estimated unregulated stream flow represent new contributions to the study of stream flow alteration in GTNP.”	x				

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										SHW	GVT	GHB	PAL	SAL
Two Ocean Creek Fish Passage	Snake Headwaters	Complete	2003	2004	GTNP	NPS; JH One-Fly; WYG&F	Existing culvert prevented fish from returning to Two Ocean Lake.	Need to monitor fish passage through new structures.	Work was completed on April 22, 2004. Two rock weirs were installed below the existing culvert to improve fish passage. Streambanks were revegetated with native willows.	x				
Effects of Lake Drawdown on Park Resources	Snake Headwaters	Ongoing	2004		GTNP	NPS; RM-CESU	Fluctuating lake levels affect a variety of park resources.		A workshop to establish a set of research priorities for Jackson Lake was scheduled for June 7 through 9.	x				
Elk Ranch Reservoir Restoration	Snake Headwaters	Ongoing	2004		GTNP	NPS	This reservoir was used as mitigation for improvement to JL Dam. The headgates are in disrepair. Restoration of native vegetation was never completed. Reservoir serves as Trumpeter swan nesting area.		Project not yet funded.	x				
Conservation Buyer Program	Snake Headwaters		1996					Matches land with rich scenic, wildlife, and other natural resource values with conservation-minded buyers.						
Conservation Easement	Snake Headwaters				Fremont County	Jackson Hole Land Trust								
Conservation Easement	Snake Headwaters				Teton County	Jackson Hole Land Trust		Cattle Ranch in Hoback River Drainage						
Conservation Easement	Snake Headwaters				Teton County	Jackson Hole Land Trust		Gros Ventre Drainage						
Conservation Easement	Snake Headwaters				Teton County	Jackson Hole Land Trust		Buffalo Fork						

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Fish Populations in the Sage Creek-Smoky Creek Drainages, Caribou County, Idaho	Snake Headwaters	Completed	1979	1979	IDFG	IDFG		The fish populations need to be monitored in the future in order to assess any impacts from the mining operation.	The project collected baseline data on fish populations in order to assess the effects of a phosphate mine in this drainage.							x					
Goose Creek Mesa	Upper Snake	Completed	1984	1998	IDFG ICDC	IDFG		The area has been grazed historically by sheep and cattle. There is no evidence of cutting within the site. The site is an established RNA on the Burley Resource Area.	The site is grazed by cattle. The site is within an area of non-intensive to intensive rangeland management.												x	
Federal Aid in Fish Restoration: Project 8. Hatchery Trout Evaluations. Subproject 1. Sterile Trout Investigations	Upper Snake	Ongoing	1996	1997	IDFG	IDFG		The angler survey needs to be extended a number of years to draw any conclusions. The hatchery fish trained to recognize bait items lost the ability in approximately 1 week. None of the treatments produced sterile fish in significant numbers, and new or refined treatments should be investigated in the future.								x					
Blue Gulch #27 Fence	Upper Snake	Ongoing	1998		BLM	BLM			Cooperative project with IDFG and Pheasants Forever. Construct 3-wire fence around perimeter of Sikes Act wildlife tract to protect upland bird habitat.									x			
Back Country Weed Treatment		Completed	2003	2003	Bonneville	RAC Title II				x											
Bear Lake Trail Maintenance		Approved	2003	2003	Bear Lake/Caribou	RAC Title II										x					
Blackfoot River Road Hardening		Completed	2003	2003	Caribou	RAC Title II										x					
Ecology of Montane Wetlands		Completed	2003	2003	Fremont/Teton	RAC Title II							x								
Highlands Herbicidal Weed Control		Approved	2003	2003	Caribou	RAC Title II										x					
Huffman Spring		Approved	2003	2003	Oneida	RAC Title II													x		
Morgan Summit Parking Area		Completed	2003	2003	Madison	RAC Title II							x								
Pritchard Creek Restoration		Completed	2003	2003	Bonneville	RAC Title II				x											
Sawtell Creeks Habitat Improvement		Approved	2003	2003	Fremont	RAC Title II					x										

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Thunder Mountain Trail Relocation		Approved	2003	2003	Bonneville	RAC Title II				x											
Trail Creek Cedron Bridge		Approved	2003	2003	Teton	RAC Title II							x								
Ecology of Montane Wetlands in the Caribou-Targhee NF		Completed	2002	2002	Fremont	RAC Title II					x										
Fall Creek Road and Trailhead Improvement		Completed	2002	2002	Bonneville	RAC Title II				x											
Garden Creek Fish Passage		Completed	2002	2002	Bonneville	RAC Title II				x											
Golden Lake Culvert Replacement		Completed	2002	2002	Fremont	RAC Title II					x										
Golden Lake Culvert Replacement		Completed	2002	2002	Fremont	RAC Title II					x										
Mesa Marsh Noxious Weed Inventory and Control		Completed	2002	2002	Fremont	RAC Title II						x									
Mesa Marsh Noxious Weed Management Area		Completed	2002	2002	Fremont	RAC Title II						x									
1135 Restoration	Pocatello, Portneuf River	Completed		1997	U.S. Army Corps of Engineers (COE)	COE												x			
Site protection	Fort Hall Landmark, Snake River	Completed		1997	COE	COE											x				
Flood control	Above Blackfoot, Snake River	Completed	1996	1996	COE	COE											x				
Flood control	Bancroft, Portneuf River Drainage	Completed		1995	COE	COE												x			
Channel clearing	Heise- Roberts, Snake River	Completed	1954	1994	COE	COE				x											
Ririe Dam and Lake	Willow Creek	Completed		1994	COE	COE				x											
Pre-auth study	Ririe, Ririe Groundwater Study	Completed		1990	COE	COE				x											

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Pre-auth study	Idaho, Oakley Westside Channel	Completed		1989	COE	COE														x	
Pre-auth study	Idaho, Ririe	Completed		1988	COE	COE				x											
Pre-auth study	Bingham County, Snake River	Completed		1988	COE	COE										x					
Pre-auth study	Idaho, Teton River	Completed		1988	COE	COE							x								
Term 1986	Blackfoot River, Blackfoot Dam and Reservoir Modification	Completed		1986	COE	COE										x					
Study	Fremont County, Henry's Fork River	Completed		1986	COE	COE					x										
Pre-auth study	Madison County, South Fork Teton River	Completed		1986	COE	COE							x								
Pre-auth study	Cassia County, Cassia Creek	Completed		1985	COE	COE														x	
Dams/Not Done	Idaho, Raft River	Completed		1985	COE	COE													x		
Debris Removal	Idaho, Rapid Creek	Completed		1985	COE	COE											x				
Pre-auth study	Bancroft, Squaw Creek	Completed		1985	COE	COE											x				
Emergency Flood Control	Riverside, Snake River	Completed		1977	COE	COE				x											
Flood Hazard Report	Rexburg-Sugar City, Teton River	Completed		1977	COE	COE							x								
Floodplain Study	McCammon, Portneuf River	Completed		1976	COE	COE											x				
	Vicinity of Shoshone, Dietrich and Milner-Gooding Canal Diversions	Completed		1974	COE	COE												x			
Floodplain Study	Vicinity of Inkom, Portneuf River	Completed		1974	COE	COE											x				

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Flood Control	Lava Hot Springs, Portneuf River	Completed		1973	COE	COE											x				
	Near Rexburg, Lyman Creek	Completed	1970	1971	COE	COE							x								
Floodplain Study	Pocatello, Portneuf River	Completed		1970	COE	COE											x				
Floodplain Study	Vicinity of Pocatello, Portneuf River, and Tributaries	Completed		1970	COE	COE											x				
Channel Repairs	Idaho, Portneuf River and Marsh Creek	Completed	1963	1969	COE	COE											x				
Flood Control	Snake River, Heise-Roberts Area	Completed	1949	1968	COE	COE											x				
Channel Repairs	Idaho, Portneuf River And Marsh Creek	Completed	1966	1968	COE	COE											x				
Idaho Habitat Management	Magic Valley	Ongoing	2003	2004	IDFG	IDFG			Annual budget for WMA.									x	x	x	
Idaho Habitat Management	Southeast	Ongoing	2003	2004	IDFG	IDFG			Annual budget for WMA.					x	x	x	x				
Idaho Habitat Management	Upper Snake	Ongoing	2003	2004	IDFG	IDFG			Annual budget for WMA.	x	x	x	x								
HIP	Magic Valley	Ongoing	2002	2003	IDFG	IDFG	Feed, cover, and riparian condition.		Food plot, shrub and tree planting, stubble, wetland creation, nesting, cover and riparian enhancement.									x	x	x	
HIP	Southeast	Ongoing	2002	2003	IDFG	IDFG	Feed, cover, and riparian condition.		Food plot, shrub and tree planting, fencing, and wetland creation.					x	x	x	x				
HIP	Upper Snake	Ongoing	2002	2003	IDFG	IDFG	Feed, cover, and riparian condition.		Food plot, shrub and tree planting, fencing, and wetland creation.	x	x	x	x								
Teton River Riparian Restoration	Teton River	Ongoing	2003	2004	USFWS	USFWS		Improve Yellowstone cutthroat trout habitat at five locations on the Teton River. Objectives: overhanging protective vegetation; large woody debris; stabilization of streambank; plant native willows/vegetation in riparian area; fence streambank.					x								
Tex Creek I, II	Tex Creek I, II	Ongoing		2004	RMEF; IDFG	RMEF; IDFG				x											

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South Hills, Sugarloaf Mountain	South Hills, Sugarloaf Mountain	Completed	2003	2003	Mule Deer Foundation	Private; BLM	Feed, cover, and riparian condition.		Native cover planting and seedlings.									x			
IDEQ 319 projects		Ongoing	2003	2004	IDEQ	IDEQ				x	x	x	x	x	x	x	x	x	x	x	x
Trumpeter Swan Translocations in Southeast Idaho		Ongoing	2001	2005	IDFG	IDFG		Winter translocation efforts to address Trumpeter swan over-crowding in the Island Park area of Idaho began in 1990. Dispersing the wintering population and establishing secure use of other parts of southeastern Idaho might lessen population impacts on habitat and concern over die-offs in Island Park because of disease or starvation. Dispersal to more southerly wintering areas could also increase early spring food resources for the resident segment of the southern Idaho nesting population. Winter translocation efforts up to this time, however, have not adequately achieved the goal of dispersing the population to new wintering grounds. During the winters of 2001-2003 a multi-agency group trapped and translocated cygnets from Harriman State Park (HSP). Trapping and translocating cygnets without accompanying adults from the traditional wintering grounds has not been attempted prior to this project. A control group of marked cygnets was released at HSP and all other trapped cygnets were released in the Bear River and Bear Lake area. Project objectives are to: 1) Determine survival of marked cygnets released at the trap site. 2) Determine survival of marked cygnets translocated to alternate wintering areas. 3) Determine suitability of alternate wintering sites and the ability of these sites to support and hold swans throughout the winter.			x											
Amphibian monitoring		Ongoing	2003	2013	IDFG	IDFG		Basic amphibian surveys and monitoring across the region. Survey three sites each year focusing on high mountain lakes and wildlife management areas.		x	x	x	x	x							

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Ashton Groundwater Protection	Lower Henry's Fork		2000	2003	IDEQ — Idaho Falls	319 Program	Water Quality		Soil vadose zone monitoring to measure the amount of water leached below the root zone during the irrigation seasons. Spring and fall soil sampling.			x									
Blackfoot Southeast Pond Project	Blackfoot River		2002	2003	Blackfoot City Engineer, Public Works	319 Program	Water Quality	Stormwater Retention Pond	Water quality.							x					
Blackfoot Southwest Pond Project	Blackfoot River		2002	2003	Blackfoot City Engineer, Public Works	319 Program	Water Quality	Stormwater Retention Pond	Water quality.							x					
Cedar Draw Coulee	Lake Walcott		2003	2004	Twin Falls Canal Company	319 Program	Water Quality	The Coulee drains 9,000 acres of agricultural land and introduces nitrogen, phosphorous, bacteria, and pesticides to return flow irrigation water. BMPs to be installed include a series of three serpentine-shaped ponds that will be interconnected with riparian wetland areas.	Water quality.									x			
Edson Fichter	Portneuf River		2003	2004	IDFG	319 Program	Water Quality	BMPs to be installed include revetments, seeding along stream bank, restoration of 700 feet of meandering stream channel, installation of 300 feet of pipe to convey water to a settling pond, and installation of a small settling pond.	Water quality.								x				
H17 Drain	Lake Walcott		2001	2002	Burley Irrigation District	319 Program	Water Quality	Sediment basin installed at the bottom end of a 6-mile-long irrigation canal. The basin is 200 feet long and 50 feet wide. This facility captures sediment from return irrigation water prior to discharge to Goose Creek and Snake River.	Water quality.									x			
Kinsey Corral	Lake Walcott		2003	2004	Twin Falls NRCS	319 Program	Water Quality	Fencing and corral relocation.	Bacteria and sediment by IDEQ.									x			
Main Purrine	Lake Walcott		2003	2004	Twin Falls Canal Company	319 Program	Water Quality	12,000 acres of agricultural land are drained into the Main Perrine Coulee resulting in sediment, nitrogen, phosphorous, and pesticide contamination. BMPs to be implemented include a concrete diversion structure, a large (8-acre) settling pond, and several wetlands. These features will treat 80 to 90 percent of all the water coming through the Main Perrine Coulee.	University of Idaho and IDEQ BURP.									x			

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Pocatello (1st Street Stormwater Wetland)	Portneuf River		1997	1998	City of Pocatello, Public Works	319 Program	Water Quality	This stormwater BMP is successfully capturing and treating stormwater runoff from a large portion of Pocatello's city streets resulting in cleaner water being discharged to the Portneuf River.	Idaho State University monitored for sediment, phosphorous and bacteria several years after the project was completed.								x				
Pocatello (North City Park Wetland)	Portneuf River		2002	2004	City of Pocatello, Public Works	319 Program	Water Quality	One small catchment basin has been constructed, A conveyance pipeline and infiltration sump have been installed, a large bioinfiltration/wetland basin could be constructed in an oxbow to the Portneuf River.	Water quality, plant survival.								x				
Raft River	Raft River		1999	2003	IASCD	319 Program	Water Quality	Rock crossings, rock drop structures (20), stream bank stabilization (revetments), diversion structures (12), weirs (12), concrete irrigation return flow structures, plantings including willows and grass, and grazing management.	Photo points, BURP assessments, and soil moisture analysis.										x		
Rapid Creek Restoration (Upper)	Portneuf River		2001	2004	ISCC	319 Program	Water Quality	Water well and pump, corral reclamation and berms, pipeline, water troughs, fencing – 1,500 feet, stream bank restoration, and vegetation.	Pre-project sampling was conducted along Rapid Creek by ISCC. The same sample locations will be used for post-project monitoring for a 3-year period. After 3 years, sampling will be conducted every other year.								x				
Rock Creek Rehabilitation	Lake Walcott		2001	2003	Twin Falls County Parks and Waterways Department	319 Program	Water Quality	Two stormwater detention ponds, stream bank stabilization-sloping, geo-matting, seeding, trees, shrubs, sprinkler system, installation of 5,000 yards of topsoil, removal of old concrete from a 2-acre area, and installation of two pedestrian bridges across Rock Creek.	Photopoints.									x			
Sheridan Creek, Diversion 10 Restoration	Upper Henry's		1996	2003	NRCS; HFF; Sheridan Valley Grazing Association; Idaho Fish and Wildlife Foundation; IDL; IDFG; USFS; CSCD	60% 319 Program, the other 40% will be funded through land owners; Henry's Fork Foundation; and the Henry's Fork Council; IDPR (HSP)	Water Quality	Stream bank stabilization, fencing, grazing plans, weed control, nine large diversions, 14 miles of fencing, 10 rock check dams, six culverts, numerous rock drop structures, 0.5 mile of riparian plantings along stream banks, and one water well.	BURP monitoring will be collected along Sheridan Creek every 5 years and annual photo points will be revisited.		x										

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										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Twenty four Mile Creek TMDL Implementation	Portneuf River		2000	2005	Soda Springs Soil Conservation Commission; Caribou SCD	60% of this project will be funded by the 319 monies. The other 40% funded from local entities, both in-kind and monies, including land owners; EQUIP funds; CRP funds; and WQPA funds	Water Quality	Stream bank stabilization, fencing, grazing plans, and weed control.	Parameters sampled include discharge, temperature, sediment, nutrient, bacteria, and photopoints.								x				
Bergman Ditch Replacement – Improved irrigation water delivery – Squirrel Creek State Agricultural Water Quality Project (SAWQP)	Upper Henry's		1994	1994	Private land owners; Squirrel Creek Irrigation and Canal Company; NRCS	Yellowstone SCD					x										
Diamond D Ranch Management Improvement – Riparian exclusion fencing on Targhee and Howard Creeks, monitoring of rest-rotation grazing, and improved irrigation efficiency.	Upper Henry's		1995	1995	NRCS; USDA USFS; HLF; The Nature Conservancy (TNC); IDFG; ISCC; Island Park Sportsmen Association (IPSA); Howard Creek Ranch	IDFG Diamond D Ranch					x										
Rocky Mountain Trumpeter Swan Relocation and Range Expansion Project – Hazing to disperse wintering swans from the Henry's Fork area	Upper Henry's		1995	1995	USBR; U.S. Geological Survey (USGS); IDFG	USFWS					x										
Henry's Lake SAWQP – 15-year project to protect riparian areas and prevent shoreline erosion	Upper Henry's		1995	1995	Private land owners; NRCS	YSCD					x										

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										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Publication of A Homeowner's Handbook for Living in Teton Valley	Teton River		1995	1995	World Wildlife Fund, GYC; Community Association for Responsible Planning; Teton Valley/Regional Land Trust (TRLT); USFS	Teton County Economic Development Council							x								
Site-Specific Technology for Agriculture			1995	1995	INEEL; NRCS; Ricks College	Hess Farms					x	x	x								
North Leigh Creek Amphibian Enhancement Project – Educate public about western boreal toad and spotted frog habitat	Teton River		1995	1995	Wildlife Forever	USFS							x								
Buffalo River Fish Passage Facilities	Upper Henry's		1996	1996	IDFG; HFF; USFS; USFWS; Federal Energy Regulatory Commission (FERC)	Buffalo Hydro, Inc.					x										
Warm River Fish Hatchery – Reopen hatchery to produce rainbow and Yellowstone cutthroat trout	Upper Henry's		1996	1996		SBT					x										
Henry's Lake Flat Water Development – Riparian exclusion fencing and development of alternative water source for livestock	Upper Henry's		1996	1996	IDPR; TNC; Farm Services Administration (FSA); NRCS; Howard Creek Ranch	Idaho Department of Lands (IDL)					x										
Targhee National Forest Revised Forest Plan – Comments submitted to the Supervisor of the Targhee National Forest			1996	1996		Council					x	x	x								

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Davis Lake Allotment Well Construction – Develop a well water source for livestock to allow restoration of flow in Sheridan Creek	Upper Henry's		1996	1996	HFF; IDL; IDPR; IDWR; NRCS; USFS; Davis Lake Allotment Permit Holders; ISCC	Clark SCD (CSCD)					x											
Teton Watershed Integrated Resource Analysis Project – Develop an information management system for the Teton Subbasin	Teton River		1997	1997	IDFG; HFF; TRLT; IDEQ; Fremont-Madison Irrigation District (FMID)	INEEL							x									
Operation of Ashton Gage on Fall River for 1997	Upper Henry's		1997	1997	IdaWest/ Marysville Hydro; WD1; FMID; USGS	FMID					x											
Native Cutthroat Trout Conservation Project – Inventory of streams in upper Henry's Subbasin	Upper Henry's		1997	1997	HFF; IDFG; Idaho State University (ISU); Gregory Aquatics	USFS					x											
Henry's Fork Weed Management Area Project – Noxious weed information and education			1997	1997	BLM; USBR; Fremont County, ID; Teton County, WY; IDA; IDPR; ITD; IDL; IDFG; Rocky Mountain Elk Foundation; Fall River Rural Electric Cooperative (FRREC); Union Pacific Railroad	USFS; NPS					x	x										
Squirrel Meadows - Grand Targhee Resort Land Exchange	Lower Henry's		1997	1997		USFS						x										
Willow Creek Vegetation Management Project – Restore aspen-dominated plant community	Upper Henry's		1998	1998		USFS					x											

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Ashton Visitor Center, Phase Two – Staffing and publication of brochures	Upper Henry's		1998	1998		Ashton Area Development Committee					x										
Henry's Fork Springs Investigation – Research into the mechanisms of spring recharge in the upper Henry's Subbasin	Upper Henry's		1998	1998	USGS; FMID; INEEL; USU; University of Utah; University of Oregon	HFF					x										
Thurmon Creek Yellowstone Cutthroat Trout Restoration – Eliminate nonnative trout and reintroduce cutthroat trout	Upper Henry's		1998	1998	USFS; IDFG; IDPR; USBR	Native Trout Subcommitte e					x										
Upper Snake River Managed Groundwater Recharge – Augment flow at Thousand Springs by recharging aquifer in Henry's Fork Basin	Upper Henry's		1998	1998	Egin Bench Canals, Inc.; Fall River Irrigation Co.; Salem Union Canal Co.; Twin Groves Irrigation Co.; FMID; WD1; BLM; Private land owners	IWRB					x										
Teton Dam Reservoir – Future Management Study, Phase I – Collect and analyze data to determine future management of area inundated by the reservoir upstream of the Teton Dam	Teton River		1998	1998	IDFG; USGS; BLM	USBR							x								
The Henry's Fork Ag Corridors Conservation Project – Perform education and outreach to preserve farmland and open space	Lower Henry's Fork		1999	1999	Private land owners; NRCS; IDFG; Land Trust Alliance; Fremont County Commissioner; HFF	TRLT						x									

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Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
1999 Henry's Fork Weed Management Area Cooperative Early Detection/ Eradication Project			1999	1999	TNC; Fremont County (ID) Weed Control; Teton County (WY) Weed and Pest; IDA; IDPR; IDT; IDL; IDFG; USFS; BLM; NPS; NRCS; USBR; National Fish and Wildlife Foundation (NFWF)	Henry's Fork Weed Management Area Working Group					x	x										
Publication of Aquatic Resources of the Henry's Fork Watershed, Idaho, a Special Issue of the Intermountain Journal of Sciences			1999	1999	American Fisheries Society; FRREC; Federation of Fly Fishers; HFF; IDFG; Montana Cooperative Fisheries Research Unit at Montana State University; Trout Unlimited (TU); USFS	Intermountain Journal of Sciences					x	x										
Greater Yellowstone Trumpeter Swan Initiative – Coordinate private and agency efforts to restore a regional population of swans	Upper Henry's		1999	1999	USFS; HFF; IDFG; FMID; IDPR	The Trumpeter Swan Society					x											
Ashton Reservoir Water Quality Protection – Proposal for Clean Water Act § 319 funding	Upper Henry's		2000	2000	Private land owners	TRLT					x											
2000 Henry's Fork Weed Management Area Cooperative Early Detection/ Eradication Project – Mapping noxious weeds			2000	2000	TNC; Fremont County (ID) Weed Control; Teton County (WY) Weed and Pest; IDA; IDPR; IDT; IDL; IDFG; USFS; BLM; NPS; NRCS; USBR; NFWF	Henry's Fork Weed Management Area Working Group					x	x										

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Teton River Hydrologic Monitoring and Spring Creek Study – Install stream gages and monitor discharge, monitor water quality	Teton River		2001	2001	Private land owners; Teton Valley Trout Unlimited (TVTU); IDFG; IDEQ; Idaho Association of SCDs (IASCD); USGS; Intermountain Aquatics, Inc.; TRLT	Friends of the Teton River							x								
Ecology of Montane Wetlands in the Caribou-Targhee National Forest – Year 1 – Field research to better understand montane wetlands dynamics	Upper Henry's		2002	2003	University of Missouri-Columbia; IDFG; USFWS; USBR;	USFS					x										
Habitat Assessment and Restoration – Research and implementation to improve habitat for Yellowstone cutthroat trout	Upper Henry's		2002	2002	IDFG; TRLT; ISU; Intermountain Aquatics, Inc.; TVTU; USFS	Friends of the Teton River					x										
Foster's Slough Restoration Project	Teton River		2002	2002	Private land owners; NRCS; TSCD; IDFG; TVTU; Intermountain Aquatics, Inc.; Ducks Unlimited; SAIC; NFWF	TRLT							x								
Marysville Pipeline Project – Conduct a feasibility study to replace Marysville Canal with a pipeline to improve water quality in Fall River and the Henry's Fork River	Upper Henry's		2002	2002	NRCS	Marysville Canal Company					x										
Sawtell Creeks Yellowstone Cutthroat Trout Restoration Project – Restore stream connectivity to allow fish passage	Upper Henry's		2003	2003	Private land owners; IDFG; NRCS	USFS on behalf of the Native Trout Subcommittee					x										

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Watershed Perspectives on Hydrologic Alteration in the Henry's Fork Basin – Research and data analysis			2003	2003	USGS; HFF; TNC; TU; GYC; FMID; ISU Undergraduate Research Committee	ISU					x	x										
Henry's Fork Greenway – Construction of signs	Lower Henry's Fork		2003	2003	Henry's Fork Greenway Committee; City of St. Anthony Parks and Recreation Committee; Fremont County; BLM; TRLT; HFF; IDEQ; IDT; COE	City of St. Anthony						x										
Gray's Lake/Willow Creek Basin Review	Willow Creek Subbasin and Gray's Lake Area	Ongoing	2004	2005	GYC	GYC		GYC is currently conducting a review of conservation opportunities in the Willow Creek Subbasin and Gray's Lake area. A review of historical information is underway and talks with land owners, agencies and other NGOs have begun as well. Depending upon the outcome of the review and assessment, GYC will begin a collaborative process to protect and restore the lands, water, and wildlife in these locations. The main concerns are private land development, water, and land issues related to the Gray's Lake NWR, and Yellowstone cutthroat trout populations in the Willow Creek Subbasin.	Special use permits to access across USDA-Administered lands must be acquired.					x							
Kirk Wetland	Teton				Ducks Unlimited; Partners for Fish and Wildlife Project	USFWS			Teton Valley Wetlands Restoration				x								
Flat Ranch Wetland restoration	Upper Henry's				TNC; Partners for Fish and Wildlife Project	USFWS					x										
Flying R Ranch Riparian habitat restoration	Upper Henry's				TNC; Partners for Fish and Wildlife Project	USFWS					x										
Diamond D Ranch Habitat protection and restoration	Upper Henry's				TNC; Partners for Fish and Wildlife Project	USFWS					x										

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Foster/Fox Creek Wetland protection	Teton				Teton Valley Land Trust; Partners for Fish and Wildlife Project	USFWS							x								
Hill Project Wetland protection and fish passage restoration	Teton				Teton Valley Land Trust; Partners for Fish and Wildlife Project	USFWS							x								
Fox Creek and Teton River restoration	Teton				Teton Valley Land Trust; Partners for Fish and Wildlife Project	USFWS							x								
Woods Creek Fen	Lower Henry's				Teton Valley Land Trust; Partners for Fish and Wildlife Project	USFWS		Peatland restoration in Henry's Fork watershed.				x									
Six S Ranch	Cassia County				Six S Ranch; Partners for Fish and Wildlife Project	USFWS		Habitat development and management.												x	
Si Ellen Dairy	Jerome County				Si Ellen Dairy; Partners for Fish and Wildlife Project	USFWS		Wetland and upland restoration.													x
Salisbury Habitat development and management	Fremont County				Salisbury; Partners for Fish and Wildlife Project	USFWS						x									
Reid Ranch	Bingham County				North Bingham Soil and Water Conservation District; Reid Ranch	USFWS		Riparian protection and management on the Blackfoot River.								x					
Sellars Creek	Bingham County				IDFG	USFWS		Riparian development, restoration, and management.								x					
Davis-Bond WRP	Madison County				Bond, Davis-Bond WRP; Partners for Fish and Wildlife Project	USFWS		Slough restoration on the Henry's Fork.					x								

TABLE B-2
Upper Snake Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic Area of Coverage											
										IFA	UHF	LHF	TET	WIL	AMF	BFT	PTF	LWT	RFT	GSE	USR
Bradley/ Blackfoot River	Bingham County				Central Bingham Soil and Water Conservation District, Bradley; Partners for Fish and Wildlife Project	USFWS		Riparian restoration and development.								x					
Klausmann Marsh	Teton				IDFG; Partners for Fish and Wildlife Project	USFWS		Wetland development and management.					x								
BPA Fort Hall Stream Restoration Program Contract 94BI32745 Project 92-10	Upper Subbasin	Ongoing	1991	2007	SBT	BPA/Tribes		Project-addressing limiting factors of yellowstone cutthroat trout such as enhancement projects of instream and riparian habitat.	Areas of coverage are within boundaries of the Fort Hall Reservation, American Falls, and Portneuf Watersheds.												
BIA 638 Resident Fisheries Program	Upper Subbasin	Ongoing			SBT	BPA/Tribes		Project-addressing limiting factors of yellowstone cutthroat trout such as enhancement projects of instream and riparian habitat.	Areas of coverage are within boundaries of the Fort Hall Reservation, American Falls, and Portneuf Watersheds.												
Southern Idaho Wildlife Mitigation Program; Project # 199505702	Upper Snake Subbasin	Ongoing	1995			BPA/Tribes		Project protects, enhances, restores, and maintains wildlife habitat to mitigate for construction and inundation losses at Palisades and Minidoka dams.	The Southern Idaho Wildlife Mitigation Agreement between the IDFG and the Shoshone-Bannock Tribes provides the two managing entities a mechanism for dispersal of habitat units and funding to accomplish projects through out Southern Idaho, which includes mitigation for losses at Palisades, Minidoka, Anderson Ranch, and Black Canyon Dams.												

TABLE B-3
Upper Snake Closed Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic area of coverage				
										BCM	MDL	BCK	LLR	BLR
Summit Creek Exclosure and Instream Habitat Improvement	Upper Closed Snake	Ongoing	1968	1998	IDFG ICDC	IDFG	Unpaved roads in the area receive considerable amount of traffic and may be a source of sediment to the stream and wetlands.						x	
Grassland Kipuka	Upper Snake	Unknown	1979	1988	IDFG ICDC	IDFG			7-28-96: U.S. Route 20-26-93, which bisects the RNA, was widened within the last month and is currently being paved. During construction, the two road cuts were enlarged considerably, destroying part of the west slope once covered by excellent stands of low sagebrush. Observation by Bob Moseley, Idaho CDC.					x
Game Creek	Upper Snake	Unknown	1996	1997	IDFG ICDC	IDFG		Game Creek is within Upper Snake River Districts BLM, Medicine Lodge RA. It is managed as a RNA.			X			
Mesa Marsh Noxious Weed Control		Completed	2003	2003	Fremont	RAC Title II				x				
Webber Creek Trailhead Toilet Replacement		Approved	2003	2003	Clark	RAC Title II					x			
Restriction and Information Signing		Completed	2002	2002	Clark	RAC Title II					x			
Travel Management and Information Signing		Approved	2002	2002	Clark	RAC Title II					x			
Crooked Creek Ranch	Crooked Creek Ranch	Ongoing	2001	2004	TNC; North American Grouse Partnership; Native Seed Network	Private, BLM		Model for sage-steppe grassland management.			x			
IDEQ 319 projects		Ongoing	2003	2004	IDEQ	IDEQ				x	x	x	x	x
Amphibian monitoring		Ongoing	2003	2013	IDFG	IDFG		Basic amphibian surveys and monitoring across the region. Survey three sites each year focusing on high mountain lakes and WMAs.		x	x	x	x	x
Lost Rivers National Learning Site in Holistic Management	Big Lost and Little Lost	Ongoing	2002	2007	USDA USFS; Allan Savory Center for Holistic Management	USDA USFS		To assist communities in building this kind of approach, members of the community have used a variety of models in a few projects, including Holistic Management decision-making (see www.holisticmanagement.org). This planning and decision-making process has a track record of helping rural producers and diverse community groups create more productive land (including wildlife habitat) and increased wealth.					x	x

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Upper Snake Closed Subbasin Project Inventory List, USP

Project Name (BPA Contract #)	Subbasin/ Location	Status	Begin Year	End Year	Implementing/ Principal Agency	Funding/ Sponsor	Cause of Limiting Factors	Project Description	Comments/ Results/ Monitoring	Geographic area of coverage				
										BCM	MDL	BCK	LLR	BLR
Thousand Springs, Chilly Slough	Big Lost	Complete	2003	2003	RMEF; USFWS; IDFG	RMEF								x
Medicine Lodge (Irving Creek)	Medicine Lodge		2002	2003	Clark County Conservation District	319 Program, Additional funding sources include Continuous Conservation Reserve Program (CRP) for fencing and willows, EQUIP for AFOs, ISCC	Water Quality	Willow Clumps, Willow pole plantings, Toe rock rip rap, Vertical bundles of willows, V-Notch weirs used for drop structures, Grass, Fencing			x			
Medicine Lodge (Warm Creek)	Medicine Lodge		2003	2004	Clark County Conservation District	319 Program, Additional funding sources include Continuous CRP for fencing and willows, EQUIP for AFOs, ISCC	Water Quality				x			
Romrell WRP Habitat Development and Management	Clark County				Romrell WRP; Partners for Fish and Wildlife Project	USFWS					x			
Beller Farm	Butte County				Butte Soil and Water Conservation District; Beller Farm; Partners for Fish and Wildlife Project	USFWS		Riparian habitat restoration.						x
Freeman	Custer County				Butte Soil and Water Conservation District, Freeman; Partners for Fish and Wildlife Project	USFWS		Riparian and wetland habitat protection.						x

DRAFT INVENTORY APPENDIX C

Watersheds within the Upper Snake Province

DRAFT INVENTORY APPENDIX C

Watersheds within the Upper Snake Province

Drainage areas, numbers of named streams, and their total stream kilometers for the 22 major hydrologic units (watersheds) within the USP (source: IFWIS 2003).

Watershed	Code	Hydrologic Unit Code	State	Drainage Area (km^2)	Number of Named Streams	Total Stream (km)
Snake Headwaters Subbasin						
Greys-Hoback	GHB	17040103	Wyoming	4,062	311	1,161
Gros Ventre	GVT	17040102	Wyoming	1,663	195	576
Palisades	PAL	17040104	Idaho/Wyoming	2,395	170	896
Salt	SAL	17040105	Idaho/Wyoming	2,303	231	939
Snake Headwaters	SHW	17040101	Wyoming	4,405	232	1,080
			Subbasin Totals	**14,828**	**1,139**	**4,652**
Upper Snake Subbasin						
American Falls	AMF	17040206	Idaho	7,544	136	1,004
Blackfoot	BFT	17040207	Idaho	2,842	141	984
Goose	GSE	17040211	Idaho/Utah/ Nevada	2,898	215	1,113
Idaho Falls	IFA	17040201	Idaho	2,975	48	485
Lower Henry's Fork	LHF	17040203	Idaho/Wyoming	2,666	108	761
Portneuf	PTF	17040208	Idaho	3,441	300	1,455
Raft	RFT	17040210	Idaho/Utah	3,915	232	1,342
Teton	TET	17040204	Idaho/Wyoming	2,857	159	1,163
Upper Henry's Fork	UHF	17040202	Idaho/Wyoming	2,873	223	1,242
Upper Snake-Rock	USR	17040212	Idaho	2,530	39	347
Lake Walcott	LWT	17040209	Idaho	9,283	142	865
Willow	WIL	17040205	Idaho	1,682	83	611
			Subbasin Totals	**45,506**	**1,826**	**11,372**
Upper Snake Closed Subbasin						
Beaver-Camas	BCM	17040214	Idaho	2,576	177	898
Birch Creek	BCK	17040216	Idaho	1,864	123	737
Big Lost River	BLR	17040218	Idaho	5,139	474	2,161
Little Lost River	LLR	17040217	Idaho	2,516	157	894

Watershed	Code	Hydrologic Unit Code	State	Drainage Area (km^2)	Number of Named Streams	Total Stream (km)
Medicine Lodge	MDL	17040215	Idaho	2,428	98	603
			Subbasin Totals	**14,523**	**1,029**	**5,293**
			Province Totals	**74,858**	**3,994**	**21,317**