# SECTION 23 – Table of Contents

# 23 Spokane Subbasin Inventory of Existing Programs – Aquatic

## 23.1 Current Management Directions[1]

The states of Washington and Idaho and the Native Tribal governments each have planning and management functions for fish and wildlife resources in the Spokane Subbasin. Cooperation exists, and although emphasis and legal mandates may be difficult, their programs should be compatible.

State and Federal agencies and Tribal governments that have management authority over fish and wildlife resources in the Spokane Subbasin include the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (WDOE), the Spokane Tribe of Indians (STOI), and the Coeur d' Alene Tribe. Other state and federal agencies, including, but not limited to, the U.S. Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), and the Natural Resources Conservation Service (NRCS) are involved in programs that affect the land or water that provide habitat for fish and wildlife. A complete list of state, federal, and Tribal entities that are involved in management of fish and wildlife or their habitats is included in section 2.4.1, along with a description of the agency's management direction.

The following section describes the local government entities that are involved in natural resources management in the Spokane Subbasin.

### 23.1.1 Local Government

#### 23.1.1.1 Lincoln County Conservation District (LCCD)

***Mission Statement***

The philosophy of the District is that all natural resources are integrated. Their mission is to protect and enhance soil, water, air, plants, animals and human (SWAPAH) of Lincoln County through an integrated approach and educate the general public about the responsible use of SWAPAH, through economically viable and socially acceptable programs. Their intention is to promote the responsible use, increase knowledge and research of the natural resource base.

***Current Management Strategies***

The LCCD's current management strategies can be summarized from excerpts of the District's updated Long Range Plan. The goals and objectives include:

<u>Water Quality</u>

- Address water quality concerns in streams and lakes in Lincoln County
- Address groundwater issues in Lincoln County
- Implement restoration projects that would improve water quality

[1] Portions of Section 23.1 were contributed to by the Spokane River Subbasin Summary Report (2000) pp. 17-20, 25.

- Work with Natural Resources Conservation Service (NRCS), US Fish and Wildlife Service (USFWS), Washington Department of Ecology (WDOE) and Lincoln County to address water quality complaints

Wildlife

- Establish wildlife-habitat and enhance forest/wetland resources through NRCS programs that include: Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP), and Wildlife Habitat Incentive Program (WHIP)

Education / Information / Communication

- Increase public awareness of District activities
- Provide educational conservation information to the public through newsletters, public meetings, newspaper articles, etc.

District Operations and Management

- Maintain an active and effective LCCD board
- Promote district programs and activities
- Insure adequate funding for LCCD operations

In the last five years, the LCCD has been involved in a minimal number of projects in Spokane and Upper Columbia subbasins. Many landowners in these subbasins have taken advantage of NRCS programs that include CRP, EQIP, and WHIP. Currently, funding sources are focused on finding solutions to improve water quality in the Upper Crab/Wilson Creek Watershed Water Resource Inventory Area (WRIA) #43.

#### 23.1.1.2 Spokane County Conservation District (SCCD)

In Washington state, the SCCD has taken the lead role in facilitation and implementation of watershed management activities within the Hangman Creek (WRIA 56) and Little Spokane River (WRIA 55) watersheds, and to a lesser extent the Spokane River watershed (WRIA 54/57). A large number of research, planning, and implementation projects have been conducted over the last decade. Currently, WRIA 54, 55, 56, and 57 are undergoing watershed planning.

The SCCD has developed working relationships with many of the local landowners, governmental entities, and interest groups to improve the long-term conditions within the watersheds. The SCCD is the lead facilitator of watershed planning for the Hangman Creek watershed and is currently working with the Pend Oreille Conservation District on a water quality management plan for the Little Spokane River. Under ESHB 2514, the work focuses on water quantity issues in the Subbasin, but does address other issues such as water quality, TMDLs, habitat, and instream flow.

#### 23.1.1.3 Pend Oreille Conservation District (POCD)

The POCD sponsored a (WDOE) grant on the Little Spokane Watershed in 1998. Information was collected in partnership with SCCD. Data was collected for quantity and

field and laboratory water quality parameters. Currently POCD is working with SCCD on a water quality management plan for the Little Spokane River.

#### 23.1.1.4 Coeur d' Alene Tribe

The Coeur d' Alene Tribe is taking the lead role with watershed management activities on the Idaho section of Hangman Creek, as well as other projects designed to make substitutions to Tribes for subsistence fishing lost. Efforts are focused on water quality, habitat, instream flow, land acquisition for restoration purposes, and short term solutions to provide subsistence such as put and take ponds.

## 23.2 Existing and Imminent Protections

Washington Department of Fish and Wildlife (WDFW) maintains regulatory control of all activities that may impact water/aquatic habitat within the state of Washington through enforcement of the hydraulic code. Additionally, the department is an active partner in application of the Growth Management Act (GMA), intended to protect focal species habitat for redband/rainbow trout, mountain whitefish, and kokanee. Protection is afforded through the "Wild Salmonid Policy" developed by WDFW. "The goal of this Wild Salmonid Policy is to protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries, non-consumptive fish benefits, and other related cultural and ecological values" (http://www.wa.gov/wdfw/fish/wsp/joint/final/fwsp01.htm).

### 23.2.1 Hydraulic Code (1949)

The Washington State Legislature in 1949 passed the "Hydraulic Code" (RCW 75.20.100-160). The law requires any person, organization, or government agency wishing to conduct any construction activity in or near state waters must do so under the terms of a permit, called the Hydraulic Project Approval (HPA), issued by WDFW. State waters include all marine and fresh waters. The law's purpose is to ensure needed construction occurs in a manner that prevents damage to the state's fish, shellfish, and their habitat.

### 23.2.2 Salmon Recovery Act (Washington State House Bill 2496)

The Washington State Legislature established Lead Entities in ESHB 2496, the state Salmon Recovery Act (RCW 77.85), which the governor signed into law in April 1998. Since 1999, the legislature has provided funding to WDFW to support the infrastructure and capacity needs of Lead Entities engaged in salmonid habitat protection, restoration, and assessment at the watershed level.

### 23.2.3 Watershed Management Act (Washington State House Bill 2514)

In 1998 the governor signed HB 2514, the Watershed Management Act, providing the impetus for Watershed Planning Units to form throughout the state. WDOE administers this program through grants.

## 23.3 Inventory of Restoration and Conservation Projects

Refer to Appendix H for a comprehensive list of BPA and non-BPA funded projects within the IMP.

### 23.3.1 BPA Funded Projects

Many of the BPA funded projects listed below are not limited to the Spokane Subbasin, but are tied to two or more subbasins located in the Intermountain Province.

***Joint Stock Assessment Project #9700400***

Discussed in section 2.4.3 Inventory of Restoration and Conservation Projects under the subheading Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams (all of the IMP within Washington).

***Spokane Tribal Hatchery #9104600***

The Spokane Tribal Hatchery (Galbraith Springs) project originated from the Northwest Power Planning Council (Council) 1987 Columbia Basin Fish and Wildlife Program. The *goal* of this project is to aid in the restoration and enhancement of the Lake Roosevelt and Banks Lake fisheries adversely affected by the construction and operation of Grand Coulee Dam. The *objective* is to produce kokanee salmon and rainbow trout for release into Lake Roosevelt for maintaining a viable fishery. The goal and objective of this project adheres to the Council's Resident Fish Substitution Policy and specifically to the biological objectives addressed in the Council's Columbia River Basin Fish and Wildlife Program to mitigate for hydropower related fish losses in the blocked area above Chief Joseph/Grand Coulee Dams.

The Spokane Tribal Hatchery (managed by the STOI is one component of 4 artificial production *projects* operated complementary of one another as part of a *program* to restore and enhance the Grand Coulee impoundment fisheries (Lake Roosevelt and Banks Lake). The other artificial production components include the Sherman Creek Hatchery, Ford Trout Hatchery and the Lake Roosevelt Kokanee and Rainbow Trout Net Pen Projects. The Spokane Tribe operates the Spokane Tribal Hatchery, the WDFW operates the Sherman Creek Hatchery, Ford Trout Hatchery and the Kokanee Net Pen Project and the Lake Roosevelt Development Association operates the Rainbow Trout Net Pen Project.

Each project has its own production goal to collectively produce up to 1,000,000 kokanee yearlings, 1.4 million kokanee fry/fingerlings and 500,000 rainbow trout yearlings for annual stocking into Lake Roosevelt and Banks Lake. Fishery managers from the WDFW, STOI and Colville Confederated Tribes comprise the Lake Roosevelt Hatcheries Coordination Team responsible for directing hatchery and net pen rearing operations. Performance and evaluation of hatchery and net pen reared fish released into the project area and the impact on the biota is monitored and evaluated by the Lake Roosevelt and Banks Lake Fisheries Evaluation Programs.

***Sherman Creek Hatchery #9104700***

Sherman Creek Hatchery's (managed by WDFW) primary objective is the restoration and enhancement of the recreational and subsistence fishery in Lake Roosevelt and Banks Lake. The Sherman Creek Hatchery (SCH) was designed to rear 1.7 million kokanee fry for acclimation and imprinting during the spring and early summer. Additionally, it was designed to trap all available returning adult kokanee during the fall for broodstock operations and evaluations. Since the start of this program, the operations on Lake Roosevelt have been modified to better achieve program goals.

The WDFW, STOI and the Colville Confederated Tribes (CCT) form the interagency Lake Roosevelt Hatcheries Coordination Team (LRHCT), which sets goals and objectives for both Sherman Creek and the Spokane Tribal Hatchery. It also serves to coordinate enhancement efforts on Lake Roosevelt and Banks Lake.

The primary changes have been to replace the kokanee fingerling program with a yearling (post smolt) program of up to 1 million fish. To handle the increased production, twenty net pens were constructed and are currently operated. The second significant change was to rear up to 300,000 rainbow trout fingerling at SCH from July through October, for stocking into the volunteer net pens. This enables the Spokane Tribal Hatchery (STH) to rear additional kokanee to further the enhancement efforts on Lake Roosevelt.

Current objectives include increased use of native/indigenous stocks where available for propagation into Upper Columbia River Basin Waters.

The Lake Roosevelt Fisheries Evaluation Program (LRFEP) is responsible for monitoring and evaluation on the Lake Roosevelt Projects. From 1988 to 1998, the principal sport fishery on Lake Roosevelt has shifted from walleye to include rainbow trout and kokanee salmon (Underwood et al. 1997; Tilson and Scholz 1997). The angler use, harvest rates for rainbow and kokanee, and the economic value of the fishery have increased substantially during this 10-year period. The investigations on the lake also suggest that the hatchery and net pen programs have enhanced the Lake Roosevelt fishery while not negatively impacting wild and native stocks within the lake.

***Lake Roosevelt Trout Net Pen Project #9500900***

The Lake Roosevelt Net Pen Project is a grass roots, community based, effort to enhance rainbow trout harvest opportunities. This project began in the 1980s with local anglers looking for a method to enhance the Lake Roosevelt fishery. In 1996, BPA provided a coordinator to assure this program's continuation. Today the project produces approximately 500,000 rainbow trout and 250,000 kokanee salmon for the Lake Roosevelt sport and subsistence fishery. The STH rears the rainbow trout from eggs in November to fry in September. The hatchery then transfers the fish to the net pens in September, where they are reared to catchable size by June. The rainbow trout are released ideally in June, but in years of deep drawdown, physical limitations require earlier releases. The net pen program produces the most successful fishery in the lake. Over 95 percent of all rainbow trout captured in the lake are from the net pens.

***Chief Joseph Kokanee Enhancement Project #9501100)***
The goals of the Chief Joseph Kokanee Enhancement Project are to protect and enhance the natural production of kokanee stocks above Chief Joseph and Grand Coulee dams, to provide successful subsistence and recreational fisheries, and to provide a broodstock source for artificial production in Lake Roosevelt.

Field activities began during in the fall of 1995 and continue today. Activities include: (1) spawning escapement monitoring and enumeration of adult kokanee present in Lake Roosevelt and Lake Rufus Woods Reservoir tributaries (San Poil River, Big Sheep Creek, Deep Creek, Onion Creek, Ora-Pa-Ken Creek, and Nespelem River respectively), (2) collection of genetic material from adult tributary spawning populations in the aforementioned streams and free-ranging kokanee in Lake Roosevelt kokanee, (3) collection of kokanee "swim-up" from redds and monitoring fry emigration from the San Poil River to Lake Roosevelt, (4) hydroacoustic monitoring of fish entrainment through Grand Coulee Dam.

A critical accomplishment of this project has been the identification of a potentially unique stock of kokanee. Genetic evaluations have resulted in the collection of information that may characterize a free-ranging kokanee population in Lake Roosevelt. Rapid declines of the adult tributary spawning population have been documented through adult spawning escapement and redd surveys from 1995-1997, although more recent information may not support this (John Arterburn, CCT, personal communication). This population has been identified as critically depressed and declining.

Additional important achievements related to this project include the identification of spawning locations in the San Poil River and Barnaby Creek, seasonal adult run-timing, and potential limiting factors to tributary production such as abnormal peak late-winter and early-spring flows, bedload movement, and passage barriers relating to reservoir operations. The project has documented substantial entrainment related to Grand Coulee Dam. Important data have and continue to be collected to access entrainment characteristics related to project operations (flood control draft, power draft, power peaking, and spring and summer flow augmentation).

***Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Project #9001800***
The goal of the project is to contribute to subsistence and recreational fisheries by protecting and enhancing the production of adfluvial rainbow trout populations through improvement to fish passage and in-stream habitat in Lake Roosevelt tributaries.

Early fisheries investigations (Scholz et al. 1985) indicated that the lack of high-quality spawning and rearing habitat was a limiting factor to adfluvial rainbow trout production in Lake Roosevelt. Limited stream surveys also identified fish passage barriers (improper culvert installation and intermittent flows) as limiting production.

Twenty-seven streams were examined during 1990-1991 to assess fish habitat, fish population estimates and potential limiting factors to adfluvial rainbow trout production. Five streams were selected for planning and implementation of passage and habitat

improvements based upon the presence of adfluvial rainbow trout, limiting factors, and potential for improved production.

Design and implementation of habitat and passage improvement actions on the five selected streams began in 1992 and continued through 1995. Implementation actions affected 20.9 miles of stream course. Specific actions included re-installation of six culverts, 500 meters of channel reconstruction (meanders) installed in previously channeled stream courses, and 125 in-stream structures installed in efforts to improve passage and improve habitat quality. Riparian improvements included placing 14,500 riparian plants/shrubs/trees and livestock exclusion fence along 4.5 miles of stream course. Habitat quantity was increased by 11 percent through passage improvement alone.

Monitoring of the effectiveness of implementation actions began in 1995 and is expected to continue through 2001. Definitive results and evaluation will be available in post-2001. However, interim accomplishments realized during the monitoring activities include trend information related to adult spawning year-class strength, adult run-timing, juvenile outmigration timing, juvenile population densities, and longevity and function of instream structures and channel reconfiguration.

***Lake Roosevelt Monitoring Program #1994-043-00***

Project Description:

This program has two primary goals. The first is to monitor and evaluate the performance of fish released into Lake Roosevelt by the Spokane Tribal and Sherman Creek hatcheries and the net pen program. The second goal is to develop a fisheries management plan for Lake Roosevelt that prescribes mitigation/substitution actions and hydro-operations that will maximize ecosystem diversity, complexity, and sustainability. In order to develop an achievable fisheries management plan, a better understanding of this dynamic reservoir ecosystem is required. The Lake Roosevelt Ecology Model is being developed to improve knowledge of physical and chemical limnology, hydrology, and biological production of the reservoir to better predict the effects of single actions on the ecosystem and fishery. Objectives include development of a Lake Roosevelt Fishery Management Plan with hydro-operation recommendations, refined analyses of trophic interactions and effects of various parameters on trophic levels, maintenance of databases in order to validate, refine, and maintain the Lake Roosevelt Ecology Model, validation and refinement of the Lake Roosevelt Ecology Model, monitoring and evaluation of impacts of hatchery origin fish on native species and the lower trophic levels of Lake Roosevelt, monitoring and evaluation of wild fish and different hatchery stocks of kokanee salmon, and rainbow trout performance in Lake Roosevelt.

Associated Monitoring:

This program is the monitoring and evaluation tool for the Sherman Creek and Spokane Tribal Hatcheries.

Accomplishments:
Accomplishments include identification of changes in the fish assemblage and community structure of resident fish species, identification of diet preferences and dietary overlaps that could lead to competition (inter- and intraspecific), evaluation of various hatchery stocks performance through tagging studies, tracking of the economic value of the Lake Roosevelt fishery through fishing pressure and harvest in Lake Roosevelt as identified by a reservoir-wide creel study, and established a limnological dataset for the Lake Roosevelt Ecology Model. Additionally, management goals for specific species were also formulated.

***Lake Roosevelt Sturgeon Recovery Project #1995-027-00***
Project Description:
Without effective intervention, white sturgeon population appears headed for extinction in the Columbia River upstream from Grand Coulee Dam. Natural recruitment has failed and the population now consists of an aging cohort of adults whose numbers are steadily dwindling. As described in Section 10.4A of the 1994 FWP, concern has arisen over the declining status of native sturgeon populations throughout the Columbia River Basin. White sturgeon populations above Grand Coulee Dam were closed to harvest in 1996 due to increasing concerns over the apparent declining status of the population. Mitigative and/or restorative efforts have become necessary to maintain this particular white sturgeon stock, which possesses genetic traits different from other Columbia River stocks (Setter and Brannon 1992; Brannon et al. 1987). Similar genetic differences and recruitment failure for the Kootenai River white sturgeon stock led to its listing as an endangered species in 1994. In 1998, the WDFW and the STOI sampled an aged white sturgeon population above Grand Coulee Dam and confirmed virtually no recruitment has occurred during the past 20 to 25 years.

The Upper Columbia River White Sturgeon Recovery Plan, initiated in Canada and completed with involvement by U.S. parties, identifies the lack of information on the actual numbers and limiting factors of white sturgeon in U.S. waters of the transboundary reach between Lake Roosevelt and Keenleyside Dam as a critical uncertainty. The overall goal is to prevent the extinction of Upper Columbia River white sturgeon and to recover the population to a level allowing for harvest.

Objectives of the program include development of recovery plans for white sturgeon in the Upper Columbia River in coordination with U.S., Canadian, Federal, State, and Tribal parties to determine abundance, distribution, and population productivity of adult white sturgeon, whether one or multiple white sturgeon populations exist, and to conduct a limiting factors analysis of white sturgeon in the Upper Columbia River between Grand Coulee Dam and the international border. Additional objectives are to determine whether suitable white sturgeon spawning habitat and conditions exist between Grand Coulee Dam and the international border, to determine abundance, distribution, and relative year-class strength of juvenile white sturgeon between Grand Coulee Dam and the international border, and to evaluate the feasibility of prospective recovery measures for white sturgeon in the transboundary reach.

Associated Monitoring:
The program will do initial studies to determine current status of white sturgeon in the Upper Columbia River between Grand Coulee Dam and the international border. The program, now and in the future, will monitor implementation of recovery efforts.

Accomplishments:
During 2001-2002, this project assisted in the development of an Upper Columbia River White Sturgeon Recovery Plan reviewing available information on sturgeon status and biology, identified objectives, strategies, and measures for sturgeon recovery, and outlined a coordinated effort on both sides of the border.

Special Notes:
Delays in contracting in 2001-2002 delayed adult sampling for an additional year, and minimized juvenile sampling in 2002. Currently, the program is fully staffed for needs in 2003-2004. Monitoring to determine current population status, and evaluation of artificial production feasibility as a conservation interim action is moving forward.

***Lake Roosevelt Emergency Fish Restoration Project***
Project Description:
This project was a one-time funded project by BPA to compensate for power system operations during the power emergency period. A solicitation was developed by the Colville Confederated Tribes Fish and Wildlife Department and submitted to BPA for funding.

Several factors were involved in creating the request for funding. These included safety of the volunteers maintaining the project during the cold, windy winter months. Many of the net pens were badly worn and damaged from the recent untimely drawdown period. Safety was another primary concern. The final concern was that the drawdown occurred during a time when high entrainment traditionally happened. New net pen complexes were purchased that had safety walkways and handrails installed. A total of four pen complexes of four pens each were purchased and installed.

The project purchased a large number of triploid steelhead trout for planting in Lake Roosevelt at various locations. The first lot of fish purchased averaged 1.6 pounds each and the following group at 2.2 pounds each. Following this, another 100,000 fingerlings were purchased and planted into net pens. Four sets of net pens were purchased by this project and donated to the Lake Roosevelt Net Pen Program along with associated tools, docks and storage bins.

All of the large triploid trout were tagged with floy tags to determine the success of triploids in the fishery. In addition 10,000 of the fingerling were tagged upon release.

Associated Monitoring:
The project was a total success as evidenced by tag recovery documented by the Lake Roosevelt Monitoring Project. While no monitoring efforts were undertaken by the project, the Lake Roosevelt Monitoring Project is collecting data pertinent to the project's success. Current Lake Roosevelt monitoring efforts are still documenting the recruitment

of the triploids to the creel.

Accomplishments:

- Replaced many old degraded net pens with new net pens and docks having a safety handrail attached and a skid resistant walkway.
- Purchased needed equipment and waterproof storage boxes for fish feed.
- Contributed to a very successful winter steelhead fishery along Lake Roosevelt.
- Helped generate further positive public feelings for the Tribal and BPA funded fishery enhancement effort.
- As evidenced by the number of letters from the local business operators, the project created a windfall for local restaurants and motel owners.
- Planted 12,000 pounds of catchable triploid steelhead trout all along the reservoir from Spring canyon to as far north as Northport.
- Planted 100,000 fingerling trout from the spring transfers.
- The fish planted by the project are still recruiting to the creel.
- Used triploids to supplement the Lake Roosevelt fishery, which is not only cost-effective but also enduring. The fish seem to remain in the lake (not entraining out) over time, which may suggest they be used on a continuing basis. Unfortunately the project was only funded for a single year.

***Coeur d' Alene Tribe***

A complete list of Coeur d' Alene Tribal projects, programs, and accomplishments is presented in Section 7: Coeur d' Alene Subbasin Inventory of Existing Programs-Aquatic.

***Fish Enhancement on the Coeur d' Alene Reservation***

This project began in 1987, when the Council amended the Columbia River Basin Fish and Wildlife Program as to conduct baseline stream surveys of tributaries located on the Coeur d' Alene Indian Reservation. An ongoing resident fish substitution project, this project is funded through the BPA Project #9004400 to mitigate for lost anadromous fishing opportunities resulting from the construction and operation of Grand Coulee Dam. Initial work used a modified Missouri method (Fajen and Wehnes 1981) to rank reservation streams according to their potential for habitat development for westslope cutthroat trout and bull trout. Four streams (Alder, Benewah, Evans, and Lake creeks) were identified as having the best potential for restoration and were targeted for further study.

Between 1992 and 1994, the tribe described watershed processes and resource conditions in the four target drainages. Channel types delineated a framework to predict channel response and to identify areas best suited for improvement projects (Rosgen 1991). Channel stability evaluations provided a quantitative determination of existing channel stability (Kappesser 1992; Pfancuch 1975). Riparian stand conditions identified potential LWD recruitment and channel shading problems. Biological assessments included physical aquatic habitat evaluation, trout population estimates, biomass estimates, individual stock assessments, and quantification of benthic macroinvertebrates.

In 1994, the Council adopted and in 1995 funded the recommendations for: 1) habitat restoration in Lake, Benewah, Evans, and Alder creeks; 2) purchase of critical watershed areas; 3) an educational/outreach program to facilitate a "holistic" watershed protection process; 4) an interim hatchery production fishery for tribal and non-tribal members of the reservation through construction, operation and maintenance of five trout ponds; 5) design, construct, operate and maintain a trout production facility; and 5) a five-year monitoring program to evaluate the effectiveness of the production and habitat improvement projects.

***Coeur d' Alene Tribe Trout Production Facility***

A trout production facility is planned for the Coeur d' Alene Reservation to supplement native fish stocks in tributaries located on the Reservation, as well as, provide fish for an interim fishery in trout ponds. The Coeur d' Alene Tribe Trout Production Facility is intended to rear and release westslope cutthroat trout into rivers and streams with the express purpose of increasing the numbers of fish spawning, incubating and rearing in the natural environment. It will use the modern technology hatcheries offer to overcome the mortality occurring in lakes, rivers, and streams after eggs are laid in the gravel. Supplementation of native fish stocks in conjunction with effective habitat restoration will be the primary means of achieving these biological goals.

***Implement Wildlife-Habitat Protection and Restoration on the Coeur d' Alene Indian Reservation: Hangman Watershed***

Project Description:

Protect and/or restore riparian, wetland, and priority upland wildlife-habitats within the Hangman Watershed on the Coeur d' Alene Indian Reservation as part of mitigation efforts in the Spokane River Subbasin. Components of this project include the identification of landscape scale management processes that have lead to the 303d listing of Hangman Watershed streams, and formulating and implementing an economical means of restoring the Hangman Watershed streams to a high level of geomorphic and ecologic integrity. The ultimate goal of the Hangman Restoration Project is to prepare the landscape of the Hangman Watershed for the return of salmon to the Spokane Subbasin.

Associated Monitoring:

Produced a Draft Wildlife Monitoring Plan defining:

- Protocols to monitor trends of specific wildlife species and assemblages to reflect effectiveness of management on acquired properties.
- Protocols to monitor broad scale vegetation patterns throughout the Hangman Watershed east of the Washington-Idaho border.
- Protocols to monitor changes in vegetative communities occurring as a result of protection and restoration.

Continue adaptive management in project implementation through:

- Annual noxious weed monitoring of project site.
- Evaluations of survival and growth of restoration stock within one year of planting.
- Landscape photography on a five-year cycle.

Accomplishments:

- Developed a GIS database of land ownership and areas currently managed to provide some measure of wildlife-habitat protection or restoration.
- Assembled a list of native or desired plants for target restoration sites.
- Prepared a draft Habitat Prioritization Plan using landscape and fisheries data to select parcels offering the greatest potential to improve wildlife and fish habitats.
- Initiated an Instream Flow/Hydrology study expected to:
    1. Predict available fish habitats for specific flow regimes.
    2. Produce estimates for changes in stream flow for specific changes in land management.
    3. Identify areas important to establishing and monitoring annual flow patterns in streams that support native species and minimize erosion.

***Hangman Creek Fisheries Restoration on the Coeur d' Alene Indian Reservation, BPA Project 2001-032-00***

Project Description:

This is a sister project to *Implement-Habitat Protection and Restoration on the Coeur d' Alene Indian Reservation: Hangman Watershed*. This project establishes the historic and current distribution of redband trout (*Oncorhynchus mykiss gairdneri)* and other native fish species throughout Hangman Creek and its tributaries. The main emphasis is to substitute restoration of resident fish habitat for lost subsistence from anadromous fish resulting from construction of the Columbia River dams. These findings will determine if the trout are redband and if they are recoverable. If not, then another native salmonid species may be pursued as an alternative for Tribal subsistence. Phase I of the project is a bioassessment of the watershed and restoration project planning. Phase II is implementation of restoration plans, and Phase III will be monitoring of the effectiveness of restoration efforts.

Some of the methods being used to assess salmonid habitat are:

- Conduct a fisheries inventory for distribution and population estimates using electroshocking equipment.
- Study migratory habitats to determine if fish are adfluvial or resident fish.
- Conduct a genetics study to determine if salmonids are pure strain Redband Trout and their relationship to other rainbow stocks in the Spokane River watershed.
- Perform water quality/quantity testing by taking discharge, D.O., pH, conductivity and temp, as well as collecting water samples for laboratory analysis.
- Conduct a macro invertebrates study in Hangman Creek and its' tributaries to identify species, numbers, diversity and biomass as another means to assess the health of Hangman Creek and its tributaries. water quality and erosion data will continue to be collected to establish background data. The first year of genetics sampling will be reported in a preliminary report in 2004, and a final report in 2005. Conducting a two-year Instream Flow Incremental

Methodology (IFIM) study to assess the feasibility of improving baseline flows and temperatures.
- Coordinating Idaho Department of Environmental Quality BURP (Beneficial Uses Reconnaissance Project) surveys within Idaho boundaries.
- Assessing erosional processes.
- Characterize the watershed by channel typing using Rosgen protocols in order to use the proper restoration techniques.
- Educate and involve the public in restoration activities.

Accomplishments

- Mapped out salmonid distribution throughout the Idaho reaches of Hangman Creek
- Collected water quality/quantity data in 2002-2004
- Collected genetics samples in 2003 to be analyzed in 2004 by WDFW
- Surveyed fourteen sites using BURP methodology during 2002-2003.
- Collected continuous temperature and discharge measurements to be used for the IFIM study.
- Coordinated efforts of logging operations to remove 3 culverts and block access to stream crossings in 2002.
- Collected erosion and sediment data using bank pins and analyzing water samples for Total Suspended Solids in 2003.

## 23.3.2 Non-BPA Funded Projects

### 23.3.2.1 Federal Energy Regulatory Commission (FERC)

***Re-licensing of the Spokane River Hydropower Project***

Project Description:

The project entails a re-licensing of five Avista dams (Post Falls, Upper Falls, Monroe Street, Nine Mile, and Long Lake dams) on mainstem of Spokane River.

Associated Monitoring:

Initial studies using radio-telemetry are intended to track fish to determine seasonal fish distribution, habitat preference, and critical spawning areas for the mainstem Spokane River. Bull trout and cutthroat trout studies are ongoing in Coeur d' Alene Lake as part of the FERC process. In 2003, these studies include monitoring of TDGs and water temperatures, as well as evaluating the water budget.

Accomplishments:

Studies are currently ongoing in 2003/2004 with the FERC licensing expected to be complete in 2004/2005. Studies incorporate water quality, TDG monitoring, etc. Protection, Mitigation, and Enhancement (PME) efforts will commence once the FERC license is renewed. Fish passage is one objective that will be identified at each facility once passage is achieved at Chief Joseph and Grand Coulee dams.

### 23.3.2.2 Project sponsored by the Pend Oreille Conservation District

***Little Spokane Water Quality Assessment***

Project Description:

The "Little Spokane Water Quality Assessment" WDOE grant G9900036 was partnered with the Spokane Conservation District. The report contains baseline data for ten sites from October 1998 through September 1999. This project took place in both Pend Oreille and Spokane counties.

### 23.3.2.3 Projects sponsored by Spokane County Utilities Division

***Little/Middle Spokane WRIA 55/57***

Project Description:

The Utilities Division of the Spokane County Public Works Department is the lead agency for the Middle Spokane River Watershed Planning of the Little/Middle Spokane WRIA 55/57. The Planning Unit began in 1998 and commenced work on phase 3 in July 2002, which is expected to be complete the first quarter of 2004. The watershed assessment scope of work includes:

1. Planning unit facilitation and purpose
2. Develop a generalized water balance for WRIA 55/57
3. Develop current water use estimates for residential, commercial, industrial and agricultural activities
4. Develop estimates of instream flow needs
5. Estimate future water needs
6. Water rights and claims
7. Water quality

(Source: http://www.ecy.wa.gov/watershed/55scope%20of%20work.htm)

Major issues to be addressed include water supply needs and the sole aquifer source, Spokane Valley-Rathdrum Prairie aquifer, and FERC re-licensing of the Spokane Hydroelectric River Project and instream flows. An instream flow assessment for the Middle Spokane is still being considered. For more information go to http://www.wcy.wa.gov/watershed/5557.html.

Accomplishments:

The following tasks have been completed: the executive summary of the Level 1 assessment and an instream flow assessment on the Little Spokane River (2003).

***The Little Spokane River Watershed Plan Development; A Compilation of Project Results (2001-2002)***

Project Description:

This project was intended to fill baseline data gaps in the water quality and quantity issues for the Little Spokane River watershed. The data collected for this project included a basin-wide macro invertebrate study, a basin-wide riparian GIS mapping study, selected nitrogen sampling on Deadman and Little Deep creeks near recent housing developments, and a network of stream discharge stations. The project was funded by the WDOE and ended in 2002.

Associated Monitoring:
No additional monitoring is planned at this time.

Accomplishments:
Baseline information was collected on nitrates, riparian areas, and macroinvertebrate populations.

Notes:
The SCCD is currently undertaking the formal water quality management plan with another WDOE grant. WDOE will be conducting a formal TMDL process in the watershed.

### 23.3.2.4 Projects sponsored by the Spokane County Conservation District (SCCD)

***WRIA 54 (Lower Spokane River)***

Project Description:
WRIA 54 encompasses the lower Spokane River (see Figure 21.2 in Section 21). This project began in 2004 and is expected to be complete in 2008. The project is funded by WDOE and is sponsored by Spokane County. Collaborators for this project include WRIA 54 Stakeholders and planning unit members. The purpose of the project is to produce a written watershed plan that addresses water quality, water quantity, and instream flow within WRIA 54.

Accomplishments:
The initiating governments have met and are joining together a planning unit team to begin assessment of WRIA with the overall goal of completing a watershed plan.

***A Chronicle of Latah (Hangman) Creek: Fisheries and Land Use (SCCD, 1998)***

Project Description:
The chronicle of fishery resources in the watershed documents early accounts of the creek and fish from Native Americans, exploration journals, and local historians and residents. From the early accounts, it suggests Hangman Creek was once a highly productive salmon rearing stream and home to native cutthroat and rainbow trout. The project was funded by the Washington State Conservation Commission and ended in 1997.

Associated Monitoring:
Dr. Al Scholz and Charles Lee, Eastern Washington University, recently conducted an extensive fishery sampling study on Hangman Creek (1998-2002). Their work consisted of 63 different sites throughout the entire Hangman basin. They recorded the number, relative abundance, and catch-per-unit effort of all species captured through backpack electro-fishing. Preliminary tables and maps may be available, but the final report is not yet completed.

Accomplishments:
Research of historical archives, newspaper articles, reports, resource agency records, historical society collections and long-time resident interviews were utilized to compile a chronology of land use events impacting the fisheries in Hangman Creek.

***Hangman (Latah ) Creek Comprehensive Flood Hazard Management Plan (CFHMP)***
Project Description:
The Hangman Creek Stream Team was initiated by the WDOE in the spring of 1996 following a four-day run-off event (a peak flow of 14,700 cfs) incurring widespread flooding and stream bank damage to the lower portion of Hangman Creek. A group of private citizens and resource agency staff was organized to address flooding and erosion damage issues concerning lower Hangman Creek. The project was funded by the WDOE and ended in 2000.

The goals of the CFHMP were to:
- Identify stream bank erosion sites
- Identify recurring flood problem areas
- Realize trends and opportunities in land use suitability and capability
- Analyze flood plain management factors within Spokane County and the City of Spokane jurisdictional boundaries

The CFHMP Work Group, the public, and professional agency representatives developed alternatives to the local problem sites. Land use recommendations reflect potential changes to current policy guidelines and could be utilized by public officials as a resource in evaluating areas in Hangman Creek for development and planning.

Accomplishments***:***
Identified problem areas and alternatives.

***Hangman Creek Management Plan (SCCD, 1994)***
Project Description:
In 1994, the SCCD completed a watershed management plan for Hangman Creek. The plan provides information on the watershed characteristics, soils, general land uses in the watershed, land ownership, flow data, fauna and flora, water quality problems, and best management practices (BMPs). In order to address water quality problems associated with Hangman Creek, the management plan included a Water Quality Monitoring Plan. The project was funded by WDOE and although funding ended in 1994, the last objective was completed in 2002.

Accomplishments:
This management plan identified and characterized many of the current land use issues remaining today. It outlined a strategy to reduce overall pollutant loading with associated BMP implementation.

The first of the objectives was completed in 1999 with the publication of the *Hangman (Latah) Creek Water Quality Monitoring Report, Water Resources Public Data File 99-*

*01*. The second objective was completed in 2000 with the publication of the *Hangman Creek Subwatershed Improvement Project Report*. The third objective was completed in 2002 with the publication of *The Hangman Creek Water Quality Network: A Summary of Sediment Discharge and Continuous Flow Measurements (1998-2001)*.

***Hangman Creek Riparian/Sediment Reduction Projects***

Project Description:

The projects listed below are designed to enhance the shorelines through riparian rehabilitation, stabilization, and sediment reduction. The SCCD has worked on many projects in Hangman Creek over the last five years.

- Grunte Project
- Leuthold Project
- Snyder Project
- 12 Riparian Projects on Hangman Creek

Accomplishments:

The projects listed above are all helping reduce sediment loads to Hangman Creek, through bank stabilization, riparian vegetation, and other measures. The number of projects completed on Hangman Creek continues to grow. Additional projects have increased landowner awareness of programs and assistance.

***Hangman Creek Subwatershed Improvement Project Report (SCCD, 2000)***

Project Description:

To quantify the effectiveness of erosion-reducing BMPs on water quality, a sub-watershed improvement project was carried out on two nearly identical small watersheds. For the sub-watershed improvement project, the SCCD monitored two sub-watersheds of Hangman Creek over a four-year period, from October 1995 through October 1999. The purpose of the monitoring was to determine if the implementation of BMPs could be shown to improve the water quality of the receiving waters. The project was funded by WDOE and ended in 1999.

Accomplishments:

The main benefits of this project include reduced sediment runoff, increased storage of water and sediment on farms, increased riparian vegetation, and better wildlife habitat. This project was not designed or intended to evaluate specific individual BMPs; rather, a watershed approach was used in the design of the project BMPs. Because of the watershed approach used in this project, no specific BMP can be recommended as being the best to install. What can be recommended is the use of a site-specific approach with farm planning to decide the best BMPs to install for each individual farm or location.

***Hydrology of the Hangman Creek Watershed (WRIA 56)***

Project Description:

The primary purpose of this study is to review pertinent hydrologic and geologic literature and establish a general water balance for the Hangman (Latah) Creek watershed (WRIA 56.) The study area includes all of the land within the watershed, which spans two states and four counties: Spokane and Whitman counties in Washington and

Benewah and Kootenai counties in Idaho. This project was funded by WDOE and ended in June of 2003.

Accomplishments:
Baseline information on hydrology and groundwater.

***Biological Assessment of Hangman (Latah) Creek Watershed (SCCD, 1998)***
Project Description:
The goal of the study was to collect macroinvertebrate data from Hangman Creek to determine if the health of the stream could be related to the local land uses. The project was funded by the Washington State Conservation Commission and although funding ended in 1997, data is still being gathered by various agencies.

Associated Monitoring:
The WDOE (EAP/EMTS) has recently conducted additional biological sampling on Hangman Creek. They collected macroinvertebrate samples during the fall season of 2003 (August). This additional sampling is tied to the upcoming TMDL assessment work in 2004.

Accomplishments:
The biological assessment did develop a baseline that can be of further assistance in the years to come. Conservation practices throughout the watershed may provide significant impacts that can be measured in 5-10 years. The issue of grass burning throughout the watershed may alter farming practices and cause more producers to return to annual crops. This practice may have adverse impacts to water quality and invertebrate populations. The information gained will be valuable to future efforts.

Notes:
The biological monitoring program in the watershed is not comprehensive. Additional sites and extended monitoring are needed to better assess the biological integrity of tributaries and portions of the main stem on Hangman Creek.

***Hangman (Latah) Creek Management Plan, 2004 (WRIA 56)***
Project Description:
The SCCD accepted the facilitation role for the development of the WRIA 56 management plan in the fall of 1999. The SCCD, under RCW 90.82, formed a central Planning Unit (PU) representing various watershed stakeholders: special districts, local residents, governmental agencies, and affected tribes. Together, the PU commenced the task of assessing and evaluating existing information, conducting short-term studies, and formulating recommendations that will affect the future of water use in the basin for many years to come. The PU developed this management document in an effort to balance and protect the watershed's instream resources, associated habitats, and economic interests. The project is currently in phase 3 with the final plan due in fall 2004 (http://www.ecy.wa.gov/watershed/56.html). Major issues being addressed in the watershed plan include instream flows in Hangman Creek, future demand of domestic water supply, and water quality related to suspended sediment.

Accomplishments:
The collaboration (buy-in) of local governments and agencies with local landowners and interest groups will be invaluable for implementation of the plan.

Notes:
The management plan includes a compilation of projects: instream flows, water balance, historical vegetation map, water quality summary, hydrological investigations, PFC inventory, GIS map layers (groundwater elevations, precipitation, water rights, current land use).

***Hangman Creek Main Stem Channel/Riparian Evaluation***
Project Description:
In the spring of 2003, the SCCD conducted an inventory to assess the functional status of riparian-wetlands along the main stem of Hangman Creek. The extensive assessment evaluated over fifty-eight river miles within the Washington state portion of the watershed.

Accomplishments:
The assessment determined Hangman Creek has extensive riparian-wetland problems magnified by years of human perturbation. The main stem was mapped. The tributaries will be completed at a later date. This project was a pilot effort in eastern Washington.

***Hangman (Latah) Creek Water Quality Monitoring Report (SCCD, 1999). Public Data File 99-01***
Project Description:
The water quality report completed in 1999 summarizes water quality monitoring at six stations over a three-year period. The stations monitored were:

1. Hangman Creek at the Idaho State Line
2. Little Hangman Creek
3. Rattler Run Creek at the mouth
4. Hangman Creek at Bradshaw Road
5. Rock Creek at Jackson Road
6. Hangman Creek at Keevy Road

Associated Monitoring:
Additional monitoring on the mainstem of Hangman Creek is periodically conducted by the SCCD and WDOE. The SCCD conducts the basic suite of parameters during seepage runs and other associated projects.

Accomplishments:
The data collected helps to illustrate the water quality issues and concerns throughout the entire basin.

***Hangman Creek Water Quality Network: A Summary of Sediment Discharge and Continuous Flow Measurements (1998-2001)***

Project Description:

This Washington State Conservation Commission grant is a continuation of a water quality improvement project initiated in 1997. The SCCD monitored stream discharge at five stations and sampled for bedload sediments at three sites within the Hangman Creek watershed. The SCCD coordinated with the USGS on sampling suspended sediment at the USGS gaging station (Marne Bridge).

Accomplishments:

This project provided baseline information on suspended and bedload transport through the system (apportioned). The discharge (seepage) measurements provided valuable surface/ground water interaction information. It illustrated how 80 percent of the summer flows occur within the last five miles of the stream.

***Pre-Settlement Vegetation of the Hangman Creek Watershed and Soil Loss***

Project Description:

This investigation provides an assessment of the historic condition of the native vegetative cover and estimates how changes in land use throughout the Hangman Creek watershed have influenced the overall water availability and soil loss.

Accomplishments:

This produced the first historic vegetative cover map (GIS layer).

***Hangman Creek Instream Flow Project***

Project Description:

Hardin and Davis, Inc. (HDI) studied habitat conditions in Hangman Creek and its tributaries. HDI used Physical Habitat Simulation (PHABSIM), Stream Network Temperature Model (SNTEMP), and hydrological investigations to evaluate instream flow conditions for fisheries. This project was funded by WDOE and ended in May of 2003.

Accomplishments:

The project gathered baseline information on fish habitat requirements.

Notes:

Coeur d' Alene Tribe is conducting similar work in the headwaters of Hangman Creek.

**23.3.2.5 Projects sponsored by the Spokane Tribe of Indians**

***Water Quality and Quantity Monitoring on Spokane Indian Reservation***

Project Description:

This project is located in Wellpinit. It began in 1993 and is ongoing. The purpose of the project is to protect and enhance the water resources of the Spokane Indian Reservation. Project collaborators include WDOE, EPA, and STOI. EPA provides funding.

Associated Monitoring:
Monitoring activities associated with the project include: all major stream flows and water quality, inland lake water quality, total dissolved gas on Spokane and Columbia Rivers, groundwater, bacteria, sediments, stream surveys, and review of land use activity.

Accomplishments:
Thus far project accomplishments include EPA approved Spokane Tribal Water Quality Standards (WQS), identification of water not meeting the WQS, annual reports summarizing annual monitoring/data collection, and the Chamokane Creek watershed plan.

***Spokane Tribe Integrated Resource Management Plan***
Project Description:
This project is located in Wellpinit. It began in 2003 and is ongoing. The purpose of the project is to write a new 10-year Integrated Resource Management Plan (IRMP) replacing the 1994 IRMP that will address all land use activities within the Spokane Indian Reservation.

Accomplishments:
The draft IRMP has been completed and a new Forest Management Plan is being developed.

***Natural Resource Damage Assessment (NRDA) for the Midnight Mine and Dawn Mill Site***
Project Description:
This project started in 2002 and is ongoing. Collaborators include the STOI, National Parks Service, USFWS, and Colville Tribe. The Department of Interior funds the project. The purpose of the project is to assess natural resource damages incurred as a result of the extraction and processing of uranium within the Blue and Chamokane Creek drainages.

Accomplishments:
Studies on sediment, invertebrates, fish, and small mammals have been completed although results and conclusions are not currently available.

**23.3.2.6 Project sponsored by EPA**
***Midnight Uranium Site Superfund Site***
Project Description:
This project is ongoing and was started in 2000. The purpose of the project is to assess and clean up Midnight Uranium Mine, which impacts Blue Creek and the lower portion of the Spokane River. Project collaborators include the STOI, EPA, and USFWS.

Accomplishments:
A Draft Ecological Risk Assessment has been completed.

### 23.3.27 Other Projects with respect to Lake Roosevelt

Other projects with respect to Lake Roosevelt are presented as part of the aquatic inventory in the Upper Columbia (Section 31).

## 23.4 Strategies Currently Being Implemented Through Existing Projects

### 23.4.1 Limiting Factors and Strategies Currently Being Implemented

As described in section 2.4, a database was developed listing the recent projects that have been implemented in the Subbasin. Each project was coded for the limiting factors addressed and the strategies employed. Many projects addressed more than one limiting factor or employed more than one strategy.

In the Spokane Subbasin, 56 recent restoration and conservation projects were identified. Of the projects identified, 34 were focused on resident fish, 16 primarily benefited wildlife, five benefited both fish and wildlife, and one was unknown.

A little more than half of the recent projects in the Spokane Subbasin (56 percent) addressed habitat related limiting factors. The efforts have been distributed between improvements to habitat quality (18 percent), improvements to water quality or quantity (14 percent), increases in habitat quantity (15 percent), or reductions to fish or wildlife passage (9 percent) (Figure 23.1). The lack of information has been addressed in 16 percent of the recent projects. Other non-habitat related limiting factors include disease, competition, predation, and hybridization and have been addressed by 11 percent of the recent projects. Indirect mitigation was addressed by 12 percent of projects.

Projects have implemented a diverse array of strategies in the Spokane Subbasin (Figure 23.2). Habitat improvement or restoration activities have been undertaken by 21 percent of the projects. The second largest category includes research, monitoring, and evaluation with 17 percent of projects engaged in this activity.

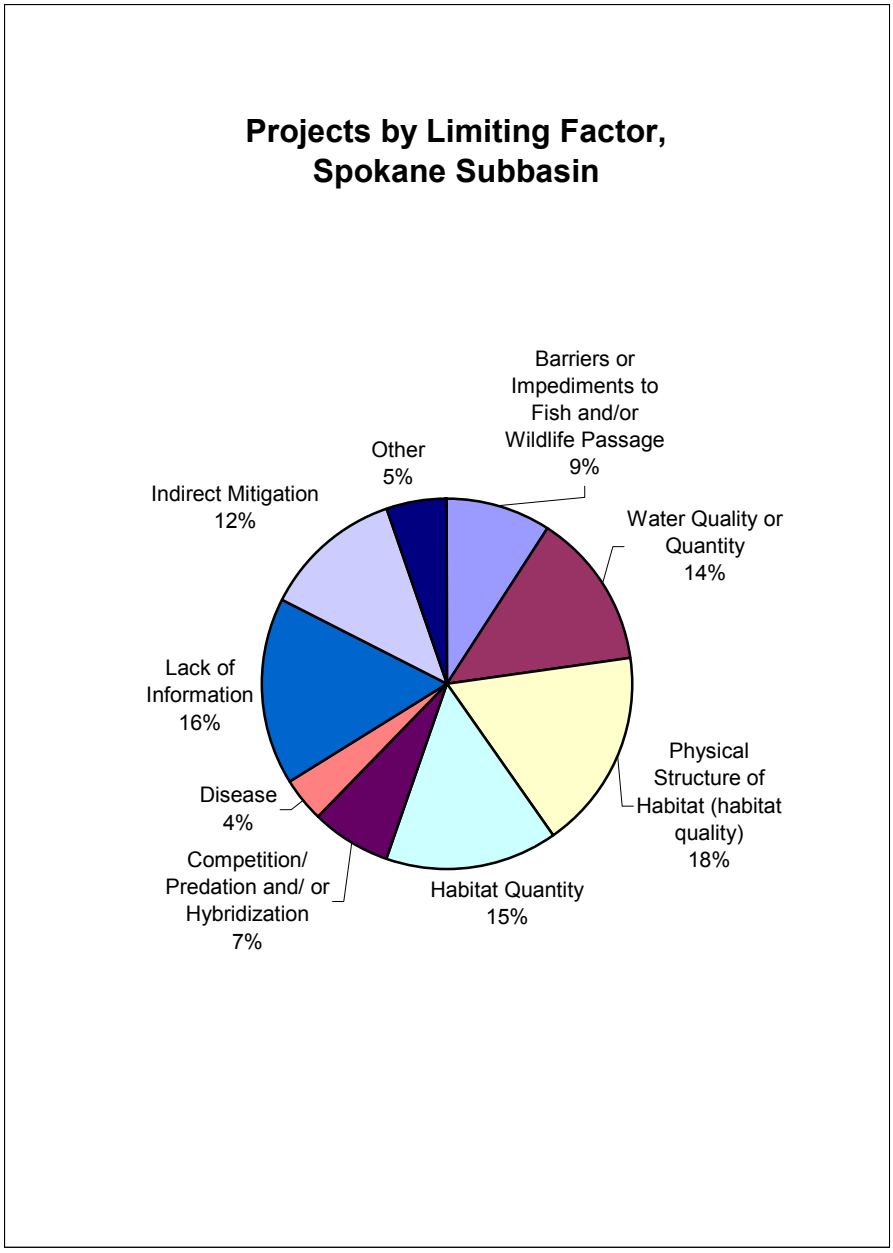


Figure 23.1. The percentage of the 56 recent restoration and conservation projects that addressed various limiting factors within the Spokane Subbasin

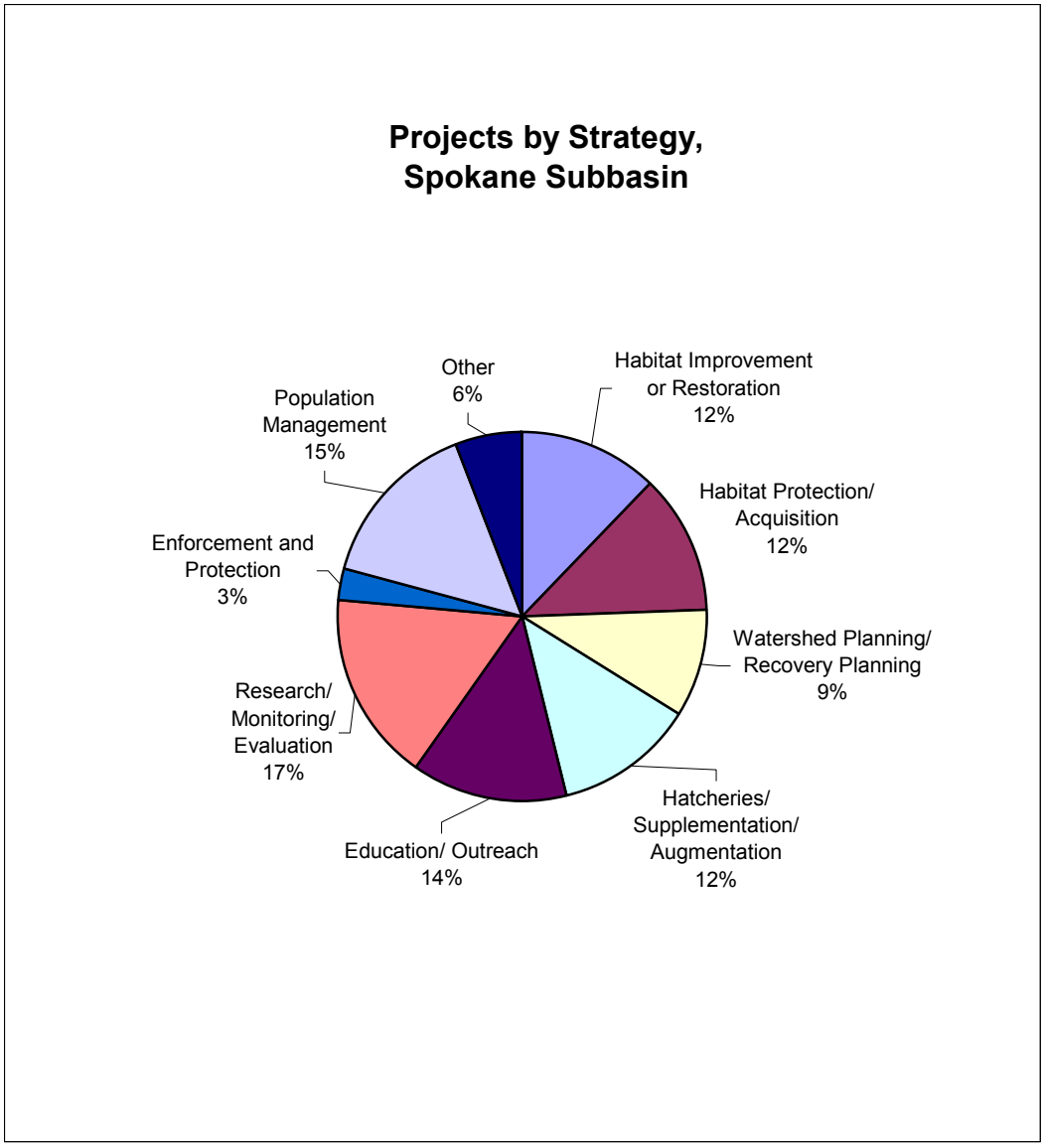


Figure 23.2. The percentage of the 56 recent restoration and conservation projects that addressed various strategies within the Spokane Subbasin

### 23.4.2 Gaps Between Actions Taken and Actions Needed

The Technical Guide for Subbasin Planners requires that gaps between actions taken and actions needed be identified. This perspective will help determine whether ongoing activities are appropriate or should be modified and lead to new management activity considerations.

In the IMP, the Technical Coordination Group provided information on the gaps based on their knowledge and experience in their subbasins. The input follows.

Many areas in the Spokane Subbasin are in need of additional data. Baseline data gathering was identified as a need in the Spokane Subbasin in general (See management

plan objective 1A1, strategy a and objective 1A2 strategy a). Hangman Creek in particular was identified by the technical coordination group as being in need of attention. Hangman Creek was identified as having a wide array of limiting factors (addressed in an earlier section) that affect fish and wildlife in the Spokane Subbasin. Fish and wildlife managers have a particular interest in addressing concerns in this watershed.

Several objectives and strategies are proposed in the Spokane Subbasin Management Plan (Section 26) to address Hangman Creek. For example, Subbasin Objective 1B4: Determine a range of flows suitable for protection and enhancement of native resident fish species in the Subbasin, includes Strategy a: Complete or initiate flow studies on Spokane River, Little Spokane River, Hangman Creek, and other tributaries to determine flows suitable for protection and enhancement of native resident fish species.

Another example is Spokane Subbasin objective 2B3: Supplement non-self sustaining fish species to provide a recreational and subsistence fishery, which includes proposed strategy f: Construct a total of 5 ponds in the Upper Hangman Watershed to function as put-and-take trout fisheries by 2012.