6. Local Context

Chief Joseph Dam Hatchery Program
MASTER PLAN

6

Local Context

6.1 DESCRIPTION OF THE OKANOGAN SUBBASIN

6.1.1 OVERVIEW

The first time visitor to the Okanogan subbasin is often struck by the uniqueness of the terrain. In general, the Okanogan River is an exceptionally flat and slow moving river. The average width of the drainage area for the mainstem Okanogan is approximately 35 miles, and the valley floodplain averages about 1 mile in width. The eastern and western boundaries of the mainstem subbasin are outlined by steep, jagged ridgelines with elevations ranging from 1,500 feet to more than 6,000 feet above the subbasin floor. In summer months the Okanogan valley can broil under waves of heat and unremitting sunshine. In the winter, snow blankets large portions of the subbasin. The River valley is characterized largely by agricultural development, however remarkable gems, including picturesque waterfalls and mild rapids, are sprinkled throughout the length of the River. Knowledgeable visitors who spend some time exploring the area are often impressed by the obvious capacity of much of the Okanogan subbasin habitat to support healthy runs of salmon.

Upper Columbia Regional Fisheries Enhancement Group

FIGURE 14: Photo of the Okanogan River

From its headwaters in British Columbia, the Okanogan River descends at a languid pace through Okanogan Lake, Skaha Lake, Lake Vaseaux, and Osoyoos Lake before reaching the United States where it meanders gently another 79 miles to its confluence with the Columbia River (RM 533.5). The elevation of the mainstem drops from 920 feet at the international boundary to 780 feet at the River's confluence with the Columbia River. Osoyoos Lake occupies the northernmost 4 miles of the Okanogan Valley floor in Washington State and extends several miles into Canada.

The Okanogan subbasin, including the Similkameen subwatershed, is the largest and most complex of the four mid-Columbia River tributaries (Entiat, Okanogan, Methow and Wenatchee). The subbasin includes nearly 2,600 square miles within the state of Washington, and about 6,300 square miles in the Canadian province of British Columbia. For the purposes of the draft *Okanogan/Similkameen Subbasin Plan*, at least 71 subbasin tributaries were identified on the U.S. side of the subbasin. On the Canadian side, the British Columbia Ministry of Water, Air and Land Protection's *Watershed Atlas* identifies an additional 94 subwatersheds. The Similkameen River enters the Okanogan River from the west approximately 2 miles south of the U.S./Canada border (Okanogan RM 77). The Similkameen is the Okanogan River's largest tributary draining a watershed of nearly 2,900 square miles.

Average precipitation in the main Okanogan Valley is 12 inches, the majority of which falls as snow (Talayco 2002). The Okanogan subbasin exhibits a typical snowmelt system with high flows coinciding with spring rains and melting snow pack, peaking between late May and early June. Minimum flows occur in early fall to mid-winter. The Similkameen River contributes 75% of the Okanogan

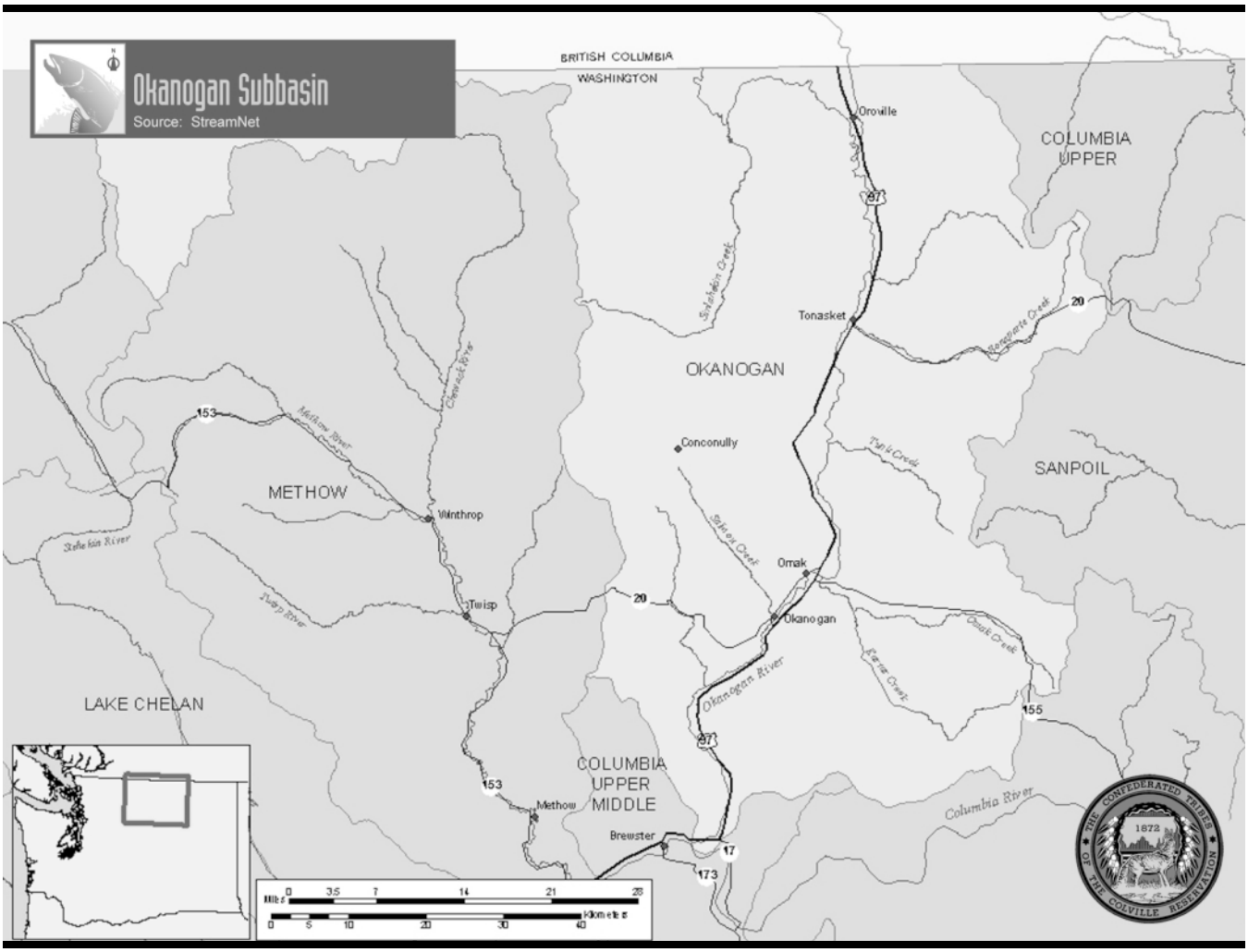


FIGURE 15: Map of the Okanogan Subbasin

River's flow (Talayco 2002). Isolated summer thunderstorms, occurring approximately once every two years, can cause flash flooding within subwatersheds.

6.1.2 LAND USE

Approximately 34% of the lands in the U.S. Okanogan subbasin are privately owned. The Colville Reservation makes up roughly 25% of the U.S. subbasin. The remaining 41% is publicly owned, and of that portion 21% is managed by the U.S. Forest Service (USFS), 17% is managed by the State of Washington, with the remaining 3% managed by the Bureau of Land Management (Entrix and Golder 2002). Major U.S. communities within the subbasin include the towns of Brewster, Omak, Tonasket and Oroville (in the Canadian subbasin are the towns of Osoyoos, Oliver, Penticton and Kelowna).

State and county highways run parallel to the Okanogan River at close proximity for its entire length in the U.S. except for a reach from Riverside to Janis, Washington. On the U.S. side, the stretch of River between the towns of Riverside and Janis is the only largely undeveloped reach. In the Canadian portion of the subbasin, British Columbia's major highway corridor also runs parallel to the River from Kelowna to Osoyoos.

Land use in the Okanogan subbasin includes agriculture, range, timber, residential and recreation, and some industrial and commercial. Agricultural fields are

located directly adjacent to the Okanogan River along much of its length. On the U.S. side, the Okanogan subbasin contains approximately 36,000 to 40,000 acres of irrigated lands. Agricultural water withdrawals pose an ongoing challenge to salmon restoration in some mainstem, and many tributary reaches. Approximately 60% of the irrigated acreage (24,421 acres) is under the control of irrigation districts or ditch companies (Entrix and Golder 2002). Nine irrigation districts and canal companies operate on the U.S. side of the Okanogan subbasin. The Oroville-Tonasket Irrigation District (OTID) is responsible for irrigation of roughly 20% of the total irrigated land in the U.S. Okanogan subbasin (Entrix and Golder 2002).

Steve Smith

FIGURE 16: Photo Zosel Dam

The unique partnership between the Colville Tribes and the OTID warrants a brief comment. Like many irrigation districts, the OTID makes use of settling ponds prior to distributing its irrigation waters. The OTID use their settling ponds for six months out of the year and in the remaining six months the ponds sit idle. As it happens, the requirements of over-wintering summer/fall Chinook salmon in the Okanogan subbasin align very well with the time period when the OTID ponds are not in use. In an innovative partnership between the OTID and the Colville Tribes, the Tribes have agreed to lease these ponds, pay electrical pumping charges, and conduct upgrades and modifications necessary to convert the ponds for use as acclimation facilities during the irrigation district's off-season. This partnership between the OTID and the Colville Tribes represents one example of the types of creative, innovative, and cost effective strategies that can – and must – be developed to restore and conserve salmon and steelhead populations.

6.1.3 DAMS AND OTHER IMPEDIMENTS

Twenty dams are located in the U.S. portion of the Okanogan subbasin including nine owned by the state, seven private, three federal, and one operated by a PUD. In the Canadian Okanogan subbasin, 13 vertical drop structures exist along the Okanogan River (NMFS 1996). In addition, Canadian low-head dams at Okanogan Lake, Skaha Lake and Vaseaux Lake are impassable to fish.

Diversions in Loup Loup, Salmon, and Antoine creeks prevent the full use of habitat potentially available to anadromous salmonids in the U.S. portions of the subbasin. The Similkameen River is presently impassable to all anadromous salmonids at Enloe Dam (RM 8.8). It is largely believed that prior to construction of Enloe Dam, a series of natural falls blocked salmon and steelhead passage into the subwatershed. In one of the local Coyote stories shared in the Okanagan tradition, Coyote (Sen'k'lip), is said to have created a big dam on the Similkameen River to stop the salmon from passing. Coyote did this when the Similkameen people told him they would not give him one of their prettiest daughters in exchange for salmon in the summer because they had plenty of mountain goat to eat (Vedan 2002).

Zosel Dam at river mile 77 is used to control the levels of Osoyoos Lake. Reconstruction work completed in 1987 resulted in improved fish passage into Osoyoos Lake. McIntyre Dam, located 12.5 miles above Osoyoos Lake is the current upper limit to migratory fish in the Okanogan River, although historically anadromous salmon, in particular sockeye, are known to have used the waters of Okanagan Lake.

6.1.4 RIVER AND TRIBUTARY CONDITIONS

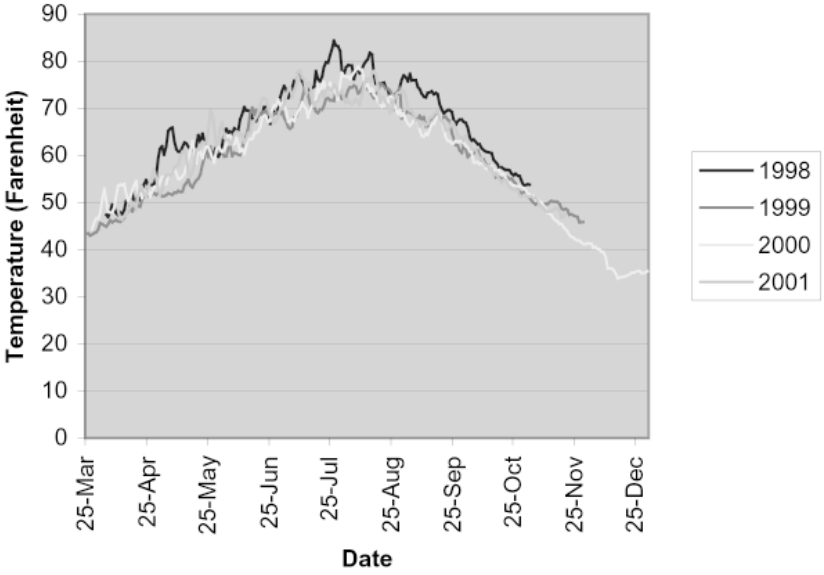


Figure 17: Okanogan River Average Monthly Temperatures Measured at Oroville, WA with Thermographs 1998-2001

The Okanogan River is channelized from its mouth to the town of Oliver in Canada.

The lowest 17 miles of the Okanogan River presently lie within the backwater pool (Lake Pateros) of Wells Dam. This area is subject to daily water fluctuations from Wells Dam operational changes. Temperatures in this portion of the Columbia River range from 38°F to 75°F. Stream banks in this reach are rarely exposed to high-energy flows and remain relatively intact, due to low gradient and storage influences. Substrate consists almost entirely of mud, silt, and sand. Riparian vegetation is composed of a dense layer of shrubs and saplings, which effectively protect the banks from scouring and erosion. There are few mature trees in this reach.

The Okanogan River between river mile 17 and the base of Osoyoos Lake, is a broad, shallow, low gradient, channel with relatively homogeneous habitat. There are few pools, and limited large woody debris. Sediment levels are high and substrate embeddedness is relatively widespread.

Temperatures in the Okanogan River regularly exceed lethal tolerance levels for salmonids in mid-to-late summer. Temperatures in the Okanogan River ranged from 32°F to 85°F between 1998 and 2001 (Colville Tribes, unpublished data). Due to the extensive series of lakes in the Canadian portion of the basin, the Okanogan River actually tends to be warmer in the northern reaches near Oroville, WA, than it is further south in Malott, WA (Figures 17 and 18). High water temperatures in late summer and fall often form a temporary thermal barrier, blocking adults from migrating to spawning grounds. These thermal conditions have also sometimes excluded juvenile salmon from rearing in most of the Okanogan subbasin, except during the first few weeks after emergence (Talayco 2002). When temperatures reach critical levels, dissolved oxygen concentrations in the Okanogan River are generally at or above saturation levels. The lowest saturation values have been detected at Malott, WA.

Although it is typically cooler than the Okanogan River, the Similkameen River is also 303(d) listed for temperature. Between 1999 and 2001, Similkameen River temperatures ranged from 33°F to 74°F (Colville Tribes, unpublished data). Mid-summer

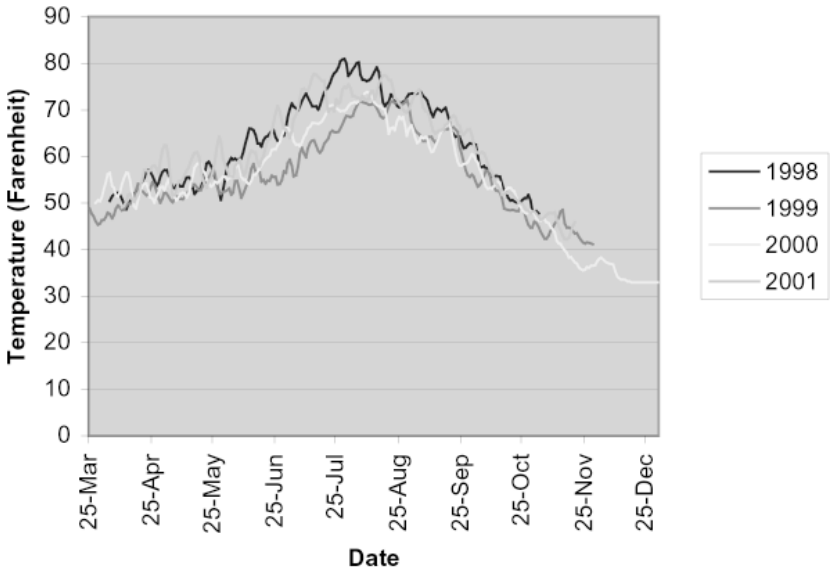


Figure 18: Okanogan River Average Monthly Temperatures Measured at Malott, WA with Thermographs 1998-2001

temperatures exceed 71°F, precluding summer rearing of salmonid juveniles. The Similkameen River also has high levels of suspended sediment.

6.2 STATUS OF CURRENT ENVIRONMENTAL ASSESSMENTS

The following section lists major environmental assessments that have been completed in the Okanogan subbasin in recent years. This is by no means a comprehensive list. In addition to the assessments conducted by various U.S. agencies, Canadian agencies and watershed planning groups have also completed a number of assessments associated with watershed planning activities in the Canadian portion of the Okanogan subbasin. A comprehensive list of additional U.S. and Canadian assessment resources will be included in the completed *Okanogan Subbasin Plan*.

It is worth noting however, that the bulk of assessments completed to date in the U.S. Okanogan Subbasin have generally been conducted at a relatively course scale. There is a substantial need to develop adequate baseline data throughout much of the Okanogan subbasin. It is anticipated that the Okanogan/Similkameen Baseline Monitoring and Evaluation Program (BPA Project 200302200) will help to address this unmet need [see Chapter 10 for additional discussion].

6.2.1 OKANOGAN SUBBASIN PLAN

In accordance with the Council's subbasin planning directives and timeline an Okanogan Subbasin Plan is currently being developed. The completed subbasin plan will incorporate information from the draft Okanogan/Similkameen Subbasin Summary, from new EDT modeling, and from information gathered as part of Washington State Salmon Recovery Planning requirements, and Canadian information sources.

6.2.2 OKANOGAN/SIMILKAMEEN SUBBASIN SUMMARY

The draft *Okanogan/Similkameen Subbasin Summary* was completed in 2002. This document contains extensive assessment information for the Okanogan subbasin (Talayco 2002). Although the document is somewhat unwieldy due to the sheer quantity of materials and a somewhat challenging organizational structure, there is a great deal of valuable assessment data gathered in the document. Appendices include extensive maps documenting anadromous fish distributions, land use, habitat, and hydrological information for both the U.S. and Canadian portions of the subbasin. As noted above, information contained in the *Okanogan/Similkameen Subbasin Summary* will be updated and incorporated selectively into the *Okanogan Subbasin Plan*.

6.2.3 SALMON AND STEELHEAD HABITAT LIMITING FACTORS ASSESSMENT

The draft *Salmon and Steelhead Habitat Limiting Factors Assessment Watershed Resource Inventory 49: Okanogan Watershed* (Okanogan LFA) was completed in 2002 (Entrix and Golder 2002). The Okanogan LFA provides a summary of the current understanding of habitat conditions in the Okanogan River and its tributaries based on the professional knowledge of a Technical Advisory Group that included a mixture of agency and consulting scientists from both the U.S. and Canada. The Okanogan LFA identified action items for each sub-watershed to address the identified limiting factors. The action items are not prioritized but do provide a good summary of immediate needs in the Okanogan subbasin tributaries.

6.2.4 BIOLOGICAL ASSESSMENT AND MANAGEMENT PLAN: MID COLUMBIA RIVER HATCHERY PROGRAM

As noted in Chapter 5, as part of negotiations for the Mid-Columbia HCPs, a document titled, *Biological Assessment and Management Plan: Mid Columbia River Hatchery Program*, was developed (BAMP) (Bugert 1998). The BAMP presents a plan for operation, and evaluation of anadromous salmonid hatcheries in the Columbia River upstream of the Yakima River confluence. Although the BAMP has not been formally approved, it includes broadly supported genetic, and ecologic assessments of summer/fall Chinook, spring Chinook, sockeye and steelhead.

6.3 OTHER ANADROMOUS FISH IN THE OKANOGAN SUBBASIN

The Okanogan River represents the uppermost tributary of the upper Columbia River currently available to anadromous salmonids. The Okanogan subbasin presently supports runs of summer/fall Chinook salmon, sockeye salmon, and a limited run of summer steelhead.

6.3.1 UPPER COLUMBIA SUMMER STEELHEAD

The summer run steelhead of the Okanogan are considered part of the Upper Columbia Summer Steelhead ESU, and were listed as endangered on August 18, 1997. Although the historical records for steelhead in the Okanogan subbasin are not very complete, Mullan et al. (1992) asserts that few steelhead historically used the Okanogan River. Current habitat conditions in much of the Okanogan subbasin are generally poor to support most life history requirements of steelhead, although the Colville Tribes have committed substantial efforts to restoration of key habitat and to innovative supplementation strategies.

Salmon Creek historically supported self-sustaining steelhead runs, but lack of stream flow currently restricts access in many years. As much as half of the steelhead production in the U.S. portion of the Okanogan subbasin may have been lost to irrigation water withdrawals on Salmon Creek which currently cause severe limits to access (WDFW and WWTIT 1994). In 1955-56, the escapement estimate to the Okanogan was about 50 fish from a total run size of about 97 fish (WDFW 1990). Assuming a 50% loss in production from Salmon Creek since 1916, the average run-size prior to the extensive hydroelectric development in the mid-Columbia River reach, is believed to have been about 200 fish. The estimated total run-size of naturally produced summer steelhead to the Okanogan subbasin declined to between 4 and 34 fish, from 1977 to 1988 (WDFW 1990).

Some evidence suggests that historically steelhead may have also used other tributaries in the Okanogan subbasin (Chapman et al. 1994a). It is also possible that Okanogan subbasin steelhead production could at one time have occurred primarily in Canada, with remnant populations still existing today above Zosel Dam. Fulton (1970) indicates that Omak Creek may have been important to steelhead production. Since the mid-1990s the Colville Tribes have engaged in extensive efforts to restore steelhead in Omak Creek. Actions have included: road decommissioning, riparian planting, removal of fish passage barriers, channel restoration, and construction of fences to reduce impacts caused by livestock. In 2003 the Colville Tribes initiated a local broodstock program on Omak Creek to improve steelhead viability.

A steelhead kelt reconditioning program is also being initiated. In 2004, the Tribes counted over 100 steelhead entering Omak Creek [see Chapter 6 for additional information on projects and programs].

6.3.2 SOCKEYE SALMON

According to WDFW & WWTIT (1994), a "healthy" stock of sockeye salmon continues to use the Okanogan subbasin for spawning and rearing. The Okanogan sockeye are not currently listed under the ESA. Spawning population escapement estimates ranged from 20,202 to 34,679 fish in 1993, depending on the methodology used to calculate spawning population size (Hansen 1993). Sockeye spawning occurs predominantly in the mainstem of the Okanagan River upstream of Osoyoos Lake, with some spawning also taking place in the tributaries of Osoyoos Lake in years with high flows. McIntyre Dam, 12.5 miles upstream of Osoyoos Lake, generally represents the upstream limit of spawning under typical flow years. In years with high flows sockeye may pass the dam. Sockeye have been observed spawning up to Skaha Lake (Entrix and Golder 2002). Spawning may occur as early as September 15, with timing linked closely to water temperatures. In Hansen's study, approximately 58% of the spawning population was male and 42% female. Sockeye in the Okanagan spend either one or two years in freshwater residency before smoltification and seaward outmigration (Hansen 1993).

6.3.3 UPPER COLUMBIA SPRING CHINOOK

The Upper Columbia River Spring Chinook were listed as Endangered on March 24, 1999. The listed

ESU includes all naturally spawned populations of spring Chinook in accessible reaches of Columbia River tributaries between Rock Island and Chief Joseph dams, *excluding* the Okanogan River. Several hatchery populations from the Methow and Wenatchee subbasins where included in the listed ESU. Critical habitat for the listed ESU was designated on February 16, 2000, and included all river reaches accessible to listed spring Chinook in Columbia River tributaries between Rock Island and Chief Joseph dams, *excluding* the Okanogan River (Talayco 2002). Upper Columbia River Spring Chinook are considered extinct from the Okanogan subbasin.

FIGURE 19: 1913 Photo of Dolly Varden (Bull Trout) Caught in Okanogan River

The Upper Columbia River Spring Chinook ESU includes stream-type Chinook salmon spawning above Rock Island Dam in the Wenatchee, Entiat, and Methow rivers. All Chinook salmon in the Okanogan River are now believed to be ocean-type and are considered part of the Upper Columbia River Summer/Fall Chinook ESU (Meyers 1998). Historically, spring Chinook salmon were numerous in the Okanogan subbasin and were harvested by members of the Colville Tribes in the Okanogan River during their May thru October salmon fisheries.

Upper Columbia River Spring Chinook are discussed in greater detail in Chapter 13 [see also Appendix D].

6.4 RESIDENT FISH

Important native resident species in the Okanogan subbasin include mountain whitefish, rainbow trout, and westslope cutthroat trout.

6.4.1 BULL TROUT

The distinct population segment for bull trout, incorporating the entire Columbia River (i.e., upper and lower), was listed as endangered on June 20, 1999. The Okanogan River does not provide suitable habitat for bull trout due to their requirement for very cold, clean waters with clean gravel/cobble substrate for successful spawning and rearing. Bull trout were documented in Salmon and Loup Loup creeks, and are also known to have migrated in the Okanogan River. There is some disagreement as to whether bull trout were once present in the Okanogan River. A 1913 account of local fishing success in *The Chronicle* notes, "some extra nice big Dolly Varden trout that had been caught by Phillip Umbrite in the Okanogan River from the bridge right in the heart of Omak" (V.4, No. 25, November 7, 1913). The same day's paper also notes, "O.E. Bisher was seen leading two fine specimens of the Dolly Varden trout tribe down Main street last Saturday headed for the hotel and the skillet. Bish said they had nabbed a hook baited with beef steak which he had cast carelessly into the Okanogan River."

Bull trout were reported in creel census records from the 1940s and 1950s in the north fork of Salmon Creek (Entrix and Golder 2002). Scott and Crossman (1973) reported that bull trout are not present within the Canadian portions of the Okanogan River system.

Various exotic (non-native) warm water species have also been introduced into the Okanogan subbasin (OWC 2000). These include: largemouth bass, smallmouth bass, black crappie, bluegill, yellow perch, pumpkinseed sunfish, black bullhead, tench, common carp, and walleye.

6.5 OKANOGAN SUBBASIN COORDINATED PLANNING ACTIVITIES

There are a host of coordinated salmon and steelhead recovery activities currently underway in the Okanogan subbasin. Following is an abbreviated account of activities with the greatest relevancy to the CJDHP. For a more complete list of planning activities

targeted to fish, wildlife and the larger ecosystem of the Okanogan subbasin (both U.S. and Canada) readers are encouraged to refer to the draft *Okanogan Subbasin Plan*.

6.5.1 OKANOGAN SUBBASIN PLANNING

As noted earlier, in accordance with the Council's subbasin planning directives and timeline a subbasin plan is being developed for the Okanogan subbasin. The Colville Tribes and Okanogan County lead the subbasin planning effort in the Okanogan subbasin. The Colville Tribes are coordinating the development of the assessment and inventory and final management plan, while Okanogan County is coordinating the public outreach and communication. In addition to an updated assessment, planners have updated the subbasin inventory of projects and programs and are developing an Okanogan subbasin management plan. Subbasin planners in the Okanogan subbasin coordinated their product with other planning activities in the subbasin, particularly Washington State's Salmon Recovery planning requirements. Okanogan subbasin planners have also made extensive efforts to coordinate with key management agencies, First Nations, and citizens groups in the Canadian portion of the subbasin.

Subbasin planners in the Okanogan subbasin reviewed the need for, and components of, the CJDHP in the context of: historical and current conditions, known limiting factors, inventory of programs and projects, and the Okanogan subbasin vision. The CJDHP is an important tool (i.e. identified strategy) for meeting the biological objectives identified in the Okanogan Subbasin management plan and is consistent with the strategies identified in the plan.

6.5.2 UPPER COLUMBIA SALMON RECOVERY BOARD

The Upper Columbia Salmon Recovery Board (UCSRB) is a standing committee of the North Central Washington Resource Conservation and Development Council. The UCSRB Board of Directors includes elected officials or designates from Chelan, Douglas, and Okanogan Counties, the Colville Tribes and the Yakama Nation. The UCSRB coordinates and oversees regional recovery planning for salmon. The UCSRB is guiding development of a draft Upper Columbia salmon recovery plan as part of the State of Washington's statewide salmon recovery planning efforts. The draft plan is slated for completion in December of 2004 with a final plan to be completed by June of 2005. The UCSRB's efforts are being integrated with subbasin planning activities in the Okanogan subbasin. As noted previously, the completed *Okanogan Subbasin Plan* will also include elements necessary for a Washington State Salmon Recovery Plan.

6.5.3 OKANOGAN SUBBASIN LEAD ENTITY STRATEGY

The Colville Tribes and Okanogan County have been co-leads for the 'Okanogan County Lead Entity Strategy' since 1999. The primary purpose of the Okanogan County Lead Entity is to provide guidance regarding the development of habitat protection and restoration projects. These efforts focus primarily on the Salmon Recovery Funding Board's grant process, and Okanogan County's related contractual work with the WDFW. Each designated Lead Entity maintains a separate Citizen Committee and conducts a project prioritization process. During the last three years the Upper Columbia Lead Entities have coordinated salmon recovery efforts in the Upper Columbia by submitting an integrated regional project list. This level of cooperation and coordination is indicative of the shared commitment to salmon recovery in the subbasin – as well as of some broadly shared agreement regarding prioritization of actions to achieve recovery goals. The CJDHP is consistent with, and would complement, the types of habitat restoration priorities articulated through the Okanogan County Lead Entity strategy.

6.5.4 UPPER COLUMBIA REGIONAL TECHNICAL TEAM

The Regional Technical Team's (RTT) membership includes a broad range of technical experts from the Okanogan subbasin and the Columbia Basin at large. To support salmon recovery planning efforts, the RTT developed an *Upper Columbia Biological Strategy* specifically to provide guidance to the Washington State Salmon Recovery Funding Board process. The RTT's *Upper Columbia Biological Strategy* has also been adopted as a tool to help guide subbasin planning

work in the region. Technical guidance developed by the RTT was taken into consideration in the development of the summer/fall Chinook HGMP that is foundational to the CJDHP. The RTT has also provided substantial input in the development of the Okanogan Subbasin Plan.

6.5.5 UPPER COLUMBIA RIVER REGIONAL FISHERIES ENHANCEMENT GROUP

While not explicitly a planning body, the Upper Columbia River Regional Fisheries Enhancement Group (UCRFEG) has supported planning efforts and implementation of those plans through facilitation of community stewardship of fish and fish habitats in the upper Columbia region, including the Okanogan subbasin. The group coordinates delivery of state salmon recovery funding for local community projects and has facilitated Transboundary community demonstration projects. The UCRFEG provides a liaison between legislators, planning agencies, technicians, fish biologists and landowners in the Okanogan subbasin. The success of the CJDHP in restoring naturally-spawning summer/fall Chinook populations in the Okanogan is in part dependent on the cooperation and support of landowners and citizens in the Okanogan subbasin. The UCRFEG is an important tool for educating the Okanogan subbasin populace about the importance and means of achieving improved habitat conditions throughout the subbasin – and to implementing on the ground projects that address identified limiting factors.

6.5.6 TRANSBOUNDARY COORDINATION

6.5.6.1 Canadian Okanagan Subbasin Technical Working Group

The Canadian Okanagan Subbasin Technical Working Group (COBTWG) is a working group addressing technical issues associated with management of salmon and resident fish stocks and their habitat requirements in the Canadian portions of the Okanagan subbasin. COBTWG participants include Fisheries and Oceans Canada (federal), Okanagan Nation Alliance Fisheries Program (Okanagan First Nations), and the B.C. Ministry of Water, Land, and Air Protection (provincial). The COBTWG has provided some input in the development of the Okanogan Subbasin Plan. Coordination of planning activities among technical groups on the U.S. side of the border, the Colville Tribes, and the COBTWG is ongoing.

6.5.6.2 Okanagan Nation Alliance and the Colville Confederated Tribes

In March of 2001, the Okanagan Nation Alliance entered into a Letter of Understanding with the Colville Tribes committing to work together in implementing ecosystem-based management principles to recover sockeye, Chinook and steelhead in the Okanogan subbasin. The Okanagan Nation Alliance leads a Transboundary effort to restore Okanogan subbasin salmon ecosystems and in particular, the historical Okanagan Nation salmon fisheries. A specific focus of the Okanagan Nation Alliance's efforts is restoration of Okanagan sockeye to their former range in the upper Okanogan subbasin.

Both the Colville Tribes and Okanagan Nation Alliance recognize that habitat improvements and passage improvements for sockeye, steelhead or Chinook salmon will have overlapping benefits for all species. In addition, both the Colville Tribes and Okanagan Nation Alliance agree that salmon don't recognize international borders, and that conservation and restoration measures must be implemented regardless of political borders. The focus of the CJDHP on addressing historical - and historic - inequities in mitigation for Upper Columbia salmon losses, along with the CJDHP's emphasis on implementing actions within a larger ecosystem framework, is consistent with the focus of the joint Transboundary efforts of the Colville Tribes and Okanagan Nation Alliance.

6.6 CURRENT AND PLANNED MANAGEMENT ACTIVITIES

The following section includes an abbreviated overview of current and planned management activities that would specifically affect operation of the CJDHP, or activities that would be affected by the proposed program. A more comprehensive list of management activities in the Okanogan subbasin is presented in the draft *Okanogan Subbasin Plan*.

6.6.1 MID-COLUMBIA PLANS

6.6.1.1 Mid-Columbia Habitat Conservation Plans

Aside from artificial production associated with the Grand Coulee Dam Mitigation Agreement, artificial production in the Okanogan subbasin has historically been driven by mitigation agreements among the Douglas, Chelan, and Grant County PUDs. Chelan County PUD provides funding for Eastbank Hatchery and Similkameen Pond, and Douglas County Public Utility District operates Wells Dam and Wells Hatchery.

At present, the Mid-Columbia Habitat Conservation Plans (HCPs) for anadromous salmon and steelhead have been signed by NOAA Fisheries, USFWS, WDFW, the Colville Tribes and Douglas and Chelan PUDs; and undergone regulatory review by NOAA Fisheries. In November 2003, the plans were submitted to the Federal Energy Regulatory Commission for review. The FERC will decide how to amend the Mid-Columbia PUD project licenses based on the HCPs.

The Chelan and Douglas PUDs worked with various state and federal fisheries agencies, including NOAA Fisheries, USFWS, WDFW, three tribes and American Rivers, to develop the HCPs. Chelan PUD developed plans for the Rocky Reach and Rock Island hydroelectric projects. Douglas PUD developed a HCP for the Wells hydroelectric project.

The HCPs commit the two utilities to a 50-year program to ensure that their hydroelectric projects have no net impact on mid-Columbia salmon and steelhead runs. These goals are to be accomplished through a combination of fish bypass systems, spill at the hydro projects, off-site hatchery programs and evaluations, and habitat restoration work conducted in mid-Columbia tributary streams. In addition to meeting the ESA, the plans are also intended to satisfy the projects' obligations under the Federal Power Act, the Fish and Wildlife Coordination Act, the Essential Fish Habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act, the Pacific Northwest Electric Power Planning and Conservation Act and Title 77 RCW of the State of Washington, and to obligate the parties to work together to address water quality issues.

6.6.1.2 Biological Assessment and Management Plan

A comprehensive ESU-wide plan for the propagation of Upper Columbia River summer/fall Chinook does not currently exist. As referenced earlier, the Mid-Columbia HCP process included development of the BAMP, which once approved would provide some ESU-wide coordination. The BAMP outlines a phased approach to increasing artificial production of summer/fall Chinook in the mid-Columbia region (upstream from the Yakima River) to make progress toward a "no net impact" objective for operations of the Mid-Columbia PUDs. The document includes identification of production increases intended to be consistent with conservation of low-risk, natural populations and recovery of listed species. The BAMP approach relies on phased production in order to minimize negative effects of collecting broodstocks on natural populations and to allow for possible adaptation of the program based on monitoring outcomes. At this time the BAMP has not been formerly approved.

The proposed CJDHP includes several deviations from the BAMP, which are outlined in detail in the summer/fall Chinook [see SF HGMP, p. 35 for additional detail].

6.6.2 COLVILLE TRIBES

The Colville Tribes are currently developing a tribal anadromous fish management plan. The draft plan includes the following goals and objectives:

- Enhance and restore all anadromous salmonid species and stocks under the management authority of the Colville Tribes – to historical levels if possible, but at least to fishable levels;
- Facilitate regulated fisheries on relatively abundant hatchery stocks of anadromous salmon and steelhead, while protecting weak stocks;
- Facilitate the pursuit by Tribal members of their rightful ceremonial and subsistence fisheries;
- Ensure that anadromous fisheries will operate in concert with the recovery of endangered upper Columbia River steelhead and upper Columbia River spring Chinook;
- Provide for complimentary recreational fisheries in the Okanogan, Methow, and Columbia rivers, when feasible, i.e., at larger runs sizes;

- Ensure spawning escapement sufficient to allow natural populations of anadromous salmonids, including stocks targeted for fisheries as well as ESA-listed anadromous salmonid species, to rebuild;
- Develop plans and methodologies for selective harvest of specific stocks of anadromous salmonids – to facilitate conservation and rebuilding of depleted stocks;
- Integrate conservation enforcement with fish restoration measures and fishery development;
- Develop plans and methodologies to restore anadromous species that are currently depleted or extirpated (i.e., sockeye and coho salmon) to areas under the Colville Tribes' jurisdiction, and that are accessible to anadromous fish;
- Evaluate the feasibility of strategies and methodologies to restore anadromous species and stocks that are currently extirpated in the Upper Columbia Blocked Area's which fall under Colville Tribes jurisdiction;
- Incorporate public education and outreach activities into anadromous fishery management planning;
- Integrate individual anadromous salmonid species management plans (i.e., Chinook salmon, coho salmon, sockeye salmon, and steelhead) into an overall integrated framework;
- Integrate individual anadromous salmonid species management plans with resident fish management plans (i.e., sturgeon, trout, bass, catfish and walleye) within an overall integrated framework;
- Coordinate anadromous fishery management with ESA processes, i.e., Hydropower Biological Assessments/Biological Opinions, Harvest Biological Assessments/Biological Opinions, HGMPs, Habitat Conservation Plans, and Fish Recovery Plans;
- Coordinate anadromous fishery management with BPA-funded enhancement & mitigation, the Council's Fish and Wildlife Program and regional ecosystem management processes (i.e., Provincial Review and Subbasin Planning); and
- Coordinate anadromous fish restoration efforts from various funding sources (i.e., NOAA Fisheries, USFWS, Bureau of Reclamation, BPA, Bureau of Indian Affairs, Congressional Appropriations, the Pacific Coastal Salmon Recovery Fund, and other grant sources) into a comprehensive Master Plan that links the various efforts.

Alison Squier

FIGURE 20: Photo Colville Fish and Wildlife Staff Moving Temporary Fish Trap in Omak Creek

Central to the Colville Tribes' anadromous fish management plan is the restoration of natural spawning populations of summer/fall and spring Chinook, sockeye salmon, and steelhead to their historical habitat throughout the traditional lands of the Colville Tribes.

The Colville Tribes intend to restore spring Chinook runs to the base of Chief Joseph Dam for harvest purposes and into the Okanogan River subbasin to reintroduce extirpated runs. [Details of the Colville Tribes' proposed spring Chinook programs are presented in Chapter 13, and in Appendix D.]

The Colville Tribes are also investigating the feasibility of restoring runs of summer/fall Chinook above Chief Joseph Dam. A spawning habitat survey has been completed for upper Rufus Woods Lake. A reconnaissance study of adult and juvenile fish passage options at Chief Joseph Dam has also been completed (COE 2002). Pending implementation of the CJDHP, and once anticipated increased runs of summer/fall Chinook have been achieved, the Colville Tribes may elect to collect and pass some of those fish above the Dam as part of an experiment to test the feasibility of adult spawning in the Lake and passage around Chief

Joseph Dam. The live-capture gear and methodologies developed as part of the CJDHP broodstock collection program, and the hatchery's adult collection facilities, may provide valuable cost-effective means to pass fish over the Chief Joseph Dam. The Colville Tribes plan to explore a range of cost-effective options [see SF HGMP, p. 40].

The Colville Tribes currently manage a ceremonial and subsistence fishery in the tailrace immediately below Chief Joseph Dam. The fishery uses hook-and-line gear to snag Upper Columbia River summer/fall Chinook. Historically the fishery began on July 1 and ended no later than September 30. The fishery is designed to harvest summer/fall Chinook in excess of the current escapement objective of 3,500 fish. Incidental harvest of steelhead is restricted under regulation of the ESA. In 2001, steelhead mortality was limited to 200 fish. Starting in 2002, the fishery was extended through October 31, and was physically extended downriver 12 miles to the confluence of the Okanogan River. Mortality of both hatchery-origin and natural-origin steelhead is specified as a percentage of the run over Wells Dam (CCT 2002). As noted previously, because the tailrace fishery is located in a terminal site and uses hook-and-line gear, it has very limited capacity to harvest large numbers of Chinook surplus to escapement needs.

6.6.3 YAKAMA NATION

The Yakama Nation plans to re-introduce naturally-spawning coho salmon in the Methow subbasin, and has identified an interest in eventually expanding this re-introduction into the Okanogan subbasin. Their plan is to implement these coho restoration activities in phases. The first phase, which is described in the Mid-Columbia coho HGMP identified two goals: 1) continue existing studies and initiate new ones to determine whether a brood stock can be developed from Lower Columbia River coho stocks whose progeny can survive in increasing numbers to return as adults to the mid-Columbia region; and 2) initiate natural reproduction in areas of low risk to sensitive species. Results of these studies will guide future decisions regarding re-introduction of coho into the Methow subbasin and any other expansion of the program.

If these proposals are implemented the co-managers in the Columbia Cascade Province will need to coordinate closely to minimize deleterious effects or interactions from the coho or summer/fall Chinook artificial production programs. Information gleaned from the monitoring and evaluation programs associated with the CJDHP and the proposed coho re-introduction program, in addition to the Okanogan Baseline monitoring and evaluation program will be essential to making decisions about whether, and how, to proceed with artificial production programs in the upper Columbia. In addition, the results of basinwide review efforts on artificial production and supplementation will need to be considered carefully.

6.6.4 WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

The WDFW, as the state agency with legislated authority for management of fish in Washington, and as the lead agency in the summer Chinook salmon run-size enhancement program funded by Chelan County PUD and Douglas County PUD, operates the Similkameen Pond summer/fall Chinook program, traps summer/fall Chinook broodstock at Wells Dam, and operates the Eastbank Hatchery.

The WDFW is an active participant in salmon recovery and subbasin planning activities in the Okanogan subbasin, including coordination and implementation of regional monitoring and evaluation programs. The WDFW is responsible for the administration of State statutes directed towards the protection of fish and wildlife habitats and is also a party to the *U.S. v Oregon* agreements.

The recreational fishery in the upper Columbia and Okanogan rivers is managed by WDFW. Recreational fisheries for summer/fall Chinook in the Okanogan and upper Columbia rivers are opened when forecasted runs of summer Chinook indicate a significant surplus to broodstock and escapement needs. A surplus is calculated as the anticipated run at Priest Rapids Dam less 5,750 fish required for broodstock at hatchery programs upstream of the Dam, less 2.5% of the Priest Rapids count for lower-river recreational fisheries, less 5% harvest by the Wanapum Tribe, less an allocation for natural escapement in the Wenatchee,

Methow, Similkameen, Okanogan, Entiat, and Chelan rivers. As escapement goals for each of these rivers has not yet been established, WDFW has conservatively used the sum of the maximum annual escapements to each river for 1996-2000, about 11,000 fish at Priest Rapids Dam as the trigger to open recreational fisheries.

6.6.5 OKANAGAN NATION ALLIANCE

The Okanagan Nation Alliance (ONA) is the Tribal Council representing the Okanagan Nation. The Okanagan Nation's traditional homelands cover a large area of the southern interior of British Columbia and Northern Washington. The ONA is comprised of the following Indian Band Reserves: Upper Nicola, Okanagan, Westbank, Tsinstikeptum, Penticton, Osoyoos, Upper Similkameen, and Lower Similkameen.

The Okanagan River flows from Canada and summer/fall Chinook salmon still migrate through Osoyoos Lake to spawn and rear in Canadian waters. As noted previously, the ONA and the Colville Tribes have agreed to collaborate on recovery of fish and wildlife in the Transboundary Okanagan subbasin. The ONA is now working through Canada's Species At Risk Act (SARA) to seek a listing and develop recovery plans for Chinook salmon in the Canadian portions of the Okanagan River. It is worth noting a key difference between the Canadian SARA and the U.S. ESA. Under SARA work does not stop at protecting and restoring endangered species – an objective under SARA is also reinstatement of extirpated species to historical habitat.

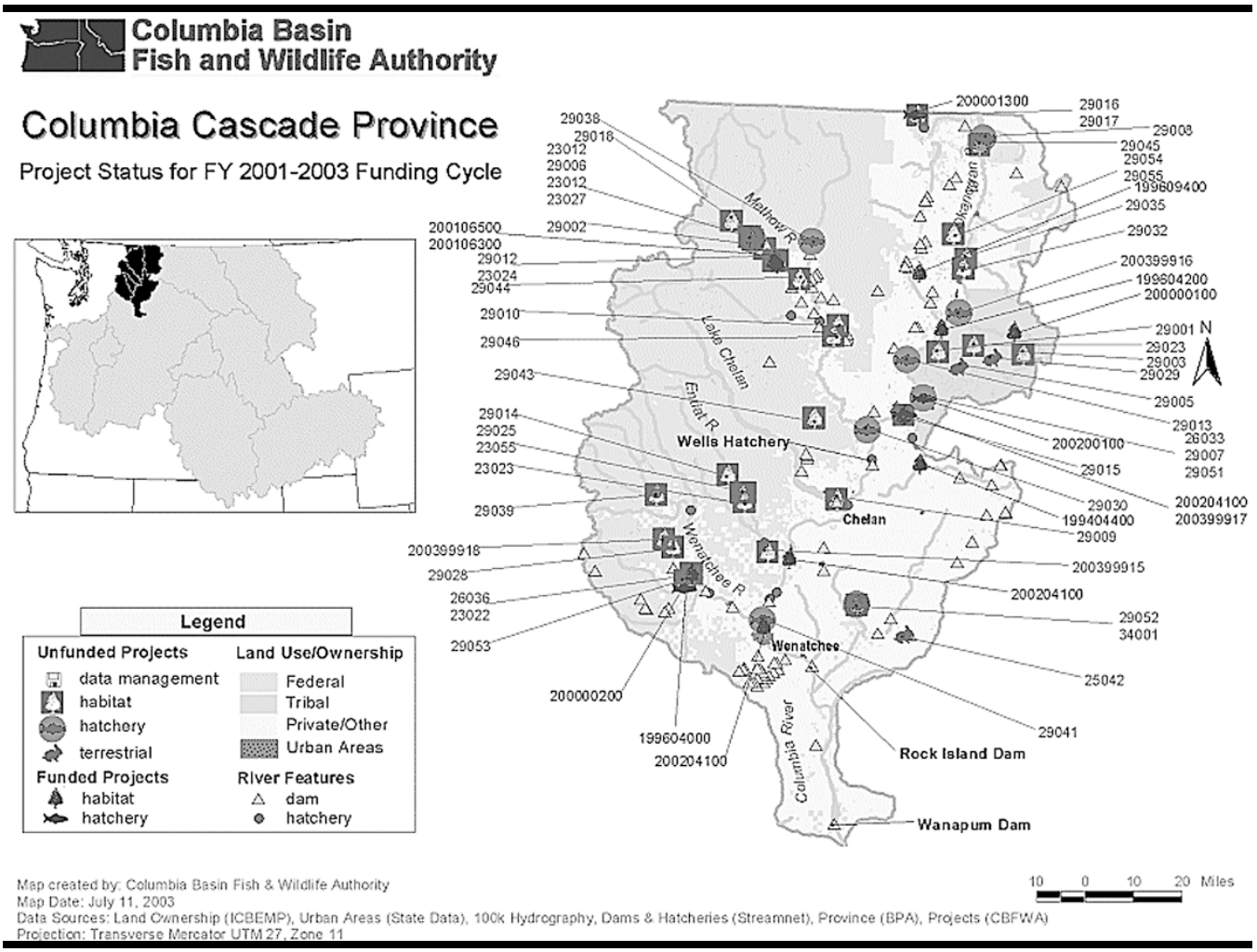
The CJDHP and its underlying summer/fall Chinook HGMP (and possibly spring Chinook HGMP) may need to be expanded in the future to reflect any artificial production plans that arise from Canadian recovery efforts related to summer/fall Chinook. This could include additions in production, changes in release sites of existing production, or further refinement of harvest management guidelines to protect fish arising from Canadian waters. The Colville Tribes' have used BPA funding to study passage at Enloe Dam (see next section) and the ONA and the Colville Tribes have agreed to work toward a regional resolution to fish passage issues at Enloe Dam and to working with the Upper and Lower Similkameen Indian Bands to protect related fishing rights and interests.

Significant numbers of sockeye currently spawn in the Canadian portion of Okanagan River (35,000 - 45,000 in 2000 and 2001). After successfully migrating over 9 mainstem Columbia River dams sockeye migration is terminated at McIntyre Dam. The barrier at McIntyre Dam could easily be bypassed or laddered, which would allow sockeye to access an additional 6.8 miles of their historical range. The Colville Tribes implemented a BPA funded project to evaluate an experimental re-introduction of sockeye salmon into Skaha Lake and Canadian fisheries authorities have indicated that passage of sockeye past McIntyre Dam is acceptable. Cooperative efforts to develop necessary passage facilities at McIntyre Dam are currently ongoing.

6.7 RELEVANT RECENT AND ONGOING PROJECTS AND PROGRAMS

The follow section summarizes key projects or programs enacted in recent years to address salmon and steelhead conservation and restoration in the Okanogan basin. The Okanogan Subbasin Plan includes a far more comprehensive list of fish and wildlife projects and programs, including an extensive list of projects that have been implemented in the Canadian portion of the subbasin.

Although funding for restoration and conservation projects in the Cascade Columbia, including the Okanogan subbasin, has been very limited for many years, the Colville Tribes, federal and state agencies, Okanogan County, and citizen groups have worked aggressively to develop and identify funds to implement a variety of restoration and conservation programs. Sources of funding for recovery and restoration projects in the Okanogan subbasin have come from BPA, Pacific Coastal Salmon Recovery Funds (both as direct awards to the Colville Tribes and via the Washington State administered funds), Bureau of Indian Affairs, National Fish and Wildlife Foundation, Washington Department of Natural Resources, through the Canadian Forest Renewal B.C. program, and through a wide variety of federal and state grant programs.



Source: Columbia Basin Fish and Wildlife Authority: http://www.cbfwa.org/

FIGURE 21: BPA Funded Fish and Wildlife Projects in the Columbia Cascade Province, FY 2001-2003 Funding Cycle

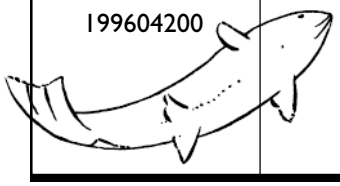
NOAA Fisheries has recently developed performance metrics to more effectively track progress of salmon recovery activities implemented through the Pacific Coastal Salmon Recovery Fund program. This performance metrics sorts conservation and recovery projects into five broad categories: habitat protection and enhancement; salmon enhancement; watershed planning and coordination; public education; and research, monitoring and evaluation. The list of relevant projects presented in Tables 4 through 8 is organized in those five categories. In addition, a visual summary of the fiscal year 2001-2003 BPA funded projects implemented in the Columbia Cascade Province is provided in Figure 21.

6.7.1 HABITAT PROTECTION AND RESTORATION

Recent habitat protection and restoration activities in the Okanogan subbasin have included: protection and restoration of land along key tributaries and mainstem reaches, restoration of stream channels, restoration of riparian habitat, fencing programs, screening projects, and removal of passage blockages. Habitat restoration in the Okanogan subbasin to date has been focused primarily on Salmon and Omak creeks, and on discreet reaches of the Okanogan mainstem. In particular, the systematic restoration efforts in Omak Creek have resulted in significantly increased canopy cover, improved steam function in the lower reaches of the Creek, and elimination of sources of sediment loading. Actions are currently underway to improve passage at Mission Falls on Omak Creek. The Colville Tribes plan on beginning similar restoration efforts on either Antoine or Loop Loop Creek in the near future. These combined habitat protection and restoration activities, and future work, will be vital to the success of the CJDHP.

Table 4: Partial List Okanogan Subbasin Habitat Recovery and Restoration Projects

PROJECT NUMBER	FUNDING SOURCE	PROJECT DESCRIPTION AND BENEFITS DERIVED FROM PROJECT
200000100	BPA	Redesign channel in lower Omak Creek to address erosion and lateral migration of the channel. Benefit: improved rearing and spawning habitat for summer steelhead and Chinook salmon.
00-1683-D	SRFB	Point bar and log weir construction on mainstem Omak Creek to divert flow from exposed banks. Benefit: improved rearing and spawning habitat for summer steelhead and Chinook salmon.
CCT02-2	PCSRF	Habitat acquisition on lower Omak Creek to restore and protect important riparian habitat. Benefit: improved rearing and spawning habitat for summer steelhead and Chinook salmon.
CCT02-4	PCSRF	Omak Creek summer steelhead habitat passage project to remove barrier to passage at Mission Falls and replace collapsing culverts on road crossing upstream from Mission Falls. Benefit: restore access for summer steelhead and protect Creek from massive sediment load dump if culverts collapse.
NA	BIA	Riparian restoration and stream bank stabilization along Omak Creek (mitigation for fire retardant spill in Omak Creek). Benefit: improved rearing and spawning habitat for summer steelhead and Chinook salmon.
CCT01-1	PCSRF	Omak Creek groundwater supplementation feasibility study to determine if well water could be used to effectively increase flows and decrease water temperatures on a portion of lower Omak Creek. Goal was to address elevated stream temperatures, although feasibility study indicated well flows were not adequate to achieve desired results.
198347700	BPA	Study passage related issues at Enloe Dam and identify potential of salmonid habitat above the dam. Benefit: open additional habitat for sockeye salmon.
199604200	BPA	Conduct ongoing restoration work in Salmon Creek to restore habitat and open access to important habitat through restoration of water flows, current efforts involve completion of EIS. Benefit: restore important habitat for spring Chinook salmon and summer steelhead.



6.7.2 SALMON ENHANCEMENT

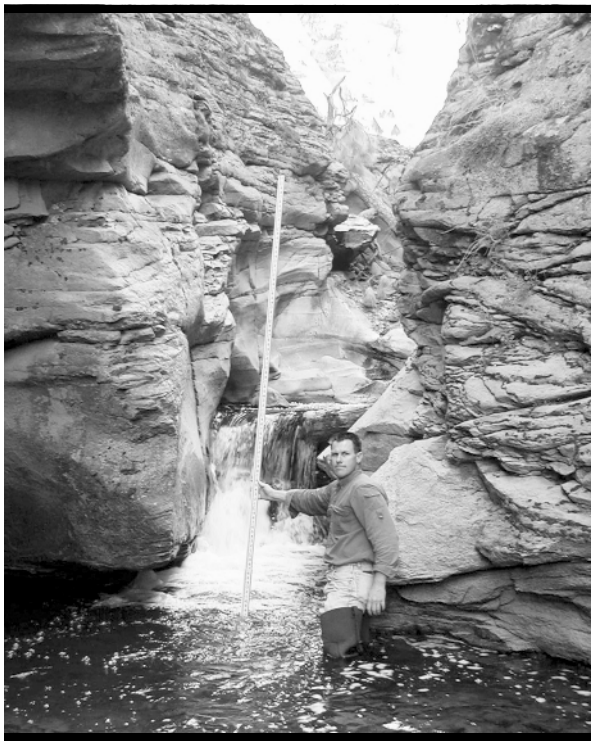
In addition to the WDFW run summer/fall Chinook artificial production program currently implemented at Similkameen Pond, the Colville Tribes have initiated a number of programs designed to restore naturally-spawning populations of salmon and steelhead to the Okanogan subbasin. The programs described in the CJDHP will complement these existing programs [see Chapter 9; and the SF HGMP, pp. 28-34, and 40-43, for additional discussion of potential ecological interactions of CJDHP with other species].

Table 5: Partial List Okanogan Subbasin Salmon Enhancement Projects

PROJECT NUMBER	FUNDING SOURCE	PROJECT DESCRIPTION AND BENEFITS DERIVED FROM PROJECT
200001300	BPA	Evaluate an experimental re-introduction of sockeye salmon into Skaha Lake. Benefit: restore sockeye habitat.
CCT01-2	PCSRF	Conduct steelhead kelt reconditioning feasibility study. Benefit: increase natural-origin summer steelhead populations.
CCT01-4	PCSRF	Construct St. Mary's Mission (Omak Creek) acclimation pond. Benefit: improve distribution of natural-origin spring Chinook salmon.
CCT01-5 and CCT03-2	PCSRF	Develop local Okanogan River locally adapted summer steelhead broodstock – Phase 1 and Phase 2. Benefit: increase natural-origin summer steelhead populations.
CCT02-3	PCSRF	Modify OTID irrigation settling pond to make it suitable for rearing Okanogan summer Chinook – Bonaparte Acclimation Pond. Benefit: improve distribution of natural-origin summer/fall Chinook salmon.

6.7.3 WATERSHED PLANNING AND COORDINATION

There are numerous efforts to more effectively coordinate and prioritize conservation and recovery activities in the Okanogan subbasin, the Columbia Cascade Province, and the Columbia River Basin. Effective coordination and information sharing are crucial to assuring sustainability of salmon and steelhead populations. In the Okanogan subbasin many of these planning and coordination activities involve participation of scientists, as well as local governments and citizens. An important benefit of coordinated planning is the ability to identify cost-share opportunities and alternative sources of project funding. An additional important benefit is more effective prioritization of activities and fund allocations. The existing watershed plans and ongoing coordination between agencies, tribes and citizens is utterly essential to successful implementation of the CJDHP.

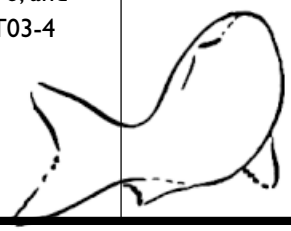


Alison Squier

FIGURE 22: Photo Mission Falls on Omak Creek

Table 6: Partial List Okanogan Subbasin Watershed Planning Projects

PROJECT NUMBER	FUNDING SOURCE	PROJECT DESCRIPTION AND BENEFITS DERIVED FROM PROJECT
NA	BPA	Okanogan Subbasin Planning. Benefit: prioritized objectives and strategies for salmon recovery in Okanogan subbasin
199604200	BPA	Watershed coordination in Okanogan subbasin including collection of data necessary to recovery of anadromous fish. Benefit: more effective salmon and steelhead recovery and enhancement efforts.
CCT01-3, CCT02-6, and CCT03-4	PCSRF	Upper Columbia Basin salmon recovery planning and coordination. Funds allow for participation of Colville Tribes in watershed planning activities, Upper Columbia Salmon Recovery Board, TRT, RTT, and numerous other salmon recovery and planning forums and technical groups. Funding is also used in development of the Colville Tribes' anadromous fish restoration plan. Benefit: more effective salmon and steelhead recovery and enhancement efforts.



6.7.4 PUBLIC EDUCATION

Public education and outreach activities are often identified as high priorities in forums and workshops convened around salmon recovery, yet these programs are fairly consistently cut from budgets when funding is tight. Public education and outreach is crucial to forging successful partnerships to recover and assure the sustainability of salmon and steelhead throughout the Columbia River basin.

When the Colville Tribes presented the CJDHP proposal to local stakeholder groups, some commented on the importance of including public educational facilities at the Chief Joseph Dam Hatchery site. Although educational and outreach efforts are sometimes viewed as providing somewhat intangible benefits, the Colville Tribes is committed to developing educational opportunities and partnerships wherever possible.

Table 7: Partial List Okanogan Subbasin Public Education Projects

PROJECT NUMBER	FUNDING SOURCE	PROJECT DESCRIPTION AND BENEFITS DERIVED FROM PROJECT
CCT01-3a	PSCRF	Salmon recovery education and outreach to develop displays and educational materials for use in schools, at public meetings, festivals and fairs, etc. Benefit: more effective salmon and steelhead recovery and enhancement efforts.
NA	NA	Okanogan River Salmon Festivals – this weeklong event was coordinated for the first time by the UCRFEG in 2002, and then again in 2003. The event consisted of a series of traveling festivals coordinated to follow the upstream migration of salmon to their home waters in the Okanogan subbasin. Events were held in communities along the Okanogan River each weekend moving upstream along with the returning salmon. Benefit: more effective salmon and steelhead recovery and enhancement efforts.

6.7.5 RESEARCH, MONITORING AND EVALUATION

One of the fundamental needs in the Okanogan subbasin is comprehensive baseline data. In late 2004, BPA agreed to fund project 200399916 to initiate an Okanogan/Similkameen Baseline monitoring and evaluation project. This project, in coordination with many project specific, as well as larger regional, monitoring and evaluation programs, will begin to address the data and information voids that exist in the Okanogan subbasin. Successful implementation and adaptation of the CJDHP are dependent on coordinated and effective monitoring and evaluation programs [see Chapter 10, and Appendix H for additional discussion of CJDHP specific, and other regional monitoring and evaluation activities].

Table 8: Partial List Okanogan Subbasin Research, Monitoring and Evaluation Projects

PROJECT NUMBER	FUNDING SOURCE	PROJECT DESCRIPTION AND BENEFITS DERIVED FROM PROJECT
200399916	BPA	Okanogan/Similkameen Baseline monitoring and evaluation program. Benefit: increase knowledge about existing conditions and improve ability to adapt recovery and harvest programs to restore naturally-spawning populations of salmon and steelhead.
CCT02-5 and CCT03-3	PCSRF	Conduct monitoring and evaluation of project measures associated with recovery and restoration of Chinook and steelhead in Omak Creek. Benefit: increase knowledge about existing conditions and improve ability to adapt recovery and harvest programs to restore naturally-spawning populations of salmon and steelhead.