

Draft

San Poil River
Subbasin Summary

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San Poil River Subbasin Summary

Table of Contents

Fish and Wildlife Resources.....	1
Subbasin Description	1
Fish and Wildlife Status	3
Habitat Areas and Quality	7
Watershed Assessment.....	8
Limiting Factors	9
Artificial Production	11
Existing and Past Efforts.....	11
Subbasin Management	16
Existing Plans, Policies, and Guidelines	16
Goals, Objectives, and Strategies	16
Wildlife Objective 2.....	21
Research, Monitoring and Evaluation Activities.....	23
Statement of Fish and Wildlife Needs- Enhancements/Projects.....	25
Statement of Fish and Wildlife Needs	26
References	28
Subbasin Recommendations	30
FY 2001 Projects Proposals Review.....	30
Projects and Budgets.....	30
Research, Monitoring and Evaluation Activities.....	34
Needed Future Actions.....	35
Actions by Others.....	37

San Poil River Subbasin Summary

Fish and Wildlife Resources

Subbasin Description

General Location

The San Poil River Subbasin originates in the Okanogan Highlands in north central Washington and flows south for approximately 59 miles through the Colville National Forest and Confederated Tribes of the Colville Reservation (CTCR). The San Poil River enters Lake Roosevelt at river mile (RM) 615.5 (Figure 1).

Drainage Area

The San Poil Subbasin drains approximately 1,086 square miles of Ferry County, WA (EPA 2000) and incorporates one Washington Department of Ecology (WDOE) Water Inventory Resource Area (WRIA), WRIA 52. Primary tributaries to the San Poil River include O'Brien, Granite, Scatter, Ninemile, Westfork San Poil River, Lost, Gold, Seventeenmile, Twentythreemile, North Nanamkin, South Nanamkin, Thirtymile, Bridge, Iron, Louie, and Manilla creeks. Major lakes include Gold Swan, Ferry, Long, Crawfish, and San Poil.

Climate

The area has a continental climate that is influenced by maritime air masses from the Pacific Coast. This region has an average temperature of 44° F, with the month of July being the warmest and January the coldest. An average of 16.73 inches of precipitation falls on the region, with an average of 51 inches of snow. (Weather Underground 2000)

Topography/geomorphology (geology and soils)

Elevation ranges from 1290 feet above sea level (the full pool level in Lake Roosevelt) to 7100 feet (Snow Peak, Kettle Range).

Geology

The San Poil subbasin lies on two geologic provinces. The first is the old coastal plain that at one time was part of the western margin of North American. The coastal plain was shifted into tight folds of sedimentary rock, with granitic intrusions known now as the Kootenai Arc. West of the Kootenai Arc is the Okanogan subcontinent that was an island about the size of California that was pushed up against the Kootenai Arc due to continental drift. The southern portions of both provinces disappear beneath the Miocene basalt flows of the Columbia Plateau to the south. (Alt and Hyndman, 1984)

Sanpoil River

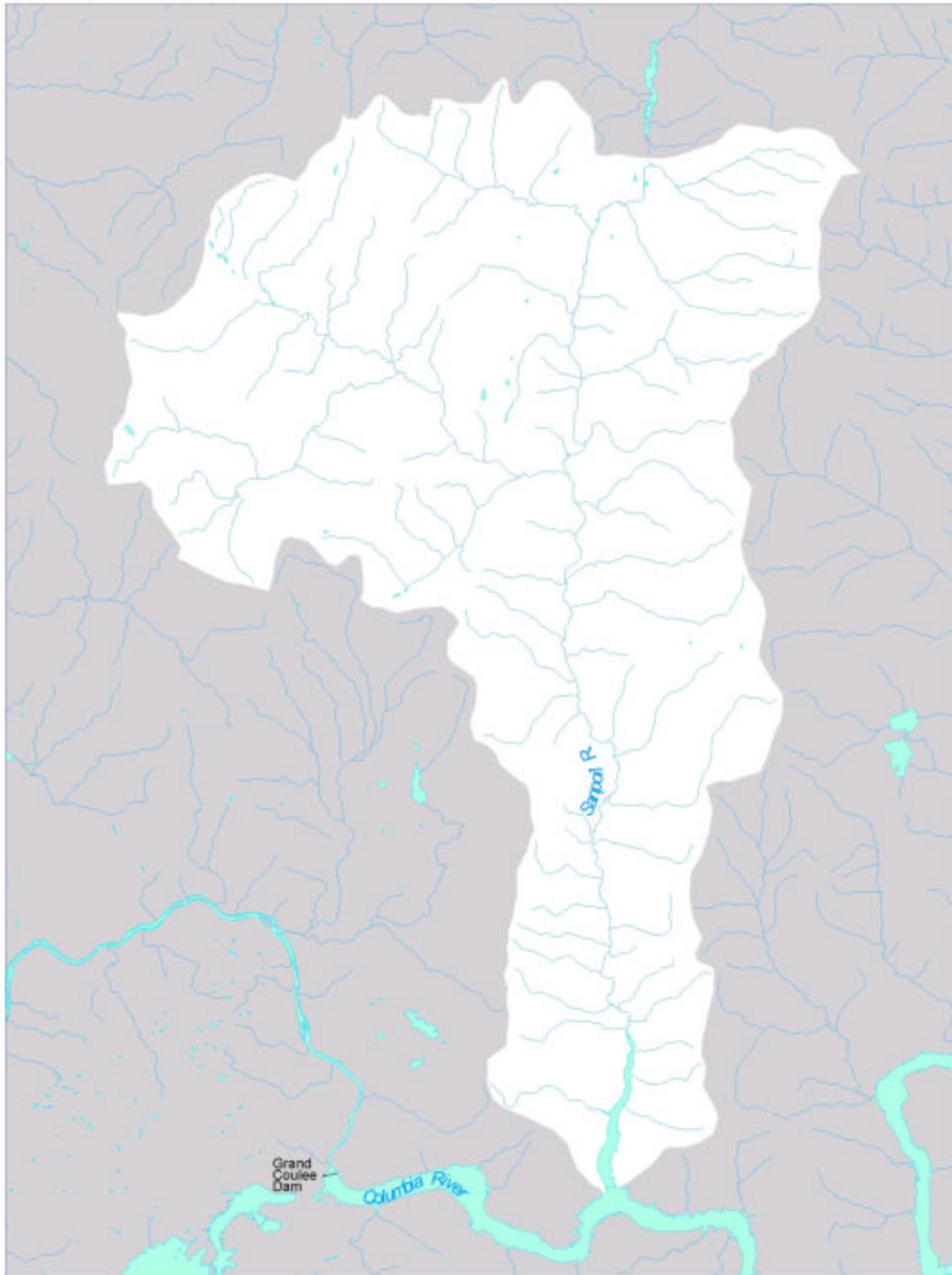


Figure 1. San Poil River Subbasin

Soils

Soils of the watershed are tied to elevation. In high elevation mountain areas, the soils are derived from granite parent material. The texture is a gravelly sandy loam that normally

has a depth of a meter or less. These soils also have some volcanic ash, which has a silt loam texture. In lower elevations at the margins of river valleys, soils are derived from glacial till. The texture is normally sandy-loam to loam and moderately dark in color. At the lowest elevation along rivers the soils are coarse in texture. They are derived from glacial outwash sands and gravels (Dyrness and Franklin, 1988).

Land Use

The primary land uses in this subbasin are agriculture, grazing, logging, and mining. Some urbanization has occurred within the subbasin. Cattle grazing is present throughout the subbasin contributing to soil compaction, increased stream width to depth ratios, and displacement of native wildlife species. Heavily forested areas within the subbasin are managed for timber harvests and many areas are comprised of timber harvest and associated road construction are present throughout the subbasin on Colville Indian Reservation land, private land, and Colville National Forest Land. Mining and human settlement (town of Republic) are also land uses in the basin.

Vegetation

Natural vegetation in the low elevations of the subbasin are generally dominated by pine savannas with grasses, shrubs, and ponderosa pine trees. As these areas transition into higher elevations with increased precipitation, alpine communities of Douglas fir/ponderosa pine/larch and cedar/hemlock develop.

Fish and Wildlife Status

Anadromous Fish

Construction of Chief Joseph and Grand Coulee dams on the Columbia River blocked anadromous and resident fish migrations to the upper Columbia watershed. The San Poil River has no significant blockages and is accessible for virtually its entire length to migratory fish. Prior to hydroelectric development, the San Poil River sustained a large run of summer and fall chinook, but was most famous for summer steelhead runs. The loss of anadromous fish irrevocably altered the ecosystem and changed the social/economic systems of those inhabiting the San Poil Subbasin.

Resident Fish

Resident fish species were also impacted through habitat alteration (inundation), lost productivity (absence of nutrient component attributable to anadromous fish), habitat degradation relating to land-use practices (agriculture, grazing, logging and municipal development) and altered aquatic communities (exotic introductions). Currently, bull trout are not present at detectable levels throughout the subbasin and westslope cutthroat trout are limited to a few tributaries including the South Fork San Poil River on Colville National Forest Land (Tom Shuhda, Colville National Forest, Fish Biologist, personal communication). The majority of the remaining salmonid stock assemblage consists of native northwest species comprised of non-native stocks (coastal rainbow trout) and non-native species (brook trout). The non-salmonid community changes are mostly unknown, although since anadromous species have been extirpated it is assumed some changes have

occurred. The very lowest section of the San Poil River and the bay in Lake Roosevelt contain non-native species such as walleye and smallmouth bass. Mountain whitefish also occur, but have not been examined. Historical stocking data indicate non-native species/stocks (i.e., rainbow trout (various non-native stocks), eastern brook trout, coastal cutthroat trout, kokanee, and possibly others (including warm water species illegally introduced)) have been stocked to supplement depressed fisheries since the early 1930's, and that such stockings may have occurred as early as 1890 (Thiessen, 1965; Halfmoon, 1978; Jones, 1999).

Rainbow trout

Preliminary genetic analyses indicate that the adfluvial rainbow trout population that migrates from Lake Roosevelt to the San Poil River to spawn is introgressed between coastal rainbow and redband trout (Kirk Truscott, Colville Fish and Wildlife Division Fish Biologist, personal communication). Given the historic abundance of steelhead in the basin and the redband trout component of the current population, the population may contain genetic material of the native steelhead stock. The significance of maintaining the population, aside from native species conservation, is that it may provide a native donor stock for anadromous reintroduction. Ongoing efforts to monitor this population include upstream and downstream trapping.

Upstream migration of adult fish has been monitored annually since 1994 (Table 1). Jones (2000) describes the spawning migration to be mostly comprised of age-3 and age-4 individuals. Results of the upstream monitoring show that 1994 and 1995 year-classes exhibited substantially larger returns than did the 1996-1999 year-classes, possibly a result of Lake Roosevelt water elevations (Jones 2000). Downstream monitoring of juvenile out migrations was conducted between 1996 and 1999 using fikee nets in tributaries and a five-foot diameter screw trap in the mainstem. Juvenile trapping success was limited due to flashy hydrographs (Table 2). Although entrainment of individuals through Grand Coulee Dam is hypothesized, the extent is unknown.

Table 1. Adfluvial rainbow trout adult returns to five San Poil River tributaries from 1994-1999

Year	Adult Return
1994	246
1995	214
1996	39
1997	13
1998	37
1999	59

Table 2. Trap results for juvenile rainbow trout collected in the San Poil Subbasin mainstem and tributaries from 1996-1999

Year	Tributary traps	Mainstem screw trap
1996	163	212
1997	12	511
1998	339	228
1999	497	264

Results of assessments on six tributaries to the San Poil River conducted between 1991 and 1999 indicated that juvenile rainbow trout prefer pool habitat (Jones 1999, Boyce et al., 1998). Juvenile rainbow trout occupied pool habitat at a density of 1.9 fish per square meter while they occupied riffle habitat at a rate of 0.7 fish per square meter.

Kokanee

An adfluvial population of kokanee annually migrates up the San Poil River to spawn. Escapements have been critically low since monitoring began in 1995 (LeCaire 1999). Fish are identified as wild or hatchery origin fish by presence or absence of an adipose fin. Preliminary allozyme data suggests that the wild population is genetically unique and possibly of native origin (LeCaire 1999). These data are preliminary and lack statistical rigor to make conclusions (LeCaire 1999). The population is considered a critically depressed native stock.

Wildlife

Dam construction and subsequent inundation resulted in the loss of low elevation wildlife habitat above Grand Coulee Dam to the Canadian Border. A total of 151 miles of habitat in the Columbia River mainstem was inundated as well as 28 miles of the lower Spokane River, 12 miles of the San Poil River, and 15 miles of the Kettle River. Over 20,000 acres of this loss occurred within the Colville Indian Reservation, a portion of which is in the San Poil Subbasin. Habitat for mule deer and other wildlife species, such as sharp-tailed grouse, animals that native peoples relied upon for subsistence, was destroyed following inundation of the Columbia River mainstem. Although this area is within the subbasin, the lost area will be dealt with in the Lake Roosevelt Subbasin Summary, as the loss is a product of Grand Coulee Dam construction. Table 3 illustrates the wildlife target species along with those species that have sensitive/listed status with state and federal agencies. Population status/information is also provided for each respective category (large and small mammals and birds).

Table 3. Target Wildlife Species (*denotes sensitive/ listed species)

Large Mammals	Small Mammals	Birds	Amphibians
Mule deer <i>Odocoileus hemionus</i>	Bobcat <i>Lynx rufus</i>	Spruce grouse <i>Dendragapus canadensis</i>	*Columbia spotted frog <i>Rana luteiventris</i>
White-tailed deer <i>Odocoileus virginianus</i>	Weasel <i>Mustela vison</i>	Ruffed grouse <i>Bonasa umbellus</i>	
Moose <i>Alces alces</i>	Marten <i>Martes americana</i>	Blue grouse <i>Dendragapus obscurus</i>	
Elk <i>Cervus elaphus</i>	Badger <i>Taxidea taxus</i>	Turkey <i>Meleagris gallopavo</i>	
Black bear <i>Ursus americanus</i>	Beaver <i>Castor canadensis</i>	California quail <i>Colinus spp.</i>	
Bighorn sheep <i>Ovis canadensis</i>	Muskrat <i>Ondatra zibethicus</i>	Ring-necked pheasant <i>Phasianus colchicus</i>	
*Gray Wolf <i>Canis lupus</i>	Coyote <i>Canis latrans</i>	Gray partridge <i>Perdix perdix</i>	
*Grizzly bear <i>Ursus arctos</i>	Cougar <i>Felis concolor</i>	Chukar <i>Alectoris chukar</i>	
*Grizzly bear <i>Ursus arctos</i>	*Townsend's big-eared bat <i>Plecotus townsendii</i>	Mourning dove <i>Senaida macroura</i>	
	*Fisher (<i>Martes pennanti</i>)	Ducks	
		Geese	
	*Lynx <i>Lynx lynx</i>	Swans	
	*Wolverine <i>Gulo gulo</i>	*Golden eagle <i>Aquila chrysaetos</i>	
	*Merriam's shrew <i>Sorex merriami</i>	*Merlin <i>Falco columbarius</i>	
		*Northern goshawk <i>Accipitergentilis</i>	
		Peregrine Falcon <i>Falco peregrinus</i>	
		Sharp-tailed grouse <i>Tympanuchus phasianellus</i>	
		*Whitehead woodpecker <i>Picoides albolarvatus</i>	
		*Burrowing owl <i>Athene cunicularia</i>	
		*Flammulated owl <i>Otus flammeolus</i>	
		*Vaux's swift <i>Chaetura vauxi</i>	
		*Black-backed woodpecker <i>Picoides articus</i>	
		*Lewis woodpecker <i>Melanerpes lewis</i>	
		*Bald eagle <i>Haliaeetus leucocephalus</i>	
		*American white pelican <i>Pelecanus erythrorhynchus</i>	
		*Loggerheaded shrike <i>Lanius ludovicianus</i>	
		*Sage sparrow <i>Amphispiza belli</i>	
		*Sage thrasher <i>Oreoscoptes montanus</i>	
		Neotropical Birds	
		*Common loon <i>Gavia immer</i>	

Large mammal population status

Mule deer and white-tailed deer populations appear to be stable to decreasing in western Ferry County, State of Washington Game Management Unit (GMU) 101, including headwater tributaries in the San Poil subbasin. Increases and/or stability in deer populations are attributable to a succession of mild winters; 1997–98/1998-99. Fawn/doe ratios were 76 and 46 per 100 in 1997 and 1998, respectively. The 1998 count reflects a large female cohort from 1997. The mule deer fawn/doe ratio on spring green up range in 1999 and 1998 was 61 and 39 per 100, respectively (WDFW, 1999). However, mule deer are suffering long term declines attributed to habitat changes, habitat fragmentation and other factors. Data from CTCR aerial trend counts (February 2000) indicate severe declines in both mule deer and white-tail populations.

Elk are continuing to expand into the Kettle Crest (GMU 101), the divide between the San Poil and Lake Roosevelt subbasins. Habitat conditions look favorable for the foreseeable future as a result of logging in the 1980's which increased forage production. Mature timber areas are declining and thermal cover on summer and winter ranges may become a future problem (WDFW, 1999).

On the CTCR Reservation area of the subbasin, the elk population appears stable. The 1999 tribal elk harvest was the lowest since the number of elk tags issued doubled in 1993. In the San Poil Subbasin, elk remained widely distributed, resulting from removal of hiding cover, improved road access and an abundance of forage resulting from heavy precipitation during the growing season (Murphy and Judd, 1999). The series of mild winters has also benefited elk.

Small mammal population status

Lynx are listed as both a Federal and State Threatened species. The Kettle Crest is designated as a lynx analysis unit (LAU) in areas above 4000 ft (Richardson, 1999). Suitable lynx habitat also occurs in cold air drainages, adjacent to the LAU, in the lodgepole pine zone within the reservation boundary (Boyce et al., 1998). cursory field reviews indicate that foraging habitat has not fully developed in previous cutovers and burned areas, and that denning habitat is lacking on the reservation, in the San Poil Subbasin.

Bird population status-

Forest grouse (ruffed and blue grouse) are representative species for riparian shrub/tree and forested habitats occurring within the subbasin. Current state-wide population levels are considered healthy and sufficient to meet hunter demand. However, production is influenced by weather (WDFW, 1999) and the carrying capacity of available habitat. Ruffed and blue grouse make up the majority of the upland species utilized by CTCR members. Both winter survival and brood production success have remained stable and/or increased during the past five years (Murphy and Judd, 1999).

Habitat Areas and Quality

Fish

Natural resource use and development (agriculture, grazing, logging, mining, etc.) and urbanization have negatively affected the ecosystem by degrading habitat. Native resident salmonids, including cutthroat trout, bull trout and mountain whitefish have either disappeared or are only remnant populations. The absence of marine derived nutrients from

anadromous fish has impacted the entire ecosystem from primary producers, to tertiary aquatic consumers, and many terrestrial predators. Exacerbating the biological habitat degradations, physical habitats have been severely impacted as well. Many riverine habitats exhibit unstable banks, poor riparian communities, high summer temperatures, high substrate embeddedness, and intermittent flows. The potential for natural reproduction by native or non-native species has been declining in many of the subwatersheds.

Tributary habitats in the Colville National Forest range from poor to good depending upon the past and present level of activities within the subwatersheds. In general, where habitat is poor to fair, road densities are high and many roads are located within the riparian areas of these tributaries. Stream habitat is degraded where the riparian habitat is easily accessible to livestock, and in many cases, the vegetation is overgrazed. Specifically, reaches of these tributaries in poor to fair condition have low numbers of pools, large instream wood, and high embeddedness of the streambed substrate decreasing the amount of spawning and rearing habitat. Those tributary reaches in good condition lack access for livestock or vehicles within the riparian area and tend to have high gradients (Tom Shuhda, Colville National Forest Fish Biologist, personal communication).

Six tributaries of the San Poil River were inventoried for habitat conditions between 1991 and 1999 (Jones 1999, Boyce et al. 1998). Although results are derived from only six tributaries, they are assumed to represent conditions throughout the watershed. The six streams inventoried collectively had a pool to riffle ratio of 0.23:1. Substrate composition of the streams consisted of 15% sand, 42% gravel, 31% cobble, 10.1% boulder, and less than 1% bedrock. Hunter et al. (1991) suggested that pool to riffle ratios representing ideal salmonid habitat are 0.4 to 1.5:1.

Wildlife

Wildlife response to dam construction impacts and general downward habitat quality trends have been largely negative. In addition, wildlife species are impacted by the same activities previously described for fish.

Recently, wildlife ESA listings have increased concurrent with habitat degradation due to logging, road development and maintenance, grazing, and urban development. The greatest impacts have occurred in shrub-steppe, riparian, and old-growth forests habitat types that support many target species.

Enhancement activities will be necessary in some areas to return the landscape to a properly functioning ecosystem. Enhancement activities will be planned and implemented, using “best science principles”, to help ensure project success while maintaining cost effectiveness. Passive restoration “letting nature heal itself,” will be emphasized over active restoration wherever feasible.

Watershed Assessment

Limited watershed assessments have been conducted on the Colville Indian Reservation (CTCR) (Hunner and Jones, 1996; USFS- Westfork San Poil, 1996) and elsewhere in the San Poil Subbasin. The CTCR assessments include a physical description of each watershed in the subbasin (within the Reservation), known fish species presence and general conditions of the watershed and stream channel. Road density and crossings, soils (sensitivity and capacity for water retention), and a gross forest vegetation overview

(canopy closure, ECA) were analyzed as well. Several quantitative assessments regarding constraints to fish production have been and are being conducted as well (CTCR Lake Roosevelt Habitat Improvement Project- 9001800). Fish habitat and passage evaluations were conducted in the San Poil River Basin and other tributaries of the mainstem (LeCaire and Peone, 1991; WDOT, 1996). In addition, an Integrated Resource Management Plan has been developed on the Colville Indian Reservation, which analyzed historical and present conditions and established goals, objectives and standards for resource management/use.

Other documents available through the US Forest Service include: Westfork San Poil River Watershed Analysis, Scatter Creek Watershed Analysis, West Fork Granite Creek Watershed Analysis, and The Ninemile/Thirteenmile Creek Watershed Analysis.

Limiting Factors

Fish

Limiting factors to fish populations are hypotheses in this subbasin, and have little or no experimental data to support them. However, it is widely accepted that degraded fluvial habitat conditions, similar to those existing in the Nespelem watershed, limit native salmonid populations. Human caused impacts has degraded the San Poil River and its tributary habitats. Of the tributaries that were once perennial, 44% are now intermittent (Hunner and Jones 1996). These impacts have directly or indirectly contributed to elevated water temperatures, embedded substrate, and reduced habitat complexity (Jones 1999).

The same blockages that prevent anadromous fish from ascending to their historic range indirectly prevent resident fish from returning to their spawning locations in the Lake Roosevelt tributaries. The presence of Grand Coulee Dam and the migratory nature of salmonids, especially during smoltification, result in resident fish entrainment, thus fish are unable to return to the San Poil Basin for spawning. Additionally, the absence of marine derived nutrients from anadromous fish and the associated productivity is likely limiting resident salmonid production.

The Lake Roosevelt Habitat Improvement Project (LRHI) (Jones 1999; LeCaire and Peone 1991) and Washington Department of Transportation (WDOT) survey of state roads in 1997 examined migration barriers and determined that blockages from improperly installed culverts were limiting fish production, particularly migratory rainbow trout.

Wildlife

In general, the primary limiting factors for wildlife are habitat loss, fragmentation, and conversion of habitat for agricultural and other anthropogenic purposes. Predation and hunter harvest may impact some species; however, to what extent is largely unknown at this juncture. Specific limiting factors for mule deer and sharp-tailed grouse within the San Poil River Subbasin and adjacent Subbasins/Provinces include habitat quality issues, reproductive performance limitations, and relatively unknown and/or unsubstantiated mortality factors. Additional information on limiting factors is described for representative species within the broad categories of large mammals, small mammals and birds.

Large mammal limiting factors

Aerial surveys and harvest trends have shown a steep decline in mule deer numbers over the last 10 years on the Colville Reservation side of the Lake Rufus Woods Subbasin, as well as adjacent subbasins (CCT, WDFW unpublished file data). Although the reasons for depressed mule deer numbers are unknown, reductions in deer habitat and forage quality and alteration of seral plant communities resulting from livestock grazing (78 percent of shrub-steppe is in a declining state), forest management practices, new road construction (Boyce et al., 1998), and other anthropogenic factors have been hypothesized as causes for reduced deer numbers (Anderson, Bowden, and Medin 1972/1990, Bartman 1984, Griffith and Peek 1989).

Predation of adult and juvenile mule deer by cougars, coyotes, and black bear has also been identified as a potential limiting factor. Certainly all these factors can and do affect mule deer numbers, as can subsistence/recreational hunting (Hamlin, Riley, Pyrah, Dood, and Mackie 1984, Unsworth, Pac, White, and Bartmann 1999, Whittaker and Lindzey 1999). Unfortunately, without additional investigations and research to identify/verify specific reasons for declines in mule deer numbers, the causes for decline will remain only speculative.

Cover (thermal/security) and/or forage may limit elk numbers, particularly on winter ranges or calving areas. Proper size and juxtaposition of forage sites/escape cover patches along with minimal disturbance encourages full utilization of the landscape within a given area. Open road densities that exceed 1.0 mile of road per square mile of habitat significantly reduces elk habitat effectiveness (Thomas et.al., 1988).

Small mammal limiting factors

Lynx are limited by the availability of a winter prey base, primarily snow-shoe hare, as well as environmental/anthropogenic factors including forest management practices, wildfires, fire suppression, insect epidemics, and lynx harvest management (Stinson 2000). Stinson (2000) further stated that lynx are relatively tolerant of human activity; however, urban developments and roads with high traffic volumes may affect lynx movements.

The amount and quality of lynx foraging habitat is primarily a result of post timber harvest regeneration, wildfires, and to a lesser extent controlled burns. Grazing by livestock also has the potential to impact lynx by removing herbaceous forage that snowshoe hares use during the summer. Ruediger et.al. (2000) suggests that cattle grazing is also a factor in the decline of aspen stand regeneration in Rocky Mountain subalpine areas, and probably degrades snowshoe hare habitat in riparian willow areas as well. In contrast, wind throw, insects, and disease aid in creating lynx denning habitat.

Bird limiting factors

Ruffed and blue grouse are affected by forest practices that use regeneration techniques that result in: extensive deciduous tree and shrub control, reduced tree stocking rates, decreased cover and stem density, introduction of tree species that provide less habitat benefits, and short harvest rotations which eliminates recruitment of large down woody debris (used by grouse as drumming sites) and precludes future production of large limbed trees suitable for winter roosting and foraging (WDFW, 1999). Ruffed and blue grouse are

also impacted by intensive grazing of open lowland forests that reduces the quantity and quality of breeding and brood rearing habitat (WDFW, 1991).

Artificial Production

The WDFW stocks four lakes within the subbasin with fish from the Colville Hatchery. Annual stocking of the four lakes include the following:

- Ferry Lake 3,000 catchable rainbow trout (5/pound).
- Long Lake 9,000 westslope cutthroat (250/pound).
- Swan Lake 15,000 rainbow trout (100/pound).
- Fish Lake 500 catchable rainbow trout (5/pound)

Colville Tribal Hatchery annual stocking in the San Poil River is approximately 15,000 sub-catchable Goldendale stock rainbow trout. Lost Creek is also stocked annually with approximately 700-1000 catchable Mount Whitney stock rainbow trout.

The stocking effort in the San Poil Subbasin is only a small portion of the artificial production program at either hatchery.

A completed Hatchery and Genetics Management Plan will be submitted with Fiscal Year 2001 Project Proposals on August 16, 2000 for the WDFW Colville Hatchery and for the Colville Tribal Hatchery.

Existing and Past Efforts

San Poil River Subbasin fish and wildlife resources are co-managed by the State of Washington and the CTCR within the northern portion and by the CTCR within the boundaries of the Reservation.

Fish

The two management agencies with fisheries management responsibility within the subbasin have initiated numerous projects through the Northwest Power Planning Council's Fish and Wildlife Program. These projects were created to partially mitigate for the loss of anadromous fish due to the creation of the federal hydropower system utilizing resident fish (resident fish substitution). The following projects have enhanced the resident fishery (both native and non-native) in the San Poil Subbasin:

1. habitat/passage improvements- Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Project, #9001800;
2. stock assessments- Chief Joseph Kokanee Enhancement Project, #9501100 and Lake Roosevelt Monitoring Program, #944300;
3. artificial production enhancement activities- Colville Tribal Fish Hatchery, #8503800; and
4. cooperative resource management- Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams, #9700400.

Other fish management efforts include the WDFW Colville Hatchery. Hatchery production programs are being monitored to evaluate their contribution to existing fisheries in the subbasin. Habitat improvement projects are currently being monitored/evaluated for

effectiveness, while existing habitat and fish population evaluations are proceeding throughout the basin.

Colville Tribal Hatchery (#8503800)

Operations began at the hatchery in the fall of 1990 and have continued to the present time. Originally, the project was production goal oriented (1990-1994). In 1995, fisheries-related goals and objectives were developed to assess the impact on subsistence and recreational fisheries (Truscott, 1995). Included were short-term (i.e. annual production objectives and administrative objectives) and long-term (e.g., average creel size fish, catch per unit efforts, average fish condition factor in creel, increases in natural production fishery component, maintenance and development of free-ranging brood stock sources, monitoring and evaluation, and development of comprehensive fishery management plans) fishery-related objectives. Reports and technical papers developed during this period include annual operating plans and annual operating reports. The annual contribution to the San Poil River Subbasin is approximately 15,000 sub-catchable rainbow trout.

The continued development and monitoring of reservation rainbow brood stocks was limited to four streams during the 1997-98 period. Monitoring activities investigating potential brood stock source included adfluvial rainbow trout stocks in the San Poil River Subbasin. Monitoring activities in 1997 recovered 13 gravid adfluvial rainbows in the four identified streams. Extreme high water flows in the spring of 1997 prevented meaningful trapping/monitoring of the adfluvial rainbow trout population in the San Poil River Basin. Continued monitoring of adfluvial and lacustrine rainbow stocks is warranted at this time. However, the apparent unpredictability of year-class strength and seasonal difficulty in trapping the adfluvial stock may preclude its utility as a free-ranging broodstock source.

Chief Joseph Kokanee Enhancement Project (#9501100)

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

Field activities began during 1995 and continue in 2000. Activities include: (1) Spawning escapement monitoring and enumeration of adult kokanee present in four Lake Roosevelt and Rufus Woods Reservoir tributaries (i.e., San Poil River, Big Sheep Creek, Barnaby Creek and Nespelem River respectively), (2) Collection of genetic material from adult spawning populations from the San Poil River, Big Sheep Creek, Barnaby Creek and Nespelem River respectively, and free-ranging kokanee in Lake Roosevelt, (3) Collection of kokanee "swim-up" from redds and monitoring fry emigration from the San Poil River to Lake Roosevelt, and (4) Hydroacoustic monitoring of fish entrainment through Grand Coulee Dam.

A critical accomplishment achieved through this project has been the identification of a unique stock of kokanee that is distinctly different than any other known kokanee or sockeye population. Genetic evaluations related to this project have also collected information that will allow a characterization of the free-ranging kokanee populations in Lake Roosevelt. Rapid declines of the adult tributary spawning population have been documented through adult spawning escapement and redd surveys from 1995 through 1997. This stock has been characterized as a critically depressed and declining population.

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/early-spring flows, bedload movement and passage barriers relating to reservoir operations. The project has documented substantial entrainment related to the Grand Coulee Dam operation.

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 tributaries to Lake Roosevelt. Early fisheries investigations (Scholz et al., 1986) 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 (5) streams from the San Poil River were selected for planning and implementation of passage/habitat improvements based upon 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 in the San Poil subbasin began in 1992 and continued through 1995. Implementation actions affected 20.9 miles of stream course. Specific actions included reinstallation 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% through passage improvement alone.

Monitoring of the effectiveness of implementation actions began in 1995 and is expected to continue through 2001. Specific accomplishments related to the monitoring phase and outcomes of the program are uncertain at this time. Definitive results and evaluation will be available in post-2001. However 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/function of instream structures and channel reconfiguration.

Lake Roosevelt Monitoring Program (#944300)

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. The second goal is to develop a fisheries management plan, which prescribes mitigation 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 unique, highly altered ecosystem is required. As a result, a model is being developed to predict the effect of single actions on the ecosystem and fishery of the lake. The San Poil arm of the Lake Roosevelt is included in this subbasin.

Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams (#9700400)

The purpose of this project is to compile all data useful to fisheries management for waters in the “blocked area,” identify data gaps, and collect data to fill those gaps. This project provides the binding factor that combines all “blocked area” activities into a cohesive fisheries mitigation package. This project spans several subbasins in the Inter Mountain Province.

Wildlife

Land acquisition/enhancement projects

Since 1993, the CTCR have acquired about 21,000 acres of land under the Hellsgate Big Game Winter Range project (#9204800). Baseline habitat assessments have been completed. The results are described below for each cover type. Shrub-steppe: a total of 2,507 acres are protected and will be enhanced to support shrub-steppe obligate species. Sharp-tailed grouse and mule deer are the primary management species of concern for this cover type.

- Conifer forest: a total of 1,193 acres are protected and will be enhanced for wildlife species such as downy woodpecker and blue grouse.
- Agricultural lands: a total of 465 acres will be converted to native habitat types. These areas, including land enrolled into the Conservation Reserve Program (CRP) will then be managed for wildlife.
- Conifer woodland/Ponderosa pine savanna: a total of 180 acres are protected and will be enhanced for mule deer, Lewis woodpecker, and other wildlife species
- Riparian (riverine and shrub wetland): a total of 139 acres will be protected and enhanced for obligate species such as mink and beaver.
- Mixed forest: a total of 50 acres will be protected and enhanced for wildlife species using this cover type.
- Shoreline areas: a total of 4 acres will be protected and enhanced for waterfowl species and wading birds.

Management actions to protect and enhance these cover types include:

- Maintaining boundary fences to prevent livestock trespass.
- Removing trespass livestock.
- Controlling and/or eliminating noxious weeds.
- Maintaining and enhancing the desired vegetation for each cover type.
- Enhancing plant community diversity by planting shrubs and trees and/or seeding herbaceous vegetation.
- Conducting controlled burns to improve vegetation conditions

Colville Tribe wildlife managers monitor both habitat and animal population responses to management activities. Habitat is monitored using habitat evaluation procedures (HEP), permanent vegetation transects, and photo plots.

Large and small mammal surveys, including fawn counts and small mammal surveys, are conducted to establish baseline population data, determine species’ response to management actions, and document wildlife population trends. Sharp-tailed grouse

lek/neo-tropical breeding bird surveys are also conducted. The presence of threatened and endangered species is documented and weekly wildlife visual counts are taken.

Four parcels totaling 4,535 acres comprise mitigation lands within the San Poil Subbasin. Approximately 70 acres are enrolled in CRP. A portion of one of the parcels lies within the Lake Roosevelt Subbasin. Including mitigation lands, a total of 130 acres is enrolled in CRP within the entire San Poil SubBasin (Beckwith, personal communication, 2000).

Other wildlife management continuing efforts include

1. Eastern Washington Mule Deer Study (WDFW, CTRC, Chelan County PUD).
2. The Colville Tribe issues harvest regulations annually for tribal and non-tribal members on the Reservation and Tribal member regulations for the northern half of the subbasin.
3. The State of Washington issues harvest regulations annually for the general public on the northern half of the subbasin.
4. CTRC attempts annual aerial population surveys for mule deer, whitetail deer, elk, wild horse and predators.
5. Hellsgate Post Season Deer Count (CTCR- on Reservation)
6. North Half Big Game Surveys (CTCR)
7. Upland Game Bird Brood Counts (CTCR- on Reservation)
8. Waterfowl Pair and Brood Counts (CTCR- on Reservation)
9. Bald Eagle Nest Surveys (CTCR- on Reservation)
10. Predator control and beaver recolonization (CTCR- on Reservation)
11. Lake Roosevelt Bald Eagle Production Surveys (NPS)
12. Peregrine Falcon Introduction Survey (NPS)

The Interagency Lynx Committee has developed a draft Field Reference Notebook for resource managers describing the temporal and spatial components of lynx habitat. The US Forest Service has developed a conservation strategy for lynx. WDFW has begun a five-year mule deer study with CTRC, Chelan PUD and other cooperators to learn more about declining mule deer herds. The Colville Tribe has purchased 1,720 acres of seasonal deer and riparian habitat under Bonneville Power Administration project number 199506700 in the subbasin (Berger and Judd, 1999).

Ongoing activities on CNF lands in the subbasin include livestock grazing, outdoor recreation (at both developed and dispersed sites), trail and road maintenance, mining exploration, noxious weed control and flood damage repair on the North and South Forks of the San Poil River. Two loon nesting platforms and a boom to limit boat access are also being placed on Ferry Lake.

Timber harvest will occur in the North Fork San Poil River area in the summer of 2000. A future timber sale is proposed in the Scatter Creek watershed for 2001. Prescribed burning of the understory of within ponderosa/Douglas fir eco-types is proposed in order to improve winter range for mule deer. Habitat improvements have also occurred on NFS lands within the subbasin. These include improved road maintenance practices, placement of 10 instream structures, fencing one mile of riparian habitat to exclude livestock grazing, and closing roads after timber harvests and flood damage events.

Subbasin Management

Existing Plans, Policies, and Guidelines

Federal Government

USFS. Uses several documents to manage lands:

- NW Forest Plan
- Okanogan Forest Land and Resource Management Plan
- Colville National Forest Land and Resource Management Plan
- Inland Native Fish Strategy (INFISH- soon to be amended by ICBEMP)
- National Forest Management Act

National Park Service. Lake Roosevelt National Recreation Area- General Management Plan

Tribal Government

Colville Tribal codes from "Tribal Law and Order Code". Six codes or parts of codes may affect fish and wildlife. Most are urban planning/land use.

CTCR/BIA uses the Colville Reservation Forest Plan, Integrated Resource Management Plan, Code of Federal Regulations, and others to manage land, fish and wildlife on the Reservation.

State Government

State of Washington. Uses several documents and hundreds of laws (RCW's) to manage land, fish and wildlife, such as the Forest and Fish, Wild Salmon Policy and Stream Stocking Policy.

Local Government

Ferry County Codes. Nine codes or parts of codes may affect fish and wildlife. Most are urban planning/land use.

Okanogan County <http://www.okanogancounty.org>. Ten codes or parts of codes may affect fish and wildlife. Most are urban planning/land use.

Goals, Objectives, and Strategies

Maintain viable populations (numbers and distribution of reproductive individuals) of native and desired non-native species of fish and wildlife, and their supporting habitats, while providing sufficient numbers to meet the cultural, subsistence and recreational needs.

Objectives and strategies below were developed by adaptation or modification of statements in the State of Washington Draft Wild Salmonid Policy Environmental Impact Statement (1997), Interior Columbia Basin Ecosystem Management Plan (USFS), the Colville Confederated Tribes Fish and Wildlife Department (Tribes' IRMP) and the

ongoing subbasin planning process for the NWPPC. The objectives are not prioritized. All quantifiable numbers are subject to change as data and analysis increases/improves.

Fish Objective 1

Define desired and managed species of fish for the various bodies of water or stocks within the San Poil River Basin by 2005.

Strategy

Identify stock and community composition in each watershed within the subbasin.

Fish Objective 2

Provide a subsistence and recreational adfluvial rainbow trout fishery in perpetuity that supports a catch per unit effort (CPUE) of one fish per hour and an annual harvest (target) of 10,000 to 40,000 adult adfluvial rainbow trout derived from the San Poil Stock by 2020.

Note: many/most of these may be harvested in Lake Roosevelt and not in the San Poil Subbasin.

Strategies

1. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.
2. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
3. Reduce or prevent adfluvial rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
4. Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (ie. forage base- zooplankton, benthic invertebrates, and terrestrial insects).
5. Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.
6. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.

Fish Objective 3

Manage adfluvial rainbow trout populations as self-sustaining with an adult recruitment annual target of 5,000 to 20,000 adults, annual fry production target of 2.8-11.5 million, and annual parr production target of 862,000- 3.4 million by 2020.

Strategies

1. Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.
2. Eliminate stocking of non-native species in all lotic environments.
3. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.

4. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
5. Reduce or prevent adfluvial rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
6. Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (ie. forage base - zooplankton, benthic invertebrates, and terrestrial insects).
7. Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.
8. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.

Fish Objective 4

Provide a subsistence and recreational resident rainbow trout fishery in perpetuity that provides a catch per unit effort (CPUE) of one fish per hour.

Strategies

1. Use artificial production to stock three lakes in the subbasin annually.
 - Ferry Lake- 3,000 catchable size rainbow trout.
 - Fish Lake- 500 catchable size rainbow trout.
 - Swan Lake- 15,000 fry size rainbow trout.
2. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.
3. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
4. Reduce or prevent resident rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
5. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil Subbasin.
6. Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.
7. Eliminate stocking of non-native species in all lotic environments.
8. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.

Fish Objective 5

Provide a subsistence and recreational kokanee salmon fishery in perpetuity that provides a catch per unit effort (CPUE) of one fish per hour and an annual harvest (target) of 10,000 to 40,000 adult kokanee salmon derived from the San Poil stock. Note: many/most of these may be harvested in Lake Roosevelt and not in the San Poil Subbasin.

Strategies

1. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.

2. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
3. Reduce or prevent kokanee salmon entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
4. Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e., forage base- zooplankton, benthic invertebrates, and terrestrial insects).
5. Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.
6. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.

Fish Objective 6

Manage kokanee salmon populations as self-sustaining with an adult recruitment annual target of 5,000 to 20,000 adults, an annual fry production target of 2.8-11.5 million, and an annual parr production target of 862,000- 3.4 million by 2020.

Strategies

1. Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.
2. Eliminate stocking of non-native species in all lotic environments.
3. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.
4. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
5. Reduce or prevent kokanee salmon entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
6. Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e., forage base - zooplankton, benthic invertebrates, and terrestrial insects).
7. Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.
8. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.

Fish Objective 7

Provide a subsistence and cutthroat trout fishery in perpetuity with a catch per unit effort (CPUE) of one fish per hour.

Strategies

1. Use artificial production to stock Long Lake with 9,000 fry size westslope cutthroat trout annually.
2. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.

3. Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.
4. Reduce or prevent cutthroat trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).
5. Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil Subbasin.
6. Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.
7. Eliminate stocking of non-native species in all lotic environments.
8. Maintain or increase the quality and quantity of habitat necessary to maximize fish production.

Fish Objective 8

Restore watersheds and aquatic and riparian areas where natural watershed processes, functions and conditions have been degraded. Implement restoration activities based on priorities established from ecosystem analyses and assessments of watersheds.

Strategies

1. Perform a basin-wide stream mapping and condition survey that includes delineation of 100-year floodplains on Tribal Code- Type I and II streams and State Type 1, 2 and 3 streams.
2. Develop and utilize a cumulative impact analysis system to establish activity threshold levels for each watershed that shall not be exceeded. This system will consider the nature and extent of activities and supplement watershed sensitivity rating analysis applications.
3. Provide for a riparian management zone along all perennial and intermittent streams, lakes, wetlands, and other water bodies.
4. Manage riparian vegetation to restore or maintain structure, age and composition consistent with the site potential.
5. Establish qualitative and quantitative watershed disturbance (natural and management) levels and parameters for upland and riparian area zones to provide early indication of potential watershed cumulative effects and causal mechanisms for aquatic and riparian conditions.
6. Restore aquatic and terrestrial habitats that have high potential for improvement by reducing road-related effects where roads have been demonstrated to have an adverse effect. Quantity and quality road indicators and road related use should be used to assess adverse effects on aquatic/riparian and terrestrial species and their habitat.
7. Design new and improve existing culverts, bridges and other stream crossings to accommodate a 100 year flood, including associated bedload and debris where those existing structures pose a substantial risk to riparian conditions. Substantial risk is defined as those that do not meet design and operation maintenance criteria, or that has been shown to be less effective for controlling erosion, or that retard attainment of riparian management objectives.
8. Quantify instream minimum flow requirements for streams in the San Poil River Basin. Conduct hydrologic modeling to produce estimated streamflows and water balances for

the basin. Apply information to water resource management and to integrated natural resource planning activities on a watershed or local scale.

9. Determine point and non-point pollution sources within the San Poil Subbasin.
10. Identify and assess stressed systems every five years. This includes determining impaired use(s), causes of impairment, and sources of pollution. Prioritize systems for restoration and pursue corrective action.

Wildlife Goals

1. Fully mitigate for all losses caused by the federal hydropower system within the San Poil Subbasin and Intermountain Province.
2. Maintain viable mule deer populations in the San Poil Subbasin and throughout Northeast Washington.
3. Maintain viable sharp-tailed grouse populations in the San Poil Subbasin and Intermountain Province.

Wildlife Objective 1

Mitigate/compensate for all hydropower construction losses by 2010.

Strategies

- 1.1 Acquire the management rights to enough property to mitigate/compensate for lost wildlife habitat.
- 1.2 Protect and enhance acquired properties to attain full habitat/wildlife potential and maintain/manage for perpetuity.

Tasks

- 1.2.1 Maintain boundary fences to prevent livestock trespass and remove trespass livestock.
- 1.2.2 Control and/or eliminate noxious weeds.
- 1.2.3 Maintain and enhance desired vegetation for each cover type by planting and/or seeding and through prescribed burns.
- 1.2.4 Identify important/desirable wildlife species and habitats within the San Poil Subbasin and develop associated management strategies i.e., maintain and/or enhance the integrity of bald eagle nesting territories and winter roost sites; protect peregrine falcon nest sites from disturbance etc.

Wildlife Objective 2

Identify specific factors limiting/affecting mule deer populations in the Rufus Woods Lake subbasin and adjacent subbasins/provinces by 2004 (Figure 1).

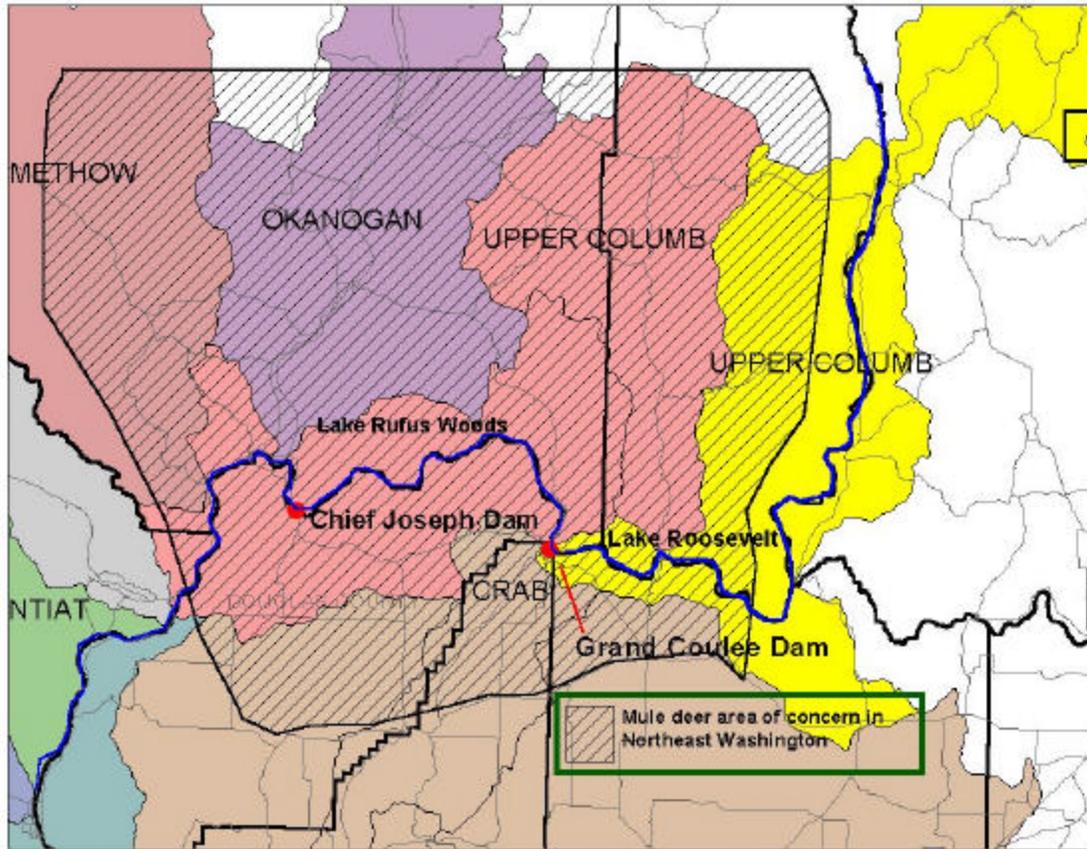


Figure 2. Mule deer area of concern in Northeast Washington.

Wildlife Strategies

- 2.1 Continue mule deer habitat quality/browse nutrition research project in cooperation with WDFW, CCT, Chelan county PUD, Colville National Forest, Okanogan National Forest, Wenatchee National Forest, Inland Northwest Wildlife Council, Northern Okanogan Sports Council, Washington State University, University of Washington, and the University of Idaho.
- 2.2 Monitor doe/fawn ratios and hunter harvest annually.
- 2.3 Conduct mule deer winter counts annually.
- 2.4 Control non-native weedy vegetation on critical mule deer habitat and re-establish preferred mule deer forage plant species where practical.
- 2.5 Monitor livestock use and determine grazing impacts.
- 2.6 Develop restoration strategies for altered landscapes/habitat.

Wildlife Objective 3

Increase present sharp-tailed grouse populations within the Intermountain Province and associated subbasins to a minimum of 800 grouse by 2010.

Wildlife Strategies

- 3.1 Develop cooperative management agreements with private landowners and government agencies (NRCS, WDFW, STOI, CCT, DNR, BLM, Conservation Districts etc.)
- 3.2 Acquire, protect, enhance, and maintain sharp-tailed grouse habitat.
- 3.3 Identify and document the locations of existing meta populations/population sinks.
- 3.4 Identify and map critical/potential habitat.
- 3.5 Conduct sharp-tailed grouse trap and transfer programs to increase genetic variation.
- 3.6 Monitor sharp-tailed grouse using radio telemetry, lek surveys, etc., to identify movement corridors and habitat use and determine mortality factors.
- 3.7 Monitor habitat quality and develop strategies to improve habitat conditions based on monitoring results and species response to habitat changes.

Research, Monitoring and Evaluation Activities

At this point in time, research, monitoring and evaluation projects are focused on small areas and/or are still in the initial stages of assessments and enhancements. Most of what does occur in the San Poil Subbasin is done as part of a larger project and not focused at the subbasin. Adequate RME activities are not in place, but are shown as needs in the next section (Fish and Wildlife Needs).

Two projects fit, as a general rule, into this category in the Subbasin (and Province). The Lake Roosevelt Monitoring Program looks primarily at Lake Roosevelt, although creel surveys, data collection and other objectives in the project affect or are affected by fish and people from the San Poil Subbasin. The Chief Joseph Kokanee Enhancement Project is examining genetics of populations of kokanee and spawning adult recruitment in the San Poil River (and others). That project has examined fish entrainment at Grand Coulee Dam and is now focusing on reducing it (affects fish that can not return to the San Poil). These projects do not directly tie into other projects, but do supplement them. They also support management of the reservoir, by providing information on water quality, biological background, losses, specie interactions, and human uses of the fisheries (either from hatcheries or natural production).

Lake Roosevelt Monitoring Program (#944300)

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. The second goal is to develop a fisheries management plan, which prescribes mitigation 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 unique highly altered ecosystem is required. As a result, a model is

being developed to predict the effect of single actions on the ecosystem and fishery of the lake.

Chief Joseph Kokanee Enhancement Project (#9501100)

The goal of the chief Joseph Kokanee Enhancement Project is 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 provide a broodstock source for artificial production in Lake Roosevelt. Activities include: (1) Spawning escapement monitoring and enumeration of adult kokanee present in four tributaries to Lake Roosevelt and Rufus Woods Reservoir (San Poil River, Big Sheep Creek, Barnaby Creek and Nespelem River respectively), (2) Collection of genetic material from adult tributary spawning populations in the above streams and free-ranging kokanee in Lake Roosevelt, (3) examining methods of reducing entrainment and hydro acoustic monitoring of fish entrainment through Grand Coulee Dam.

Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Project (#9001800)

This project is not an RME project, but has been monitoring adult and juvenile adfluvial rainbow trout in four streams in the subbasin for the last four years. The project has also been monitoring the responses/changes in habitat and vegetation where improvements were constructed.

Colville Tribal Hatchery

This project is a fish substitution measure, but has creel censuring, relative abundance surveys, stocking rates, food habits analysis, limnological assessments funded by or associated with it, although most is done outside of this subbasin.

Hellsgate Winter Range Project

This project is also not an RME project, but is, or will be, monitoring vegetation, small mammals and possibly other attributes for response(s) to changes in management and improvements in the acquired lands.

Other wildlife, continuing, monitoring efforts include (funding/participating agency(s) listed)

1. Eastern Washington Mule Deer Study (WDFW, CTCR, Chelan County PUD).
2. The Tribes issues harvest regulations annually for tribal and non-tribal members on the Reservation and Tribal member regulations for the North Half.
3. The State of Washington issues harvest regulations annually for the general public on the North Half.
4. CTCR F&W attempts annual aerial population surveys for mule deer, whitetail deer, elk, wild horse and predators.
5. Hellsgate Post Season Deer Count (CTCR- on Reservation)
6. North Half Big Game Surveys (CTCR)
7. Upland Game Bird Brood Counts (CTCR- on Reservation)
8. Waterfowl Pair and Brood Counts (CTCR- on Reservation)

9. Bald Eagle Nest Surveys (CTCR- on Reservation)
10. Predator control and beaver recolonization (CTCR- on Reservation)
11. Lake Roosevelt Bald Eagle Production Surveys (NPS)
12. Peregrine Falcon Introduction Survey (NPS)

Statement of Fish and Wildlife Needs- Enhancements/Projects

Limiting factors to fisheries production in the San Poil Subbasin are primarily related to mainstem blockages, operation of the hydro-system, depressed habitat conditions (P/R, water quantity and quality, sedimentation, riparian conditions etc.), and limited knowledge about the ecosystem (s), such as species, life histories, habitat use, population dynamics. Causes of the affected environment are all attributable to human water and land use/practices in one form or another. Therefore, the needs are to address what has been altered.

The primary limiting factors for wildlife are habitat loss/conversion, fragmentation, and loss of habitat linkage corridors, and increased road density. Additional limiting factors may include predation and hunter harvest.

Present BPA Projects and what limiting factor(s) they address:

Habitat/passage improvements- The Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Project (#9001800) is changing to address passage improvements, primarily manmade barriers from roads (culverts) and major habitat alterations (land use), which have been found to be a major limiting factor for several resident fish species.

Stock assessments- Chief Joseph Kokanee Enhancement Project (#9501100) and Lake Roosevelt Fisheries Monitoring Program (#944300) are addressing the hydro-operations problem of entrainment, which has been found to be substantial and significant through Grand Coulee Dam. The project is addressing this limiting factor by examining methods of reducing the entrainment.

Artificial production enhancement activities- Colville Tribal Fish Hatchery (#8503800) and Lake Roosevelt Rainbow Trout Net Pens (#9500900) and other projects in Lake Roosevelt primarily address losses from hydro-operations to fisheries.

Cooperative resource management- Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams (#9700400) is developing better communication and data use throughout the province.

The Joint Stock Assessment Project (JSAP) area (blocked area) is composed of 32 unique water bodies covering 9.3 million acres. The project boundary is defined as all water bodies upstream of Chief Joseph Dam within the State of Washington. Prior to hydropower development, the area was a productive, stable ecosystem (Scholz et al. 1985) which contained healthy, native, self-sustaining populations of resident fish, wildlife, and anadromous fish.

The present the fish assemblage is drastically different than pre-dam development. Anadromous fish have been extirpated due to the construction of Grand Coulee Dam. Thirty-nine resident fish species are known to exist in the blocked area, the majority of which are not native. This largely non-native assemblage is, in part, the product of authorized and unauthorized introductions. Dynamics of the current system have been developing over the last five decades, and have not reached equilibrium. Managers today are unclear of simple ecological aspects of the system such as distribution and range of the 39 fish species.

The JSAP has been designed to function as a tool for fish managers in the blocked area. This tool will focus on understanding the dynamics of fish and their habitats throughout the area and recommend management actions based on the best available science and the condition of the entire areas' ecosystem. The JSAP allows managers to view the Blocked Area as a system by compiling previously collected data, organizing available data, identifying areas needing data, performing necessary research, and recommending management actions. Managers acknowledge that to effectively manage the fisheries, information such as species present and relative densities are required at a minimum. It is important to realize that this project has been set up to centrally accommodate all managers avoiding effort duplication, and ensuring Area wide coordination at achieving the stated vision.

In 1993, managers identified a need for a coordinated approach to fish management in the blocked area. This coordinated approach included a baseline stock inventory of the resident fish species inhabiting the area and is the basis for measure 10.8B.26. This need was also recognized by the Independent Science Review Panel (ISRP) in their 1998 report. Recommendations made by the ISRP are very similar to the way in which the JSAP has been set up.

The JSAP is centered around the concept in the Council's program that management actions should be based upon and supported by the best available scientific knowledge [Section 4.(h)(6)(B)] and the stated vision of the Blocked Area Management Plan (in press). By integrating information the JSAP uses information collected by all blocked area projects and other sources to identify data gaps and fill necessary voids. The information collected by the JSAP combined with information collected by other projects and sources increases the scientific knowledge of the whole system. This increased knowledge allows for more educated decisions on fish management actions, greatly increasing the chances for native fish recovery and providing successful subsistence and recreational fisheries. Because blocked area managers implementing projects addressing specific Council Program measures will use this information, success of the JSAP increases the likelihood of other project success.

RME- Lake Roosevelt Monitoring Program (#944300) is providing better understanding of the data and improved knowledge of the Lake ecosystem.

Wildlife- Hellsgate Big Game Winter Range Project (#9204800) provides partial mitigation from losses due to Grand Coulee Dam through protection, restoration and enhancement of low elevation winter range habitat and reducing fragmentation (long term) for wildlife.

Statement of Fish and Wildlife Needs

1. Conduct stock assessments and population inventories (both adult and juvenile) to estimate population strength and population dynamics. Some of this has been done, by two projects, but an estimated 80 to 90 percent of the area has not or minimally been surveyed.

NOTE: Stocking of fluvial rainbow trout in tributaries utilized by adfluvial rainbow trout has been reduced or suspended (Colville Tribal Hatchery, Colville Hatchery- via no stream stocking policy) and kokanee fishing regulations altered to accommodate naturally produced and/or native fish. Artificial production and program

monitoring/evaluation efforts need to continue and should be expanded to include ecological interactions.

2. Assess fish habitat (quality and availability-passage) and riparian conditions. Some habitat surveys have been done, but not mapped. Protocols have changed from that taken in the past, and therefore some assessments may not be as robust when considering if natural barriers and/or habitat exist in some streams. Riparian conditions have been assessed in some areas, but no mainstem survey of the San Poil has been done as of yet. Habitat/passage improvement projects that affect natural production should continue with monitoring/evaluation efforts and expand to improve passage and habitat if current evaluations indicate sufficient positive results.
3. Water quality and quantity is known to be impaired in many areas, but actual data is weak or non-existent over large areas or periods of time (most data is “spot” data). No thorough, continuous, monitoring program is currently known to exist. Water withdrawals and permits issued needs to be addressed; fish loss to diversions and screening of them is unknown.
4. Operation of fish weirs on the main stem San Poil River and major spawning tributaries to assess adult escapement and potential introgression of hatchery fish into the spawning population is needed for rainbow trout and kokanee salmon.
5. Genetic evaluation of potentially distinct stocks of kokanee is just beginning in the Chief Joseph Kokanee Evaluation Project. Very little is known about other stocks in the subbasin and needs to be assessed for potential negative interactions with non-native species and /or management actions.
6. Initiation of watershed management activities to complement stream habitat improvements is needed. No watershed groups/councils were found to exist in the subbasin, although some small-scale collaborative efforts have occurred between individuals or agencies to improve stream/riparian conditions.
7. Minimize impacts due to hydro-operations at Grand Coulee Dam. Entrainment through Grand Coulee Dam has been assessed by the Chief Joseph Kokanee Enhancement Project, and currently deterrents to fish are being developed.
8. Identify and assess stressed aquatic systems every five years. This includes determining impaired use(s), causes of impairment, and sources of pollution. Prioritize systems for restoration and pursue corrective action.
9. Regulations, and those agencies that enforce them, need more support. Presently, most environmental laws are not enforced due to lack of funding and community understanding (eg. educational programs).
10. Identify specific limiting factors such as habitat quality, reproductive performance, and mortality factors affecting mule deer and sharp-tailed grouse populations within the San Poil River Subbasin and adjacent Subbasins/Provinces. Develop new and innovative management strategies based on research results.
11. Wildlife species, including aquatic, populations need to be evaluated as to composition (occurrence), relative density, and habitat use (mapping).
12. Wildlife habitat assessments need to be done to address the current status and availability.
13. Provide for mitigation from losses due to Grand Coulee Dam through protection, restoration and enhancement of fish, wildlife and associated habitat.
14. Continuing operation and maintenance of acquisitions.

15. Continuing substitution for lost fisheries within the blocked area.
16. Assess agents that are threats to fish and wildlife, including exotic plant and animal introductions and spread, urban development etc.

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Subbasin Recommendations

FY 2001 Projects Proposals Review

Projects and Budgets

Project: 21002 - Early life history and survival of adfluvial rainbow trout in the San Poil River Basin

Sponsor: PNNL

Short Description:

Investigate overwintering behavior and survival of juvenile adfluvial rainbow trout in the San Poil River drainage and examine relationships between habitat parameters and survival.

Abbreviated Abstract

The goal of this project is to improve recruitment of juvenile adfluvial rainbow trout by examining survival, identifying critical habitat types, and relating early life history to river processes in the San Poil River drainage. Project objectives include: 1) determine

differential survival of juvenile adfluvial rainbow trout in relation to habitat quality and quantity 2) describe fish behavior and quantify habitat use and preferences using underwater videography and snorkeling, and 3) investigate how life history and survival are associated with warm groundwater presence, river ice, and other habitat parameters to determine optimal areas for habitat protection and enhancement.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
19950110	Chief Joseph Kokanee Enhancement	
199001800	Lake Roosevelt Rainbow Trout Habitat / Passage Improvement Project	Identifying the critical habitat features which appear to be limiting fish production. These features could then be the focus of habitat improvement projects such as #9001800
198503800	Colville Tribal hatchery Project	Identifying habitat types and areas where stocked fish would have the highest likelihood of survival

Relationship to Existing Goals, Objectives and Strategies

Project 21002 requests funding to investigate overwintering behavior and survival of juvenile adfluvial rainbow trout in the San Poil River drainage and examine relationships between habitat parameters and survival. Although the reviewers identified this work as potentially important, it was identified as a recommended action based on the fact that these populations have survived these conditions for generations. This proposal addresses Fish and Wildlife Needs 1 and 2, the Goal to maintain viable populations of native and desired non-native species of fish and wildlife and their supporting habitats, Objective 2/Strategies 1 and 6, Objective 3/Strategies 3 and 8, and Objective 4/Strategies 2 and 8 as identified in the San Poil Subbasin Summary.

Review Comments

The team’s recommendation was fund - Recommended Action.

Budget

FY01	FY02	FY03
\$155,092	\$175,000	\$165,000

Project: 199001800 - Evaluate Rainbow Trout/Habitat Improvements of Tributaries to Lake Roosevelt

Sponsor: CCT

Short Description:

Increase the quality and quantity of spawning and rearing habitat in streams draining into Lake Roosevelt by eliminating migration barriers, improving riparian conditions, and improving instream habitat.

Abbreviated Abstract

The Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Project is a resident fish substitution project to mitigate for anadromous fish losses above Chief Joseph and Grand Coulee Dams. The goal of the project is to increase natural production of adfluvial rainbow trout in tributaries in the Intermountain Province through fish passage improvements. The project will analyze and address fish passage/habitat improvements by subbasin in this order: San Poil River, Lake Roosevelt, Rufus Woods and the Spokane River. Objectives are to: 1) improve/create passage for adfluvial rainbow trout and kokanee salmon in Bridge Creek, an identified stream for improvement in 1991, and 2) create passage where manmade barriers exist in the Intermountain Province.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
199501100	Chief Joseph Kokanee Enhancement Project	San Poil River is a common river and fishery to both projects. Some data collection and analysis work is shared.
199404300	Lake Roosevelt Monitoring Program	Data and analysis sharing from project to LRMP.
199700400	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	Data and analysis sharing from project to overall province management.
199204800	Hellsgate Big Game Winter Range Project	Several properties in the project are on or near the San Poil River. The target species enhancement may affect target wildlife species (birds of prey, carnivores, such as bears, etc.)
198503800	Colville Tribal Fish Hatchery	Fisheries data from the project influences stocking from hatchery into the San Poil Subbasin.

Relationship to Existing Goals, Objectives and Strategies

Project 199001800 requests continued funding to improving the quality and quantity of spawning and rearing habitat in selected streams that drain into Lake Roosevelt by eliminating migration barriers, improving riparian conditions, and improving instream habitat. This proposal addresses Fish and Wildlife Needs 2, the Goal to maintain viable populations of native and desired non-native species of fish and wildlife and their

supporting habitats, and Objectives 2-6 and all associated strategies as identified in the San Poil Subbasin Summary.

Review Comments

The team’s recommendation was fund - Urgent/High Priority.

Budget

FY01	FY02	FY03
\$199,019	\$358,500	\$268,500

Project: 199501100 - Chief Joseph Kokanee Enhancement Project

Sponsor: CCT

Short Description:

Determine status of naturally produced kokanee using adult recruitment, genetic identification and entrainment at Grand Coulee Dam. Enhance kokanee and rainbow trout populations by augmentation and entrainment prevention.

Abbreviated Abstract

In 1995, the Chief Joseph Kokanee Enhancement Project began a stock status determination/limiting factors analysis in Lake Roosevelt and Rufus Wood Reservoir. Stock status (adult recruitment and genetic evaluation) efforts concentrated on tributary spawning locations (San Poil, Nespelem and Kettle Rivers, Big Sheep and Barnaby Creeks). Adult recruitment to all monitored tributary locations has been minimal with the exception of the 1998 hatchery jack return to Barnaby Creek and the 1999 adult return to the Nespelem River. The project will continue to monitor escapement trends and collect tissue samples for genetic analyses. Strong correlations exist between entrainment and lake elevations, hatchery and net pen releases and dam discharge. Following recommendations of the ISRP, the project is developing a statistical protocol and study plan to test the efficacy of a strobe light array as a deterrent to fish entrainment. The plan will determine fish behavior as they encounter the strong currents present at the third power plant and determine if strobe light technology will elicit a positive, sustained avoidance response to strobe light operation. A unique cooperative study opportunity exists to test the efficacy of strobe light technology as a fish deterrent at Grand Coulee Dam with the BOR and USGS. Fish behavior as they encounter high water velocities (near the third powerhouse) will be determined during the strobe light test using split/multibeam hydro acoustic technology.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
(none)		.

Relationship to Existing Goals, Objectives and Strategies

Project 199501100 requests continued funding to evaluate the status of naturally produced kokanee using adult recruitment, genetic analyses and entrainment at Grand Coulee Dam. The proposal addresses Fish and Wildlife Needs 5 and 7, the Goal to maintain viable populations of native and desired non-native species of fish and wildlife and their supporting habitats, and Objective 6 and all associated strategies as identified in the San Poil Subbasin Summary.

Review Comments

The team’s recommendation was to fund - Urgent/High Priority.

Budget

FY01	FY02	FY03
\$1,145,762	\$1,471,000	\$1,371,000

Research, Monitoring and Evaluation Activities

Numerous activities are ongoing in the subbasin (both BPA and non-BPA funded) that currently provide some of the research, monitoring and evaluation needs in the SanPoil River Subbasin. Monitoring activities cover a wide range of both fish and wildlife and associated habitats, as listed below:

1. Monitoring effectiveness of in-stream habitat and passage improvement actions within the SanPoil River Basin tributaries (Project # 199501100).
2. Monitoring and evaluating performance of fish released into Lake Roosevelt by the Spokane Tribal and Sherman Creek Hatcheries, investigating/defining biotic and abiotic impacts of reservoir operations and model development to predict ecosystem and fishery impacts resulting from existing and proposed reservoir operations (Project # 19944300).
3. Monitoring and evaluation activities continue to characterize critically depressed and declining population of naturally spawning kokanee in the SanPoil River, including; genetics and adult spawning escapement. Additionally, important potential limiting factors to tributary production such as abnormal peak late-winter/early-spring flows, bedload movement and passage barriers relating to reservoir operations and fish entrainment at Grand Coulee Dam have been investigated (Project # 199501100). This project proposes to continue refining the genetic evaluation, trend monitoring of adult escapement, and test the efficacy of strobe lights as a deterrent to fish entrainment at Grand Coulee Dam.
4. The Colville Tribal Fish Hatchery (Project # 198503800) proposes to investigate the presence/distribution/status of native salmonid populations within the Colville Reservation, including the SanPoil River Basin.
5. The Colville Tribe’s wildlife project (Project # 199204800) is monitoring both habitat and animal population responses to management activities. From the habitat stand point, this is being done using habitat evaluation procedures (HEP), permanent vegetative transects and photo plots. Both large and small mammal surveys are being conducted for

the animal populations. Lek surveys for sharp-tailed grouse are also being conducted. Surveys for other bird species are planned for the near future. Wildlife management activities on the project also include small mammal surveys, neo-tropical breeding bird surveys, fawn counts (mule deer production), threatened and endangered species presence survey (initial survey at time of acquisition of properties), weekly wildlife species visual counts on mitigation lands.

6. The Colville National Forest has and continues to investigate the presence of native salmonids within the National Forest.

Other non-BPA funded activities in the subbasin are:

1. Eastern Washington Mule Deer Study (WDFW, CTCR, Chelan County PUD). The Colville Tribe issues harvest regulations annually for tribal and non-tribal members on the Reservation and Tribal member regulations for the northern half of the subbasin.
2. The State of Washington issues harvest regulations annually for the general public on the northern half of the subbasin.
3. CTCR attempts annual aerial population surveys for mule deer, whitetail deer, elk, wild horse and predators.
4. Hellsgate Post Season Deer Count (CTCR- on Reservation)
5. North Half Big Game Surveys (CTCR)
6. Upland Game Bird Brood Counts (CTCR- on Reservation)
7. Waterfowl Pair and Brood Counts (CTCR- on Reservation)
8. Bald Eagle Nest Surveys (CTCR- on Reservation)
9. Predator control and beaver recolonization (CTCR- on Reservation)
10. Lake Roosevelt Bald Eagle Production Surveys (NPS)
11. Peregrine Falcon Introduction Survey (NPS)

Needed Future Actions

Limiting factors to fisheries production in the SanPoil River Subbasin are primarily related to blockages, operation of the hydro-system (water regimes, productivity and fish entrainment), habitat conditions (water quantity and quality, sedimentation, riparian conditions etc.) and knowledge about the ecosystem(s), such as species, life histories, habitat use, population dynamics etc. Causes of the affected environment are all

attributable to human development, predominately water and land use/practices in one form or another.

In general, the primary limiting factors for wildlife are habitat loss, fragmentation, and conversion of habitat for agricultural and other anthropogenic purposes. Predation and hunter harvest may impact some species; however, to what extent is largely unknown at this juncture. Specific limiting factors for mule deer and sharp-tailed grouse within the San Poil River Subbasin and adjacent Subbasins/Provinces include habitat quality issues, reproductive performance limitations, and relatively unknown and/or unsubstantiated mortality factors. Additional information on limiting factors is described for representative species within the broad categories of large mammals, small mammals and birds.

BPA funding should be used in the future to restore the condition and function of watersheds within the subbasin. In efforts to address watershed management consistent with functioning ecosystems, continued funding of research activities to increase knowledge of site-specific species life histories, habitat utilization, and population dynamics are appropriate. Furthermore, funding activities that specifically address physical and biological constraints to fish and wildlife productivity in the subbasin watersheds are critical elements to effective resource management and appropriately funded by BPA.

Future activities include;

- 1) Surveys that provide information relative to species presence/distribution/status as a function of existing and future habitat conditions. Knowledge of existing conditions (population and habitat) and response to mitigation actions (both population and habitat) is essential to adaptive management philosophy and proactive management within the basin.

- 2) Research and monitoring activities that provide information regarding Inter and Intra-specific interactions within and between populations and species are important data gaps that need to be addressed to effectively manage altered habitats and diverse species assemblages (both native and non-native) within this subbasin. Investigation activities include but are not limited to genetic introgression, competition (forage and habitat), predation and habitat utilization.

- 3) Fish passage: Feasibility studies to assess the re-introduction of anadromous fish to the area above Grand Coulee Dam are paramount to meeting fish and wildlife goals and objectives in this subbasin. Additionally, identification / planning / implementation of fish passage activities to address human induced blockages throughout the subbasin is appropriate to increase available fish habitat and utilization.

- 4) Improved water flow regimes: Activities that promote improved water flow regimes in Lake Roosevelt (maximize elevations and water retention times) to maximize productivity and minimize entrainment. Adfluvial rainbow trout utilizing the SanPoil River use Lake Roosevelt as a rearing area and may be greatly affect by water regimes in the reservoir.

- 5) Improved fluvial habitat conditions: Activities that promote watershed management to increase instream flows and water quality that are consistent with species requirements are critical to meeting fish and wildlife objectives in the subbasin. Such activities include but are not limited to upland management, riparian management, water allocation (acquisition

and or conservation of consumptive water rights and their conversion to instream water), point and non-point pollution management and total dissolved gas abatement. Re-establishing perennial flows throughout the subbasin should be a primary fisheries focus within this SanPoil River Subbasin.

6) Improved upland habitat conditions: Activities that promote improved upland management is important to watershed function. Actions that decrease habitat loss, fragmentation and isolation will be critical if both fish and wildlife objectives are to be achieved in this subbasin. Specific elements include conservation easements, land acquisition and watershed management plans.

Actions by Others

The NRCS will continue to provide technical support to soil and water managers with distribution of federal cost-share monies associated with reducing soil erosion. They also provide engineering support for land and water resource development, protection and restoration projects.

The Army Corp of Engineers, Bonneville power Administration and Bureau of Reclamation will continue to work towards effective regulation of water flows and elevations within Lake Roosevelt consistent with fish and wildlife needs, including State, Federal and Tribal water quality standards while meeting hydropower, flood control and irrigation needs.

The Department of Natural Resources (DNR), through a Memorandum of Understanding, and the Forest Practice Act will continue to regulate forest practice applications through the Timber, Fish and Wildlife process on fee lands within the reservation, and areas outside of the reservation.

The U.S. Forest Service will continue to restore and protect stream habitat within the national forest. They will also continue to identify native salmonid populations and evaluate and rectify potential fish passage obstacles associated with the forest road system and special forest use permit holders (i.e. irrigation districts).

The Department of Fish and Wildlife will continue management of fish and wildlife resources within Lake Rufus Woods consistent with legal jurisdiction.

The Department of Ecology will continue to administer the State Shoreline Management Act in those areas outside of the reservation boundaries.

The Natural Resources Department of the Colville Confederated Tribes will continue to manage and regulate natural resources (including fish and wildlife and associated habitats) within the Tribes legal jurisdiction. Activities include but are not limited to the following areas: Fish and Wildlife management, enforcement, land use activities (timber, range and mineral development), water rights and adjudication, development permitting, hydraulics permitting and shore line protection (e.g. CTCR Shoreline Management Act).

Ferry County will continue to regulate and enforce the Growth Management Act in areas outside the Colville reservation, consistent with regulatory authority, to perpetuate responsible planning and land use activities.

Table 1. Rufus Woods Subbasin Summary FY 2001 BPA Funding Proposal Matrix

Project Proposal ID	21002	199001800	199501100					
Provincial Team Funding Recommendation	Fund - Recommended Action	Urgent/High Priority	Urgent/High Priority					
Fish Objective 2 Provide a subsistence and recreational adfluvial rainbow trout fishery in perpetuity that supports a catch per unit effort (CPUE) of one fish per hour and an annual harvest (target) of 10,000 to 40,000 adult adfluvial rainbow trout derived from the San Poil Stock by 2020. Note: many/most of these may be harvested in Lake Roosevelt and not in the San Poil Subbasin.	+	+						
Strategy 1: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.	+	+						
Strategy 2: Provide and maintain passage to all useable salmonid +habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.		+						
Strategy 3: Reduce or prevent adfluvial rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).		+						
Strategy 4: Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e. forage base- zooplankton, benthic invertebrates, and terrestrial insects).		+						
Strategy 5: Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.		+						
Strategy 6: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.	+	+						
Strategy 7: Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e. forage base – zooplankton, benthic invertebrates, and terrestrial insects).		+						
Strategy 8: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.		+						
Fish Objective 3: Manage adfluvial rainbow trout populations as self-sustaining with an adult recruitment annual target of 5,000 to 20,000 adults, annual fry production target of 2.8-11.5 million, and annual parr production target of 862,000- 3.4 million by 2020.	+	+						
Strategy 1: Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.		+						
Strategy 2: Eliminate stocking of non-native species in all lotic environments.		+						
Strategy 3: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.	+	+						
Strategy 4: Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.		+						

Strategy 5: Reduce or prevent adfluvial rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).		+												
Strategy 6: Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e. forage base – zooplankton, benthic invertebrates, and terrestrial insects).		+												
Strategy 7: Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.		+												
Strategy 8: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.		+												
Fish Objective 4: Provide a subsistence and recreational resident rainbow trout fishery in perpetuity that provides a catch per unit effort (CPUE) of one fish per hour.		+												
Strategy 1: Use artificial production to stock three lakes in the subbasin annually. Ferry Lake- 3,000 catchable size rainbow trout. Fish Lake- 500 catchable size rainbow trout.	+	+												
Strategy 2: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.	+	+												
Strategy 3: Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.		+												
Strategy 4: Reduce or prevent resident rainbow trout entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).		+												
Strategy 5: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil Subbasin.		+												
Strategy 6: Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.		+												
Strategy 7: Eliminate stocking of non-native species in all lotic environments.		+												
Strategy 8: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.	+	+												
Fish Objective 5: Provide a subsistence and recreational kokanee salmon fishery in perpetuity that provides a catch per unit effort (CPUE) of one fish per hour and an annual harvest (target) of 10,000 to 40,000 adult kokanee salmon derived from the San Poil stock. Note: many/most of these may be harvested in Lake Roosevelt and not in the San Poil Subbasin.		+												
Strategy 1: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.		+												
Strategy 2: Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.		+												
Strategy 3: Reduce or prevent kokanee salmon entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).		+												
Strategy 4: Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e., forage base- zooplankton, benthic invertebrates, and terrestrial insects).		+												
Strategy 5: Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.		+												
Strategy 6: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.		+												

Fish Objective 6: Manage kokanee salmon populations as self-sustaining with an adult recruitment annual target of 5,000 to 20,000 adults, an annual fry production target of 2.8-11.5 million, and an annual parr production target of 862,000- 3.4 million by 2020.		+	+							
Strategy 1: Identify and address adverse impacts on aquatic resources associated with artificial production, fish harvest, habitat manipulation and land use practices.		+	+							
Strategy 2: Eliminate stocking of non-native species in all lotic environments.		+	+							
Strategy 3: Maintain or increase the quality and quantity of habitat necessary to maximize fish production.		+	+							
Strategy 4: Provide and maintain passage to all useable salmonid habitat for all life stages. Ensure natural, partial or complete fish passage barriers are maintained where necessary, to maintain biodiversity among and within fish populations and wildlife.		+	+							
Strategy 5: Reduce or prevent kokanee salmon entry into artificial channels or conduits (migration into irrigation ditches, entrainment into hydroelectric turbines, etc.).		+	+							
Strategy 6: Maximize elevation and water retention times in Lake Roosevelt to increase rearing capacity (i.e., forage base – zooplankton, benthic invertebrates, and terrestrial insects).		+	+							
Strategy 7: Minimize predation of fry and parr at the confluence of the San Poil River and Lake Roosevelt.		+	+							
Strategy 8: Develop and implement specific management plans that restore adequate temperature, flows and habitat necessary for aquatic resources in the San Poil River System.		+	+							
These project titles are referenced by ID above: 21002 - Early life history and survival of adfluvial rainbow trout in the San Poil River Basin 199001800 - Evaluate rainbow trout/habitat improvements of tributaries to Lake Roosevelt 199501100 - Chief Joseph kokanee enhancement project										

Note: + = Potential or anticipated affect on subbasin objectives and strategies.