Draft

Fifteenmile Creek Subbasin Summary

(including Oregon Tributaries between Hood River and The Dalles Dam)

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Northwest Power Planning Council

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Subbasin Description

General Location

The Fifteenmile Creek subbasin, located in north central Oregon, drains 373 square miles of Wasco and Hood River counties. Originating on the east slope of Lookout Mountain about nine miles east of Mt. Hood, Fifteenmile Creek flows northeast out of the timbered higher elevations, swings north through the dry land wheat country, then west to empty into the Columbia River near The Dalles. The Fifteenmile Creek Subbasin contains 239,000 acres in Wasco and Hood River counties. The stream flows into the Columbia River approximately one and a half miles east of The Dalles, Oregon (RM 192). The watershed is approximately forty miles long and two to fifteen miles wide. Figure 5 shows the Fifteenmile Creek Subbasin and the small tributaries to the Columbia River between Hood River and The Dalles, Oregon.

Principle tributaries to Fifteenmile Creek include Ramsey, Pine, Dry, Fivemile and Eightmile creeks. Eightmile Creek, the largest tributary, drains 118 square miles and joins Fifteenmile Creek only two miles above the confluence with the Columbia River. The Fifteenmile Creek subbasin is bounded on the west by the Mosier, Mill, Threemile and Hood River subbasins; on the south by the White River subbasin; and on the east by the Deschutes River subbasin.

The mainstem of Fifteenmile Creek drops approximately 6,405 feet in 54.5 miles from the headwaters on Lookout Mountain to the mouth. The upper stream reaches are moderate to steep gradient; the lower 43.6 miles are a relatively low 0.6% average gradient. Tributaries to Fifteenmile Creek with any significant year-round flow generally follow a similar pattern.

The flora of the Fifteenmile Creek subbasin ranges from dominantly fir and pine coniferous forests in the headwaters to grasses, perennial forbs, oak and widely scattered pine woodlands bordering the agricultural lands at the middle and lower elevations. The lower half of the basin is predominantly open range and dry land agricultural land.

The geology of the area consists of numerous outpourings of Columbia River basalt. Numerous ash falls and some ash flows are contained in the formation (Wheeler 1975). Basalt basal flows create an impermeable layer underlying the area. The area is characterized by a high spring runoff from winter snowmelt combined with spring rains.

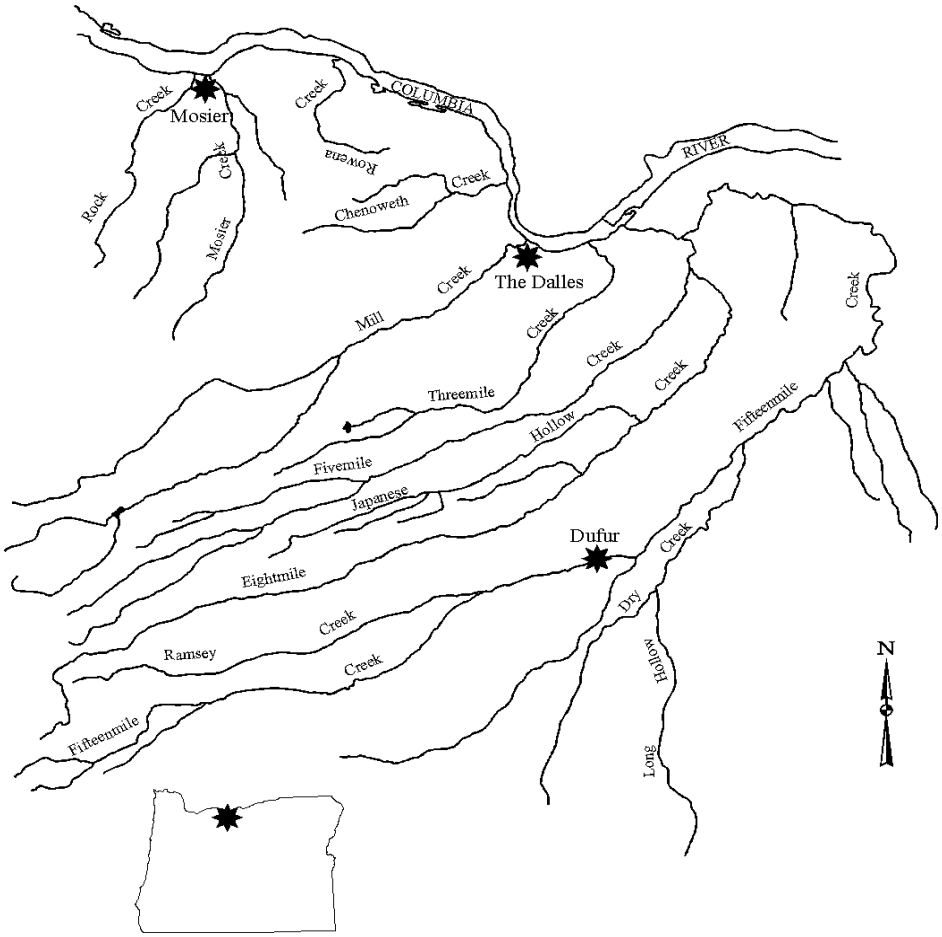

Figure 1. Fifteenmile Creek Subbasin and the small tributaries to the Columbia River between Hood River and The Dalles, Oregon

The soils of the Fifteenmile Creek subbasin fall into four general categories (Green 1982):

1. Deep, moderately sloping to steep soils on uplands and terraces in the northern portion of the subbasin, along the Columbia River and its tributaries.
2. Shallow to deep, nearly level to steep soils on uplands in the eastern portion of the subbasin, in the Columbia District and Tygh Ridge.
3. Shallow and moderately deep, moderately steep to very steep soils on uplands in the eastern portion of the subbasin, along the Deschutes River, Fifteenmile Creek and their tributaries.
4. Shallow to deep, nearly level to very steep soils on foot slopes of the Cascade Mountains in the western portion of the subbasin. They are loam, stony loam, gravelly loam and very cobbly loam soils that formed in loess, volcanic ash, and colluvium weathered from andesite and sandstone sediment.

The Fifteenmile Creek subbasin lies in the transition zone between western and eastern Oregon. Both summer and winter air temperatures can be somewhat extreme in the eastern portion of the subbasin. Prevailing winds are from the west, although easterly

winds occur along the Columbia River in December and January. Annual precipitation in the Fifteenmile Creek subbasin ranges from 12 to 100 inches, depending on elevation. The mean annual precipitation is 14 inches at The Dalles and 12 inches at Dufur. The majority of the precipitation occurs as snowfall during the winter months, only five to ten percent of the precipitation falls during June through August (Green 1982). Only 22 percent of the stream miles in the Fifteenmile subbasin are classified as perennial.

Water Resources

Irrigation is the largest water use in the watershed. Low stream flows during the irrigation season greatly limit the amount of irrigation. Summer flows have been fully appropriated since the early 1900's and only a few hundred acres regularly receive an adequate water supply during the July to September period.

The Fifteenmile Creek watershed was adjudicated in 1924 and water rights were established for irrigation, municipal, domestic, stock, power, and manufacturing. In addition, the court ordered that "a sufficient amount" of water be permitted to flow down Fifteenmile Creek and its tributaries for stock and domestic use. This right was confirmed as a prior right to all other rights.

In an attempt to provide adequate flow for juvenile and adult salmonids, minimum streamflows were adopted in the mainstem of Fifteenmile Creek. These minimum streamflows were later converted to instream water rights and are held in trust for the people of the state of Oregon. These instream water rights are junior to all prior rights.

Land Use

The entire Fifteenmile Creek subbasin is located within the boundary of lands ceded to the United States government by the seven bands of Wasco- and Sahaptin-speaking Indians whose representatives and head men were signatories to the Treaty with the Tribes of Middle Oregon of June 25, 1855. The Confederated Tribes of the Warm Springs Reservation of Oregon are the legal successor to the Indian signatories to the treaty.

The U.S. Forest Service manages the mid to high elevation forests in approximately 15 percent (35,000 acres) of the Fifteenmile Creek subbasin. The primary land uses on the National Forest are timber management and recreation.

The Bureau of Land Management manages 600 acres of forested area in the Fivemile Creek portion of the subbasin. Primary land use on the Bureau of Land Management is timber management.

Agriculture is the most important element of the economy in the Fifteenmile Creek subbasin. Approximately 90 percent of the private land is used for the production of crops and livestock. Principal crops include wheat, alfalfa and irrigated pasture. Some orchards are located in the mid and lower portion of the watershed.

Of the approximately 239,000 acres in the subbasin, about 124,700 acres are cropland, about 7,400 acres of which are irrigated; 47,400 acres are rangeland; 65,900 acres are forestland; and 500 acres are within the urban area of the city of Dufur. The non-irrigated cropland is almost exclusively in wheat or other grain production (Dusty Eddy, personal communication).

Dufur, the only incorporated city within the Fifteenmile Creek subbasin, is an agricultural community serving the needs of the local farmers and ranchers.

Fish and Wildlife Status

Fish

Spring chinook salmon

Spring chinook salmon, *Oncorhynchus tshawytscha*, are known to have been present in the Fifteenmile Creek Subbasin since 1996. These fish have successfully spawned and chinook smolts have been observed emigrating from the subbasin. Adult spring chinook salmon have been observed in Eightmile Creek and upper Fifteenmile Creek.

Little life history information has been collected on the spring chinook salmon in the Fifteenmile Creek subbasin. It is assumed that this population has a life history cycle similar to that of spring chinook salmon in other mid-Columbia River subbasins.

Spring chinook salmon adults probably return to Fifteenmile Creek in April to June, primarily as 4-year-old fish. Spawning occurs from late August through late September. Emergence from the gravel is sometime between mid-February and mid-April. Age zero or one smolts migrate out of the subbasin between early March and mid-June. No data are available on the age structure, sex ratio, length-weight ratio, fecundity or egg-to-smolt and smolt-to-adult survival rates for the spring chinook salmon of the Fifteenmile Creek subbasin. An estimate of the spring chinook salmon smolt production capacity for the Fifteenmile Creek subbasin is unavailable. Figure 2 shows the known distribution of spring chinook salmon in the Fifteenmile Creek subbasin.

Winter steelhead

Fifteenmile Creek supports the easternmost stock of wild winter steelhead, *Onchoryncus mykiss*, in the Columbia River basin. No hatchery winter steelhead have ever been released into the basin, the existing population is believed to be a unique stock. This population was listed as a threatened species, as part of the Mid-Columbia Ecologically Significant Unit, under the Endangered Species Act in the spring of 1999.

Little life history information has been collected on the winter steelhead in the Fifteenmile Creek subbasin. Winter steelhead in the subbasin are presumed to exhibit a life history cycle similar to that of winter steelhead in other lower Columbia River subbasins.

Winter steelhead enter Fifteenmile Creek during March and April. Spawning is generally completed by the end of April when stream flows are sufficient to provide good fish passage. Heavy siltation of former spawning areas in the lower portions of Fifteenmile Creek has eliminated spawning there except in low flow years when fish can not reach preferred spawning areas. Emergence of winter steelhead fry is usually complete by the end of May.

Juvenile steelhead spend two to three years rearing in Fifteenmile Creek before smolting and migrating downstream in April and May. Due to low summer stream flow, heavy siltation, and high stream temperatures, the lower 15 to 20 miles of Fifteenmile Creek is no longer capable of rearing juvenile salmonids from late May through October.

An estimate of the smolt production capacity of the Fifteenmile Creek drainage was developed by a technical committee comprised of personnel of the Oregon Department of Fish and Wildlife, U.S. Forest Service, U.S. NRCS, U.S. Fish and Wildlife Service, National Marine Fisheries Service and the Confederated Tribes of the Warm Springs Reservation of Oregon based on a subjective evaluation of the habitat along with

several assumptions about the spatial distribution of the population. This estimate is approximately 26,000 winter steelhead smolts.

The winter steelhead run in the Fifteenmile Creek subbasin is assumed to be at a low level, comprised of perhaps 200 to 300 adults. Spawning and rearing distribution is assumed to be located primarily in the mainstems of Fifteenmile, Eightmile and Ramsey creeks. Approximately 91 linear miles of suitable spawning habitat and 44 linear miles of suitable rearing habitat are currently available for use by winter steelhead. Figure 2 shows the known distribution of winter steelhead in the Fifteenmile Creek subbasin.

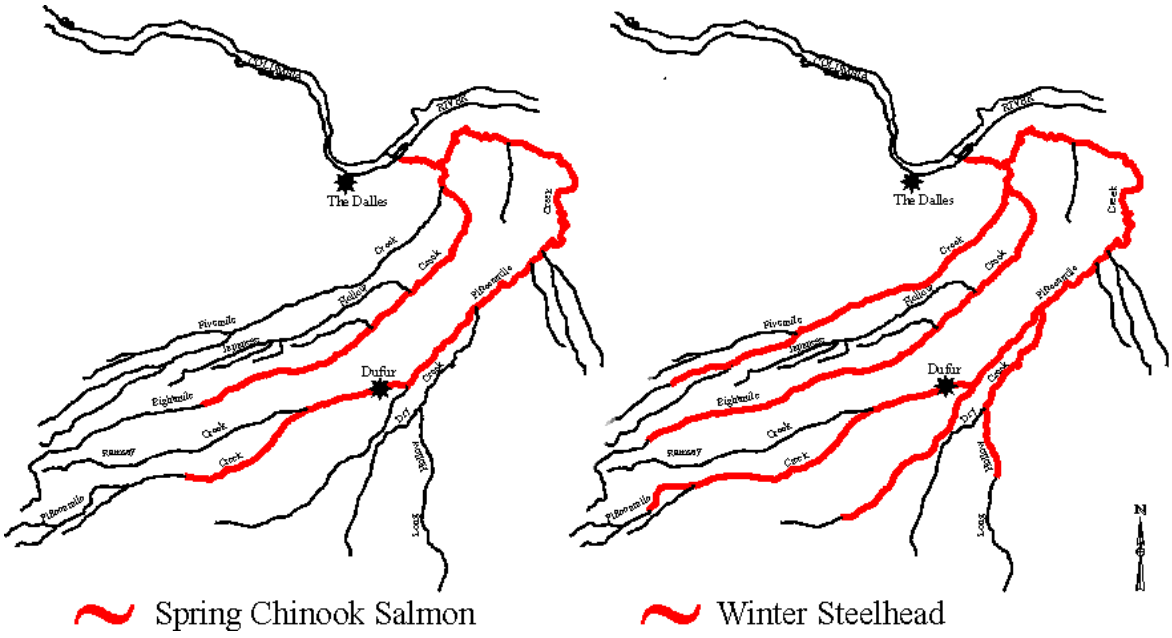

Figure 2. Distribution of anadromous salmonids in the Fifteenmile Creek Subbasin

Pacific lamprey

Pacific lamprey, *Lampetra tridentatus*, spawn and rear in the Fifteenmile Creek subbasin. Adult lamprey have been observed in Ramsey Creek, tributary to Fifteenmile Creek. Listed as a state sensitive species based on significantly depressed populations throughout their range, pacific lamprey have habitat requirements similar to winter steelhead.

Little life history information has been collected for pacific lamprey in the Fifteenmile Creek Subbasin. It is assumed that the life history cycle is similar to that of lamprey in other lower Columbia River subbasins.

Adult pacific lamprey probably enter the Fifteenmile Creek subbasin in early summer. Spawning occurs in depressions up to two feet in diameter in the small gravel of riffles. Adults die after spawning. The eggs hatch in two to three weeks, depending on water temperature. Larval lamprey spend five to six years in fine silt deposits in backwaters and quiet eddies before migrating to the ocean. Lamprey spend one to two years in the ocean before returning to fresh water to spawn (Wyndoski and Whitney 1979). Pacific lamprey were historically and are currently of significant cultural value to the Confederated Tribes of the Warm Springs Reservation of Oregon.

Redband trout

Fifteenmile Creek supports a population of the Eastern Cascades subspecies of redband trout, *Onchoryncus mykiss* (Behnke 1992). Redband trout occupy the same range as steelhead trout and are not reproductively isolated. Gene flow between resident and anadromous trout has been documented in similar watersheds (e.g. Yakima, Deschutes, Rogue, Klamath) that do not have migration barriers isolating the populations (Kostow 1994, Everest 1973).

Little life history information has been collected on the redband trout in the Fifteenmile Creek Subbasin. It is assumed that this population has a life history cycle similar to that of redband trout in other eastern Oregon subbasins.

Redband trout spawn primarily in the mid to upper portions of subbasin streams during April and May. Emergence of fry is usually complete by the end of May.

Cutthroat trout

Fivemile Creek, tributary to Fifteenmile Creek, supports the eastern most population of coastal cutthroat trout, *Salmo clarki clarki*, in the Columbia River Basin. This population has been proposed for listing as a threatened species under the Endangered Species Act. Typically, resident cutthroat trout do not co-habitate with redband trout; however, there are no natural barriers that would restrict cutthroat to Fivemile Creek and their range coincides with that of the resident redband trout in Eightmile and Fifteenmile creeks and some hybridization does occur (Spruell et. al. 1998).

Little life history information has been collected on the cutthroat trout in the Fifteenmile Creek subbasin. It is assumed that this population has a life history cycle similar to that of cutthroat trout in other lower Columbia River subbasins.

Spawning of cutthroat trout occurs from April to early May in small headwater streams. Fry emerge from the gravel in approximately two weeks, emergence is dependent on the spawning date and the water temperature (Wyndoski and Whitney 1979).

Rainbow trout

In the past, Oregon Department of Fish and Wildlife (ODFW) planted catchable redband/rainbow trout, *Onchoryncus mykiss*, from Deschutes River and Cape Cod stocks in two sections of Fifteenmile Creek. Hatchery rainbow trout were last stocked in the subbasin in 1991.

Since 1992, the U.S. Forest Service (USFS) has planted catchable rainbow trout in Hanel Lake on Wolf Run Ditch, tributary to Eightmile Creek, for national Fishing Week. A screen on the inlet of Wolf Run Ditch and an ephemeral draw at the outlet are barriers to fish migration into or out of the ditch.

Brook trout

Brook trout, *Salvelinus fontinalis*, were stocked in Eightmile Creek above Endersby and in Fifteenmile Creek above Dufur as early as 1902. While brook trout do not inter-breed with redband or cutthroat trout, they can compete for limited habitat and food resources, and prey on the eggs and juveniles of other fishes. No brook trout have been stocked in the Fifteenmile Creek for over 40 years. There are no known occurrences of naturalized brook trout in the Fifteenmile Creek subbasin.

Non-salmonid fishes

Various sculpins (family COTTIDAE), speckled dace, *Rhinichthys osculus,* longnose dace, *R. cataractae* and mountain suckers, *Catostomus platyrhynchus*, are found in the Fifteenmile Creek subbasin. These fish spawn in riffles in clean, coarse substrate. The juveniles are found in shallow areas with slow velocity (Wyndoski and Whitney 1979). Eggs and juveniles of these species are prey for juvenile steelhead and resident trout.

Northern pikeminnow

Northern pikeminnow, *Ptychocheilus oregonensis*, occupy the lower Fifteenmile Creek subbasin where summer temperatures can be extremely high. Young pikeminnows compete with salmonids for food. The diet of adult northern pikeminnows includes juvenile salmonids, lamprey, dace, suckers and sculpins.

Wildlife

Because Fifteenmile Creek subbasin lies in the transition zone between western and eastern Oregon, a wide range of climactic conditions exist in the subbasin. A variety of wildlife species, including large and small mammals, passerine birds, raptors, upland birds, waterfowl, reptiles and amphibians are associated with Fifteenmile Creek riverine, wetland and upland habitats. Some terrestrial wildlife species are native year round residents, others are migratory. Many wildlife species within the subbasin are listed as federal and/or state threatened, endangered, sensitive or at-risk.

Amphibians

Several amphibians which are associated with small perennial headwater streams in the Fifteenmile Creek subbasin are considered state sensitive species.

Cope's giant salamander, *Dicamptodon copei*, has been documented in the subbasin. This species is found in small rocky creeks, seeps and streams. The adults are found beneath surface debris on the margins of water. Habitat degradation and loss from land use practices restricts distribution of this species.

Also documented in the subbasin is the tailed frog, *Ascaphus truei.* This species requires cool, clear water and feeds in streams and the moist woods nearby. It is a prey species for Cope's giant salamander.

Potentially present but currently undocumented in the subbasin are the Oregon slender salamander, *Batrachoseps wrighti,* clouded salamander, *Aneides ferreus*, southern torrent salamander, *Rhyacotriton variegatus,* Columbia torrent salamander, *R. kezeri,* and cascade torrent salamander, *R. cascadae*. All of these amphibian species require cold, clear streams most commonly found in mature and old-growth forests.

Reptiles

Western pond turtle, *Clemmys marmorata,* and painted turtle, *Chrysemys picta,* both state sensitive species, may occur on private land along the Columbia River corridor within the Fifteenmile Creek subbasin. They occupy marshes, sloughs, ponds, slow-moving streams and quiet backwaters of rivers. (Jim Torland, personal communication).

Birds

Raptor surveys are conducted each winter in the Fifteenmile Creek Subbasin. Of particular interest are bald eagles, *Haliaeetus leucocephalus*, which winter in the area. Listed as threatened in Oregon under both state and federal Endangered Species Acts, bald eagles are currently under consideration for removal from that list. They winter in locations having adequate supplies of food and protected sites for roosting, such as valleys and stream corridors having adjoining forested uplands. The wintering population of bald eagles in the Fifteenmile Creek subbasin appears stable at this time. There are no known nest sites and no suitable nesting habitat within the subbasin.

Fifteenmile Creek subbasin is within potential feeding range of three known peregrine falcon, *Falco peregrineus anatum,* eyries. These falcons nest in rimrock along the Columbia River. No known nest sites occur in the subbasin. Listed as endangered under both state and federal endangered species acts, peregrine falcons have been recommended for reclassification to threatened.

Documented sightings of ferruginous hawks, *Buteo ragalis*, listed as a state sensitive species, have occurred in the Fifteenmile Creek subbasin in winter. This hawk inhabits open, dry country. Declining populations and a reduction in breeding range are attributed to conversion of grassland habitat to cultivated agriculture. Fifteenmile Creek subbasin borders potential breeding habitat; however, no known nest sites exist within the subbasin.

Northern spotted owl, *Strix occidentalis caurina,* listed as a threatened species under both federal and state Endangered Species Acts, are present in the upper Fifteenmile Creek subbasin. Found in mixed species stands of mature and old-growth forest containing Douglas-fir, these owls nest in cavities, abandoned raptor nests, squirrel nests, debris accumulations and mistletoe brooms. Declining habitat, primarily caused by timber harvesting, limits the distribution of this species of owl. Thirteen spotted owl activity centers have been identified in the Fifteenmile Creek subbasin on Mt. Hood National Forest land (Mt. Hood National Forest 1994).

Pileated woodpeckers, *Dryocopus pileatus*, a state sensitive species designated as a management indicator on national forest lands, are resident in the upper Fifteenmile Creek Subbasin. These birds generally inhabit old-growth and mature forests, feeding on insects found in dead and downed trees, snags and live trees. Status of the population in the subbasin is currently unknown.

A breeding population of Lewis' woodpecker, *Melanerpes lewis*, classified as a state sensitive species, is found in the Fifteenmile Creek Subbasin. These birds nest in riparian areas having cottonwoods, logged or burned over ponderosa pine forests, and open oak or oak-conifer woodland. They nest in natural cavities or those excavated by other woodpeckers. Formerly abundant in Oregon, but currently substantially depleted in numbers in western Oregon and restricted in distribution, Lewis' woodpeckers are believed to be doing well in the Oregon white oak/ponderosa pine belt of the upper Fifteenmile Creek subbasin.

Also present as a breeding population in the Fifteenmile Creek Subbasin is the western bluebird, *Sialia mexicana,* another state sensitive species. These birds nest in areas of small farms having diversified agriculture and clearcuts in which standing snags remain. They nest in natural cavities or artificial nest boxes. Populations in favorable habitat east of the Cascade Mountains are believed to be in satisfactory condition.

Annual surveys conducted by ODFW, from 1986 to 1996, in the Fifteenmile Creek Subbasin indicate that the breeding populations of both Lewis' woodpecker and western bluebird are stable. Increased competition from European starlings, *Sturnus vulgaris,* for nesting sites causes concern for the continued viability of the breeding populations of both of these cavity nesting birds (Jim Torland, personal communication).

Mountain quail, *Oreortyx pictus,* proposed for listing as a threatened species under the Endangered Species Act, are also found in the Fifteenmile Creek subbasin. These birds utilize brushy mountain forest areas for nesting and feeding. Their populations have been depressed for reasons not yet understood.

Merriam turkeys, *Meleagris gallopavo,* were introduced in the Fifteenmile Creek Subbasin in 1961 to provide hunting opportunities. This large game bird is found in the open mixed conifer/oak woodlands of the subbasin.

Mammals

ODFW biologists conduct annual herd composition and trend counts on blacktail deer, *Odocoileus hemionus columbianus,* mule deer, *O. h. hemionus,* and Rocky Mountain elk, *Cervus canadensis,* in the Fifteenmile Creek subbasin. Deer and elk populations in the subbasin are relatively stable, with deer populations increasing slightly over the last few years (Jim Torland, personal communication).

American marten, *Martes americana*, potentially occur in the subbasin. The marten is a state sensitive species designated as an indicator species for old-growth forests in all Oregon national forests. It requires large quantities of standing and downed snags and other coarse downed woody material near streams.

Fisher, *Martes pennanti,* a state sensitive species, may potentially occur in the subbasin. The fisher needs access to a high degree of overhead cover. They avoid open areas and utilize forested riparian areas.

Reliable but unconfirmed sightings of wolverine, *Gulo gulo*, have occurred in the Fifteenmile Creek subbasin. Threatened in Oregon under the state Endangered Species Act, and listed as a sensitive species by U.S. Fish and Wildlife Service (USFWS), wolverine inhabit high elevation forest areas with an abundance of prey and carrion.

Several species of bats that occur in the Fifteenmile Creek subbasin are considered state sensitive species. The long-eared myotis, *Myotis evotis*, long-legged myotis, *Myotis volans*, pallid bat, *Antrozous pallidus*, silver-haired bat, *Lasionycteris noctivagans*, and western small-footed myotis, *Myotis cilolabrum*, are all likely to occur in the Fifteenmile Creek subbasin. All of these bat species inhabit ponderosa pine and mixed conifer forests and rely on snags and decadent trees for roosting and hibernacula. A cave located on private land near Dufur is a potential roosting or hibernaculum for the Townsend's big-eared bat, *Plecotus townsendii*.

Habitat Areas and Quality

Fifteenmile Creek is characterized as having moderate to low streamflow. It is a relatively productive subbasin, with moderate to high biomass potential. The higher gradient stream reaches on the Mt. Hood National Forest typically have high quality water flow. At the transition to more gentle stream grade, at approximately the private lands-national forest interface, good salmonid spawning habitat is available. Continuing downstream in the subbasin, stream flows are reduced by irrigation withdrawals, sediment input is increased with runoff from annually cultivated cropland, and stream temperature extremes occur.

Habitat areas are characterized by urban and orchard lands in the lower subbasin, shrub steppe lands along the valleys, dry land grain fields on the uplands, and shrub steppe, oak, oak-pine and pine-fir forests in the headwaters. Wildlife are associated with riverine and adjacent riparian forest, wetlands, mixed coniferous and deciduous forest, shrub steppe and agricultural habitats in the Fifteenmile Creek Subbasin. Habitat quality varies, depending on the degree to which habitats have been converted to other land uses or impacted by human activities and invasion of non-native vegetation. Habitat has generally been degraded by past and present land management practices, the spread of non-native plant species, and urban expansion. Agricultural lands, such as fruit orchards and dry land farms, are widespread and provide limited habitat for wildlife. Bottomlands and riverine habitats along Fifteenmile Creek have also been dramatically altered by channelization, dredging, dikes, and flood control activities. Habitat restoration activities occurring along the Fifteenmile Creek mainstem and major tributaries for winter steelhead spawning and rearing are also improving the quality of riparian habitat for wildlife.

Wetlands in the Fifteenmile Creek subbasin occur as occasional features of the upper subbasin. Mostly small in size, these wetlands have high value for terrestrial wildlife and plant biodiversity. The upper subbasin has numerous perennial springs that follow the north-south geologic contact point between hard andesite and softer The Dalles formation. These springs moderate the baseflows of the predominantly snow-fed system and provide water, forage and microclimates for terrestrial plants and animals. The only mapped wetlands are Bottle Prairie, Eightmile Meadow, an Engelmann spruce swamp and a *Juncus* wetland in the headwaters of Eightmile Creek. The U.S. Fish and Wildlife Service (USFWS) national wetlands inventory identified wetlands in the mid-lower subbasin that have not been field validated (Mt. Hood National Forest 1994).

Production of game fish in the Fifteenmile Creek Subbasin is limited by various land use practices which impact the potential carrying capacity of the subbasin. Much of the habitat in the lower drainage is unsuitable for anadromous salmonids and has been seriously degraded in those areas in which anadromous salmonids are known to spawn and rear. Degradation of habitat on private lands is directly related to intensive agricultural use and associated soil erosion.

The Food Security Act of 1985 required all farmers on highly erodible land to file an erosion plan by 1995. Approximately 80 to 85 percent of the mid to lower Fifteenmile Creek watershed fits the highly erodible land category (Dusty Eddy, personal communication). Under the guidance of the Wasco County Soil and Water Conservation District, private landowners are using improved techniques on these erodible lands, including no-till and improved residue management on wheat fields, strip planting, terracing of steep hillsides and removing low productivity lands from production.

The Oregon Department of Environmental Quality (DEQ) has designated Fifteenmile Creek a water quality limited stream. The DEQ 303(d) list identifies stream segments that do not meet the water quality standards of the federal Clean Water Act. High summer water temperatures, flow modification, habitat modification and sedimentation have all been identified as water quality limiting factors in the Fifteenmile Creek subbasin.

Watershed Assessment

The Confederated Tribes of the Warm Springs Reservation of Oregon, the Oregon Department of Fish and Wildlife and the Mt. Hood National Forest worked cooperatively

to develop the Fifteenmile Basin Fish Habitat Improvement Implementation Plan (Smith et. al. 1987). This plan identifies the fish species present in the watershed, as well as their limiting factors. The plan identifies goals, objectives, and strategies for restoration of the subbasin's fishery resources. The plan objectives include the logical "top down" habitat restoration approach, which is designed to build on restoration success by starting work near the national forest boundary and proceeding downstream. This strategy has been followed during the implementation of the Fifteenmile Creek Habitat Restoration Project (1987 to present).

The Columbia Basin System Planning Salmon and Steelhead Production Plan (1990) was developed to identify options or strategies for increasing salmon and steelhead production in the Columbia River basin. The Fifteenmile Creek Subbasin production plan was one of 31 developed system wide under the auspices of the Columbia Basin Fish and Wildlife Authority. This plan documented existing and potential winter steelhead production, summarized management goals and objectives, documented existing management efforts, identified problems and opportunities associated with increasing steelhead numbers, and presented preferred and alternative management strategies.

The Mt. Hood National Forest completed a watershed analysis of the "Miles Creek Watershed" in 1994. This analysis is one of four components of the Aquatic Conservation Strategy, developed by the Forest Ecosystem Management Assessment Team in 1993, which directs management of areas and resources covered by the Supplemental Environmental Impact Statement. The watershed analysis is designed to develop and document an understanding of the ecological structures, functions, processes and interactions occurring within the watershed. It includes assessment of the status of Threatened and Endangered Species, anadromous fish and old-growth ecosystems in the national forest portion of the Fifteenmile Creek subbasin. Off-forest private lands are also discussed.

The Fifteenmile Watershed Enhancement Action Plan (Fifteenmile Creek Watershed Council 1997) describes a land treatment project to reduce soil erosion, mitigate flood hazards, improve water quality, and improve vegetative cover in the Fifteenmile Creek Subbasin. This land treatment involves cropland management systems, upland and riparian grazing management systems, forestry systems, riparian corridor improvement, irrigation efficiency improvements, and other conservation practices.

The Fifteenmile Creek Watershed Council, working in cooperation with the Wasco County Soil and Water Conservation District and Natural Resource Conservation Service is developing a watershed assessment for the private lands in the Fifteenmile Creek Subbasin.

The Oregon Department of Agriculture (ODA) is currently leading the process of developing an agriculture water quality plan that will meet state and federal water quality standards for the Fifteenmile Creek subbasin. A draft Lower Deschutes Agricultural Water Quality Management Area Plan has been written to identify strategies to prevent and control non- point source water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities and monitoring. The Fifteenmile Creek Subbasin is included in this management area. Developed by the Lower Deschutes Local Advisory Committee, with assistance from ODA and Wasco County Soil and Water Conservation District, this plan applies to lands in current agricultural use and those lying idle or on which management has been deferred.

The Natural Heritage Program maintains a data base on habitats and species occurrences throughout the state of Oregon. The Oregon Trust Agreement Planning Project (BPA 1993) and Oregon GAP Analysis Project (ODFW 1997) identified gaps in bio-diversity and needs for terrestrial habitat restoration and resulted in a prioritized list of potential habitat restoration opportunities in the Lower Mid-Columbia Subregion, including the Fifteenmile Creek Subbasin.

A Columbia Basin wide assessment of losses was conducted to quantify habitat impacts from federal hydropower system development. Wildlife mitigation objectives for the Fifteenmile Creek Subbasin are based on this losses assessment. Wildlife losses caused by the construction of the federal hydropower system were amended into the Northwest Power Planning Council's (NWPPC) Fish and Wildlife Program. Losses were measured in Habitat Units (HUs) for selected target/indicator species and area linked to priority habitats. (Note: all or part of the wildlife losses for Lower Mid-Columbia Subregion may be mitigated for in the Fifteenmile Creek Subbasin, although it is unlikely that this would be proposed or could occur.)

Limiting Factors

Fish production in the Fifteenmile Creek Subbasin is limited by water quality and quantity. Water quality limitations include seasonal temperature extremes, turbidity, and sedimentation. Water quantity issues are directly associated with consumptive water withdrawals, watershed conditions, the reduction in the ability of the streams to interact with their floodplains, and reduced recharge in the forested headwaters.

Dry land farming and extensive livestock grazing of open range land have been responsible for the elimination and degradation of the riparian zone throughout much of the middle and lower Fifteenmile Creek Subbasin. This has contributed to stream channel shifts throughout the subbasin during frequent high runoff events. Degraded riparian stream corridors, stream isolation from the flood plain, and water withdrawals for irrigation reduce the flow in many streams in the subbasin by late spring or early summer. Juvenile salmonids have been lost where irrigation diversions were unscreened or inadequately screened. These diversions have now been screened to protect fish. Logging practices on forest lands in the upper subbasin have decreased the ability of the watershed to store water and regulate runoff.

As required by the Clean Water Act, all states are required to compile a list of water quality limited water bodies and submit the list to the Environmental Protection Agency (EPA) every two years. This list is called the 303(d) list. The most current list is from 1998. In the Fifteenmile Creek Subbasin, Fifteenmile, Eightmile, Fivemile, and Ramsey creeks are listed as water quality limited for one or more parameter. Listing parameters on Fifteenmile and Eightmile creeks are temperature, sedimentation, habitat modification, and flow modification. Ramsey Creek is listed for temperature and sedimentation, and Fivemile Creek is listed for sedimentation and habitat modification.

Wildlife abundance has been affected by past hydropower development, past and current land management practices, and the spread of non-native plant and wildlife species. Factors influencing deer and elk populations include conversion of historic winter range and shrub steppe habitat to other uses, and competition with native plant assemblages by noxious weeds. Land prices continue to rise, making it more economically difficult to preserve remaining undeveloped lands for wildlife. Continued decline in populations of salmon and other fish species results in loss of overall biomass being

contributed to the subbasin. This reduction has negative effects on wildlife abundance. Opportunities to restore wildlife populations and improve wildlife habitat diminish over time as habitat loss and degradation continues. Shrub steppe habitats in the Fifteenmile Creek Subbasin are particularly sensitive to additional loss as the majority of the Columbia Plateau has been converted to a variety of agricultural uses.

Artificial Production

There are not currently, nor are there future plans for artificial production facilities or releases of hatchery produced fish in the Fifteenmile Creek Subbasin.

Existing and Past Efforts

The Fifteenmile Basin Fish Habitat Improvement Implementation Plan (Smith et. al. 1987), by the ODFW and the Mt. Hood National Forest in cooperation with the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO), was designed to maximize wild winter steelhead production in the subbasin in the most cost-effective manner. Largely funded by the Bonneville Power Administration as part of the NWPPC's Fish and Wildlife Program (Section 704-d-1, 34.02), the Plan identified existing stream habitat problems, solutions, goals and objectives, priorities, estimated project costs and associated fishery benefits.

Six factors were identified which affect the quantity and/or quality of summer rearing habitat for winter steelhead in the Fifteenmile Creek basin. These factors are: 1) up and downstream passage barriers; 2) lethal summer water temperatures; 3) low summer flows; 4) lack of habitat diversity; 5) lack of channel stability; and 6) sediment loading. To address these problems in the basin, 80 to 90 miles of stream habitat were to be treated using: 1) structural improvements for adult and juvenile passage; 2) riparian fencing; 3) structural channel stabilization; and 4) structural rearing habitat improvements.

A five year implementation plan developed priorities for habitat improvement activities in the Fifteenmile Creek basin. Priorities were based on potential benefits, cost effectiveness and location within the basin, within the constraints of logistic feasibility and landowner cooperation. Treatment strategies included passage improvement, riparian restoration, channel stabilization and habitat diversity improvement.

Oregon Department of Fish and Wildlife

Fish passage

The greatest impediment to fish passage in Fifteenmile Creek is Seufert Falls (RM 0.25). In the early 1960's, ODFW improved fish passage at Seufert Falls by building a series of low wooden sills across the stream below the falls. A flood in the winter of 1964 destroyed this fish ladder. Over the course of several years, fish passage improvement work was carried out at Seufert Falls with mixed success. Seufert Dam, located immediately upstream from Seufert Falls, was breached to improve passage in 1975. In the mid 1980's, a new fish ladder was constructed at Seufert Falls by local sportsmen and remains in use today.

The highest priority activity for the Fifteenmile Creek Habitat Enhancement Project (BPA Project No. 9304000) was improvement of upstream and downstream fish passage at five major barriers. Passage has been improved at three barriers in Fifteenmile Creek: a fishway was constructed the full width of the stream channel directly downstream from the Dufur city water intake (RM 40.0), a fishway was installed to facilitate passage

of salmonids at one irrigation diversion (RM 34.5), and a Denil steep pass fish ladder was installed at another (RM 43.5). On Ramsey Creek, a Denil steep pass fish ladder was placed at a diversion (RM 2.0) that impeded fish passage and a concrete combination diversion and fish ladder was constructed (RM 3.0) to replace an impassable diversion.

Diversion screening

Also accomplished under the Fifteenmile Creek Habitat Enhancement Project, was installation of a rotary drum fish screen in the Orchard Ridge Ditch. It operated throughout the irrigation season (May to September) to provide protection to out migrant salmonid smolts and resident trout. This diversion was later replaced by a new diversion structure which incorporates a ladder to accommodate fish passage.

In 1989, the Oregon legislature directed the ODFW to develop guidelines for determination of fish screening needs and costs throughout the state. In addition, ODFW was to develop a prioritized listing of unscreened diversions with a recommended plan to fund, construct and maintain fish screens at those diversions.

ODFW evaluated most individual water diversions throughout the state to determine if a screen was required and, if so, its relative priority for screening. A combination of biological, physical, habitat, and administrative criteria were used to evaluate and rank diversions throughout the state. A total of 3,240 diversions were identified statewide that required screening. The Fifteenmile Creek basin was ranked as a priority subbasin for diversion screening.

The Mitchell Act (Public Law 75-502) was passed by Congress in 1938 and has been amended several times. It was designed to fund salmon restoration activities in the Columbia River Basin, in view of the serious and progressive decline in fish numbers due to habitat destruction, dam construction, water diversions, over-fishing, and other factors.

Work was begun in 1990 under Mitchell Act funding to place screens on all previously unscreened or inadequately screened irrigation withdrawals in the Fifteenmile Creek basin. To date, 90 irrigation withdrawal diversions and pumps have been screened by ODFW in the Fifteenmile Creek basin. Screens are annually installed and maintained at 56 locations on Fifteenmile Creek, 26 locations on Eightmile Creek, and 8 locations on Ramsey Creek (Ken Frisby, personal communication).

Stream bank stabilization and instream habitat structures

Stream bank stabilization and instream habitat structure placement have also been ongoing in the Fifteenmile Creek basin.

After the 1974 flood, rock drop structures were incorporated into stream stabilization measures to create pools. Immediately following placement of the rocks, pools formed above the structures. These pools filled with gravel and silt during the first winter and new pools were scoured out below each structure.

The first spring after installation of the drop structures, many adult steelhead observed in the Dufur Valley were associated with the pools formed by these structures. Steelhead redds were also observed in close proximity to the structures. The voids between the rocks provided rearing and hiding areas for juvenile steelhead and trout. The drop structures also provided erosion control by slowing the velocity of the stream (Jim Newton, personal communication).

BPA funding of the Fifteenmile Creek Habitat Enhancement Project provided the means to place instream structures in Fifteenmile, Eightmile, and Ramsey creeks. From

1988 to 1997, areas lacking particular habitat types were identified for structural treatment under the Fifteenmile Basin Fish Habitat Improvement Implementation Plan (Smith, et. al. 1987).

Areas lacking quantity and quality of pools for rearing juvenile salmonids were identified and pool:riffle ratio was improved by construction of rock and log weirs, jetties, flow deflectors and boulder clusters. These structures dissipated the energy of the stream, improved habitat diversity, provided cover and rearing habitat, and trapped gravel.

Habitat enhancement activities have been completed on approximately 11.4 miles of Fifteenmile Creek, 4.4 mile of Eightmile Creek, 4.0 miles of Ramsey Creek, for a total of 924 structures on 19.8 miles of stream (Steve Springston, personal communication).

All bank stabilization and instream habitat structures are currently inspected in the spring, following high water or ice events. Repairs are made only when structures have failed, are about to fail, or would become ineffective if not maintained.

Riparian fencing

A stream bank fencing project following flooding in 1974 included the entire section of stream from Dufur west past the confluence of Ramsey Creek (six miles of stream). Vegetative recovery in the riparian areas was rapid after placement of fences. Where stream banks were bare and subject to unrestricted livestock access, the stream channel remained wide, shallow, and unstable. In the areas not grazed, the stream narrowed and deepened and pools, riffles and undercut banks were formed. Grasses, sedges, and legumes armored previously exposed banks (Jim Newton, personal communication).

As a part of the Fifteenmile Creek Habitat Enhancement Project, funded by BPA from 1986 to the present, a total of 98 miles of riparian corridor fence has been constructed to protect almost 50 miles of stream, including 26.5 miles of Fifteenmile Creek, 7.6 miles of Eightmile Creek, 4.6 miles of Ramsey Creek and 10.8 miles of Dry Creek (see Figure 3). This fencing has been installed to protect instream structures and existing bank integrity from livestock and to allow natural rehabilitation of the riparian and instream fish habitat. In addition, 7.4 miles of Fifteenmile Creek is not fenced, but livestock grazing is excluded under lease agreements with landowners, for a total of 57 miles of stream protection (Steve Springston, personal communication).

Inspection and maintenance of riparian fencing is performed by ODFW personnel at least once per month. Frequency of inspections is increased during periods of heavy livestock exposure or high water events. Fence posts, wire, gates, hardware and other components are repaired and/or replaced as needed.

Water for livestock is provided along the streams by placement of livestock water gaps each year. Maintenance of these water gaps by ODFW personnel consumes a great amount of time and materials. As many as 40 water gaps and stream crossings must be removed each year when not in use for livestock operations to prevent damage from high water and ice.

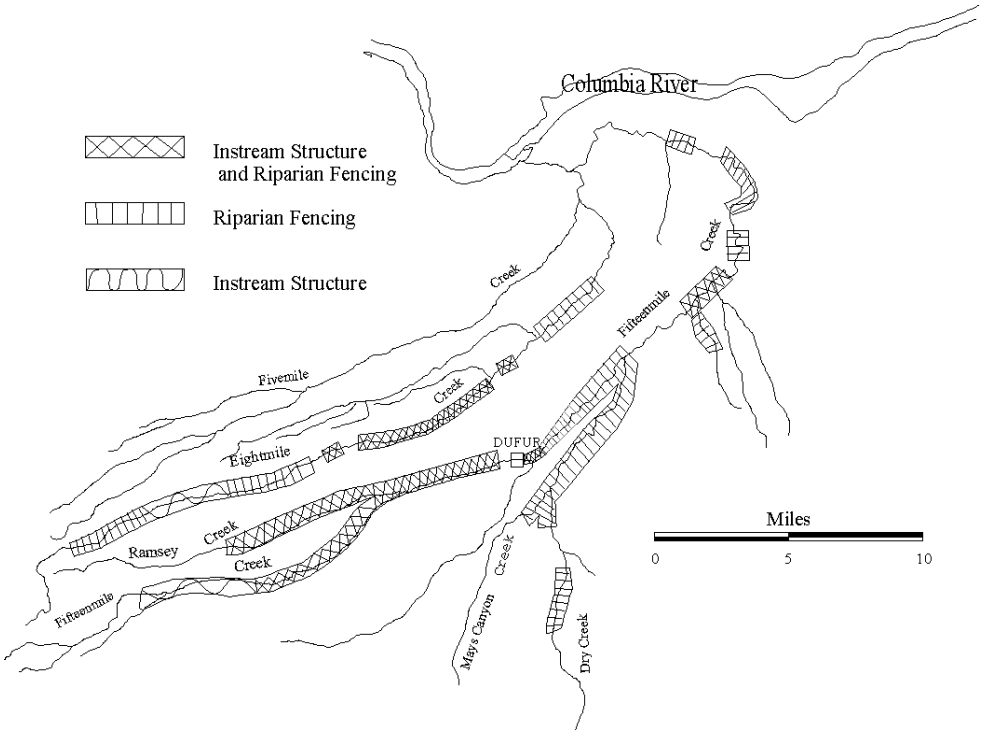

Figure 3. Current riparian fencing and instream structures in the Fifteenmile Creek subbasin

Elimination of high maintenance factors

Since 1997, also under BPA funding, solar pump stations have been installed by ODFW in nine locations throughout the Fifteenmile Creek basin. These watering sites provide off-site watering for livestock, in order to eliminate water gaps and the attendant maintenance time and expense. Twenty-seven additional locations have been identified for installation of solar pump stations (Steve Springston, personal communication).

Biological monitoring

BPA funded macro-invertebrate sampling from 1986 to 1992 to provide baseline information on water quality in the Fifteenmile Creek subbasin. Samples were collected in spring, summer and fall at eight representative sites. Initial assessment indicated that the streams in the basin were in fair to good condition at their headwaters, with declining health down stream. Macro-invertebrates exhibit fast response to changes in water quality, changes in density and species diversity will indicate changes taking place in the riparian corridor.

In 1998, ODFW began operating a downstream migrant trap in Fifteenmile Creek. Information from this trap is being used to estimate numbers of wild winter steelhead smolts migrating from the Fifteenmile Creek Subbasin, estimate the relative abundance of all downstream migrant salmonids and juvenile lamprey, and determine biological and life history patterns of wild winter steelhead and other anadromous salmonid smolts (French & Olsen 1998). Initial funding for this smolt monitoring was provided by the U.S. Fish and Wildlife Service, BPA has funded a continuation since 1999.

Winter steelhead spawning ground surveys have been conducted annually on index stream reaches in the Fifteenmile Creek subbasin since 1964. In most years, 10.5 miles of Fifteenmile Creek, 6.2 miles of Eightmile Creek and 5.0 miles of Ramsey Creek are surveyed in late April or early May for steelhead redds and spawning adults.

Stream temperature and flow monitoring

Since 1987, under BPA funding, ODFW has monitored stream temperatures at sampling sites in the Fifteenmile Creek subbasin. Currently, thermographs are deployed at ten locations throughout the subbasin from spring to fall and are inspected monthly to ensure operation.

Marsh-McBirney flow meters measured stream flow during stable flow conditions in April and August, from 1987 through 1997, at locations on Fifteenmile, Eightmile and Ramsey creeks. A staff gauge was placed by ODFW near the mouth of Fifteenmile Creek in 1998. Flows has been routinely measured since the staff gauge was installed, to correlate staff gauge readings with actual flow. Monitoring of stream flows documents changes attributable to riparian recovery and improved ground water storage after riparian enhancement projects.

Photographic documentation

Following streambank stabilization and instream habitat structure placement in 1974, photopoints were established in the project areas. Additional photopoints have been established since work began in 1987 under BPA funding. ODFW has taken photographs annually in August at these photopoints throughout the Fifteenmile Creek subbasin to document changes in channel conditions and riparian recovery in the areas treated since implementation of the Fifteenmile Creek Habitat Enhancement Project.

Operation and maintenance

NWPPC Fish and Wildlife Program Project No. 9304000 currently provides for operation and maintenance of past investments in the Fifteenmile Creek Subbasin.

Regulatory activities

As recently as 1973, Fifteenmile Creek and its tributaries were open for steelhead and trout angling from late April to late October. Beginning in 1974, steelhead angling was closed above the bridge at Petersburg (RM 2.0); since 1979, the entire Fifteenmile Creek Subbasin has been closed to steelhead angling. In 1982 the limit for trout was reduced, and in 1986 the minimum length for trout was increased. Beginning in 1998, only artificial lures and flies are allowed when fishing for trout in the Fifteenmile Creek Subbasin and all fish must be released unharmed.

U.S. Forest Service

The U.S. Forest Service (USFS) has implemented instream habitat restoration projects on Fifteenmile, Ramsey, Eightmile, and Fivemile creeks. This work has included improving fish passage at road crossings, assistance with fish screening, and installation of large woody debris. In addition, the USFS has modified campgrounds and hiking trails, closed

and scarified roads, and replanted trees in timber sale harvest units to reduce erosion and stream sedimentation.

Fish passage

Culvert modification and replacement have improved fish passage at several locations on the national forest. Using BPA funding a culvert on Ramsey Creek was modified by installing baffles. On the south fork of Fivemile Creek, a standard culvert was replaced with a bottomless arch culvert. After the 1996 flood, twin culverts on the middle fork of Fivemile Creek were replaced with a bridge. In 1999, the Barlow Ranger District on the Mt. Hood National Forest was one of three ranger districts in the NW Region involved in a pilot project to conduct fish passage surveys on all culverts and bridges on all fish bearing streams. This survey identified four locations on Eightmile Creek where culverts may be migration barriers to both adult and juvenile salmonids and modification would greatly enhance passage of fish (Gary Asbridge, personal communication).

Diversion screening

The USFS has been a partner with ODFW in diversion modification and screening projects in the Fifteenmile Creek subbasin. USFS provided funding and personnel for replacement of a diversion on Fifteenmile Creek and screening of Wolf Run Ditch on Eightmile Creek.

Stream bank stabilization and instream habitat structures

The USFS has placed log structures in several streams in the Fifteenmile Creek Subbasin. These structures, made up of one to several logs each, stabilize the banks and provide instream habitat for both adult and juvenile salmonids. BPA funding provided means for habitat enhancement of three miles of Fifteenmile Creek, three miles of Ramsey Creek, 0.2 miles of mainstem Fivemile Creek, and one mile of Middle Fork Fivemile Creek. The "Jobs in the Woods" program, which employed out-of-work loggers in the mid-1990's, added structures to an additional one mile of Fifteenmile Creek and two miles of the Middle Fork Fivemile Creek. USFS dollars tied to timber sales have provided funding for placement of log structures in Eightmile Creek, South Fork Fivemile Creek, Middle Fork Fivemile, and several miles of Cedar Creek (Gary Asbridge, personal communication).

In total, USFS has placed 650 log structures in over 12 miles of stream to provide cover, create pools, and slow water velocity to improve spawning, rearing, holding, and migration habitat for winter steelhead and resident trout in the Fifteenmile Creek subbasin. In addition, 1500 logs have been decked awaiting final approval of a log structure placement project in three miles of Ramsey Creek in the year 2000. Using funding available following the 1996 flood, the USFS also placed large woody debris on ten acres of riparian area along Fifteenmile Creek to provide floodplain roughness during high stream flows and habitat for wildlife. (Gary Asbridge, personal communication).

Locations along streams traditionally used for acquisition of water by USFS fire pumper trucks have been modified or eliminated to protect riparian and stream habitat. In most cases, access has been restricted to one side of the stream and barriers have been erected to keep the trucks from entering the water. One location on Eightmile Creek has been eliminated and replaced by a pump chance pipe for filling the pumper trucks. In all

locations, stream banks have been stabilized and native vegetation has been planted in the riparian area (Gary Asbridge, personal communication).

Campground restoration

The USFS has made modifications to their campgrounds in the Fifteenmile Creek Subbasin to repair and improve riparian areas. In all three campgrounds in the subbasin, camp sites have been defined and areas not designated as camp sites have been planted with native vegetation (Gary Asbridge, personal communication).

Roads and trails

The USFS maintains approximately 165 miles of forest roads in the Fifteenmile Creek subbasin. Since 1991, over 13 miles of road have been decommissioned by the USFS; approximately 25 percent of the funding for decommissioning has been provided by BPA. Many of these roads were located in riparian areas along streams. Ten miles of road have been scarified and planted with native vegetation; the remainder have been closed and natural vegetation allowed to encroach and obliterate the road (Ken Huskey, personal communication).

One hiking trail along Fifteenmile Creek was rerouted to move it out of a riparian area. In addition, bridges were constructed at two stream fords on a popular hiking trail.

The USFS conducts yearly maintenance of roads and hiking trails in the subbasin to reduce the risk of erosion.

Reforestation

In the upper Fifteenmile Creek Subbasin, approximately 2,930 acres have been reforested by the USFS after timber harvest. Reforestation units totaling 288 acres on Fifteenmile Creek, 1,046 acres on Eightmile Creek, 1,206 acres on Fivemile Creek, and 390 acres on Ramsey Creek have been replanted with site appropriate seedling trees. In addition, 1996 flood damaged areas along Fifteenmile and Fivemile creeks have been rehabilitated with plantings of western larch, western red cedar, Douglas-fir, and cottonwood (Edan Lira, personal communication).

Land acquisition

As part of the Salmon Summit Accord commitments, in 1994 the USFS purchased 540 acres of previously logged land adjacent to Fifteenmile Creek from the Rocky Mountain Elk Foundation (RMEF) for the benefit of anadromous fish. Another 2,500 acres of land previously owned by RMEF on the north and south banks of mainstem Ramsey Creek was also purchased. This larger parcel of forest land had been acquired by ODFW and RMEF in 1990 and planted with ponderosa pine seedlings in 1992 (Mt. Hood National Forest, 1994). In 2000 and 2001, the USFS plans to place log structures in three miles of Ramsey Creek and decommission the road that runs through the riparian area of this larger parcel of land (Gary Asbridge, personal communication).

Livestock grazing permits

Permits for grazing livestock on the upper Fifteenmile Creek watershed USFS grazing allotments have not been issued since 1992. Re-instatement of these permits would require

Riparian Reserve recommendations for protection of riparian zones and aquatic resources (Dan Fissell, personal communication).

Biological monitoring

The USFS conducts annual winter steelhead spawning ground surveys on those portions of the streams in the subbasin that lie within the national forest boundaries and some of the upper reaches on private lands.

In 1995 and 1996, sampling was done on Fifteenmile Creek and all its major tributaries to assess the status of the streams in the subbasin. Included in the sampling were pebble counts, vegetative plots, photopoints, streambed profiles and cross-sections, and McNeil core samples of suitable spawning habitat. In addition, the streams were electrofished to estimate fish populations and species presence, and to compare with estimates from a similar sample in 1985 (Gary Asbridge, personal communication).

Temperature monitoring

BPA provided funding for temperature monitoring on Mt. Hood National Forest lands in the subbasin from 1986 to 1992. Since 1992, USFS monies have been used to continue that monitoring. Continuous temperature monitors are currently deployed at 14 sites on the national forest.

Stream surveys

From 1994 to the present, the USFS has been conducting stream surveys in those portions of all the streams in the subbasin which lie within the national forest. Cedar Creek and the mainstem of Fivemile Creek remain to be surveyed. The USFS will complete these surveys in the year 2000.

Confederated Tribes of the Warm Springs Reservation of Oregon

The Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) assisted in the development of the Fifteenmile Creek Basin Fish Habitat Improvement Implementation Plan (Smith et. al. 1987) and have also participated in development of other Fifteenmile Creek Subbasin resource plans. They have been and continue to be supportive of past and ongoing habitat enhancement projects in the subbasin.

Approximately 720 acres of land in the Fifteenmile Creek Subbasin are held in trust by the U.S. Government for the CTWSRO. This property lies between the Columbia River and Fifteenmile Creek northeast of The Dalles, and is under grazing lease agreement to an adjacent landowner. The riparian area within the 80 acre grazing allotment which straddles Fifteenmile Creek is fenced and lease agreement stipulations provide for protection of the stream corridor and riparian vegetation (Brad Nye, personal communication).

The 1855 Treaty with the Tribes of Middle Oregon set out the boundaries of the Warm Springs Reservation and described the lands being ceded by the tribes. The treaty also reserved certain rights to the tribes. Among other things, the tribes retained “the exclusive right of taking fish in streams running through and bordering the reservation… and at all other usual and accustomed stations…”. Seufert Falls, near the mouth of Fifteenmile Creek is a “usual and accustomed” fishing station. Pacific lamprey and winter steelhead were historically harvested by CTWSO members at Seufert Falls. This traditional subsistence fishery was voluntarily suspended in 1984 and remains closed to aid in the recovery of the wild winter steelhead population.

Columbia River Intertribal Fish Commission

The Columbia River Intertribal Fish Commission (CRITFC) has conducted preliminary sampling of the pacific lamprey population in the Fifteenmile Creek Subbasin. The Umatilla Lamprey Restoration Project, BPA Project No. 94-026, is assessing the genetic stock structure of pacific lamprey in the Columbia River basin. Amnocete and juvenile lamprey were collected at several sites in the Fifteenmile Creek Subbasin in 1998. Genetic analysis of these samples has been completed and a final report is in press.

Fifteenmile Watershed Council

At the urging of the Wasco County Soil and Water Conservation District (SWCD), the Fifteenmile Watershed Council was formed in the spring of 1997. Working cooperatively with Fifteenmile Creek subbasin private land owners, the SWCD, NRCS, and Fifteenmile Watershed Council have worked to resolve some of the serious cropland erosion and water quality problems. This work has included development and implementation of farm conservation plans.

The Fifteenmile Watershed Action Plan (Fifteenmile Watershed Council 1997) identified ten parameters of concern in the Fifteenmile Creek subbasin: runoff, water availability, baseflow, water temperature, sediment loading, shade, streambank stability, soil erosion, vegetative condition, and flood hazard mitigation.

Seven strategies to improve the status of each of these ten parameters were identified:

1. cropland management to reduce water, sediment and nutrient runoff,
2. grazing modifications to improve the ecological condition of the plant community in the areas of the watershed where livestock graze;
3. forest management to reduce water, sediment and nutrient runoff and improve forest species diversity,
4. riparian corridor and floodplain management to recover riparian vegetation and stabilize streambank,
5. other conservation practices to reduce runoff and trap sediment and nutrients from any land use type,
6. upgrade floodwater control infrastructure, such as culverts and ditches,
7. revise county zoning ordinances to avoid locating homes or other structures in hazardous areas.

The goal of the Fifteenmile Watershed Action Plan is to have 50 percent of the landowners in the watershed enter into contracts or other agreements to make improvements to their land for the purpose of conservation by the year 2002. It is anticipated to take up to twenty years before all feasible improvements can be made throughout the Fifteenmile Creek subbasin.

Wasco County Soil and Water Conservation District

Wasco County Soil and Water Conservation District (SWCD) works with farmers and ranchers to develop conservation plans and administers grants to encourage basic conservation work on private lands in the Fifteenmile Creek subbasin. Conservation practices include no-till fallow, strip cropping, sediment basins, terraces, grass filter strips and waterways, residue management, and riparian reserves.

Fifteenmile Creek subbasin experienced a 100-year frequency flood in 1964. Prior to 1964, the stream channels were fairly stable and riparian vegetation was in fair condition. During the 1964 flooding, stream bank erosion was severe in some areas.

Federal cost-share money was available, through the Soil Conservation Service (now the NRCS), to assist landowners in recovering from the 1964 flood. The accepted corrective techniques at the time were to straighten the channel to speed the passage of flood waters and to remove streamside vegetation to avoid potential debris jams. During this project, trees near the stream were removed and the stream was straightened and channelized in most of the Dufur valley (approximately five miles). Increased gradient and decreased channel sinuosity increased water velocity. Frequently, channel erosion required repair after high spring flows.

In 1974 another 100-year flood ravaged Fifteenmile Creek. Immediately after the flood, landowners again placed the stream within a straightened sand and gravel ditch.

Following the emergency repairs by landowners in the Fifteenmile Creek Subbasin, the local area received federal funding (Fund 216 – Small Watershed Restoration) to do extensive stream bank stabilization. Funding was provided for all equipment, labor and material costs. The landowner's only obligation was to grant a temporary easement to permit construction activities on his property.

Under the supervision of NRCS, private contractors sloped vertical cut banks and armored vulnerable sites with rock rip-rap. Members of The Dalles chapter of Northwest Steelheaders applied a grass seed mixture to more than 10 miles of stream bank to accelerate re-vegetation of the exposed soil. Sportsmen, Boy Scouts, and several landowners also planted hundreds of trees and willow cuttings for stream cover.

On July 8 and 9, 1995, Wasco County suffered severe flash flood damage from a series of high intensity, short duration storms. The Fifteenmile Creek Subbasin was particularly hard-hit. The county was declared a disaster area and became eligible for Federal Emergency Mitigation (FEMA) funds. The SWCD provided assistance in developing a Natural Hazards Mitigation Plan to diminish future flash flood damage in the subbasin by preventing and controlling runoff and erosion. Conservation practices on farmland, such as desilting basins and erosion control measures were also instituted within the Fifteenmile Creek Subbasin using FEMA funds (Ron Graves, personal communication).

In February of 1996, another devastating flood hit the Fifteenmile Creek subbasin. SWCD and NRCS assisted in 43 emergency projects following this flood. After emergency work was underway, SWCD obtained grant monies, from the Governor's Watershed Enhancement Board (GWEB) and federal Clean Water Act (319), for planning and implementation of a watershed plan for the Fifteenmile Creek subbasin. In 1997, the Fifteenmile Creek Watershed Council was formed and approved by the county. SWCD continues to assist the Watershed Council in planning and implementation of projects outlined in the Watershed Action Plan (1997). SWCD has applied for Oregon Watershed Enhancement Board (OWEB) grant monies for a watershed assessment of the Fifteenmile Creek Subbasin to be completed in the year 2000 (Ron Graves, personal communication).

SWCD assisted in obtaining multiple sources of funding, and provided contracting and construction inspection services for a bioengineering project to return a portion of Fifteenmile Creek to its original channel. They have also used ODA funding for cost-sharing construction of check dam drop structures in Company Hollow, a highly erodible stream channel that flows into Fifteenmile Creek (Ron Graves, personal communication).

SWCD currently maintains 13 temperature monitoring sites in the Fifteenmile Creek subbasin (Ryan Bessette, personal communication).

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is the federal agency within the U.S. Department of Agriculture (USDA) which provides financial, technical and educational assistance to implement conservation practices on privately owned land. Using this help, farmers and ranchers in the Fifteenmile Creek Subbasin apply practices that reduce soil erosion, improve water quality and enhance forest land, grazing land and wildlife habitat. USDA funded cost-share programs are funded through the Commodity Credit Corporation (CCC) and administered by the Farm Service Agency (FSA), NRCS provides technical support for these programs. All USDA incentive and cost-share programs require landowner participants to develop a conservation plan for the practice, inspection of the project site to determine that the practice has been installed as planned, and an annual status review. If a landowner installs a practice and does not maintain or continue that practice as outlined in the conservation plan, he is required to pay back the cost-share monies and pay an additional penalty.

The Conservation Reserve Program (CRP) was established by the 1985 Farm Bill, as part of the Food Security Act of 1985. This program takes land classified as highly erodible out of crop production to reduce soil erosion and stream sediment load, improve water quality, establish wildlife habitat and enhance forest and wetland resources. Environmentally sensitive acreage is converted to vegetative cover, such as native grasses, wildlife plantings, trees, filter strips or riparian buffers. There are currently 37,000 acres of CRP in Wasco County, most of which lie within the Fifteenmile Creek Subbasin (Stephen Riese, personal communication).

The Environmental Quality Incentive Program (EQIP), established by the 1996 Farm Bill, works in areas identified by NRCS as conservation geographic priority areas. This program provides incentive payments and up to 75 percent cost-sharing for 42 different conservation practices, such as manure management, pest management, erosion control, and other practices to improve and maintain the health of natural resources. Since 1997, the first year of the EQIP program, 38 landowners have voluntarily established conservation plans for from five to ten years under the program (Stephen Riese, personal communication).

The Conservation Reserve Enhancement Program (CREP) provides incentive and cost-share monies for planting and maintenance of riparian trees, riparian fencing, and establishment of off-site watering for livestock along streams containing salmonid fish. This program assists landowners in setting aside a minimum of 35 feet up to 150 feet on either side of a stream for fish and wildlife enhancement. A strip of land along Dry Creek, tributary to Fifteenmile Creek, totaling 152 acres has been set aside in a CREP plan since inception of the program in 1998 (Stephen Riese, personal communication).

The Emergency Conservation Program (ECP) provides financial assistance to farmers and ranchers for the restoration of farmlands which have been affected by natural disasters. This program was available after the February 1996 flood for repair of fields and debris removal.

The Emergency Watershed Protection Program (EWP) is designed to reduce threats to life and property in the wake of natural disasters. It provides technical and cost-sharing assistance for projects to protect structures in subsequent storms. Several projects

to protect homes and bridges were funded following the February 1996 flood (Stephen Riese, personal communication).

The Forestry Incentives Program (FIP) supports good forest management practices on privately owned, non-industrial forest lands. It is designed to benefit the environment while meeting future demands for wood products. Two to three landowners in the Fifteenmile Creek subbasin use this assistance each year to plant trees, improve timber stands and other related activities (Stephen Riese, personal communication).

The Stewardship Incentive Program (SIP) provides technical and financial assistance to encourage non-industrial private forest landowners to keep their lands and natural resources productive and healthy. It provides funds for landowners of qualifying land to develop Forest Stewardship Plans to guide thinning, harvest, reforestation, and other timber related work, and provides funding for some of these activities. Forest Stewardship Plans were developed by ten landowners in the Fifteenmile Creek subbasin under SIP. One landowner in the subbasin has also used this program for reforestation work. This program has not been funded by Congress since 1998 (Stephen Riese, personal communication).

Oregon Department of Forestry

Oregon Department of Forestry (ODF) enforces the Oregon Forest Practices Act (OFPA) on all forest lands not federally owned. The OFPA contains guidelines to protect fish bearing streams during logging and other forest management activities. These guidelines include stream buffer zones and riparian management areas.

ODF also provides technical assistance to non-industrial forest land owners concerning insects, diseases, harvest techniques and reforestation. ODF works with forest land owners to develop timber management plans and administers federal cost-share programs to encourage good forest management practices. The FIP, SIP, and the pre-commercial thinning and tree planting portions of the CREP and CRP, are administered by ODF.

Oregon Department of Environmental Quality

The Clean Water Act requires each state to set Total Maximum Daily Load allocations (TMDL) for each water body on the 303(d) list. TMDLs are an analytical process for describing the maximum amount of pollutants from all sources that may enter a specific water body without violating water quality standards. Collection of water quality data is a component of the development of TMDLs. Oregon Department of Environmental Quality (DEQ) data collection efforts concentrate on collecting additional data for parameters already included on the 303(d) list. The Wasco County portion of the Middle Columbia-Hood basin, which includes the Fifteenmile Creek subbasin, is scheduled to have sediment and temperature TMDLs completed by the end of 2001. To this end, DEQ began to collect continuous temperature data in 1999 in those subbasins. This monitoring supplements on-going monitoring by ODFW, USFS and the Wasco County SWCD. DEQ will continue to collect temperature data in 2000 in preparation for development of a temperature TMDL.

DEQ currently monitors stream temperature in one site in the Fifteenmile Creek Subbasin. In addition, DEQ is planning to collect turbidity and total suspended sediment data in Eightmile, Fifteenmile, Fivemile and Ramsey creeks during the winter of

2000/2001 in preparation for the development of a sediment TMDL (Bonnie Lamb, personal communication).

Oregon Water Trust

Oregon's Instream Water Rights Law allows water right holders to donate, lease or sell some or all of their water right for transfer to instream use. Oregon Water Trust (OWT), a private, non-profit group, negotiates voluntary donations, leases or permanent purchases of out-of-stream water rights to convert to instream water rights in those streams where acquisition will provide the greatest potential benefits for fish and water quality. OWT has purchased one water right and has negotiated donation leases of all or a portion of 13 water rights in the Fifteenmile Creek Subbasin (Larry Toll, personal communication). These water rights are held in trust for the people of Oregon by the Oregon Water Resources Department.

U.S. Fish and Wildlife Service

The USFWS is assessing the status of coastal cutthroat trout in the Fifteenmile Creek Subbasin for potential listing as a threatened species under the Endangered Species Act. The USFWS also provided technical assistance in a bioengineering project of Fifteenmile Creek after the February 1996 flood.

Oregon Wildlife Coalition

Although no site-specific wildlife mitigation projects have been funded by BPA in the Fifteenmile Creek Subbasin, the Oregon Wildlife Coalition is implementing a programmatic mitigation project that may result in the implementation of mitigation projects within the subbasin. The goals of this project, Securing Wildlife Mitigation Sites – Oregon (Project No. 9705900), are to:

- Fund project coordination activities to identify, plan, propose, and implement wildlife mitigation projects within the Lower Mid-Columbia subregion, including the Fifteenmile Creek subbasin.
- Prioritize potential mitigation projects within the Fifteenmile Creek Subbasin.
- Acquire or ease lands with priority habitats within the Fifteenmile Creek Subbasin to permanently protect wildlife habitats.
- Enhance acquired or leased lands through alteration of land management practices, active restoration of habitats, control of noxious weeds and other non-native vegetation, control of public access, etc. to provide benefits to target/indicator wildlife species within the Fifteenmile Creek Subbasin.
- Develop and implement a monitoring and evaluation plan with both HEP based and non-HEP based monitoring criteria within the Fifteenmile Creek Subbasin.

Subbasin Management

Existing Management

Federal, state, tribal, county and city agencies own or manage lands in the Fifteenmile Creek subbasin. Most existing plans for each managing agency contain guidelines for protection of streams, riparian areas, fish and other aquatic life. There are additional plans that address protection of streams and stream corridors in the Fifteenmile Creek subbasin.

U.S. Forest Service

The U.S. Forest Service (USFS) manages approximately 15 percent (35,000 acres) of the Fifteenmile Creek subbasin. Management of these lands is guided by USFS policies and federal legislation. Management guidelines for the subbasin are contained in the *Mt. Hood National Forest Land and Resource Management Plan* (USFS 1990) and *Attachment A: Standards and Guidelines for Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* of the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (*Northwest Forest Management Plan*). These plans provide standards and guidelines for management of the national forest lands in the subbasin. Included in the *Northwest Forest Management Plan* is the Aquatic Conservation Strategy (ACS) which was developed to maintain and restore the ecological health of watersheds and aquatic ecosystems on public lands. The four components of the ACS, riparian reserves, key watersheds, watershed analysis, and watershed restoration are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. The ACS provides protection of salmon and steelhead habitat on federal lands by striving to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources, and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes. All proposed and existing projects in the subbasin are designed to meet the intent of the ACS objectives.

U.S. Bureau of Land Management

The U.S. Bureau of Land Management (BLM) administers approximately 600 acres of forested land in the Fifteenmile Creek subbasin. These forests are managed under guidelines established in the *Northwest Forest Management Plan* (1994) as described for those lands managed by the USFS.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) administers the Endangered Species Act as it pertains to resident fish. USFWS reviews and comments on land use activities that affect fishery resources such as timber harvest, stream alteration, dredging and filling in wetlands and hydroelectric projects. Their primary emphasis in the Fifteenmile Creek subbasin has been to review applications to the U.S. Army Corp of Engineers for permits to alter stream channels.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) administers the federal Endangered Species Act as it pertains to anadromous fish. NMFS reviews and comments on fill/removal permit applications on streams with anadromous salmonids and on any hydroelectric project proceedings where anadromous fish are involved.

Natural Resource Conservation Service

The Natural Resource Conservation Service provides technical support to the Soil and Water Conservation District (SWCD) with distribution of federal cost-share monies associated with reducing soil erosion and increasing agricultural production on privately owned land. They provide engineering and technical support for land and water resource development, protection and restoration projects.

Confederated Tribes of the Warm Springs Reservation of Oregon

The Confederated Tribes of the Warm Springs Reservation of Oregon reviews proposed management on public lands within the subbasin and provides comments relative to protection of fish and wildlife resources. Tribal range managers establish and monitor use of livestock grazing leases on tribal allotments within the subbasin.

The Oregon Plan for Salmon and Watersheds

Passed into law in 1997, the *Oregon Plan for Salmon and Watersheds* outlines a conservation plan, based on watershed restoration and ecosystem management, for protecting and improving salmon and salmon habitat in the state of Oregon. The *Steelhead Supplement to the Oregon Plan* expands this restoration and protection to steelhead and steelhead habitat.

Oregon Department of Fish and Wildlife

Oregon Department of Fish and Wildlife (ODFW) is responsible for protecting and enhancing Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations. Management of the fish and wildlife and their habitats in the Fifteenmile Creek subbasin is guided by ODFW policies and federal and state legislation. ODFW policies and plans that pertain to the subbasin include the *Natural Production Policy* (OAR 635-07-521 to 524), *Wild Fish Management Policy* (OAR 635-07-525 to 538), *Oregon Guidelines for Timing In-Water Work to Protect Fish and Wildlife Resources* (ODFW 1986), *Fifteenmile Basin Fish Habitat Improvement Implementation Plan* (USFS & ODFW 1987), *and Fifteenmile Creek Subbasin Salmon and Steelhead Production Plan* (ODFW & CTWS 1990). These plans present systematic approaches to conserving aquatic resources and establishing management priorities within the subbasin.

Oregon State Police

The Oregon State Police regularly patrol the Fifteenmile Creek subbasin to enforce laws and regulations designed to protect fish and wildlife.

Oregon Division of State Lands

Oregon Division of State Lands is responsible for regulating the removal and filling of materials in waterways. Permits are required for projects involving 50 cubic yards or more of material. Applications for permits are reviewed by the Oregon Department of Fish and Wildlife and may be modified or denied based on impacts of the project on fish populations.

Oregon Water Resources Department

The Oregon Water Resources Department (OWRD) regulates water use in the Fifteenmile Creek subbasin. Guidelines for appropriation of water (ORS 537) determine the maximum amount of water that can legally diverted from the streams in the subbasin.. OWRD also acts as trustee for instream water rights issued to the state of Oregon and held in trust for the people of the state.

Oregon Department of Forestry

The Oregon Department of Forestry enforces the Oregon Forest Practices Act (OAR 629-Division 600 to 680 and ORS 527) regulating commercial timber production and harvest on state and private lands. The OFPA contains guidelines to protect fish bearing streams during logging and other forest management activities. These guidelines include stream buffers and riparian management areas, as well as protection to small tributaries important for maintaining cool water temperature downstream.

Oregon Department of Environmental Quality

The Oregon Department of Environmental Quality is responsible for enforcing state water quality standards which require the protection of water quality and aquatic beneficial uses, including fish.

Oregon Department of Transportation

The Oregon Department of Transportation (ODOT) maintains public highways that cross streams in the Fifteenmile Creek subbasin. Bridges and culverts must meet guidelines designed to protect fish and fish habitat.

Land Conservation and Development Commission

The Land Conservation and Development Commission regulates land use on the state level. County land-use plans must comply with statewide land-use goals. Land-use plans have been helpful in protecting fish habitat, particularly by curtailing excessive development along streams.

Wasco County Planning Department

The Wasco County Planning Department regulates land use on the county level. The *Wasco County Comprehensive Plan* (1983) addresses protection of water bodies, ground water, natural areas and fish and wildlife resources. The plan has helped minimize impacts to big game habitat, particularly deer and elk winter range.

Wasco County Soil and Water Conservation District

Wasco County Soil and Water Conservation District (SWCD) works with farmers and ranchers to develop farm conservation plans and resource management plans. They administer grants to encourage conservation work on private lands in the Fifteenmile Creek subbasin.

City of Dufur

The City of Dufur administers approximately 730 acres of land that are located in the Fifteenmile Creek subbasin. These lands are located above one the city's municipal water sources and are managed to maintain the watershed.

Fifteenmile Creek Watershed Council

The Fifteenmile Creek Watershed Council is working with Fifteenmile Creek subbasin private landowners to resolve some of the serious cropland erosion and water quality problems. The *Fifteenmile Watershed Action Plan* (Fifteenmile Watershed Council 1997) provides strategies for protecting and improving riparian and aquatic health in the subbasin. It provides strategies to reduce runoff and sediment generation in the uplands, improve grazing systems in the riparian zones and uplands, manage forestlands to protect watershed values, improve riparian corridors and minimize flood damage to streambanks and riparian vegetation, improve irrigation efficiency and actively improve the management of the uplands for the purpose of wildlife.

Lower Deschutes Local Advisory Committee

The Lower Deschutes Local Advisory Committee has developed the *Lower Deschutes Agricultural Water Quality Management Area Plan* (2000) to address agricultural water quality issues in the lower Deschutes River and all streams flowing into the Columbia River between the Hood River and John Day River, which includes the Fifteenmile Creek subbasin. It identifies strategies to reduce water pollution from agricultural lands and achieve water quality standards. It applies to lands in current agricultural use and those lying idle or on which management has been deferred.

Goals, Objectives and Strategies

The goal for the Fifteenmile Creek subbasin is to restore the health and function of the ecosystem. The fish and wildlife populations of the subbasin are of economical significance to the people of the State of Oregon and the Northwest, and of cultural significance to members of the Confederated Tribes of the Warm Springs Reservation of Oregon. Restoration of the health of the Fifteenmile Creek ecosystem will ensure continued viability of these important populations. The overall goal is to continue to protect and restore the health and function of the watershed. Specific goals, objectives, and strategies are listed below.

Fish

The anadromous fish species most actively targeted for management in the Fifteenmile Creek Subbasin is the native winter steelhead. There is only incidental natural production of spring chinook, and the management intent for pacific lamprey is under discussion

because little is known about their life history and abundance. Resident redband present throughout the subbasin. Resident cutthroat trout are found in the upper reaches of some subbasin streams. The actions are designed to benefit both anadromous and resident fish populations.

Goals:

1. Protect, enhance and restore populations of resident and anadromous salmonids and lamprey in the subbasin.
2. Maintain genetic integrity of endemic resident and anadromous salmonids and lamprey in the subbasin.

Objective 1. Achieve an escapement of 1,500 wild adult winter steelhead to the mouth of Fifteenmile Creek, providing a spawner escapement of 900 adult winter steelhead with the remainder available for harvest.

Objective 2. Maintain natural populations of other resident and anadromous salmonids and lamprey in the Fifteenmile Creek subbasin at levels that promote increased utilization of available habitat and that contribute to tribal and non-tribal fisheries as measured by an increasing trend in population abundance and distribution by the year 2012.

Strategy 1. Minimize interaction of hatchery fish stocks with naturally producing Fifteenmile Creek fish populations.
- Action 1.1. Hatchery-reared fish will not be released in subbasin streams.

Strategy 2. Protect, enhance, and restore aquatic and riparian habitat in the subbasin.
- Action 2.1. Determine and monitor abundance, distribution and life history patterns of resident and anadromous salmonids and lamprey to identify and prioritize habitat restoration needs in the subbasin.
- Action 2.2. Conduct periodic comprehensive physical and biological surveys of streams and riparian corridors to identify and prioritize habitat restoration needs in the subbasin.
- Action 2.3. Continue instream and riparian habitat restoration efforts in the subbasin.
- Action 2.4. Maintain or improve passage for upstream and downstream migrant resident and anadromous salmonids and lamprey in the subbasin.
- Action 2.5. Maintain or eliminate roads in riparian and other sensitive areas.
- Action 2.6. Conduct comprehensive water sampling to assess seasonal variation in water quality and quantity in the subbasin.
- Action 2.7. Implement water conservation and stream flow restoration measures in the subbasin.

Strategy 3. Protect, enhance, and restore upland watershed habitat in the subbasin.
- Action 3.1. Implement and enforce provisions of the Fifteenmile Creek subbasin component of the Lower Deschutes Agricultural Water Quality Plan.

Action 3.2. Enforce those portions of the Oregon Forest Practices Act designed to protect water quality and the integrity of fish bearing streams.

Action 3.3. Encourage compliance with the Aquatic Conservation Strategy portion of the USDA Forest Service Northwest Forest Plan.

Action 3.4. Develop and/or implement other land and resource management plans that will result in improved water quality and stream habitat in the subbasin.

Strategy 4. Protect federal and state threatened and sensitive fish species in the subbasin.

Action 4.1. Increase enforcement of laws pertaining to fish.

Action 4.2. Provide protection for federal and state threatened and sensitive fish species in all resource management plans.

Action 4.3. Enforce state and local land use regulations designed to protect fish habitats.

Strategy 5: Integrate conservation law enforcement protection into fish, wildlife and habitat management.

Action 5.1. Identify and enforce laws and rules pertaining to fish passage, riparian habitat, and water quality protection. Provide information on enforcement actions to the system-wide conservation enforcement monitoring and evaluation project.

Action 5.2. Identify and enforce laws and rules pertaining to exotic fish transfers.

Action 5.3. Identify violations of laws and rules pertaining to habitat protection and provide information to appropriate state, federal or tribal law enforcement entity.

Action 5.4. Increase enforcement of laws and fishing regulations pertaining to illegal take of fish (all life stages).

Action 5.5. Continue enforcement of wildlife laws and regulations affecting wildlife species and habitat.

Wildlife

The overall wildlife mitigation goal for the Columbia River Basin is to achieve and sustain levels of habitat and species productivity in order to fully mitigate for all wildlife and wildlife habitat losses caused by the development and operation of the hydropower system (NWPPC 1995). This goal applies to the Columbia Gorge Province, including the Fifteenmile Creek subbasin.

The wildlife goal for the Fifteenmile Creek subbasin includes those target species selected to represent the cover types within the subbasin, and those habitat types considered priorities within the subbasin. The priority habitat types for wildlife in this subbasin are riverine/riparian, wetlands, oak woodlands, and shrub-steppe. Agricultural lands are low priority.

Goal:
Maintain, enhance, or restore populations of wildlife in the subbasin.

Objective 1. Maintain or increase wildlife species diversity in the Fifteenmile Creek subbasin.

Strategy 1. Protect, enhance, and restore wildlife habitat in the subbasin.

Action 1.1. Determine and monitor abundance and distribution of wildlife species to identify and prioritize wildlife habitat restoration needs in the subbasin.

Action 1.2. Conduct periodic comprehensive habitat and biological surveys to identify and prioritize wildlife habitat restoration needs in the subbasin.

Action 1.3. Implement wildlife habitat restoration projects in the subbasin.

Action 1.4. Acquire or lease lands with priority habitats to permanently protect wildlife habitats in the subbasin.

Action 1.5. More actively manage lands set aside for wildlife, such as CRP and CREP, to increase species diversity on those lands.

Action 1.6. Decommission unnecessary roads to reduce harassment of wildlife and encourage more uniform use of available wildlife habitat.

Action 1.7. Manage habitat to meet state management guidelines for upland birds and game mammals.

Action 1.8. Develop a management plan to protect oak woodlands.

Strategy 2. Protect federal and state threatened, endangered, and sensitive wildlife species in subbasin.

Action 2.1. Increase enforcement of laws pertaining to wildlife.

Action 2.2. Provide protection for federal and state threatened, endangered, and sensitive wildlife species in all resource management plans.

Action 2.3. Enforce state and local land use regulations designed to protect wildlife habitats.

Research, Monitoring and Evaluation Activities

Current monitoring and evaluation activities within the subbasin include maintenance of photopoints at 41 sites, stream temperature monitoring at 38 sites, stream flow monitoring at one site, steelhead spawning surveys on index stream reaches, smolt migration monitoring, and habitat restoration work monitoring (i.e. riparian fences, off-channel livestock watering sites, fish passage facilities, and instream habitat structures).

Deer and elk populations in the subbasin are monitored annually through aerial and walking surveys and inventories. Winter raptor surveys are also conducted annually.

The Columbia Basin Law Enforcement Council (CBLEC) coordinates state, federal and tribal conservation law enforcement efforts throughout the Columbia Basin. Currently, a consultant for Columbia River Inter-Tribal Fisheries Enforcement is conducting monitoring and evaluation of conservation enforcement in the mainstem Columbia River between Bonneville and McNary Dams, including cooperative enforcement actions in the tributaries.

Fish and Wildlife Needs

Future work in the Fifteenmile Creek subbasin must be prioritized according to what will do the most good for the fish and wildlife resources. All projects undertaken in the subbasin should first, address the needs of those species that are of greatest concern and, second, do no harm to other species in the subbasin. Future projects should be focused in areas of greatest need. The following are needs that have been identified for the Fifteenmile Creek subbasin:

- Maintenance of all habitat treatment measures installed to date will protect the already substantial investment in the Fifteenmile Creek subbasin.

  BPA funded aquatic and riparian habitat restoration work has been ongoing in the Fifteenmile Creek subbasin since 1986. Restoration work was initiated in the upper stream reaches and has proceeded downstream. This approach provides for building on the positive effects of previous work in terms of channel stability, sediment loading, flow regime, and water temperature. Work completed to date includes: improvement of fish passage at five major barriers, screening of several high priority water diversions, stream bank stabilization, placement of 924 rock instream habitat structures in nearly 20 miles of stream, and 98 miles of riparian corridor fencing.

- Status of the wild winter steelhead population should be determined in order to prioritize all future work in the subbasin aimed at restoration of this wild stock.

  Annual spawning ground counts have been conducted on Fifteenmile, Eightmile, Fivemile, and Ramsey creeks since 1964. These surveys provide information that can be used to infer the status of the winter steelhead population but do not provide the necessary quantitative data to accurately define subbasin production. The status of other salmonid populations is limited to undocumented observations made while conducting other work in the subbasin. All habitat enhancement work done to date in the subbasin has been focused on the need to improve spawning and rearing habitat for winter steelhead, with the objective of restoring the steelhead population; however, the success of the enhancement work can only be established by determining the status of the population the projects were designed to enhance.

  In 1998, smolt monitoring program was implemented in the Fifteenmile Creek subbasin to estimate 1) subbasin winter steelhead smolt production, 2) selected biological and life history characteristics for all downstream migrant salmonids, 3) relative abundance of downstream migrant smolts other than winter steelhead, and 4) relative abundance of pacific lamprey. Because of the complex life history pattern of winter steelhead, this program will require a long term commitment of resources.

  A more sophisticated trapping facility near the mouth of Fifteenmile Creek would increase population monitoring opportunities. This trapping facility could be used to monitor adult salmonid returns to the subbasin, as well as continue monitoring

downstream migrant smolts. Ideally, this facility would be designed to also allow monitoring of pacific lamprey populations.

- Comprehensive stream surveys and riparian vegetation surveys should be performed in the subbasin to determine current physical and biological characteristics of the streams and riparian areas and to possibly identify locations where additional work is needed.

  The last physical stream surveys of streams in the subbasin outside of the national forest were conducted in 1986. A comprehensive modified Hankin and Reeves survey of the streams in the subbasin would help identify and prioritize instream habitat modification needs. It would also be useful in documenting effects of past stream restoration work in the subbasin.

- Monitoring of water quality and quantity should be expanded to ensure good quality water for utilization by fish and wildlife species in the subbasin.

  Fifteenmile, Eightmile, Fivemile and Ramsey creeks are on the Oregon Department of Environmental Quality (DEQ) 303(d) list as water quality limited for one or more parameter. Ongoing temperature monitoring at 38 sites will assist DEQ in development of TMDL allocations for the streams in the subbasin. Implementation of a more extensive water quality monitoring program, which included measuring turbidity and/or total suspended solids, dissolved oxygen, pH, alkalinity and phosphorus would provide additional information concerning other parameters and the condition of streams in the subbasin.

  Collection of macro-invertebrate samples was conducted in the subbasin from 1986 to 1992 under BPA funding. Samples were collected in spring, summer, and fall at eight representative sites to provide baseline information on water quality in the subbasin. Repeating the macro-invertebrate sampling at previously established collection sites would reveal current condition and trends in the aquatic ecosystem.

- Increasing stream flows during summer months would increase survival of wild winter steelhead and other resident and anadromous fish species in the subbasin.

  There are opportunities to buy or lease water rights in the subbasin that can then be converted to instream water rights. This action would help address limiting factors associated with low stream flow. Implementation of water conservation practices on agricultural lands in the subbasin would also provide increased stream flows. Conversion to lower volume sprinklers in orchards and elimination of flood irrigation in favor of sprinkler systems on field crops would reduce water use and allow more water for instream needs.

- Reduction of sediment input to the streams of the subbasin would increase survival of wild winter steelhead and other resident and anadromous fish species.

  Erosion from the uplands contributes large amounts of sediment to the streams of the subbasin. Benefits to the uplands will be realized with increased implementation and enforcement of practices designed to reduce erosion on forest and agricultural lands. Existing programs to assist private landowners in development and implementation of conservation practices should be continued and expanded where possible. Currently, farm conservation plans are required on all highly erodible cropland to qualify for any USDA benefits, including farm subsidies, farm loans, farm

home loans or cost share programs. Enforcement of the Oregon Forest Practices Act, Lower Deschutes Agricultural Water Quality Plan, and Aquatic Conservation Strategy portion of the U.S. Forest Service Northwest Forest Plan will protect water quality and fish habitat on public and private forest and agricultural lands.

- Improvement and/or restoration of fish passage at barriers in the subbasin will return wild winter steelhead and other resident and anadromous fish species to portions of the subbasin currently unavailable for fish production.

  There remain opportunities to improve fish passage at several locations in the subbasin. The fish ladder near the mouth of Fifteenmile Creek sustained substantial damage during the 1996 flood. The wooden log sill structure immediately downstream from this ladder is beginning to lose support pilings and will soon need major repairs. In addition, culverts at four locations on Eightmile Creek have been identified as migration barriers and remain to be modified.

- Extension of riparian fencing along the lower reaches of Fifteenmile and Eightmile creeks and into the Fivemile Creek drainage would expand on riparian restoration work currently in place and provide improved conditions in portions of the subbasin historically used by winter steelhead.

  There are opportunities to expand upon the riparian restoration projects completed to date by extending the riparian fencing along the lower reaches of Fifteenmile and Eightmile creeks. Fivemile Creek has not received any restoration work to date outside the national forest because it was identified as a lower priority; however, Fivemile Creek does support a remnant steelhead population, as well as resident rainbow and cutthroat trout. Other restoration work could be implemented on a number of smaller tributaries that have an important effect on the water quality in the existing fish bearing streams.

- Placement of additional large woody debris in the forested portions of the streams in the subbasin will provide much needed rearing habitat complexity for winter steelhead and other resident and anadromous fish species.

- Installation of additional solar pump stations for off-stream livestock watering sites will eliminate water gaps and eliminate even further the possibility of livestock intrusion on protected riparian areas along the streams of the subbasin.

- Road treatments, ranging from full decommissioning to upgrading, will help reduce often chronic sources of sediment to streams in the subbasin. In addition, elimination of unnecessary roads allows more uniform use of habitat by wildlife.

- Assessment of wildlife species presence and abundance would identify areas where habitat improvements might provide benefits to wildlife in the subbasin.

  Remaining wildlife related tasks within the Fifteenmile Creek Subbasin include assessment and mitigation of hydropower system operational and secondary losses, development and implementation of a regional monitoring and evaluation plan, and development of both HEP-based and non HEP-based monitoring success criteria.

- More active management of lands on which management has been deferred, such as those enrolled in CRP and CREP, would provide increased benefits to wildlife in the subbasin.

  Guidelines for plantings in CRP and CREP areas are now requiring more grass types, in order to increase species diversity. They are also encouraged to plant native trees and shrubs. Landowners are allowed to mow or burn their CRP lands to keep down the rougher, unpalatable grasses and encourage a greater variety of grasses and forbes.

- Protection of oak woodlands will ensure continued viability of this unique habitat in the subbasin.

  The oak woodlands in the Fifteenmile Creek subbasin provide a unique wildlife habitat. The only other area in Eastern Oregon with this habitat type is found along the lower Klamath River. Most of these woodlands are in private ownership. Provisions for protection of this unique habitat should be included in all planning activities within the subbasin.

- Increase law enforcement presence in the subbasin.

  If the objectives for the Fifteenmile Creek subbasin are met, tribal and non-tribal harvest opportunities in the subbasin will increase, as will the need for increased vigilance by enforcement personnel to ensure compliance with laws pertaining to fish and wildlife. Special protection of fish and wildlife species provided by federal and state Endangered Species Acts should be supplemented by land use ordinances and resource management plans.

- Preservation of viable fish & wildlife populations through improved habitat protection, habitat enhancement and law enforcement.

  Enhanced fish, wildlife & habitat law enforcement was conducted throughout the Columbia Basin by federal, state and tribal entities during 1991-1998. Beginning in May 2000, the Columbia River Fisheries Enforcement Department is implementing increased conservation enforcement efforts in the mainstem Columbia, and its tributaries -- in cooperation with adjoining jurisdictions.

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Gary Asbridge, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

Ryan Bessette, Wasco County Soil and Water Conservation District, The Dalles, Oregon.

John (Dusty) Eddy, Wasco County Soil and Water Conservation District, The Dalles, Oregon.

Dan Fissell, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

Ken Frisby, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Doug Hatch, Columbia River Intertribal Fish Commission, Portland, Oregon.

Larry Hoffman, Oregon Department of Forestry, The Dalles, Oregon.

Ron Graves, Wasco County Soil and Water Conservation District, The Dalles, Oregon.

Ken Huskey, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

Bonnie Lamb, Oregon Department of Environmental Quality, Bend, Oregon.

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Stephen Riese, Natural Resource Conservation Service, The Dalles, Oregon.

Steve Springston, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Larry Toll, Wasco County Watermaster, The Dalles, Oregon.

James Torland, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

AREA 2: COLUMBIA RIVER OREGON TRIBUTARIES BETWEEN HOOD RIVER AND THE DALLES

Fish and Wildlife Resources

Subbasin Descriptions

Location and Environment

Located in north central Oregon, six small tributaries enter the Columbia River between Hood River and The Dalles. Figure 4 shows the Fifteenmile Creek subbasin and the small tributaries to the Columbia River between Hood River and The Dalles.

Threemile Creek

Threemile Creek is a small perennial stream which originates in the scrub oak uplands southwest of The Dalles, Oregon, flows through dryland wheat country, through fruit orchards and irrigated pastures in the lower subbasin and enters the Columbia River at The Dalles (RM 190). The watershed is approximately sixteen miles long and one to three miles wide. Threemile Creek is a low gradient stream, dropping just over 1300 feet from its source to the mouth. Dry Creek is the only substantial tributary to Threemile Creek and, as its name implies, it is intermittent, as are the upper reaches of Threemile Creek. The Threemile Creek subbasin is bounded on the south and east by the Fifteenmile Creek subbasin, and on the west and north by Mill Creek.

Mill Creek

Mill Creek originates on the east slope of Mill Creek Buttes in the Mt. Hood National Forest. Both the North and South forks flow generally northeasterly out of the timbered higher elevations and through scrub oak and grasslands. At the confluence of the North and South forks (RM 8.0), agricultural lands begin. Mill Creek flows through the City of The Dalles and, at Highway 30, enters a concrete tunnel which empties it directly into the Columbia River. The watershed is approximately twenty miles long and three to four miles wide. Mill Creek is moderate to high gradient in the upper reaches, with low gradient in the lower watershed, total drop over the twenty miles of stream is approximately 4500 feet. Mill Creek Falls, at RM 3.0 of South Fork Mill Creek is approximately 100 feet in height. The Mill Creek watershed is bounded on the south and east by Threemile Creek and the Fifteenmile Creek subbasin, on the north by Chenoweth and Mosier Creeks, and on the west by the Hood River subbasin.

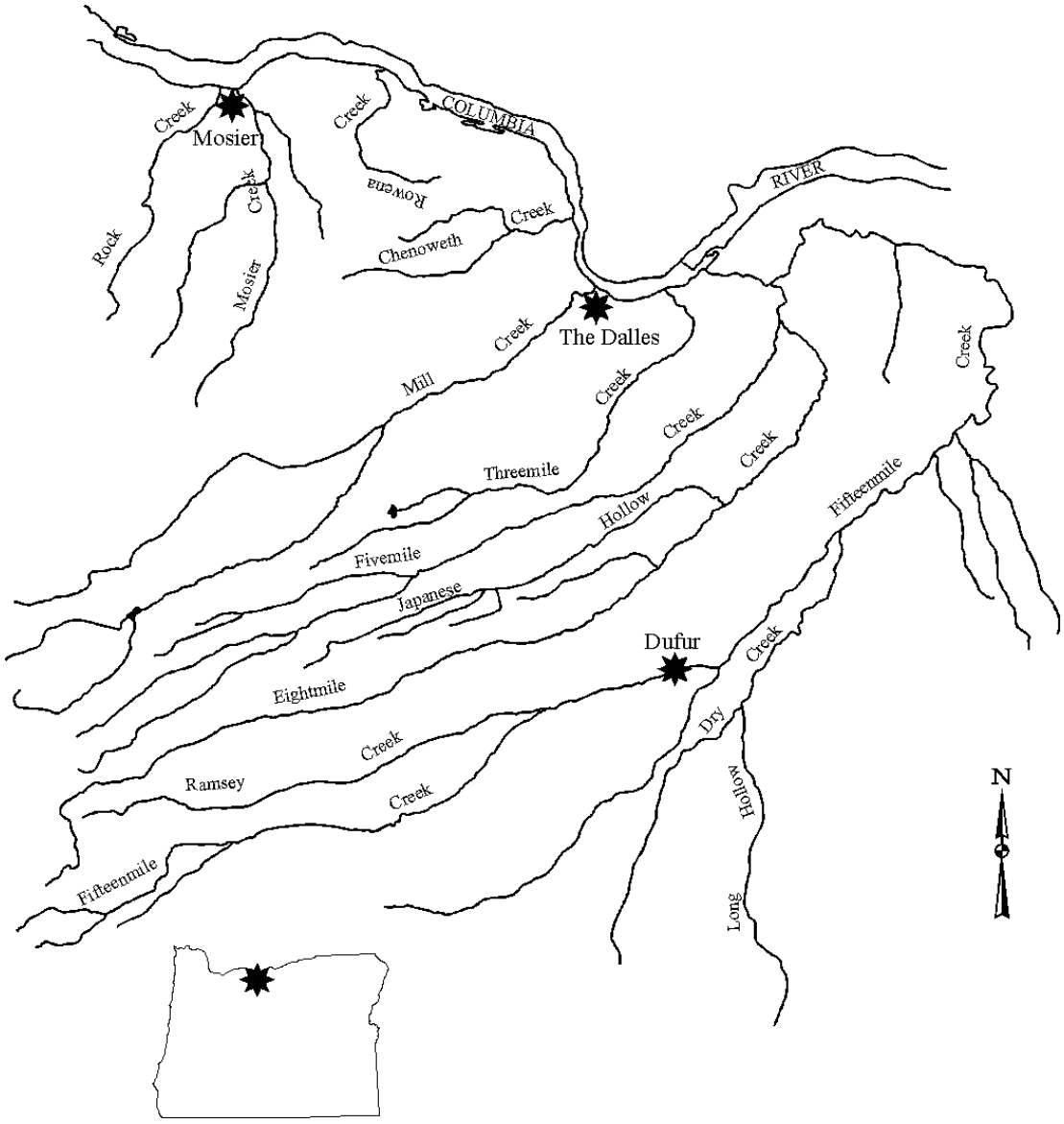

Figure 4. Map of Fifteenmile Creek subbasin and the small tributaries to the Columbia River between Hood River and The Dalles, Oregon

Chenoweth Creek

Chenoweth Creek originates in the mixed pine/oak woodlands west of The Dalles. It flows east and then northeast through rolling hills vegetated with scrub oak to enter the Columbia River at The Dalles (RM 188). The watershed is approximately nine miles long and two to five miles wide. Total drop of Chenoweth Creek from headwater to mouth is approximately 2100 feet. Brown and Badger creeks are the only substantial tributaries to Chenoweth Creek and they are intermittent, as are the upper reaches of Chenoweth Creek. The Chenoweth Creek watershed is bounded on the south by Mill Creek, on the east by the Columbia River, on the north by the Rowena Creek, and on the west by Mosier Creek.

Rowena Creek

Rowena Creek is a short, high gradient, approximately five mile long, stream that flows west and then north from scrub oak covered hills into the Columbia River near the community of Rowena (RM 182). This short stream drops approximately 2000 feet from headwater to mouth. Rowena Creek is bounded on the south by Chenoweth Creek, on the east and north by the Columbia River and on the west by Mosier Creek.

Mosier Creek

Mosier Creek originates in the Mt. Hood National Forest near Gibson Prairie. It flows north out of mixed pine/fir forest through fruit orchards to enter the Columbia River at the town of Mosier (RM 176). The watershed is approximately ten miles long and two to eight miles wide. Elevation change from headwater to mouth is approximately 3300 feet. Mosier Creek is bounded on the south by Mill Creek, on the east by Chenoweth and Rowena Creeks, on the north by the Columbia River and on the west by the Hood River subbasin.

Rock Creek

Rock Creek originates in mixed pine/fir forest and flows north to enter the Columbia River at the town of Mosier (RM 176). The Rock Creek watershed is a much wetter, more west-side ecotype that Mosier Creek. The watershed is approximately seven miles long and one to two miles wide, and drops approximately 2900 feet from headwater to the mouth. Rock Creek is bounded on the east by Mosier Creek, on the north by the Columbia River and on the west and south by the Hood River subbasin.

Water Resources

Summer flows on Threemile Creek are fairly good due to input of irrigation return water in the mid to lower subbasin. Several stoplog dams are located on the middle reach of Threemile Creek for pump withdrawals for irrigation.

The entire South Fork Mill Creek and its tributaries are utilized by the City of The Dalles for its domestic water supply. Crow Creek Reservoir, located on the upper South Fork, is a 23 acre storage facility for domestic water. At the head of South Fork Mill Creek, natural flow is augmented by water diverted by aqueduct from Dog River, in the Hood River subbasin. This supplemental water assures sustained minimum flows in the South Fork above Crow Creek Reservoir. Approximately 90 percent of the water needs of the City of The Dalles are provided by Crow Creek Reservoir. Irrigation withdrawals from North Fork and mainstem Mill Creek are minimal, most of the irrigation needs are provided by The Dalles Irrigation District which does not take water from Mill Creek.

Flows in Mosier Creek are good due to natural ponds and wetland areas in the middle and upper watershed. Irrigation for fruit orchards reduces flow during the summer months.

Chenoweth, Rowena, and Rock creeks are small streams with low summer flows. The upper reaches of these streams are intermittent in the summer and fall. Little or no water is available for irrigation withdrawals from these streams.

Land Use

The majority of the lands bordering Threemile, mainstem Mill, Chenoweth, Rowena, Mosier and Rock creeks are under private ownership. The upper reaches of North Fork Mill Creek are managed by the U.S. Forest Service (USFS). South Fork Mill Creek comprises the City of The Dalles Municipal Watershed and is managed jointly by the USFS and City of The Dalles. A small tract of land in the Mosier Creek watershed is managed by the Bureau of Land Management. The upper Rock Creek watershed is in private industrial timber ownership.

Fish and Wildlife Status

Fish

Winter steelhead, *Oncorhynchus mykiss*, and coho salmon, *O. kisutch*, are found in the lower reaches of Threemile, Mill, Chenoweth, Mosier and Rock creeks. The winter steelhead are mostly wild fish, the coho salmon are likely stray hatchery fish. Fall chinook salmon, *O.* , are found in the lower reaches of Mill Creek. Figure 5 shows distribution of anadromous fish in the small tributaries to the Columbia River between Hood River and The Dalles.

Barriers, both natural and man-made, restrict anadromous fish to the lower reaches of nearly all these streams. In Threemile Creek, anadromous fish passage is blocked at RM 0.5 due to scouring which occurred below an Oregon Department of Transportation culvert during the 1996 flood. Mill Creek Falls, RM 3.0 of South Fork Mill Creek, at 100 feet in height, blocks upstream passage of anadromous fish. North Fork Mill Creek has no known barriers to fish passage, and winter steelhead have been observed as high as the forest boundary. Rowena Creek has a 30 foot falls at the mouth, Mosier Creek has an 80 foot falls at approximately RM 0.5. The mouth of Rock Creek has a porous alluvial fan and fish passage across this fan is possible only at high winter and spring flows. Chenoweth Creek has no known passage barriers to adult anadromous fish.

Resident cutthroat trout, *Salmo clarki clarki,* are found in the mid to upper reaches of Threemile, Mill, Mosier and Rock creeks. In addition, redband trout, *Oncorhynchus mykiss,* are found in Mill and Chenoweth creeks. Life histories of the cutthroat and redband trout in these streams are similar to that of trout in the Fifteenmile Creek subbasin.

Wildlife

Western pond turtle, *Clemmys marmorata,* a state sensitive species, is found around natural and manmade ponds in the middle reaches of Mosier Creek. This is the only documented population of this turtle east of the Cascade Mountains; however, eggs of the western pond turtle have been found in the Threemile Creek watershed.

Painted turtle, *Chrysemys picta,* also a state sensitive species, is found in the marshes and sloughs along the Columbia River at the mouth of Threemile Creek.
A peregrine falcon, *Falco peregrineus anatum,* eyrie is located near Rowena Creek. These falcons nest in rimrock along the Columbia River. Listed as endangered under both state and federal endangered species acts, peregrine falcons have been recommended for reclassification to threatened.

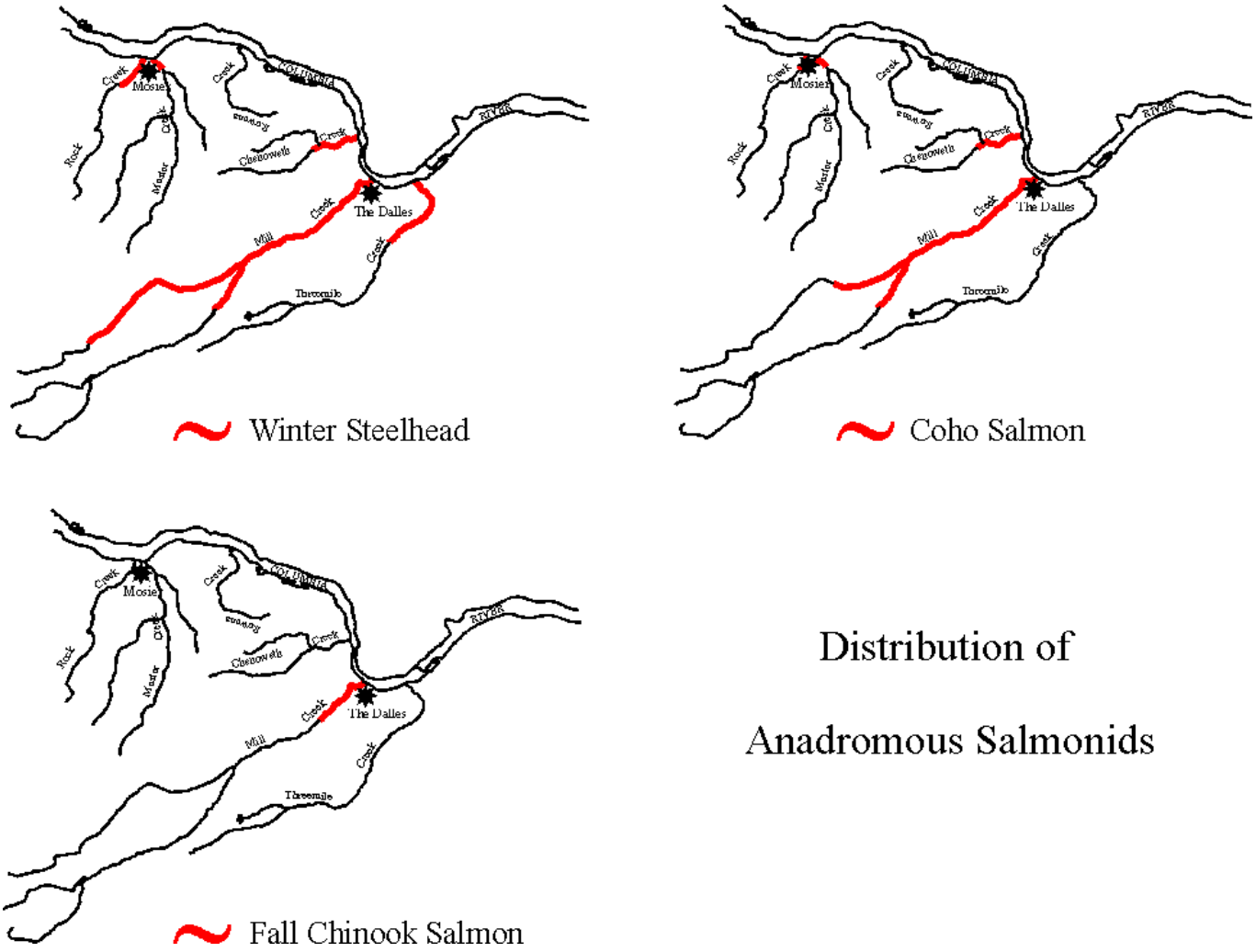

Figure 5. Distribution of anadromous salmonids in the small tributaries to the Columbia River between Hood River and The Dalles, Oregon

Merriam turkeys, *Meleagris gallopavo,* are found in good numbers in the upper and mid portions of Mosier Creek watershed. This large non-native game bird is found in open mixed conifer/oak woodlands.

Blacktail deer, *Odocoileus hemionus columbianus,* are found throughout the Mosier, Chenoweth and Mill Creek watersheds.

Small herds of Rocky Mountain elk, *Cervus canadensis*, are found in the upper portions of Threemile, Mill, Chenoweth, Mosier and Rock creeks.

Habitat Areas and Quality

Threemile Creek has been heavily impacted by agricultural land use practices. Channelization of the low gradient middle reaches of the stream, along with destruction of riparian vegetation, has increased stream velocity and reduced bank stability. Deep channel downcutting, up to 15 feet, has occurred in much of the middle portion of the

watershed. Heavy sediment loads have plugged culverts in the lower portion of the watershed, creating migration obstacles to anadromous salmonids.

The headwaters of North Fork and South Fork Mill Creek are small, shallow, cold and fast flowing streams with few pools. The stream channel is well shaded by conifers and shrubs and streambanks are relatively stable. Crow and Alder creeks, tributaries to South Fork Mill Creek, are relatively short streams with very low summer flows and are generally lacking in quality pools.

Crow Creek Reservoir, at RM 9.0 of South Fork Mill Creek, is a 23 acre impoundment formed by a 100 foot high earth and rock dam. The banks of the reservoir are steep and pool level fluctuates with increased demand for water in the summer months. High summer temperatures and low productivity water limits production of fish in the reservoir.

Bank vegetation, composed of alder and maple, provides good shading and streambanks are relatively stable on South Fork Mill Creek below Crow Creek Reservoir. Upstream passage of anadromous fish is blocked at RM 3.0 of South Fork Mill Creek by 100 foot high falls, Mill Creek Falls.

The approximately 12.4 square miles of heavily forested lands which lie within the City of The Dalles Municipal Watershed provide excellent habitat for wildlife. With the exception of limited public guided tour opportunities and a carefully controlled elk hunt each fall, the Municipal Watershed and its natural resources have been largely protected from public access and use. Timber harvests and transportation activities are the only permitted resource activities, and they are very strictly controlled and monitored by equal management authority between the USFS and the City of The Dalles (Dave Anderson, personal communication).

The North Fork and South Fork of Mill Creek combine to form the mainstem approximately eight miles from the Columbia River. Streambanks are well shaded, however this lower gradient portion of the stream has been impacted by agricultural and urban practices.

Chenoweth Creek is a moderate to low gradient stream which experiences low flows and high temperatures in the summer months. Riparian areas along the stream have been impacted by agricultural and urban practices. Some channel manipulation has occurred, especially near the mouth where the stream flows through an industrial port area.

Rowena Creek is a short, high gradient stream in oak woodland uplands. Riparian areas along the lower reaches have been impacted by agricultural practices. There is a 30 foot waterfall immediately upstream from the mouth of the stream.

Mosier and Rock creeks are small, moderate gradient streams in steep, well forested canyons. The lower two miles of Mosier Creek is bounded by fruit orchards. Most irrigation for these orchards is provided by wells, and there is some concern that the aquifer is being depleted by this practice. Upper reaches of Rock Creek have only remnant pools remaining by the beginning of May each year.

Watershed Assessment

The South Fork Mill Creek and its tributaries comprise the City of The Dalles Municipal Watershed Reserve. The Dalles Municipal Watershed Comprehensive Management plan (1972) provides management direction for activities within the boundaries of The Dalles Watershed. This plan was developed by the City of The Dalles, U.S. Forest Service,

Oregon Department of Forestry, Oregon Department of Fish and Wildlife and U.S. Soil Conservation Service. This plan identifies and defines all natural and cultural resources within the Watershed Reserve.

The Dalles Municipal Watershed Resource Utilization Plan (1989) identifies opportunities for public utilization of the resources of The Dalles Municipal Watershed. This plan delineates activities allowed by permit in the watershed, such as elk hunting, mushroom picking and hiking.

The City of The Dalles Management Plan (Pacific Forest Consultants, Inc. 1995) discusses the timber resources of the City of The Dalles Municipal Watershed and provides a five year timber harvest, stand improvement and reforestation plan which will protect water quality, soils and wildlife.

The Mill Creek Watershed Analysis is currently in press. This analysis, by the U.S. Forest Service, will provide a scientific assessment of processes within and surrounding the watershed to support planning, as well as a baseline from which to assess maintaining or restoring the condition of aquatic, riparian and terrestrial habitats.

Gorge Trust, a non-profit organization, has obtained funding for a watershed assessment of Mosier Creek, to be prepared in the year 2000 by the Mosier Creek Watershed Council. Technical assistance for this assessment will be provided by the Wasco County Soil and Water Conservation Service. This assessment will characterize watershed and stream habitat conditions to support planning for watershed health and will be used to develop a Watershed Action Plan.

No watershed assessments or analyses are available for Threemile, Chenoweth, Rowena or Rock creeks.

Limiting Factors

Fish production in Threemile, Mill, Chenoweth, Mosier and Rock creeks is limited by water quality and quantity. Water quality limitations include seasonal temperature extremes, turbidity and sedimentation. Water quality issues are directly associated with consumptive water withdrawals, watershed conditions and reduction in the inability of the streams to interact with their floodplains. Channel manipulation and land use practices bordering these streams has degraded the riparian vegetation in some areas.

Wildlife abundance is currently limited by past and current land management practices, the spread of non-native plant and wildlife species and urban expansion. Increasing development in The Dalles and Mosier metro areas continues to eliminate remaining wildlife habitats. Land prices continue to rise, making it more economically difficult to preserve remaining undeveloped lands for wildlife. Consumptive water use can affect habitat, and also affects wildlife.

Artificial Production

Legal-sized rainbow trout were stocked in Mosier Creek by ODFW until 1971, Mill Creek was stocked from 1980 to 1997. There are no future plans for releases of hatchery produced fish in Threemile, Mill, Chenoweth, Rowena, Mosier or Rock creeks.

Existing and Past Efforts

U.S. Forest Service

The U.S. Forest Service (USFS) has conducted stream surveys of those portions of Mill Creek that lie within the forest boundary. This includes the upper reaches of the North Fork and the South Fork and its tributaries, Alder and Crow creeks. Fish species presence and upper limits were included in the surveys. In addition, a lake survey of Crow Creek Reservoir has been conducted which included seining for fish to determine species presence and abundance (Gary Asbridge, personal communication).

In 1999, the Barlow Ranger District on the Mt. Hood National Forest was one of three ranger districts in the NW Region involved in a pilot project to conduct fish passage surveys on all culverts and bridges on all fish bearing streams. This survey included Mill Creek.

The USFS maintains approximately 60 miles of forest roads in the upper Mill Creek watershed. Since 1991, 39 miles of road have been decommissioned by the USFS; approximately 25 percent of the funding for decommissioning has been provided by BPA. Many of these roads were located in riparian areas along streams. Two miles of road have been scarified and planted with native vegetation, the remainder have been closed and natural vegetation allowed to encroach and obliterate the road (Ken Huskey, personal communication).

In the upper Mill Creek watershed, approximately 770 acres have been reforested by the USFS after timber harvest. Reforestation units totaling 54 acres on the Mill Creek, 470 acres on South Fork Mill Creek and 246 acres on Crow Creek have been replanted with site appropriate seedling trees (Edan Lira, personal communication).

The USFS currently maintains two temperature monitors in the Mill Creek watershed, one on the South Fork at the forest boundary, and one on the North Fork.

Oregon Department of Fish and Wildlife

Oregon Department of Fish and Wildlife (ODFW) has conducted fish presence and abundance surveys in Threemile, Mill, Chenoweth and Mosier creeks.

Under a statewide screening program, ODFW has installed and maintains two diversion fish screens on the lower mainstem of Mill Creek (Ken Frisby, personal communication).

Oregon Department of Environmental Quality

The Clean Water Act requires each state to set Total Maximum Daily Load allocations (TMDL) for each water body on the 303(d) list. TMDLs are an analytical process for describing the maximum amount of pollutants from all sources that may enter a specific water body without violating water quality standards. Collection of water quality data is a component of the development of TMDLs. Oregon Department of Environmental Quality (DEQ) data collection efforts concentrate on collecting additional data for parameters already included on the 303(d) list. The Wasco County portion of the Middle Columbia-Hood basin, which includes Threemile, Mill, Chenoweth and Mosier watersheds, is scheduled to have sediment and temperature TMDLs completed by the end of 2001. To this end, DEQ began to collect continuous temperature data in 1999 in those watersheds. DEQ will continue to collect temperature data in 2000 in preparation for development of a temperature TMDL. DEQ currently monitors stream temperature at one site in Threemile

Creek, four sites in Mill Creek, one site in Chenoweth Creek, and three sites in Mosier Creek (Bonnie Lamb, personal communication).

Oregon Water Trust

Oregon's Instream Water Rights Law allows water right holders to donate, lease or sell some or all of their water right for transfer to instream use. Oregon Water Trust (OWT), a private, non-profit group, negotiates voluntary leases or permanent purchases of out-of-stream water rights to convert to instream water rights in those streams where acquisition will provide the greatest potential benefits for fish and water quality. OWT annually leases all or a portion of one water right in Mosier Creek (Larry Toll, personal communication). These water rights are held in trust for the people of Oregon by the Oregon Water Resources Department.

Oregon Department of Forestry

Oregon Department of Forestry (ODF) enforces the Oregon Forest Practices Act (OFPA) on all forest lands not federally owned. The OFPA contains guidelines to protect fish bearing streams during logging and other forest management activities. These guidelines include stream buffer zones and riparian management areas.

ODF also provides technical assistance to non-industrial forest land owners concerning insects, diseases, harvest techniques and reforestation. ODF works with forest land owners to develop timber management plans and administers cost-share programs to encourage good forest management practices. One of these programs, the Stewardship Incentive Program (SIP) provides technical and financial assistance to encourage non-industrial private forest landowners to keep their lands and natural resources productive and healthy. It provides funds for landowners of qualifying land to develop Forest Stewardship Plans to guide thinning, reforestation and other timber related work. This program has not been funded by Congress since 1998. One landowner on Mosier Creek has developed a Forest Stewardship Plan and used SIP funds for reforestation work (Larry Hoffman, personal communication).

Wasco County Soil and Water Conservation District

Following the February 1996 flood, Wasco County Soil and Water Conservation District (SWCD) assisted landowners on Mill Creek in watershed protection projects. Rock structures and planting of vegetation were used to stabilize the streambanks. In addition, a hazard mitigation plan was developed to reduce the impacts of future flood events in the watershed (Ron Graves, personal communication).

SWCD has assisted in the formation of a watershed council in the Mosier Creek area. SWCD has applied for Oregon Watershed Enhancement Board (OWEB) grant monies for a watershed assessment of Mosier Creek to be completed in the year 2000 (Ron Graves, personal communication).

SWCD has also provided technical assistance for development of water management plans to improve irrigation efficiency on private lands in the Threemile Creek watershed and to assess problems in the Threemile, Mill and Chenoweth creek watersheds (Ron Graves, personal communication).

City of The Dalles

Chemical, physical and microbiological water quality parameters are monitored in the City of The Dalles Municipal Watershed Reserve. Prior to 1997, nine sites within the watershed were monitored. Currently, only three sites are monitored, the intake to the Wicks Water Treatment Plant and two sites in Crow Creek Reservoir (Dave Anderson, personal communication).

The City of The Dalles is currently seeking assistance from Oregon Department of Fish and Wildlife to upgrade the intake screens of the Wicks Water Treatment Plant. The City desires to replace the existing, substandard screening system with a NMFS-approved fish screen which would also act as a debris screen for water that is drawn into the plant for treatment.

City of Mosier

A portion of lower Mosier Creek is currently the object of a land acquisition effort by the City of Mosier. A grant request to Oregon State Parks is now in the process. This portion of the stream will be afforded some protection if the acquisition is approved (Doug Crow, personal communication).

Gorge Trust and the Mosier Alliance

Gorge Trust and the Mosier Alliance have begun a restoration project, funded by a grant from Columbia River United, on four acres of land in the lower half mile of Rock Creek. Initial work has planted willows along the stream corridor, and more restoration work is planned over the next two years (Doug Crow, personal communication).

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Personal Communication

Dave Anderson, Wicks Water Treatment Plant, City of The Dalles, The Dalles, Oregon.

Gary Asbridge, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

Doug Crow, Gorge Trust, Hood River, Oregon.

Ken Frisby, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Ron Graves, Wasco Count Soil and Water Conservation District, The Dalles, Oregon.

Larry Hoffman, Oregon Department of Forestry, The Dalles, Oregon.

Ken Huskey, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

Bonnie Lamb, Oregon Department of Environmental Quality, Bend, Oregon.

Edan Lira, Barlow Ranger District, Mt. Hood National Forest, Dufur, Oregon.

James Newton, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Larry Toll, Wasco County Watermaster, The Dalles, Oregon.

James Torland, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Subbasin Recommendations for Both Areas

FY 2001 Projects Proposals Review

The Columbia Gorge Province Technical Team, composed of representatives from ODFW, WDFW, CRITFC, CTWSRO and YN met to review FY 2001 project funding proposals on October 10 and 11, 2000. The team reviewed eight subbasin proposals for ongoing and new projects seeking funding for the next three years in the Fifteenmile Subbasin. Each project proposal and team funding recommendation is discussed below as an ongoing or new project. Table 1 presents a matrix summary with the individual projects, their relationship to identified subbasin resource protection /restoration strategies, and the subbasin team's funding recommendation.

Projects and Budgets

Continuation of Ongoing Projects

Project: 21019 - Fifteenmile Subbasin Water Right Acquisition Program

Sponsor: OWT

Short Description:

Acquire 2 cfs of existing Fifteenmile Creek Subbasin water rights on a voluntary basis and transfer to instream water rights under Oregon state law; target acquisitions to maximize fulfillment of habitat objectives for instream flows.

Abbreviated Abstract

The Oregon Water Trust is requesting to continue its Fifteenmile Subbasin Water Right Acquisition Program. In FY 2000 the Fifteenmile Subbasin Program was part of OWT's larger Water Right Acquisition Program (#199908800), covering key streams in basins from Fifteenmile Creek to the Grande Ronde River. The Fifteenmile Subbasin Program is now being separated from our larger Water Right Acquisition Program to fit within the Columbia Gorge Province review process. Funding will pay for water right acquisitions when suitable opportunities become available, and will help support the staff work needed to develop such opportunities.

The purpose of the Program is to acquire water rights on a voluntary basis through purchase, gift, and water conservation projects, and to transfer these rights to instream use. OWT focuses on acquiring existing, senior water rights, which retain their original priority date upon transfer to instream use. Acquisitions are targeted to achieve watershed habitat objectives for instream flows related to water quantity and quality. OWT focuses on stream reaches identified by federal, state and tribal biologists where naturally low flows are exacerbated by water diversions that leave inadequate flows to support fish habitat, and in some cases dewater streams entirely. OWT uses a science-based methodology to evaluate each acquisition opportunity for potential ecological benefit, and also assesses economic viability.

Relationship to Other Projects

Project ID	*Title*	*Nature of Relationship*
199908800	Water Right Acquisition Program	OWT's current multi-year (FY 2000-2002) project has included the Fifteenmile subbasin. It is now being separated from our existing project and submitted under the Columbia Gorge province process.
199304000	Fifteenmile Creek Habitat Restoration Project	Acquisition of existing water rights will contribute to the flow restoration objective of this project that is sponsored by ODFW, CTWSRO, USFS and Wasco Co. SWCD.

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21019 is a request to continue the ongoing program by the Oregon Water Trust to lease or purchase consumptive subbasin surface water rights and convert them to instream water rights. This protect would compliment other water right acquisitions, as well as past and ongoing stream corridor habitat protection restoration activities. The project addresses a number of subbasin management objectives and strategies, including: 1) achieving winter steelhead population objectives, 2) protection and restoration of the riparian and aquatic habitat, 3) protection of listed species, 4) maintaining or increasing wildlife species diversity, 5) increasing wildlife habitat, and 6) potential protection of sensitive or listed wildlife species.

This project addresses subbasin fish objectives 1 (achieve an escapement of 1,500 wild winter steelhead to the mouth of Fifteenmile Creek with a spawner escapement of 900 adult winter steelhead with the remainder available for harvest), and 2 (maintain natural populations of other resident and anadromous salmonids and lamprey in the Fifteenmile Creek subbasin at levels that promote increased utilization of available habitat and that contribute to tribal and non-tribal fisheries as measured by an increasing trend in population abundance and distribution by the year 2012). Furthermore, the project addresses subbasin strategy 2, which is to protect, enhance, and restore aquatic and riparian habitat in the subbasin. Specifically, this project addresses subbasin action item 2.7, which is to implement water conservation and stream flow restoration measures.

Review Comments

The ISRP suggests that a monitoring and evaluation plan is necessary for the water right purchases. Once the purchases are made, the Oregon Resources Department water master has the responsibility to insure the water is provided in-stream, based on the water right's priority date. The M&E is being performed through other instream work being done by the co-managers working in the area. The co-managers will assist OWT to specifically address this concern.

Budget

FY01	FY02	FY03
Rec: $32,000 Category: Urgent/High Priority	Rec: $41,775 Category: Urgent/High Priority	Rec: $54,225 Category: Urgent/High Priority

Projects and Budgets

Project: 199304000 - Fifteenmile Creek Habitat Restoration Project (Request For Multi-Year Funding)

Sponsor: ODFW

Short Description:

Provide for continued operation and maintenance of all completed fish habitat restoration measures within the Fifteenmile Subbasin. Continue photo documentation of habitat recovery and the collection of stream temperature data.

Abbreviated Abstract

The Fifteenmile Creek Subbasin supports the easternmost stocks of winter steelhead and coastal cutthroat trout endemic to the Columbia Basin. In March of 1999, The National Marine Fisheries Service (NMFS) listed steelhead stocks in the Mid Columbia River Evolutionary Significant Unit (ESU) as a threatened species under the Endangered Species Act. The Fifteenmile Creek steelhead population is included in the Mid Columbia River ESU. The Fifteenmile Creek Habitat Improvement Project, which began in 1987, is an ongoing fish habitat restoration project. The project was initially designed primarily to increase the natural production of winter steelhead in the Fifteenmile Subbasin. However, as the project has evolved it has taken on more of a watershed health approach, and attempted to restore watershed function as well as steelhead habitat.

Relationship to Other Projects

Project ID	*Title*	*Nature of Relationship*
19904200	Trout Creek Fish Habitat Restoration Project	Share equipment, tools and some personnel
199304001	Fifteenmile Creek Wild Steelhead Smolt Production Project	Share office space, equipment, tools, data, and some personnel
199802100	Hood River Fish Habitat / Implement Habitat improvement actions	Share some equipment and tools
198805303	Hood River Production Program / CTWS M&E	Share some equipment and tools occasionally
199301900	Hood River Production Program - Oak Springs, Powerdale, Parkdale / O&M	Share some equipment and tools occasionally
199880304	Hood River Production Program / ODFW M&E	Share office space, equipment, tools, and some personnel

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 199304000 is a request to continue maintenance of stream corridor livestock fencing and off-channel livestock water developments associated with over fifty miles of stream. The project addresses a number of subbasin management objectives and strategies, including: 1) achieving winter steelhead population objectives, 2) protection and restoration of the riparian and aquatic habitat, 3) protection of listed species, 4) maintaining or increasing wildlife species diversity, 5) increasing wildlife habitat, and 6) potential protection of sensitive or listed wildlife species.

This project addresses the subbasin fish objectives 1 (achieve an escapement of 1,500 wild winter steelhead to the mouth of Fifteenmile Creek with a spawner escapement of 900 adult winter steelhead with the remainder available for harvest) and 2 (maintain natural populations of other resident and anadromous salmonids and lamprey in the Fifteenmile Creek subbasin at levels that promote increased utilization of available habitat and that contribute to tribal and non-tribal fisheries as measured by an increasing trend in population abundance and distribution by the year 2012). In addition, the project addresses the subbasin strategy 2, to protect, enhance, and restore aquatic and riparian habitat. Specifically, the project addresses subbasin action items 2.3, to continue instream and riparian habitat restoration efforts, and 2.4, to maintain or improve passage for upstream and downstream migrant resident and anadromous salmonids and lamprey.

Review Comments

This project was repeatedly denied funding for monitoring and evaluation in its earlier years. Due to this, data for the earlier years of this project are limited. Future work should include additional M&E to provide the measures that the ISRP is looking for. The co-managers believe that because of this project, the winter steelhead population has been able to maintain itself even during the drought years of the 1990s.

Budget

FY01	*FY02*	*FY03*
Rec: $220,040 Category: Urgent/High Priority	Rec: $223,371 Category: Urgent/High Priority	Rec: $226,702 Category: Urgent/High Priority

Project: 199304001 - 15-Mile Creek Steelhead Smolt Production

Sponsor: ODFW

Short Description:

Estimate subbasin smolt production for the wild population of winter steelhead in Fifteenmile Creek and collect information on selected life history and biological characteristics of downstream migrant fishes endemic to Fifteenmile Creek.

Abbreviated Abstract

Little quantitative data exists on the current status of the winter steelhead population in the Fifteenmile Creek subbasin, and the current status of other populations of anadromous salmonids and resident fishes is primarily derived from undocumented observations. This lack of quantitative information on the indigenous population of wild winter steelhead

prompted the U.S. Fish and Wildlife Service (USFWS) to fund, for one year, a project designed to estimate numbers of wild winter steelhead smolts produced in the subbasin. The project was approved by the USFWS in 1ate 1997 and implemented in 1998. This project was then submitted in 1998 as a Fiscal Year (FY) 1999 Project proposal to the Columbia Basin Fish and Wildlife Authority (CBFWA). The project was approved by the Sub-Regional Review Team for the Columbia Gorge Province and funded in FY 1999 by the Bonneville Power Administration (BPA) as Project No. 1993-040-01 (15-Mile Creek Steelhead Smolt Production). The USFWS and BPA projects both provided funding to operate and maintain a downstream migrant trap located near the mouth of Fifteenmile Creek. A mark and recapture program was implemented at the migrant trap primarily to estimate subbasin winter steelhead smolt production and to count other downstream migrants. However, numbers marked and recaptured at the migrant trap were sufficient to estimate subbasin winter steelhead smolt production as well as spring chinook salmon and cutthroat trout smolt production in the subbasin. Downstream migrant salmonids were also bio-sampled to quantify selected life history patterns and morphometric and meristic characteristics. Data will be used to 1) determine the current status of the indigenous wild winter steelhead population, 2) identify populations of anadromous salmonids, other than winter steelhead, in the subbasin and determine their current status, and 3) provide critical baseline biological and life history information on all anadromous salmonid populations indigenous to the Fifteenmile Creek subbasin.

Relationship to Other Projects

Project ID	*Title*	*Nature of Relationship*
199304001	Fifteenmile Creek Wild Steelhead Smolt Production Project	Share office space, equipment, tools, data, and some personnel
198805303	Hood River Production Program / CTWS M&E	Share some equipment and tools occasionally
199301900	Hood River Production Program - Oak Springs, Powerdale, Parkdale / O&M	Share some equipment and tools occasionally
199880304	Hood River Production Program / ODFW M&E	Share office space, equipment, tools, and some personnel

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 199304001 is a request to continue monitoring steelhead smolt production within the subbasin. Data are collected at a downstream migrant screw trap located near the mouth of Fifteenmile Creek. The Fifteenmile Creek Fish Habitat Restoration Program has been repeatedly criticized for the lack of monitoring and evaluation activities. This project provides the best evaluation of natural fish production success within the subbasin.

This project addresses the subbasin fish objective 1, to achieve an escapement of 1,500 wild winter steelhead to the mouth of Fifteenmile Creek with a spawner escapement of 900 adult winter steelhead with the remainder available for harvest. In addition, the project addresses the subbasin strategy 2, to protect, enhance, and restore aquatic and riparian habitat. Specifically, the project addresses subbasin action item 2.1, which is to determine and monitor abundance, distribution and life history patterns of resident and

anadromous salmonids and lamprey to identify and prioritize habitat restoration needs in the subbasin.

Review Comments

Demographic information is being collected through this program on the steelhead smolts. Due to the limited number of outmigrants, PIT tags are not being used because of the low probability of recovery. The ISRP recommends modifying the scope of this project, which would exceed the needs for the Fifteenmile subbasin at this time. The project provides the foundation of all fish monitoring in the Fifteenmile subbasin for all activities and therefore is considered urgent at this time. If this data were lost, the ability to measure the success of any project in this subbasin would be lost.

Budget

FY01	*FY02*	*FY03*
Rec: $33,704 Category: Urgent/High Priority	Rec: $28,500 Category: Urgent/High Priority	Rec: $30,000 Category: Urgent/High Priority

Project: 21001 - Fifteenmile Creek Riparian Fencing / Physical stream Survey Project

Sponsor: ODFW

Short Description:

Construct approximately 30 miles of riparian protection fence over a three-year period along Fifteenmile Creek and its tributaries. Conduct a physical stream of 90 miles of privately owned stream in the Fifteenmile Subbasin.

Abbreviated Abstract

The Fifteenmile Creek Subbasin supports the easternmost stock of winter steelhead and coastal cutthroat trout endemic to the Columbia Basin. In March of 1999, The National Marine Fisheries Service (NMFS) listed steelhead stocks in the Middle Columbia River Evolutionary Significant Unit (ESU) as a threatened species under the endangered species act. The Fifteenmile Creek winter steelhead population is included in the Middle Columbia River ESU. Since 1987, the Fifteenmile Creek Habitat Improvement Project has been implementing fish habitat restoration work that was primarily designed to increase production of winter steelhead in the Fifteenmile Creek Subbasin. Funding for continued implementation of restoration activities for the Fifteenmile Creek Habitat Improvement Project was terminated in 1999; after that time the project entered a maintenance and operation phase.

Current funding for the Fifteenmile Creek Habitat Improvement Project only allows for the continued operation and maintenance of existing restoration / enhancement structures and no new implementation work. The Fifteenmile Creek Riparian Fencing/Physical Stream Survey Project is a project designed to fulfill two needs identified in the Fifteenmile Creek Subbasin Summary (Newton, Draft). The summary identified continuing riparian habitat restoration, and conducting periodic comprehensive physical and biological surveys as tasks needed to further protect, enhance and restore

aquatic and riparian habitat in the subbasin. The Fifteenmile Creek Riparian Fencing/Physical Stream Survey Project is requesting funding to construct an additional thirty miles of riparian protection fence, and to conduct a comprehensive physical habitat survey on ninety miles of streams throughout the Fifteenmile Creek Subbasin. The proposed project is requesting funding a total of three years of funding to complete the fencing and conduct the physical habitat survey. The riparian protection fencing will compliment the existing fencing projects to increase the number of stream miles that are protected. The physical stream habitat surveys will be used to identify habitat deficiencies and guide future restoration activities in the Subbasin. The physical habitat surveys will additionally act as a monitoring tool to establish a baseline set of data that defines current habitat conditions.

Relationship to Other Projects

Project ID	*Title*	*Nature of Relationship*
19904200	Trout Creek Fish Habitat Restoration Project	Share equipment, tools, and some personnel.
199304001	Fifteenmile Creek Wild Steelhead Smolt Monitoring	Share office space, equipment, tools, data, and some personnel.
199802100	Hood River Fish Habitat / Implement Habitat improvement actions	Share some equipment and tools.
198805303	Hood River Production Program / CTWS M&E	Share some equipment and tools occasionally
199301900	Hood River Production Program - Oak Springs, Powerdale, Parkdale, / O&M	Share some equipment and tools occasionally
199880304	Hood River Production Program / ODFW M&E	Share office space, equipment, tools, data, and some personnel.

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21001 would complement work implemented and maintained under Project 19930400. This project would include more stream riparian corridor livestock fencing to protect and restore the diverse riparian plant community, stream bank stability and instream habitat conditions. More than fifty miles of stream corridor within the subbasin is currently protected from livestock grazing. This project would add up to fifteen additional miles of protected stream corridor and extend downstream the stream reaches treated to date. The project would also compliment the new CREP (Conservation Reserve Enhancement Program) Program, which provides monetary incentives to landowners to protect stream corridors.

The project addresses subbasin management objective 1) achieve an escapement of 1,500 wild adult winter steelhead to the mouth of Fifteenmile Creek, providing a spawner escapement of 900 adult winter steelhead. More specifically the project addresses strategy 2) protect, enhance and restore aquatic and riparian habitat in the subbasin. The project also addresses subbasin action items, including 1) achieving winter steelhead population objectives, 2) protection and restoration of the riparian and aquatic habitat, 3) protection of listed species, 4) maintaining or increasing wildlife species diversity, 5) increasing wildlife habitat, and 6) potential protection of sensitive or listed wildlife

species. This project also includes the physical stream survey to evaluate past restoration measures and help to prioritize future restoration activities within the subbasin.

Specifically, this project addresses subbasin fish objective 1, to achieve an annual escapement of 1,500 wild adult winter steelhead to the mouth of Fifteenmile Creek, providing a spawner escapement of 900 adult winter steelhead, and wildlife objective 1, to maintain or increase wildlife species diversity in the subbasin. The project addresses subbasin fish strategies 2, to protect, enhance and restore aquatic and riparian habitat in the subbasin, and 4, to protect federal and state threatened and sensitive fish species in the subbasin. Wildlife strategies addressed by the project include 1) protect, enhance and restore wildlife habitat in the subbasin, and 2) protect federal and state threatened, endangered and sensitive wildlife species in the subbasin. Specific subbasin fishery action items addressed by the project include 2.2, to conduct periodic comprehensive physical and biological surveys of streams and riparian corridors to identify and prioritize habitat restoration needs in the subbasin, and 2.3, to continue instream and riparian habitat restoration efforts in the subbasin. Wildlife action items addressed include 1.2, to conduct periodic comprehensive habitat and biological surveys to identify and prioritize wildlife habitat restoration needs, and 1.3, to implement wildlife habitat restoration projects in the subbasin.

Review Comments

This project is functionally tied to Project 199304000. Because this is new work and an expanded scope for the original project, the work was submitted under a new project number. The ISRP comments focus on the lack of monitoring; however, this project has been underway for 15 years and monitoring has consistently been underfunded or not funded. Therefore, pre-treatment data is not available in this area. The ISRP suggests tree planting to accelerate the recovery process. The regional manager's experience on the east side streams has been a poor success rate with tree planting. Also, there is concern that artificial planting may have a negative effect on the natural succession process. During the site visits the project sponsors explained that the habitat protection work began at the headwaters (at USFS boundary) and have been working they way downstream. As the work progresses downstream, the steelhead habitat has been expanding. This work is continuing on the same course and is proposed to be implemented on the downstream edge of existing steelhead habitat. The Fifteenmile Creek Watershed Council is currently working on a comprehensive watershed assessment. Until that plan is complete, the restoration in the Fifteenmile is prioritized according to an existing Fifteenmile Creek Habitat Implementation Plan developed by ODFW, CTWSRO and the USFW in 1987 included in the project proposal. Monitoring and evaluation should be included in future scopes of work to measure implementation of activities proposed here. To measure the direct effects on fish abundance with any scientific credibility is very difficult without an appropriate control stream for comparison.

Budget

FY01	*FY02*	*FY03*
Rec: $151,685 Category: Urgent/High Priority	Rec: $157,579 Category: Urgent/High Priority	Rec: $162,579 Category: Urgent/High Priority

Project: 21012 - Evaluate Status of Coastal Cutthroat Trout in the Columbia River Basin above Bonneville Dam

Sponsor: USGS-CRRL

Short Description:

Survey Columbia River tributaries above Bonneville Dam for coastal cutthroat trout to determine population status, to identify limiting factors, and to understand the role of current and past human and natural disturbances affecting status.

Abbreviated Abstract

The goal of the proposed study is to provide vital information on the current status of cutthroat trout populations in the lower Columbia River basin as a necessary prerequisite to future recovery efforts. Study objectives are to 1) document existing data on historical and current distribution and describe management practices that affect the coastal form of cutthroat trout in the Columbia River basin above Bonneville Dam, and 2) determine status of naturally reproducing populations of cutthroat trout above Bonneville Dam. Objective 1 will be conducted from 2001-02 using a combination of questionnaires and a review of existing biological data and land-use, production, and harvest management practices. Objective 2 will be conducted from 2001-03 by conducting fish and habitat surveys.

Relationship to Other Projects

Project ID	*Title*	*Nature of Relationship*
9304000	Fifteenmile Creek Habitat Restoration Project	We will contact project biologists for their help in identifying potential populations of cutthroat trout populations and we will survey this watershed. Habitat improvements for steelhead could help cutthroat trout.
9405400	Bull Trout Life History Project -- NE Oregon	We will contact project biologists for their help in identifying potential populations of cutthroat trout populations in the Hood River watershed, a watershed that we will survey for the proposed project.
8805304	Hood River Production Program	We will contact project biologists for their help in identifying potential populations of cutthroat trout populations in the Hood River watershed, a watershed that we will survey for the proposed project.
9204101	Fish Passage Evaluations - Lower Columbia River	This project may well have data on passage of sea-run cutthroat trout to the Hood, White Salmon, Little White Salmon, Klickitat, and Wind rivers, all of which we plan to survey during the proposed project.
8812000	Yakima Natural Production and Enhancement Program	This project's activities and findings in the Klickitat watershed may help us locate populations of cutthroat trout.
9801900	Wind River Watershed Project	We will contact project biologists for their help in identifying potential populations of cutthroat trout populations in the Wind River watershed, a watershed that we will survey for the proposed project.
9033	Document Native Trout Populations	We will contact project biologist to see what they have found in some of the upper reaches of watersheds that we intend to sample. Our surveys will be more extensive (covering the Gorge Province) and in some areas more intensive (population estimates).

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21012 was a request for funding a project to evaluate the status of coastal cutthroat in the province. The team recommended funding with a high priority for project objective 1, which proposed to collect available data on cutthroat distribution and numbers. Other past or ongoing projects have collected data on cutthroat populations in the subbasin. This project would address the potential protection of sensitive or listed fish species in the subbasin.

This project addresses subbasin fishery objective 2, to maintain natural populations of other resident and anadromous salmonids and lamprey in the subbasin. The project also addresses subbasin fish strategy 4, to protect federal and state threatened and sensitive fish species in the subbasin. Specifically the project addresses subbasin fish action item 2.1, to determine and monitor abundance, distribution and life history patterns of resident and anadromous salmonids and lamprey in the subbasin.

Review Comments

Many projects within the basin are finding cutthroat information. An organized accumulation of this information is needed. This project should first accumulate all available information from all fish and wildlife agencies and tribes in the basin. Fieldwork should then focus on subbasins and areas where data is missing.

Budget

FY01	FY02	FY03
Rec: $39,770 Category: Urgent/High Priority Notes: Funding for Objective 1 should be considered a high priority. The other objectives should be considered high priority in FY 02 and 03 if warranted based on the results from FY 01. We recommend funding only Objective 1 during FY 2001.	Rec: $240,926 Category: Urgent/High Priority	Rec: $253,038 Category: Urgent/High Priority

Project: 21014 - Mitigate Streambank Sediment Sources in Fifteenmile Watershed using Bioengineering Techniques

Sponsor: Wasco SWCD

Short Description:

Treat seven sites of active streambank erosion using bioengineering techniques that promote revegetation of banks, dissipates hydrologic energy and create instream habitat.

Abbreviated Abstract

This project will use bioengineering techniques to address seven active erosion sites on four properties in the Fifteenmile Watershed. The project designs will add structure to the stream, routing high flows away from the erosive banks and dissipating excess hydrologic energy of the stream. Hardening of the banks will be avoided, where possible. All sites will include re-vegetation of the banks using locally adapted willow cuttings. Six sites will use deflectors or upstream barbs to dissipate and redirect energy. Four sites will replace riparian fencing damaged by erosion. At the two most critical sites, which are quickly eroding tilled fields, banks will be reshaped and strengthened using toe rock and biodegradable geotextile fabric lifts planted with an ODFW-approved native grass mix

and locally-adapted willows. All instream work will be accomplished in the instream work window. Private landowners will provide cost-share for all practices, either in cash or in-kind. Reduction of sediment loading from eroding streambanks will benefit winter steelhead and other species.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
199304000	Fifteenmile Creek Habitat Restoration Project	Complimentary projects. Restoration project implements fencing and off stream water developments but includes no active bank restoration. This project addresses site- specific sediment sources.
199304001	15-Mile Creek Steelhead Smolt Production	Complimentary projects
	Mid-Columbia Riparian Buffers	Complimentary projects. This project addresses site- specific sediment problems, while Buffer project extends work begun by ODFW, enrolling stream reaches in the CREP program.
	Accelerate the Application of Integrated Pest Management to Reduce the Risk of Pesticide Pollution in Wasco County Orchards in Fifteenmile Watershed	Complimentary projects - this proposal focuses on stream/riparian restoration, while the referenced proposal works on upland sources of pollution.

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21014 is a "shotgun approach" which proposes to treat stream bank erosion at widely scattered subbasin sites with bioengineering technology. The team was concerned that these projects were aimed at protection of cropland rather than improvement of fish and wildlife habitat. The project does little or nothing toward addressing subbasin objectives and strategies for resource protect and/or restoration. The technology is expensive and the success of this type of application is questionable. It did not appear that there were appreciable fish and wildlife benefits from the project because of the limited scope of this proposal.

This project attempts to address subbasin fish objective 1, to achieve an escapement of 1,500 wild adult winter steelhead with a spawner escapement of 900 wild adult winter steelhead. The project also attempts to address subbasin fish strategy 2, to protect, enhance and restore aquatic and riparian habitat in the subbasin. Specifically, the project tries to address subbasin fish action item 2.3, to continue instream and riparian habitat restoration efforts in the subbasin.

Review Comments

This project exemplifies the patchwork criticism from the ISRP. The work is based on opportunities by cooperative landowners and not by a prioritized method of implementation. This project should wait for a comprehensive habitat assessment. The

cost per mile for this type of work is very high without a major contribution to the stream for fish and wildlife. There are other techniques that could be used at this site that would cost less and provide greater benefits to the fish. We would like to see a more explicit plan for disseminating the information to other farmers and ranchers to encourage more landowner participation in projects like this. Some of the sites identified in the proposal do address current fish and wildlife management priorities. Other sites within the proposal would not rank as high priorities within the Fifteenmile subbasin. It would be interesting for the project sponsors to provide alternate techniques that may focus on benefits for fish, with a monitoring plan to measure benefits of the various restoration techniques.

Budget

FY01	FY02	FY03
Rec: $159,355 Category: Recommended Action	Rec: $39,149 Category: Recommended Action	Rec: $4,430 Category: Recommended Action

Project: 21015 - Riparian Buffers

Sponsor: Wasco SWCD

Short Description:

Implements CREP riparian buffer protection/restoration program using cost-share provided by USDA, state of Oregon, and private landowners.

Abbreviated Abstract

Wasco County SWCD provides local leadership in implementation of several full-scale watershed enhancement projects focused on improving watershed health. Working in close partnership with NRCS our team's strength is our ability to develop and implement scientifically sound, economically feasible resource management plans for private landowners.

This project to implement riparian buffer systems in the Mid-Columbia addresses limiting factors identified in the Fifteenmile Subbasin Summary, June 30, 2000. It will dedicate 1.0 FTE to provide the technical planning support needed to implement at least 36 riparian buffer system contracts on approximately 872 acres covering an estimated 40 miles of anadromous fish streams. Buffer widths will be between 35 and 180 ft. on each side of the stream. Implementation will include prescribed plantings, fencing, and related practices. Actual implementation costs, lease payments, and maintenance costs will be borne by existing USDA's Conservation Reserve and Conservation Reserve Enhancement programs. Leases will be for 10-15 year periods. This program meets a critical need in Fifteenmile Watershed in particular where existing ODFW riparian lease agreements begin to expire soon. Lack of staffing to conduct assessments and develop plans has created a growing backlog of potential projects. Thirteen participants are signed up, awaiting assessment and plan development. Landowners on 36 additional reaches have

expressed interest in entering into long-term buffer contracts. The majority of the proposed work will be done in the Hood and Fifteenmile subbasins with a small amount in adjacent subbasins.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
199304000	Fifteenmile Creek Habitat Improvement Project	Complimentary. Extends work began by ODFW in 1987. ODFW Riparian lease agreements begin to expire soon. This project will implement riparian buffers through 10-15 year lease agreements funded by Oregon and USDA under the CRP and CREP program
199304001	15-Mile Creek Steelhead Smolt Production	Complementary project. Establishes 35 ft. to 160 ft. riparian buffers each side of stream, establishing and protecting fish habitat.

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21015 was a request for one FTE (full time equivalent) employee to help administer the new CREP stream corridor restoration program funded by USDA. The proponents indicated that more than 30 landowners have applied for enrollment in the CREP Program, but NRCS and SWCD staffing does not provide time for processing applications and enrolling landowners. This project would compliment past and ongoing stream corridor restoration activities in the subbasin. The project addresses a number of subbasin management objectives and strategies, including: 1) achieving winter steelhead population objectives, 2) protection and restoration of the riparian and aquatic habitat, 3) protection of listed species, 4) maintaining or increasing wildlife species diversity, 5) increasing wildlife habitat, and 6) potential protection of sensitive or listed wildlife species.

Specifically, this project will facilitate work that will addresses subbasin fish objectives 1, to achieve an escapement of 1,500 wild adult winter steelhead with a spawner escapement of 900 wild adult winter steelhead, and objective 2, to maintain natural populations of other resident and anadromous salmonids and lamprey. The project also addresses the subbasin wildlife objective 1, to maintain or increase wildlife species diversity in the subbasin. The project will ultimately result in work that will address subbasin fish strategies 2, to protect, enhance and restore aquatic and riparian habitat in the subbasin and 4, to protect federal and state threatened and sensitive fish species in the subbasin. Wildlife strategies that will be addressed include action items 1.3, to implement wildlife habitat restoration projects in the subbasin, and 1.5, to more actively manage lands set aside for wildlife such as CREP to increase species diversity on those lands.

Review Comments

The benefits that could be realized for fish and wildlife by funding this project could potentially be very high. The under-riding question, however, is whether one federal agency should be funding a staff position to facilitate another federal program's

implementation. This is a major policy decision to be made by CBFWA Members, BPA, and NWPPC to determine if there any other process to fund this position. The personality of the individual may seriously influence the effectiveness of the position.

Budget

FY01	FY02	FY03
Rec: $73,414 Category: Do Not Fund Notes: Funding this project raises a policy question that should be addressed by CBFWA, NWPPC and BPA.	Rec: $75,616 Category: Do Not Fund	Rec: $77,884 Category: Do Not Fund

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Project: 21016 - Accelerate the Application of Integrated Fruit Management to Reduce the Risk of Pesticide Pollution in Fifteenmile Subbasin Orchards

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Sponsor: Wy'East RC&D
Short Description:

Accelerate the implementation of Integrated Fruit Management in orchards that use new generation pesticides and sprayer technology to reduce the risk of pollution to land and aquatic resources from pesticides affecting salmon and steelhead.

Abbreviated Abstract

This project is to prevent pesticide pollution from orchard operations in the Fifteenmile Subbasin, 17070105. The Wasco County Fruit and Produce League orchard growers objective is to implement Integrated Fruit Management (IFP) practices with special attention on pest management. Growers will reduce the use of broad-spectrum pesticides replaced with new generation less toxic pesticides. The new generation pesticides reduce the risk of pollution to land and aquatic resources affecting salmon and other endangered species. The use of less toxic pesticides requires growers to be more precise in the timing of the application of these pesticides because they don't persist in the environment like broad-spectrum pesticides. Growers will use a network of remote weather stations in orchards to collect precise weather data to calculate pest and disease degree-day models for specific orchard sites. Orchard growers will use the degree-day models and data to make better decisions for making precisely timed applications of new generation pesticides. A second component of the project will conduct research at Mid-Columbia Agriculture Research and Extension Center to reduce spray drift utilizing low-volume applications of pesticides for insect and disease control in older tree fruit orchards.

Relationship to Other Projects

Project ID	Title	Nature of Relationship
199304000	Fifteenmile Creek Habitat Restoration Project	Complimentary project - addresses need in subbasin

Project ID	Title	Nature of Relationship
199304001	15-Mile Creek Steelhead Smolt Production	Complimentary project - addresses need in subbasin
	Mid-Columbia CREP Planner (Proposed)	Complimentary project - addresses need in subbasin

Relationship to Existing Goals, Objectives and Strategies

Project Proposal 21016 was a request for funding to accelerate the implementation of Integrated Fruit Management in subbasin orchards in order to prevent agricultural chemicals from entering streams or adversely affecting fish or wildlife. Neither the subbasin assessment nor DEQ has identified orchard chemicals as a water quality-limiting factor within the subbasin. It did not appear that there were appreciable fish and wildlife benefits from the project because of the limited scope of this proposal.

Specifically, it does not appear that this project addresses any of the subbasin fish or wildlife objectives, strategies, or action items.

Review Comments

In the CBFWA technical review, the Managers focused on the benefits to fish and wildlife. If a technical review were provided in the context of benefits to orchard production, the review would probably exhibit different results. Pesticides in the Fifteenmile Subbasin have not been identified as a major limiting factor for fish and wildlife in the subbasin summary. The proposal does not show a direct link to fish and wildlife. The orchards in this subbasin are not generally located in the riparian zone and the sponsors showed no tie to providing data and information to the local fish and wildlife managers. No monitoring and evaluation is presented to measure benefits to fish and wildlife.

Budget

FY01	FY02	FY03
Rec: $308,772 Category: Do Not Fund	Rec: $214,827 Category: Do Not Fund	Rec: $214,858 Category: Do Not Fund

Research, Monitoring and Evaluation Activities

Noteworthy ongoing monitoring and evaluation activities include regular collection of stream temperature and flow data at a number of sites strategically located within the subbasin. This work was recently expanded with assistance from Oregon DEQ, as they collect data for development of subbasin TMDLs (total maximum daily load). TMDLs will be developed for temperature, turbidity/sediment, and agricultural chemicals. Monitoring is continuing on fish out-migrants leaving the subbasin. Data have been collected on juvenile steelhead, cutthroat and Pacific lamprey. The recovery of the riparian vegetative corridor and stream channel attributes is being monitored with a variety of photo points throughout the subbasin.

A proposal for a comprehensive physical stream survey was contained in the proposal for Project 21001. This survey would help to evaluate past stream restoration activities and prioritize future restoration activities.

New project proposal 21005 would result in the assessment of wildlife habitat and habitat condition within the subbasin. The subbasin review team recommended that project 21012 receive partial funding to help evaluate the status of coastal cutthroat within the subbasin.

Needed Future Actions

BPA funding should be used in the future to restore the condition and functionality of streams within the subbasin. These efforts can complement other programs, such as CREP and the Agricultural Water Quality Management Plan, which are intended to encourage landowner participation. Future BPA funding will be needed to ensure that habitat restoration, fish passage, off-channel water developments, and monitoring and evaluation continue within the subbasin. This maintenance is needed to insure the optimal benefits from the sizeable investment that has been made to restore subbasin streams and their associated fish populations.

Data collected on coastal cutthroat trout during the monitoring of Fifteenmile subbasin out-migrants can be assembled to aid in the collection of existing data associated with Project 21012. Similar efforts may be needed for pacific lamprey if either or both populations are eventually listed under ESA.

Data on adult steelhead escapement to the Fifteenmile Subbasin is needed to estimate smolt to adult and in-basin survival. In-basin survival data, such as smolts per adult spawner, is needed to evaluate effectiveness of past and ongoing subbasin habitat restoration measures. An adult trap located near the mouth of Fifteenmile Creek is needed to accomplish this objective by providing the opportunity to enumerate adult steelhead escapement. This potential trapping facility could also be used to protect the genetic integrity of the subbasin's indigenous fish stocks by preventing stray hatchery fish from passing upstream to spawn.

Acquisition of additional consumptive water rights and their conversion to instream water rights is crucial to the ultimate success of the subbasin fishery restoration projects. Water right conversion can result in senior water rights for instream purposes, which is imperative for improvement of late summer/fall stream flow and water quality.

Actions by Others

Rapid implementation of the CREP Program by the SWCDs and NRCS would significantly aid in the overall restoration of stream habitat and ultimately fish populations within the subbasin. Landowners have been encouraged to participate in this restoration program through monetary as well as regulatory incentives. A priority should be given to enrolling as many landowners as soon as possible.

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

The NRCS and SWCDs will continue to work with private landowners to reduce erosion from the upland portions of the watershed. The Agricultural Water Quality

Management Plans need to be implemented and remedial or enforcement actions taken when and where appropriate.

ODFW must continue to work with other funding sources to install and maintain effective fish protection screens on all water diversions or withdrawal points within the subbasin.

Table 1. Fifteenmile Subbasin Summary FY 2001 BPA Funding Proposal Matrix

Project Proposal ID	21001	21014	21015	21016	21019	199304000	199304001	21012	
Provincial Team Funding Recommendation	Urgent/High Priority	Recommended Action	Do Not Fund	Do Not Fund	Urgent/High Priority	Urgent/High Priority	Urgent/High Priority	Urgent/High Priority	
Overall Fish Objectives and Strategies									
Objective 1. Achieve annual StW escapement of 1,500 wild adults to Fifteenmile Creek with 900 wild spawners	+		+		+	+	+		
Strategy 1. Minimize interaction of hatchery fish stocks with natural Fifteenmile Creek population.									
Strategy 2. Protect, enhance, and restore aquatic and riparian habitat in the subbasin.	+		+		+	+			
Strategy 3. Protect, enhance, and restore upland watershed habitat in the subbasin.			+						
Strategy 4. Protect federal and state threatened and sensitive fish species in the subbasin.	+		+		+	+		+	
Strategy 5. Integrate conservation law enforcement protection into fish, wildlife, and habitat management.									
Wildlife Objective or Strategy									
Objective 1. Maintain or increase wildlife species diversity in the Fifteenmile Creek subbasin.	+		+		+	+			
Strategy 1. Protect, enhance, and restore wildlife habitat in the subbasin.	+		+		+	+			
Strategy 2. Protect federal and state threatened, endangered, and sensitive wildlife species in the subbasin.	+		+			+			

These project titles are referenced by ID above:

21001 - Fifteenmile Creek riparian/fencing physical stream survey project
21014 - Mitigate stream bank sediment sources in Fifteenmile watershed using bioengineering techniques
21015 - Riparian Buffers
21016 - Accelerate application of integrated fruit management to reduce the risk of pesticide pollution in Fifteenmile Subbasin
21019 - Fifteenmile Subbasin water acquisition program
199304000 - Fifteenmile Creek habitat restoration project (request for multi-year funding)
199304001 - Fifteenmile Creek steelhead smolt production
21012 - Evaluate status of coastal cutthroat trout in the Columbia River Basin above Bonneville Dam

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