Lower Rogue Watershed Action Plan

This Action Plan is meant to guide long-term restoration, enhancement, and conservation efforts in the Lower Rogue River and its tributaries; with emphasis on water quality and quantity, floodplain connectivity, off-channel habitat, and seral conditions.

ACKNOWLEDGMENTS

We could not have produced the Lower Rogue Watershed Action Plan without the assistance of past and present watershed council members, staff, and our partners. Thank you also to the Stakeholder Action Plan Team – their participation and thoughtful review were essential to the success of this project.

"I was in love with the wilderness, and the pristine Rogue River was a remnant of what America had been." ~Zane Grey

(Photo credit: Curry Historical Society)

For more information or copies of this plan, please visit our website at www.currywatersheds.org, or contact the Lower Rogue Watershed Council at 541-247-2755 (email: info@currywatersheds.org).

**Suggested citation:* Timchak, K.L. 2015 (unpublished). *Lower Rogue Watershed Action Plan.* Lower Rogue Watershed Council.

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Introduction

The Lower Rogue Watershed Council (LRWC) has a Watershed Assessment that was completed in 2005, but currently has no action plan identifying restoration or protection priorities for the Lower Rogue River basin. An action plan would serve as a valuable tool for the Council.

Four dams have now been breached in the Rogue basin - Savage Rapids, Gold Ray, Gold Hill, and Elk Creek each created bottlenecks on the Rogue's main stem in the recent past. The Rogue River now runs unrestricted for 157 miles below Lost Creek Dam; from Lost Creek Lake to the Pacific Ocean. At present, the Rogue River now has access to more habitat than it has for many years. We not only want to foster these populations, but we want to continue to protect and enhance these habitats well into the future. The photo on the right is of the Rogue River estuary; "*where the Rogue River meets the Pacific Ocean*" in Gold Beach, Oregon (*Photo courtesy of Kelly Timchak*).

Since ancient times, the Rogue River has provided humans with sustenance, both physical and aesthetic. Today, the city of Gold Beach is dependent on the lower Rogue River as a source of clean drinking water; with other local water districts dependent on water sources within the watershed as well. In our region, human health, economics, and wildlife alike are dependent on the preservation and enhancement of the life-sustaining capabilities of the lower Rogue River.

Developing an appropriate Watershed Action Plan will result in numerous benefits, and help to bring ecological uplift to the entire watershed. The Rogue River supports runs of spring and fall chinook, coho, summer and winter steelhead, cutthroat trout, Pacific lamprey, and white and green sturgeon. The watershed has long been recognized for its extraordinary biodiversity, and developing a sound Action Plan will help keep it that way for generations to come.

Purpose

The Lower Rogue Watershed Action Plan (the Plan) is intended to identify cooperative projects, as well as the overall strategies and priorities used to improve watershed health in the Lower Rogue River watershed. This Action Plan is part of a statewide strategy, the *Oregon Plan for Salmon and Watersheds*[1], to restore Oregon's fisheries to sustainable and productive levels that will provide substantial environmental, cultural, and economic benefits, and to improve water quality using locally developed solutions.

This Action Plan aims to benefit the Lower Rogue River and its rural communities by promoting watershed health and sustainable resource use. Specific goals of the Plan are to support economic and environmentally sound agriculture and forestry practices, while preserving a high quality of life for future generations.

This Plan was prepared with financial help from the Oregon Watershed Enhancement Board, the Curry County Soil & Water Conservation District, the Oregon Department of Fish & Wildlife, and the USDA Forest Service.

Description of Watershed

The Lower Rogue watershed is defined herein for the purposes of this document as the Lower Rogue and its tributaries downstream from river mile 55 and includes the Kelsey Creek watershed, near the Curry County/ Josephine County Line in Southwest Oregon. While the Lower Rogue Watershed Council includes the Illinois River and its tributaries below river mile 6.6 in its interest, this area is considered by the state of Oregon as part of the Illinois River Watershed and has been assessed by the Illinois Valley Watershed Council.

The picture to the left shows the confluence of the Illinois and the Rogue Rivers[2]. In addition, the Lower Rogue Watershed hydrologic unit extends beyond river mile 55; however, the portion beyond river mile 55 is part of the Rogue River Watershed Council's territory as defined by the state of Oregon[3].

[1] Oregon Watershed Enhancement Board. 1997. *The Oregon Plan for Salmon andWatersheds and the Healthy Streams Partnership*. State of Oregon. Salem, Oregon.
[2] The Illinois is shown entering the photo on the right to meet the Rogue River, near the town of Agness, OR. *(Photo credit: Kelly Timchak, 2015)*
[3] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.

The Lower Rogue basin is 226,668 acres and empties into the Pacific Ocean at Gold Beach, Oregon. The basin lies entirely within the Klamath Mountains Physiographic province, an area noted for steep, rugged terrain, narrow valleys, and sharp divides. Due to the geologic substrates present, most of the region is subject to varying degrees of instability. The topography of the basin reflects long-term erosion of a slowly rising upland; the result being a ridge system of roughly uniform elevation. Land use within the basin is primarily forestry related. No major urban areas, industrial centers, or agricultural operations are present in the lower Rogue basin. Human population of the Lower Rogue River basin is less than 10% of the population of the remainder of the Rogue River watershed as a whole, mostly due to the populations of Medford and Grants Pass, and the surrounding area.

Streams in this watershed provide habitat for a wide variety of cold-water species including coho salmon, spring chinook salmon, fall chinook salmon, summer and winter steelhead, multiple species of resident trout, amphibians and other fish including Pacific lamprey, green sturgeon, white sturgeon, Klamath smallscale sucker, speckled dace, prickly sculpin and others. The Rogue estuary provides important habitat for marine mammals, birds and a wide variety of fish[1].

Subwatersheds

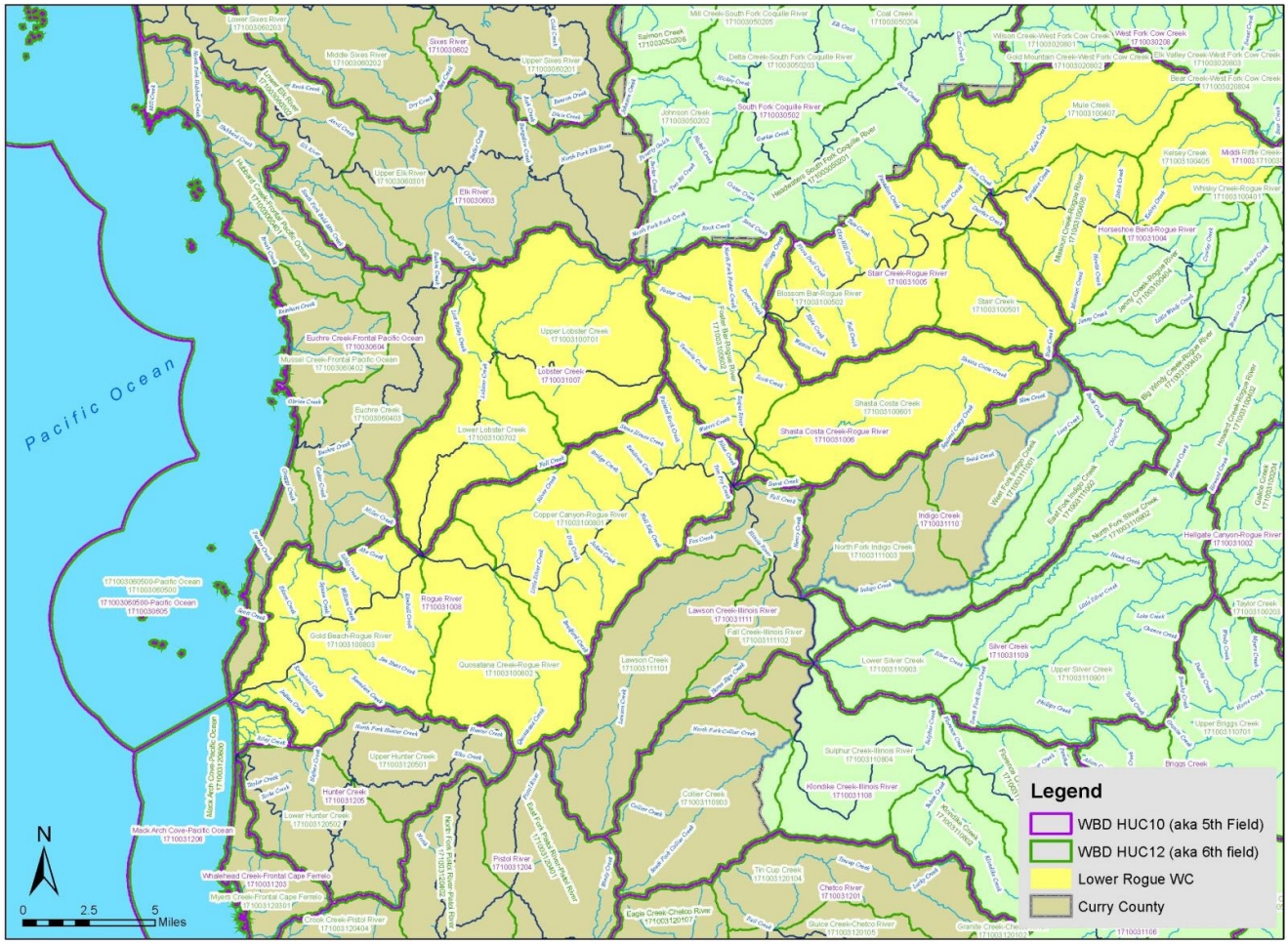
This plan includes 12 subwatersheds of the lower Rogue River watershed and one coastal watershed adjacent to the mouth of the Rogue River. These delineations are based on several factors including; hydrologic boundaries, preexisting boundaries established by federal agencies, changes in topography, and river designations (e.g. wild & scenic, recreational)[2].

These subwatersheds correspond to 12 digit hydrological unit codes (HUC) as delineated by the United States Geologic Society; Gold Beach-Rogue River, Quosatana Creek - Rogue River, Copper Canyon-Rogue River, Lower Lobster Creek, Upper Lobster Creek, Foster Bar-Rogue River, Shasta Costa Creek, Blossom Bar-Rogue River, Stair Creek, Missouri Creek-Rogue River, Mule Creek, and Kelsey Creek. For the purposes of this plan this also includes the coastal subwatershed Myers Creek – Frontal Cape Ferrelo. See figure below for a map of the Lower Rogue River Watershed boundaries.

[1] Oregon Department of Environmental Quality (OR DEQ). 2012. *Rogue Basin Water Quality Status and Action Plan Summary.*

[2] United States Geologic Society. *Water Resources of the United Sates*. Web access on March 3, 2015: http://water.usgs.gov/GIS/huc.html.

Figure 1: A HUC 12 map of the Lower Rogue River subwatershed boundaries



Land Ownership and Use

Within the Lower Rogue assessment area, 75% of the watershed is in public ownership and includes both federal and state lands. Most of the federal ownership is managed by the US Forest Service, with most of BLM's management being in the Wild and Scenic area in the Upper Rogue Mainstem. Public lands include 87% forest, 13% young nonforest, and <0.5% each in urban/agriculture and water[1].

Private lands account for 25 percent of the watershed and include 74% forest, 21% young nonforest, 3% urban/agriculture, and 2% water. The Gold Beach urban growth boundary (UGB) contains 0.14 percent of the private lands and includes 12% forest, 45% young nonforest, 40% urban/agriculture, and 3% water[1].

Figure 2 displays the divide of land ownership, while *Figure 3* displays the divide of land use in the Lower Rogue.

[1] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.

Figure 2: Land ownership in the Lower Rogue River

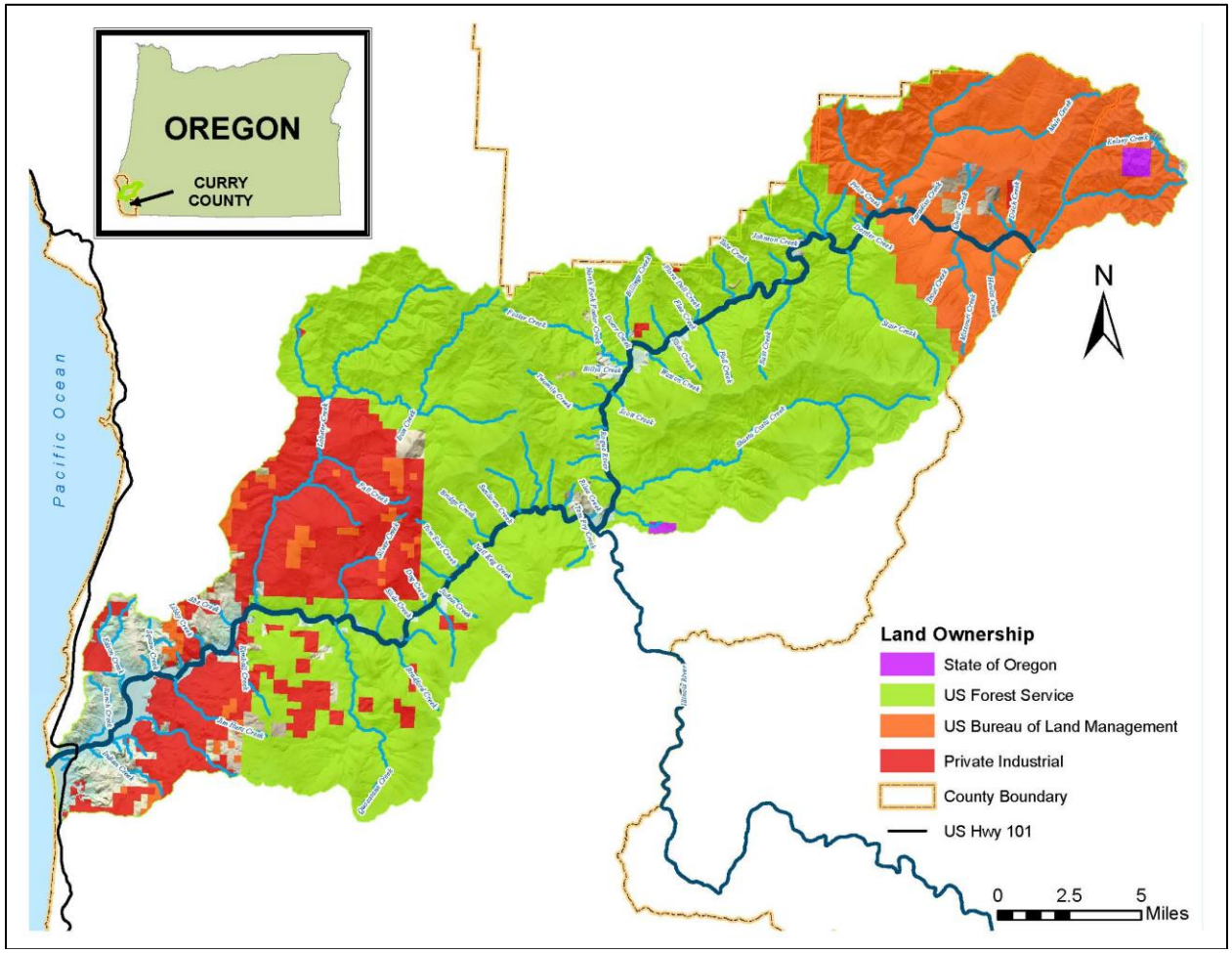
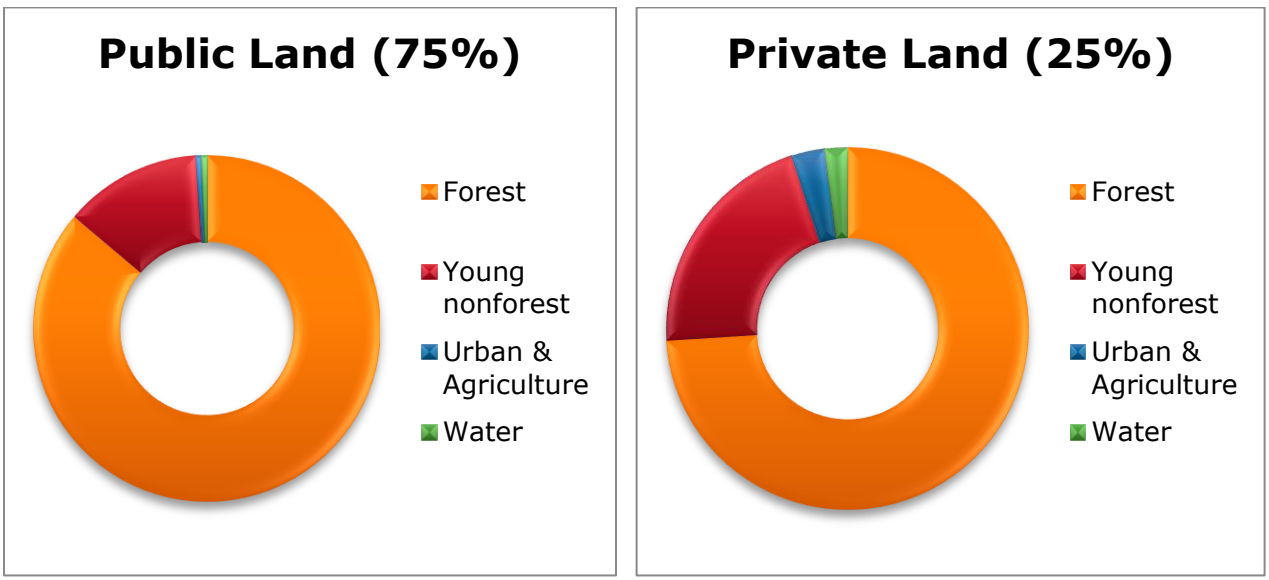


Figure 3: The ratio of Public Lands (~75%) and Private Lands (~25%) in the lower Rogue River



Demographics

The City of Gold Beach has a population of about 2000. The total population within 5 miles of the estuary is approximately 5000, which includes small communities and an urban and rural interface concentrated along the Rogue River estuary and its tributaries. According to the 2010 Census, the median age in the city was 50.6 years. There were 16.5 percent of residents under the age of 18; 5.8 percent between the ages of 18 and 24; 18.4 percent from 25 to 44; 36.5 percent from 45 to 64; and 22.7 percent were 65 years of age or older. The median income for a household in the city was $30,243, and the median income for a family was $37,634. About 8.8 percent of families and 12.4 percent of the population were below the poverty line, including 12.8 percent of those under age 18 and 6.9 percent of those ages 65 or over[1]. Construction services are the second largest employer in Curry County, and these construction costs and employment opportunities are tied to availability of natural resources.

The Rogue River supplies drinking water for the City of Gold Beach. The River is an economic focus for the community, especially for sports and commercial fishing. A recent study estimated the value of Rogue River salmon in the Rogue basin to be $17.4 million annually, and non-use values of the river at $1.5 billion annually[2]. An economic analysis for 1996-1997 calculated 58 percent of the recreational fishing use occurred in the brackish portion of the Rogue River[3]. Restoring and maintaining a healthy watershed and a healthy fishing industry is especially important in a community where greater than 15% (pockets of up to 37%) of the population is designated below poverty level and 50% of the school population is eligible for free and reduced school meals[4].

Historic Information

The land of the Lower Rogue River Watershed was once under a shallow ocean that covered all of Oregon. The Klamath Range was pushed up by plate tectonics, developing a large inland area known as the Klamath Peneplain. The tremendous outpouring of precipitation eroded the Peneplain into carved valleys, including the Rogue River[5].

Note that the information provided below is largely summarized from the 2005 Lower Rogue Watershed Assessment t[6]. The interested reader is strongly encouraged to refer to that document for further information and details.

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[1] U.S. Department of Commerce. US Census Bureau. 2010. http://censtats.census.gov/data/OR/1604129900.pdf.
[2] ECONorthwest. Helvoigt, T. and D. Charlton. 2009. *The Economic Value of Rogue River Salmon*.
[3] Sea Grant. Waldvogel, J. 2008. *Southern Oregon/Northern California Salmon and Steelhead Fishing Guides Use and Economic Analysis (1996-1997).*
[4] Curry County Commission on Children & Families. 2001. *Curry County Agency Board Collaboration Demographic Project*.
[5] Schroeder, Walt. 1999. They Found Gold On The Beach: A history of central Curry County. Curry County Historical Society Press, Gold Beach, Oregon.
[6] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.

Native American Culture

Archeological records point to a continued human occupation of Southwest Oregon for at least the last eight to nine thousand years. A site at Marial provides carbon-14 dates beginning at 8560 before present, and a site near the mouth of the Illinois River unearthed materials from a culture using the site at 6000 and 2000 years ago[1]. The "tunne" people who spoke Athapascan dialects came to the area approximately 1500 years ago and were the final Native American cultural period in southwestern Oregon[3]. The photo to the left is of a young tutuni woman (courtesy of the Curry Historical Society).

The tunne had a life more strongly oriented to riverine resources than previous groups whom may have had a greater reliance on the uplands. The tunne's numerous villages included major sites at the mouth of the Rogue River and at the confluences of the Rogue with Lobster Creek, Shasta Costa, and Quosatana, and on a flat near Ferry Hole. Population was estimated at 8,800, with each village numbering 30 to 150 individuals[1]. The tunne diet consisted primarily of salmon and acorns supplemented by a variety of game and collected food items. Villages near the ocean also collected tidal organisms such as clams, crabs, sea urchins, chitons, limpets, and snails, hunted sea mammals such as seals and sea lions[1].

Native Americans had intensive management techniques, the most powerful being the use of fire. Fire was used to help maintain wildlife habitat, procure tarweed and grass seeds, manage groves for acorns and hazel, cultivate tobacco, propagate roots and berries, and extract sugar pine sap and seeds. Native Americans burned meadows once every year or two and brush areas once or twice a decade[2].

Agriculture

The first agriculture in the Lower Rogue was classed as subsistence farming and was concentrated in homesteads along the river. Most homesteads had an orchard and a subsistence garden. In the late 1800's and early 1900's there were farms on the terraces along the lower Rogue. In 1898 there were 8,000 acres in production, but this declined to 5,600 acres by 1936. Historic summer grazing of livestock was mentioned on the prairies on Wildhorse, Big Meadow, Bald Mountain, Fishhook, Indigo, and Burnt Ridge[2]. Grazing currently occurs around Agness, and near Gold Beach around Indian Creek, Edson Creek, and Ranch Creek (in Wedderburn)[3].

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[1] U.S. Forest Service (USFS). 2000a. Rogue River below Agness Watershed Analysis. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon.

[2] Schroeder, Walt. 1999. *They Found Gold On The Beach: A history of central Curry County.* Curry County Historical Society Press, Gold Beach, Oregon.

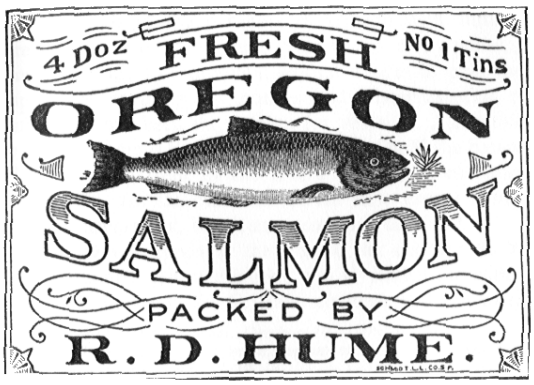
[3] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.

The early grazing of mountain meadows was responsible for the continued burning of meadows after the Native Americans were removed. By 1880, there were 22,000 sheep and 4,000 cattle in the County. By the early 1900's, grazing had shifted to beef cattle. The dairy industry developed along the rivers to the point where 400 small dairies were active in the County in 1938 with a total of 4200 cows. Streams with mild gradient and broad valleys (ideal coho salmon habitat) were ideal pasture land, so forests were cleared to accommodate grazing which led to simplified channels[1]. Conversion of these areas through the practice of "ditch, drain and dike", and the removal of streamside wood and beavers, resulted in a loss of off-channel habitat for juvenile salmonids as over-wintering or otherwise protective habitat where adequate food and safety from predators was available.

Fisheries

Fishing on the Rogue at the time of settlement was for individual use until 1857 when A.F. Myers began catching, salting, and barreling salmon[2]. In 1861, entrepreneurs in the fish canning industry labeled the Rogue River runs as large, or larger, as any in Alaska1. Myers eventually sold the business to Robert Deniston Hume in 1876[2]. In time he owned and controlled almost the entire fishery, owned thousands of acres, including all the tidelands on both sides of the river, operated a merchandise store and hotel, ran a newspaper, and owned ships carrying goods to and from the area[2].

Hume built his first hatchery in 1878 at "Hatchery Gulch" about one-quarter mile south of Indian Creek, another at the present day Patterson Memorial Bridge on the south side of the river (burned in 1893), one on Squaw Creek, one at Trail in the upper Rogue River built in 1890, and the final hatchery on Indian Creek in 1906, which is still in operation today[2]. In 1907 Hume had about 1,400,000 fry in the hatchery pens[2]. At the peak of fish canning, packs contained up to 82,500 adult Chinook in 1917 and 50,500 adult coho in 1928. Cases of salmon produced peaked in 1891 and 1917 with 25,000 cases and fell to 4,400 by 1930[1].



Historically, the Rogue River also supported large runs of Pacific lamprey, an anadromous fish important to indigenous peoples of the region, and an important nutrient resource for ospreys, bald eagles and marine mammals. Juvenile and spawned-out lampreys, like juvenile and spawned-out salmonids, are components of the aquatic food web of the Rogue River and its sub-watersheds. Runs of Rogue River Pacific lamprey have since

[1] National Marine Fisheries Service. 2014. *Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch).* National Marine Fisheries Service. Arcata, CA.

declined, and the species is currently listed as a "Species of Concern" by the U. S. Fish & Wildlife Service[1].

Floods

The largest flood of historical record was in 1861 with an estimated stage height of 43 feet in Grants Pass. The first recorded flood, and second largest, was in January 1890 when hurricane force warm winds came ashore and rainfall accumulated in the basin. The flow at the river mouth was half a mile wide and carried thousands of giant trees, remains of homes and barns, mills, and bridges with it[1]. Much of the farmland along the river was washed away including farms near Canfield and Coyote Riffles and bottomland at present day Huntley Park. Floods followed every 10 to 12 years with the largest in recent memory occurring in December 1964 at 35 feet at the Grants Pass stage[2].

The flood of 1964 devastated Lower Rogue River tributary channels and a wave of sediment swept through the lower mainstem[3]. Low gradient were the most impacted by sediment depositions, and when timber harvest on public lands resumed after 1970, another wave of sediment was unleashed[4]. The Lower Rogue continues to be impacted by the timber harvest that occurred on National Forest land during the 1970s and 1980s. During this period, harvests and expanding road networks were increasingly located on steep ground, and subsequent landslides during storm events contributed massive inputs of fine sediments into streams[2]. Aquatic habitat remains compromised by elevated water temperatures and sediment levels decades after the initial impacts[1]. However, since major dams were completed on the Rogue and Applegate Rivers in 1977 and 1980, the frequency of floods has decreased[5].

Dams

Dams were built as early as 1869 across the Rogue and its tributaries higher in the watershed for irrigation, power, and mining. Discussions regarding flow management of the Rogue River for flood control began in the 1940's. Fishery resource surveys and the documentation of large in-river mortalities of salmonids in the canyon area also occurred during this period. After discussions in the 1950's, dam sites were selected and Rogue dams were authorized with fisheries enhancement as an authorized use of the storage

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[1] U.S. Fish & Wildlife Service. *Species Fact List*. Web access on April 15, 2015: http://www.fws.gov/oregonfwo/Species/Data/PacificLamprey/default.asp

[2] Schroeder, Walt. 1999. *They Found Gold On The Beach: A history of central Curry County.* Curry County Historical Society Press, Gold Beach, Oregon.

[3] U.S. Forest Service (USFS). 2000a. Rogue River below Agness Watershed Analysis. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon.

[4] U.S. Forest Service (USFS). 1999b. Rogue River Watershed Analysis Marial to Agness Version 1.0. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon. 140 p.

[5] Jones, K.L., O'Connor, J.E., Keith, M.K., Mangano, J.F., and Wallick, J.R. 2012. Preliminary assessment of channel stability and bed-material transport in the Rogue River basin, southwestern Oregon: U.S. Geological Survey Open-File Report 2011–1280, 96 p.

allocation. Construction of the Lost Creek Dam, Applegate Dam, and Cole Rivers Hatchery occurred in the 1970's with fishery evaluation studies funded by the Corps of Engineers[1].

Large in-river mortalities of fall Chinook occurred in the first three years that Lost Creek Dam operated (shown below, *Photo Credit: Wikipedia*), but modified releases in the 1980's almost negated fall Chinook mortality. Early emergence of spring Chinook fry was documented, accompanied by later spawning by spring Chinook due to an increase in fall and winter temperatures. Loss of early-run spring Chinook, and an increase in fall Chinook was also documented. The Applegate Dam evaluation ended in late 1980's, but the Lost Creek Dam evaluation was extended to evaluate modified water temperature releases on spring Chinook.

In the 1999's, project findings indicated that changes in mainstem flows due to the dams have lesser effects on steelhead and coho. This, and large in-river mortalities of spring Chinook in 1992 and 1994 made maintenance of wild spring Chinook runs the priority for fishery managers. After the Lost Creek Dam evaluation ended, Coho salmon were listed as threatened under the Endangered Species Act, but Chinook salmon were not listed.

Both Lost Creek and Applegate Dams trap sediment, detaining 13 percent of the area of the Rogue Basin, and 29 percent of the Applegate Basin. Since 2004, four large dams have been removed in the Rogue Basin, providing salmon and steelhead with unobstructed access to over 333 miles of high-quality spawning habitat and improving water quality[2]. Jones et al.[3] did not assess the effects of dam removal on downstream sediment transport, but cited estimates of release of 6-years' worth of sand and gravel (based on annual transport rates at Savage Rapids Dam). The Rogue River now runs unrestricted for 157 miles from Lost Creek Lake to the Pacific Ocean.

Timber Harvest

The Coast Range contains highly productive, rain drenched coniferous forests that cover low elevation mountains. Sitka spruce forests originally dominated the fog-shrouded

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[1] U.S. Army Corps of Engineers. *Rogue River Basin Project*. Web access March 30, 2015: http://www.nwp.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/2043/Article/492590/rogue-river-basin-project.aspx.

[2] Oregon Department of Environmental Quality (OR DEQ). 2012. *Rogue Basin Water Quality Status and Action Plan Summary.*

[3] Jones, K.L., O'Connor, J.E., Keith, M.K., Mangano, J.F., and Wallick, J.R. 2012. Preliminary assessment of channel stability and bed-material transport in the Rogue River basin, southwestern Oregon: U.S. Geological Survey Open-File Report 2011–1280, 96 p.

coast, while a mosaic of western red cedar, western hemlock, and seral Douglas-fir blanketed inland areas. Today Douglas-fir plantations are prevalent on the intensively logged and managed landscape[1].

Timber harvest was limited prior to 1940, although lumber was an early export as indicated by the note that R.D. Hume originally came to the area in the 1870's to pick up a load of lumber[2].

On National Forest lands in the Gold Beach District, timber harvest began in the 1940's, but timber production expanded rapidly following WWII due to mechanization, with a total of 204,000 acres available for harvest[3]. Private holdings within the National Service boundary were heavily harvested during the 1950's and 1960's. Various lumber mills were established in the watershed to process the timber coming off of private and Forest Service lands and mills (saw and plywood) were constructed in nearly every valley along the coast.

Tractor logging was common and skid roads were closely spaced, with all vegetation removed and streams and riparian areas not buffered[3]. Numerous debris torrents, streamside failures, and debris slides associated with roads and logging activities were noted[3]. Logging practices included placing and leaving log stream crossings, ground skidding over compactable soils and low standard roads[2].

Timber harvest has been concentrated on the productive lower elevation sites over the years[4]. Photos from 1969 show road construction and commercial logging concentrated on the lower slopes above the Rogue River and its tributary streams. By 1986 logging activities had moved upslope, especially into the steep upper reaches of Shasta Costa and Billings Creeks. Streamside failures and debris torrents were associated with harvest within and along steep inner channels of streams[5].

Historic levels of late-successional forest have fluctuated due to climatic changes and human influence, but the Regional Ecosystem Assessment Report estimated historic levels of late-successional habitat between 45 and 75% of the Lower Rogue Basin[2]. Historic vegetation mapping shows 67% of the analysis area below Agness provided late–successional habitat in the 1940's prior to any timber harvest, reduced to 29% in the analysis area and to 26% on the Siskiyou National Forest[2].

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[1] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.
[2] Schroeder, Walt. 1999. They Found Gold On The Beach: A history of central Curry County. Curry County Historical Society Press, Gold Beach, Oregon.
[3] U.S. Forest Service (USFS). 1999b. Rogue River Watershed Analysis Marial to Agness Version 1.0. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon. 140 p.
[4] U.S. Forest Service (USFS). 2000a. Rogue River below Agness Watershed Analysis. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon.

On National Forest Lands from Marial to Agness streams are steep and timber harvest has occurred on ~10% of the watershed, mostly occurring within the Twomile, Foster, Billings, Stair and Shasta Costa Creek drainages[1]. Streams between Mule Creek and Billings Creek have had little timber harvest or road construction. Historic late-successional habitat within the Marial to Agness analysis area was on the low end of the 45-75% range given in the Regional Ecosystem Assessment Report[1]. Historic vegetation mapping shows 69% of the Rogue River (Marial to Agness) watershed provided late-successional habitat in the 1940's prior to timber harvest[1]. The picture to the right shows a more current practice on public lands of forest thinning, instead of clear-cutting whole areas (*Photo credit: Thomas Boyd, the Oregonian*).

Mining

Gold was discovered on the Rogue River in Southwest Oregon in 1851 and later in 1853 on the coast on the beaches surrounding the mouth of the Rogue River. Mining occurred on the beach for 12 miles on either side of the Rogue and water was diverted from nearby drainages to provide flow for sluice boxes. One tunnel dug by Chinese miners during the 1880's diverted water from Indian Creek to the beach behind the present City Hall[1].

Miners moved inland and over the ensuing years mined every area along the Rogue River with gold in sufficient concentrations[1]. Sluice boxes on the river bars, use of water cannons, and blasting the soil using diversion of streams into flumes all muddied the river and made it difficult for the Native Americans to catch salmon. The mining methods also changed the configuration of the river banks[3]. Boulder Creek, Lobster Creek (and tributaries), and Mule Creek were known mining areas, with a couple still active at present time. Hydraulic mining began in the 1870's and was a major activity by the 1880's[1].

Watershed Action Plan Development

We expect this document to be a living, prioritized *Lower Rogue Watershed Action Plan,* which can be implemented by a diversity of organizations, agencies, and landowners. In addition, the development of this Action Plan provided an excellent opportunity to further familiarize the Council with the watershed by examining previous documents such as assessments, former studies, monitoring activities, historical information, and available GIS maps.

Through the guidance of this Action Plan we hope to recover vital processes, evaluate overall project effectiveness, and improve long-term maintenance and stewardship in the watershed to better protect our investments. The ultimate goal is to improve restoration strategies while continuing to provide much-needed accountability to our watershed communities.

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[1] Schroeder, Walt. 1999. *They Found Gold On The Beach: A history of central Curry County.* Curry County Historical Society Press, Gold Beach, Oregon.

The following sections include information on the LRWC, our public engagement and outreach tools, an existing watershed inventory, LRWC goals and strategies, prioritization of implementation, and funding strategies to achieve those goals.

Lower Rogue Watershed Council

Watershed Councils are grassroots community groups comprised of citizens who want to help protect, restore and enhance the local watershed where they live, work, and play. They are locally organized, voluntary, non-regulatory organizations, and are intended to be broadly representative of the stakeholders in their respective areas.

The Lower Rogue Watershed Council (LRWC) was formally chartered and recognized by the Curry County Commissioners and the Governor's Watershed Enhancement Board on May 16th, 1994. The Lower Rogue Watershed includes all lands and waters of these lands that drain into the Rogue and Illinois Rivers within Curry County, Oregon, and is the western extent of the Rogue River Basin.

Our **Purpose** is *to protect, enhance, and restore long-term natural resources and economic stability of the Lower Rogue Watershed and the near shore environment.*

Our **Mission** is *to represent the broad and diverse geographic areas and community interests in the watershed and work collaboratively with these interests and landowners to develop and carry out voluntary watershed protection, restoration, enhancement, and community engagement activities.*

(*Chinook salmon congregating on a river bend. Photo credit: Thomas Weseloh*)

Information Sharing

The Lower Rogue Watershed Council employs a wide variety of mechanisms and media to inform partners, stakeholders, agencies and organizations, and the local community about watershed priorities. Regular briefings during public, monthly watershed council meetings are supplemented by presentations at meetings of the watershed council, fishing groups, and other community organizations. In addition to personal communication of watershed priorities, the Rogue River Watershed Assessment[1] and the Lower Rogue Watershed Assessment[2] are readily available on our website at www.currywatersheds.org.

Watershed Inventory

Existing Assessments, Plans, and Strategies for the Lower Rogue River and its tributaries can be found on the following page in *Table 1*. The information is organized by Agency or sponsoring Organization. There are 25 plans and assessments listed here, and these are from 1996 to the present. There are many more plans that were documented before 1996 as well.

Adoption of Action Plan

The Action Plan was presented to the Lower Rogue Watershed Council on April 21, 2014, voted upon according to our current Bylaws,[3] and received full consensus. Our voting process can be found in *Article IV,* under *Board Meetings*, sections b. and c., and then sub-sections i. and ii.

[1] Rogue Basin Coordinating Council (RBCC). 2006. *Rogue Basin Watershed Health Factors Assessment*.
[2] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.
[3] Lower Rogue Watershed Council. *Bylaws* (unpublished). Amended and accepted September 2014.

Table 1: Existing Lower Rogue Assessments, Plans, and Strategies

Organization	Plan Name	Date Published	Web Address
Bureau of Land Management (BLM)	Water Quality Restoration Plan Silver Creek Watershed	2011	http://www.blm.gov/or/districts/medford/plans/activityplans.php
	Water Quality Restoration Plan Illinois-Kerby Sub-watershed	2007	"
Lower Rogue Watershed Council (LRWC)	Rogue River Estuary Strategic Plan	2015	http://www.currywatersheds.org/LRWC_docs/Rogue_Estuary%20Strategic%20Plan_2015_FINAL.pdf
	Aquatic Health Trends on Four Lower Rogue River Tributaries	2009	n/a
	Small Stream Project Effectiveness - Edson Creek	2007	n/a
	Lower Rogue Watershed Assessment	2005	http://www.currywatersheds.org/lower_rogue_huc8.aspx
National Oceanic & Atmospheric Administration (NOAA)	Southern Oregon/Northern California Coast (SONCC) Coho Salmon Recovery Plan	2014	http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/southern_oregon_northern_california_coast/SONCC_recovery_plan.html
Oregon Department of Environmental Quality (ODEQ)	Rogue Basin Water Quality Status and Action Plan Summary	2012	http://www.deq.state.or.us/wq/watershed/Docs/RogueSummary.pdf
	Rogue Basin Total Maximum Daily Load (TMDL)	2008	http://www.deq.state.or.us/wq/tmdls/docs/roguebasin/Rogue/Chapter1andExecutiveSummary.pdf
	Lobster Creek Watershed Total Maximum Daily Load (TMDL)	2002	http://www.deq.state.or.us/wq/tmdls/docs/roguebasin/lowerrogue/tmdl.pdf
Oregon Department of Fish & Wildlife (ODFW)	Conservation Plan for Fall Chinook Salmon in the Rogue Species	2013	http://www.dfw.state.or.us/fish/local_fisheries/rogue_river/index.asp
	Rogue Spring Chinook Salmon Conservation Plan	2007	"
Rogue Basin Partnership (RBP)	Rogue Restoration Action Plan	2015	http://www.roguepartners.org/rogue-restoration-action-plan/
	Watershed Health Factors Analysis (Regional Restoration Priorities)	2006	http://www.currywatersheds.org/LRWC_docs/Rogue%20River%20Health%20Assessment_5-4-06Final.pdf
US Army Corps of Engineers	Rogue River Basin Project Water Management Plan	2013	http://www.nwp.usace.army.mil/Portals/24/docs/locations/rogue/Rogue_water-mgmt_2013.pdf
US Geological Survey	Prelimenary Assessment of Channel Stability and Bed-Material Trasnport in the Rogue River Basin, Southwest Oregon.	2012	https://pubs.er.usgs.gov/publication/ofr20111280
USDA Forest Service (USFS)	Lower Illinois River Watershed Analysis	2000; updated 2004	http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315589
	Southwest Oregon Late-Successional Reserve Assessment	1995; updated 2004	http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5315198.pdf
	Rogue River below Agness Watershed Analysis	2000	http://www.fs.usda.gov/detail/rogue-siskiyou/landmanagement/?cid=stelprdb5315589
	Lobster Creek Watershed Analysis	1999	"
	Rogue River Watershed Analysis Marial to Agness	1999	"
	Lawson Creek Watershed Analysis	1997	"
	Quosatana Creek Watershed Analaysis	1996	"
	Shasta Costa Creek Watershed Analysis	1996	"
	Bradford Creek Watershed Analysis	1996	"

Watershed Restoration Objectives and Strategies

Goals

The overall goal of the Lower Rogue Watershed Action Plan is to guide restoration, enhancement, and conservation efforts in the lower Rogue River watershed and its tributaries; emphasizing wetlands, floodplain connectivity, off-channel habitat, water quality and quantity, and community education.

Objectives and Strategies

Strategies for achieving our objectives will vary, depending on stakeholder interest and support.

A. Protect and restore high value habitats
    i. Protect existing high quality resources (i.e. spawning/rearing habitat, intact riparian areas, water quality/quantity)
    ii. Outreach to landowners to discuss the opportunities and benefits of land acquisitions and conservation easements
    iii. Protect off-channel, tidal wetland, and freshwater wetland habitats and buffers (and their adjacent riparian floodplains)

B. Focus on connectivity and passage
    i. Restore off-channel rearing areas such as sloughs, wetlands, and other highly productive areas adjacent to mainstem rivers and their tributaries (e.g. increase sinuosity and complexity of off-channel tributary habitat)
    ii. Connect marginal habitat with known areas of high productivity (i.e. allow seeding as recovery occurs)
    iii. Remove noxious weeds that may be limiting off-channel habitat (including wetlands and sloughs) and replace with native species

B. Restore watershed processes and functions
    i. Add large wood where appropriate to trap spawning gravel, create habitat complexity, and promote stability (e.g. by trapping fine sediments and organic matter)
    ii. Protect upland areas by fencing and planting to ensure delivery of cold, clean water throughout the watershed (e.g. restore degraded riparian areas, and assess and remove noxious plants)
    i. Educate the public on the functions and resources of floodplains and riparian areas, and discourage new floodplain developments

C. Expand community participation in improving watershed health
    i. Organize watershed tours, special presentations, classes and outreach materials about watershed science and conservation, and the importance of natural resources to our economy
    ii. Engage landowners to maintain and enhance healthy riparian areas (i.e. remove invasives and plant native species), and help promote the Curry County Riparian Protection Ordinance
    iii. Provide watershed community service opportunities, and solicit local financial support of LRWC projects and activities

D. Promote sustainable ecological practices and methods

i. Address the key limiting factors in the watershed: off-channel habitat, sediment supply, water quality, channel modification, and early seral conditions
ii. Work with companies, businesses, and landowners to promote participation in projects and programs that address limiting factors
iii. Partner with community stakeholders to encourage tourism in a way that is ecologically sustainable, benefits the local communities, strengthens the local economy and employs the local workforce, and where possible uses local materials and local agricultural products

Monitoring Strategy Process

The diagram below is an outline of our team process for assessing local priorities, biennial work plans, and adaptive management strategies.

Implementation

This document serves to set forth best management practices and our best, current thinking about restoration priorities for the Lower Rogue Watershed.

Prioritization of Restoration Actions

Several references were used and cited throughout this document, and it is designed to be both prescriptive (in the sense that it points towards solutions) and permissive (in the sense that it allows for new and unforeseen opportunities). A group of stakeholders was convened to look at the existing documents, make recommendations, provide current data and input, and to help edit the plan. The participants can be found below in *Table 2*.

Table 2: A list of the community stakeholders involved with the review of the Lower Rogue Watershed Action Plan

Participant	Interest	Contribution
USDA FS	Natural Resource Agency, Fisheries	In-kind; team participation, technical support, project coordination
OSU Extension, Curry County	Watershed Education	In-kind; team participation, technical support, project coordination
ODFW	Natural Resources Agency	In-kind; team participation, technical support, project coordination
Curry Soil & Water Conservation District	Effectiveness Monitoring	In-kind; team participation, technical support, project coordination
City of Gold Beach	City Government	In-kind; land use planning, economic development, TMDL implementation
Jerry's Rogue Jets	Recreation Industry	In-kind: team participation, editing, economic development
Curry Anadromous Fishermen	STEP/ODFW	In-kind: team participation, editing, volunteer recruitment and activities
Nesika Beach-Ophir Water District	Water District	In-kind: team participation, editing, volunteer recruitment and activities
Campbell Global Group	Commercial Forestry	In-kind: team participation, editing, volunteer recruitment and activities
Agness Community Representative	Interested Citizen	In-kind: team participation, editing, volunteer recruitment and activities
Gold Beach Community Representative	Interested Citizen	In-kind: team participation, editing, volunteer recruitment and activities
Gold Beach Business & Industry	Commercial Fishing	In-kind: team participation, editing, volunteer recruitment and activities

Each biennium the LRWC works through our Work Plan, and holds an in-depth discussion regarding our priorities. We ask the following questions 1) are we addressing the proper watershed limiting factors; 2) are we working with the correct partners to fulfill needs for the watershed; and 3) are we making a measurable difference in the watershed?

Please see *Appendix A* (page 44) for a summarized list of projects completed in the Lower Rogue River Basin, future monitoring and assessment needs, and future project recommendations. *Appendix B* (page 48) includes individual project ideas, along with identified partners, tasks and deliverables, and a funding strategy.

Rogue River Estuary

Over the last three years, the Rogue River estuary has been our first priority, and with the recent completion of the Rogue River Estuary Strategic Plan[1], we are now poised for additional planning and implementation of specific projects. The estuary provides a nursery and transition area for juvenile salmonids. The estuary was determined to be a limiting factor to salmonid health based on the extensive physical and hydrologic modifications that have occurred in the past and the subsequent impacts to available aquatic habitat and water quality[2].

Pasture in the historic estuarine floodplain restricts side channel development that could provide refugia for rearing coho salmon. Channelization and diking has greatly altered low gradient Lower Rogue River tributaries, the lower mainstem, and the estuary. Channel alterations of Edson and Ranch Creeks have had the greatest impact on coho salmon production in the lower Rogue River because of the extent of high potential coho salmon habitat occurring there. Williams et al.[3] used models to estimate that the lower Rogue had 80.9 intrinsic-potential kilometers of coho salmon habitat, with the highest rated habitats concentrated mostly in tributaries near the estuary.

The most important factor limiting recovery of coho salmon in the Lower Rogue River is the amount of suitable rearing habitat for juveniles. The processes that create and maintain such habitat must be restored. Channel complexity should be improved by constructing off-channel ponds or backwater habitat, reconnecting the wetlands and estuary to the river, restoring wetlands, and limiting development and fill[4]. Please refer to

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[1] Timchak, K.L. and C.R. Myers. 2015 (unpublished). *Rogue River Estuary Strategic Plan.* Lower Rogue Watershed Council.

[2] National Marine Fisheries Service. 2014. *Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch).* National Marine Fisheries Service. Arcata, CA.

[3] Williams, T.H., B. Spence, W. Duffy, D. Hillemeier, G. Kautsky, T. Lisle, M. McCain, T. Nickelson, E. Mora, and T. Pearson. 2008. Framework for assessing viability of threatened coho salmon in the Southern Oregon/Northern California Coasts Evolutionarily Significant Unit. NOAA Technical Memorandum NMFS-SWFSC-432.

[4] National Marine Fisheries Service. 2014. *Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch).* National Marine Fisheries Service. Arcata, CA.

the Rogue River Estuary Strategic Plan[1] for the full assessment and future recommendations.

The city of Gold Beach encroaches on the estuary of the Rogue River. Impervious surfaces related to development contribute stormwater runoff and non-point source pollution, as observed elsewhere in the Rogue River basin (ODEQ 2008). Commercial development along the north bank confines the lower estuary. Residential development also occurs in the Lower Rogue River riparian zone upstream to Lobster Creek and likely contributes pollutants from leaking septic systems. The high severity of this threat is due to concentrated impacts in areas of the highest IP coho salmon habitat, specifically in Edson Creek, Indian Creek, Saunders Creek, and in the estuary[2].

Fish Passage and Channel Connectivity

Along the Oregon coast, the Rogue River basin is the largest producer of Pacific salmon after the Columbia River basin[3]. Therefore, fish passage and connectivity came in close behind estuary restoration and conservation, based on decades of watershed research. These projects have a high likelihood of success, are generally cost-effective, show immediate results, and can last a long time.

The quantity and quality of spawning and rearing habitat limit the success of spawning and production of smolts. These limiting factors establish the carrying capacity of a stream. Carrying capacity is the number of animals a habitat can support throughout the year without harm to either the organisms or the habitat. Depending upon the limits of available habitat, ocean factors, escapement, etc., salmonid populations fluctuate annually as a result of varying environmental factors (e.g. extreme high and low stream flows, high stream temperatures in the summer, or ice)[3]. A stream does not necessarily reach its carrying capacity each year because of these factors.

Temperature standards set by the Department of Environmental Quality (DEQ) are meant to protect salmon and trout throughout their life histories: spawning, rearing and migration. At this time, all of the streams in the Rogue River Basin are designated as either core cold-water habitat or salmon and trout rearing and migration habitat. Spawning areas and times have been determined for streams in the basin. Temperature models, where developed, allow for a determination of natural stream temperatures which may then supersede a numeric criterion (OR DEQ, 2008)[4].

The lower Rogue River hosts natural runs of spring and fall Chinook salmon, coho salmon, steelhead, cutthroat trout, green and white sturgeon, and Pacific lamprey (among many

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[1] Timchak, K.L. and C.R. Myers. 2015 (unpublished). *Rogue River Estuary Strategic Plan.* Lower Rogue Watershed Council.

[2] National Marine Fisheries Service. 2014. *Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch).* National Marine Fisheries Service. Arcata, CA.

[3] Middle Rogue Watershed Association. 2001. Middle Rogue watershed action plan: Grants Pass, Oregon, 39 p. Accessed October 19, 2001, at *http://soda.sou.edu/awdata/050104a1.pdf*.

[4] Oregon Department of Environmental Quality (OR DEQ). 2008. Rogue River Basin Total Maximum Daily Load (TMDL).

other species)[1]. While the Rogue River basin still produces many coho salmon, the indigenous stock adapted to the lower Rogue River is diminished in range and abundance[2]. Fish distribution maps for spring and fall Chinook salmon, coho salmon, and winter and summer steelhead can be located on pages 37-39 of this document in *Figures 4-6*.

Eulachon (commonly called smelt, candlefish, or hooligan) and coho salmon are listed as threatened under the federal Endangered Species Act, while green sturgeon (the Northern Distinct Population Segment) are listed as a species of concern[3].

Stream channel crossings by roads have been the cause of serious losses of fish habitat in the Lower Rogue[4]. Assessment of migration barriers is quite important, because anadromous fish (including green and white sturgeon and lamprey) migrate upstream and downstream during their life cycles. In addition, many resident salmonids and other fish move extensively upstream and downstream to seek food, shelter, better water quality, and spawning areas[2]. Where these barriers occur, fish can no longer reach suitable habitats. Because of reduced accessible habitat, fish populations may be limited. The photo to the right shows a spawning pair of Chinook salmon in Indian Creek (*Photo credit: Rich Watson*).

Libby Pond on Libby Creek is the only known impoundment within the Lower Rogue River sub-basin that prevents access to historical coho salmon habitat. Concerns related to diversions, water use, and stream flows are restricted to Edson and Indian creeks[5].

Sediment Supply

Another limiting factor is sediment overloading, our third priority. We know that too much sediment can cause many issues; such as smothering salmon eggs, deposition, channel widening, erosion, and stream heating in the lower reaches of streams. However, restoration of riparian areas can help to secure some of this sediment as well as helping to lower water temperatures in streams and rivers, especially for small tributary streams.

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[1] Oregon Department of Fish and Wildlife. 2005. *Oregon Native Fish Status Report Public Draft: Volume I – Species Management Unit Summaries*.

[2] U.S. Forest Service (USFS). 2000a. Rogue River below Agness Watershed Analysis. Siskiyou National Forest, Gold Beach Ranger District, Gold Beach, Oregon.

[3] NOAA. Office of Protected Resources. 2015. http://www.nmfs.noaa.gov/pr/species/fish.

[4] Hicks, D. 2005. *Lower Rogue Watershed Assessment.* The Lower Rogue Watershed Council.

[5] National Marine Fisheries Service. 2014. *Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch).* National Marine Fisheries Service. Arcata, CA.

Large wood placement is another method used to trap and redistribute sediment, and to assist in the creation of habitat complexity.

High road densities, numerous road-stream crossings, and roads on steep slopes combine to pose a critical threat to most coho salmon life history phases in the lower Rogue River sub-basin. The most severe erosion potential is when multiple road-stream crossings fail in a single tributary. This occurs when a crossing washes out and creates a slug of debris and fine sediments that wash out crossings further downstream. Most timber haul roads are not surfaced, and chronically contribute fine sediment to streams, although measures are being taken to remedy the problem in Lobster Creek[1]. Several road crossings have been addressed over the last ten years, like the one pictured here (Matt Swanson shown monitoring the crossing).

Lobster Creek is a primary tributary to the lower Rogue River, which joins ten miles upstream of the Pacific Ocean in Curry County, Oregon. The watershed is 44, 253 acres (approximately 69 square miles) in size, with 64% of the acreage in federal ownership, 1% in state and county ownership, and 35% in private ownership[2]. The Rogue-Siskiyou National Forest accounts for nearly all the federal lands, and Menasha Log Co, LLC currently owns the majority of the private lands.

Lobster Creek is a vital component of the lower Rogue River fisheries. It supports a healthy run of all four salmonids native to the southern Oregon Coast: Chinook, Coho, Steelhead, and cutthroat; and has been identified as a refuge important to the long-term preservation of these indigenous salmonid populations. No barriers to anadromy exist on the mainstem, and the 5 primary tributaries: the North Fork, South Fork, Lost Valley Creek, Fall Creek, and Deadline Creek; provide a significant amount of habitat to fish returning from the ocean.

However, due to a high amount of sediment input, the LRWC inventoried roads on non-Forest Service lands between the years of 1998 and 2000. A crew worked approximately 11 weeks over the 3-year period to collect data on 83 miles of road. In 1998 the USFS also inventoried all of their stream crossings in the Lobster Creek watershed. Between

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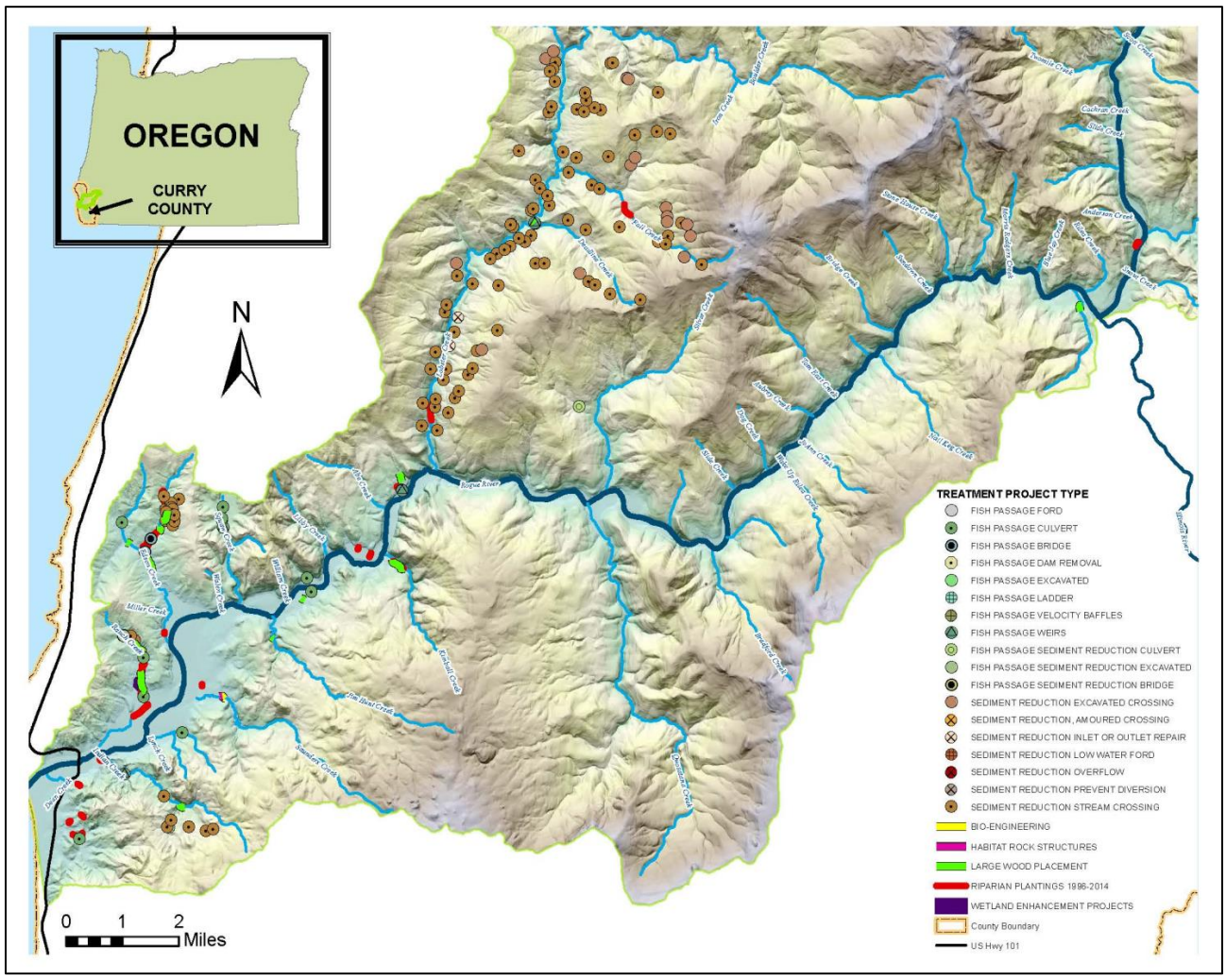
[1] Oregon Department of Environmental Quality (ODEQ). 2000. Oregon Nonpoint Source Control Program Plan, 2000 Update. ODEQ, Portland, Oregon. 190 p.

[2] Swanson, Matt. 2006 (unpublished). Lobster Creek Partnership Watershed Analysis Areas/Road Inventory Review. Lower Rogue Watershed Council.

the years of 1997 and 2002 the Council implemented several sediment abatement projects on private ownership within the Lobster Creek watershed. See *Figure 7* below for project type and location in the Lower Rogue Watershed.

Figure 7: Restoration Projects in the Lower Rogue Watershed



The Rogue Basin likely has greater over-all bed-material transport than the Umpqua Basin to the north. Wallick et al.[1] estimated that the Umpqua River transports on average of 13,000 to 51,000 cubic yards. Lacking either actual transport measurements or transport capacity calculations, the conclusion of greater bed-material transport in the Rogue River is tentative. *Table 3* displays the most current dredging information received by the Army Corps of Engineers for dredging practices in the Rogue River estuary and the Boat Basin.

[1] Wallick, J.R., J.E. O'Connor, S. Anderson, K.K. Mackenzie, C. Cannon, and J.C. Risley. 2011. *Channel change and bed-material transport in the Umpqua River basin, Oregon*. Scientific Investigations Report 2011-5041. *Prepared in cooperation with the US Army Corps of Engineers.*

Table 3: Army Corps dredging totals (2003 – 2014)

History of USACE Dredging and Material Placement at Rogue River 2003 to 2014						
Calendar Year	**Month**	**Dredge**	**Quantity (CY)**	**Placement Method**	**Placement Site**	**Notes**
2014	July	Sea Horse	15,000	scow	ODMDS	
	14C0024; clamshell dredge Sea Horse; scow WJ Marston; material sources are FNC;USCG 5,765 CY under same contract					
2014	June	Yaquina	39,155	hopper	ODMDS	
2013	----------					
2012		Yaquina	48,878	hopper	ODMDS	
2011		Yaquina	47,236	hopper	ODMDS	
2010		Yaquina	38,201	hopper	ODMDS	
2009		Yaquina	45,993	hopper	ODMDS	
2008		Yaquina	21,450	hopper	ODMDS	
2007		Yaquina	25,906	hopper	ODMDS	
2007		Contractor Clamshell	5,018	clamshell	ODMDS	USCG Station
2006		Yaquina	20,057	hopper	ODMDS	
2005		Yaquina	60,796	hopper	ODMDS	
2004		Yaquina	31,036	hopper	ODMDS	
2003		Yaquina	50,983	hopper	ODMDS	
**1997 boat basin access channel last dredged*						

Greater bed-material transport in the Rogue River is also supplied by 56 percent of the drainage basin within the Klamath Mountain geologic province. Sediment inputs from tributaries, draining steep portions of the Klamath Mountains into the Illinois and Applegate Rivers, are probably important to the overall delivery of bed material. Bed material entering the steep and confined Galice Reach (RM 27-82) is likely transported through the reach and deposited in the flatter and wider Lobster Creek and Tidal Reaches downstream[1].

Water Quality & Quantity

Historical land use decisions and current management practices have led to non-point sources of thermal pollution including removal of streamside trees and other vegetation, channel modification, warm water discharges from dams and irrigation canals, and flow modification. However, water quality in the Rogue Basin is generally considered good, with six of the eight Department of Environmental Quality (DEQ) long-term ambient

[1] Jones, K.L., O'Connor, J.E., Keith, M.K., Mangano, J.F., and Wallick, J.R. 2012. Preliminary assessment of channel stability and bed-material transport in the Rogue River basin, southwestern Oregon: U.S. Geological Survey Open-File Report 2011–1280, 96 p.

monitoring stations in the Rogue Basin recording conditions of good to excellent[1]. *Appendix C* (page 52) displays the latest Oregon Water Quality Index for the Rogue River, at Lobster Creek Bridge (10 miles upstream from the estuary).

All streams in the Rogue River Basin are designated as either core cold-water habitat or salmon and trout spawning and rearing and migration, and temperature and fine sediment have been identified as pollutant stressors that affect fish and other aquatic life throughout the basin[3]. Elevated levels of fecal coliform and *E. coli* are found primarily in the rivers, streams and creeks in the Middle Rogue subbasin, but are also present in the Lower Rogue subbasin. The photo to the right is of the Curry Soil & Water District crew performing water quality (Beth Pietrzak, Cindy Myers, and Liesl Coleman).

Under Section 303(d) of the Clean Water Act, the Environmental Protection Agency (EPA) or its state delegates are required to develop a list of the surface waters in each state that do not meet water quality criteria. These criteria are developed by each of the states to protect "beneficial uses" and must be approved by EPA. The resulting "303(d) list" of impaired waterbodies is based on the best available data and, in most cases, must be revised every two years[3]. An impaired waterbody must have a Total Maximum Daily Load (TMDL) developed for each applicable pollutant. A TMDL includes a geographic description, identification of pollutants, applicable standards, source assessment, description of data collected, loading capacity, allocation of loads, and margin of safety[2].

TMDLs have been established for the Rogue Basin and require actions to limit thermal loading to the waterbodies[2]. Please refer to the 2008 Rogue River Basin TMDL for the complete 303(d) listings for the Rogue Basin[3]. Reducing stream temperature is extremely important because excessive summer water temperatures threaten the survival of fish and other aquatic organisms. A map describing riparian shade in the Rogue River can be found in *Figure 8* on page 41.

An extensive Riparian Shade Assessment[4] was performed in the Lobster Creek Watershed in 1999, which was an assessment of riparian condition to estimate existing and potential shade on perennial streams in the Lobster Creek Watershed. Shade is one of the factors that control summer stream water temperatures. Streamflow and groundwater, channel width/depth, and bedrock/substrate heating are other factors to be considered, but were

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[1] Oregon Department of Environmental Quality (OR DEQ). 2012. *Rogue Basin Water Quality Status and Action Plan Summary.*
[2] Oregon Department of Environmental Quality (OR DEQ). 2008. Rogue River Basin Total Maximum Daily Load (TMDL).
[3] Oregon Department of Environmental Quality (OR DEQ). 2012. *Rogue Basin Water Quality Status and Action Plan Summary.*
[4] Myers, Cindy R. 1999. Lobster Creek Watershed Riparian Shade Assessment. Lower Rogue Watershed Council.

not included in this assessment. Existing shade and potential shade maps for Lobster Creek can be located in *Figures 9-10* (pages 42and 43).

Public Engagement

If people hold watershed protection as a deep, internal value, their actions on the land will tend to reflect that belief. Therefore, working hard to educate people about their place in the natural world is a valuable intervention, and can even be a powerful restoration technique. A physical restoration project may change and improve one reach of stream, but a watershed restoration presentation affecting 50 people could have even further reaching influences and implications for the environment over the long term.

The Lower Rogue Watershed Council will engage the public through a series of presentations to community groups. The LRWC will also be offering project tours, twice a year, for interested community members and landowners. The picture to the right shows Frank Burris, Oregon State University Extension Watershed Educator, teaching an estuary education class on tidal channels and connectivity near Indian Creek on the Rogue River *(Photo credit: Kelly Timchak, 2013).*

Funding strategy

We want to ensure that priority programs and projects are supported through regular state and federal grant dollars, but also through a diverse financial portfolio; including foundation support, endowments, donations, and fundraising events.

A portion of funding should also be dedicated to capacity, in order to capture existing institutional knowledge and to maintain relationships; ensuring that current programs and projects are not interrupted or significantly delayed if key employees should leave the organization. *Table 3* below gives only a small glimpse into the ever-changing and evolving world of available funds. This list should be maintained and updated with the review of the Action Plan. Individual funding strategies are listed within *Appendix B*, according to the specific type of project proposed.

Table 4: Funding Sources for Restoration, Conservation, and Enhancement Work

Funding Sources				
Granting Agency	**Grant Cycles**	**Focus**	**Availability**	**Reference**
Oregon Watershed Enhancement Board	April, October	Technical Assistance, Education, Monitoring,	Individual landowner, tribe, watershed council, soil & water conservation district, nonprofits, schools	http://www.oregon.gov/OWEB/GRANTS/pages/grant_faq.aspx
United States Fish & Wildlife Service	recurring	Coastal wetlands, fish & wildlife restoration, conservation, endangered species	State & local government, nonprofits, individuals, educational institutions	http://www.fws.gov/grants/
National Fish & Wildlife Program	recurring; can apply twice annually	More than 70 different grant programs	Federal, state, and local governments, educational institutions, and nonprofit organizations	http://www.nfwf.org/whatwedo/grants/Pages/home.aspx#.VN6cNS7rajs
Department of Environmental Quality	Nonpoint Source Pollution 319 Grants	Nonpoint source water quality and watershed enhancement projects that address the short and long term NPS priorities.	Watershed Councils, Soil and Water Conservation Districts and other Natural Resources and Water Quality related agencies; colleges and universities, and nonprofit organizations	http://www.deq.state.or.us/wq/grants/grants.htm
Environmental Protection Agency	several ongoing grant programs	Pollution, monitoring, healthy communities, coastal wetlands, estuaries, water quality, etc.	state/local government, tribe, territory, public, private profit, nonprofit organizations, institutions, specialized groups, and individuals	http://www.epa.gov/ogd/competition/open_awards.htm
Oregon Department of Fish & Wildlife	quarterly or annually; depending on grant program	Access, habitat, restoration, education, bird conservation	Individual landowner, conservation organization, hunting group, watershed council, state & federal agency, school	http://www.dfw.state.or.us/fish/docs/grant_application_chart.pdf
Wild Rivers Coast Alliance	funds 1-2 year grants, ranging from $10,000 - $100,000 per year	Support and promote healthy fish and species habitats, working landscapes, seasscapes, ans sustainable tourism	individuals and organizations	http://wildriverscoastalliance.com/SectionIndex.asp?SectionID=3

Plan Updates & Revisions

Every two years we will convene a committee, made up of members from the Lower Rogue Watershed Council Board and at least two agency staff members (taken from *Table 2*).

Their purpose will be to assess this Action Plan as well as our current OWEB Work Plan. We will also reach out to other community stakeholders for any updates, and revise the Action Plan as needed at that time.

An amended date will be included in the revised document, and signed by both the Lower Rogue Watershed Council Chair and Coordinator.

Let this page show that the Lower Rogue Watershed Council officially accepts the *Lower Rogue Watershed Action Plan*.

X Ron Ray Date 4-21-2015

Ron Ray | Chair, Lower Rogue Watershed Council

X Kelly Timchak Date April 21, 2015

Kelly Timchak | Coordinator, Lower Rogue Watershed Council

LOWER ROGUE
WATERSHED COUNCIL

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Figures

Figure 1: A HUC 12 map of the Lower Rogue River subwatershed boundaries

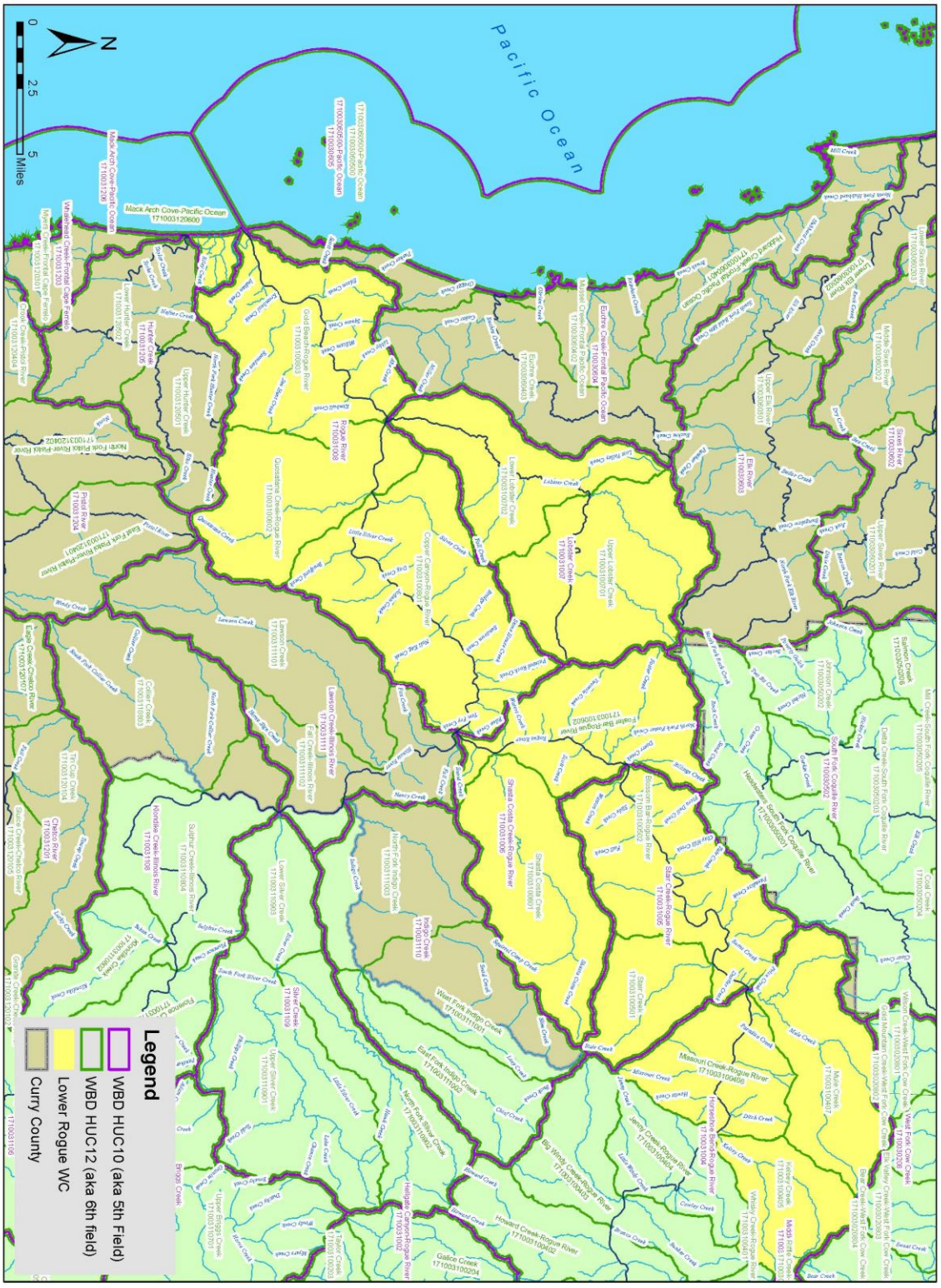


Figure 2: Land ownership in the Lower Rogue River

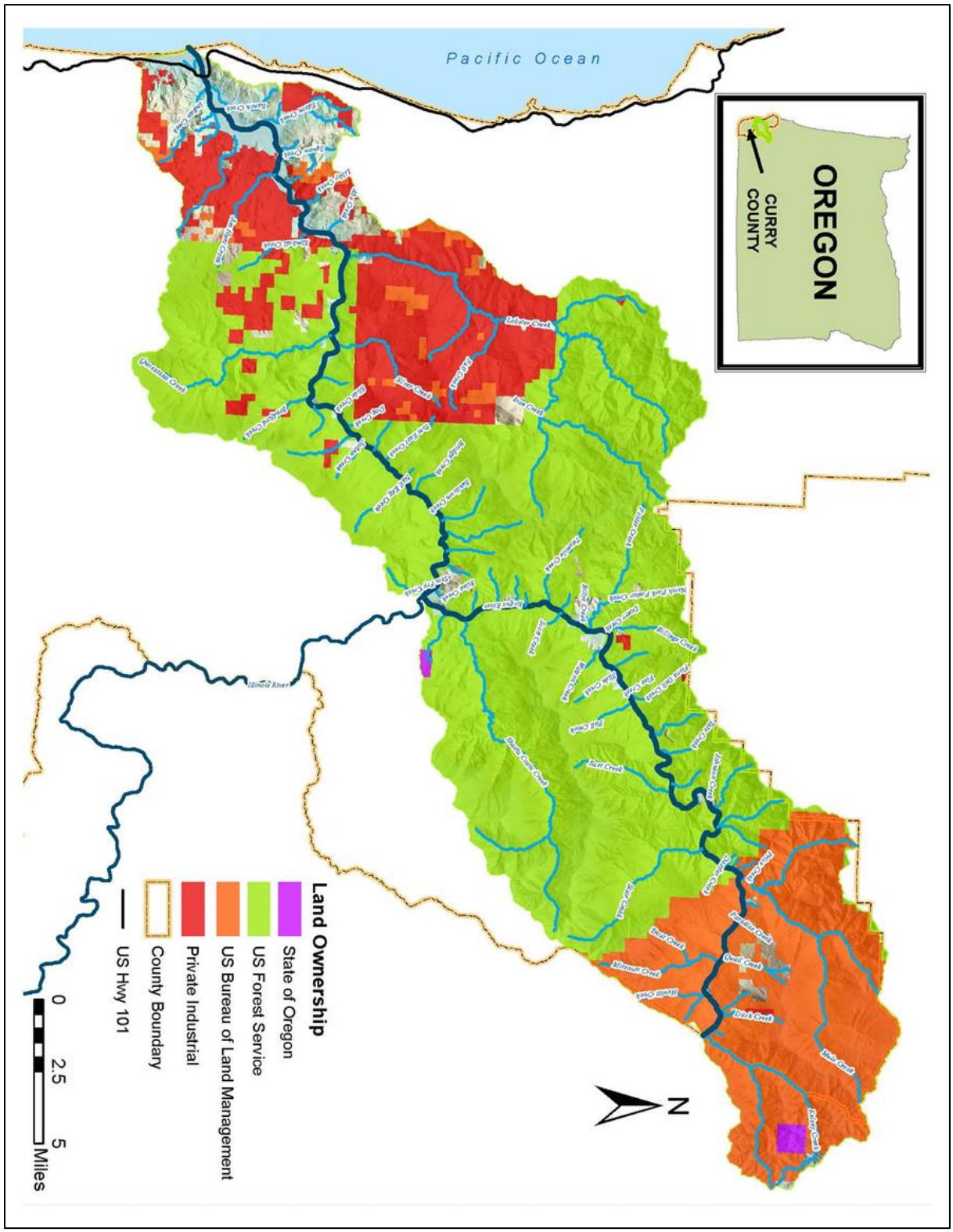


Figure 4: Spring and summer Chinook salmon distribution in the lower Rogue

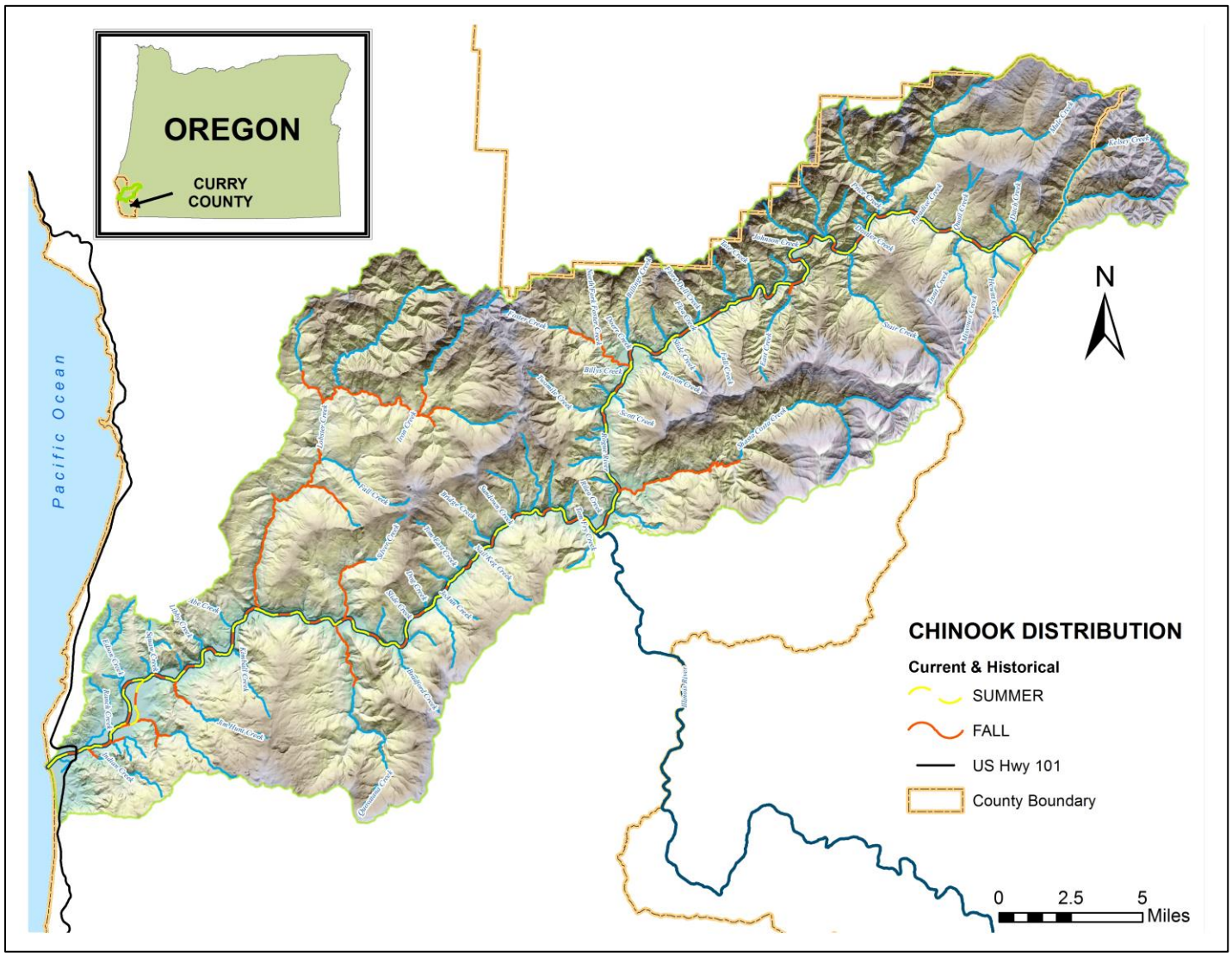


Figure 5: Coho salmon distribution in the lower Rogue

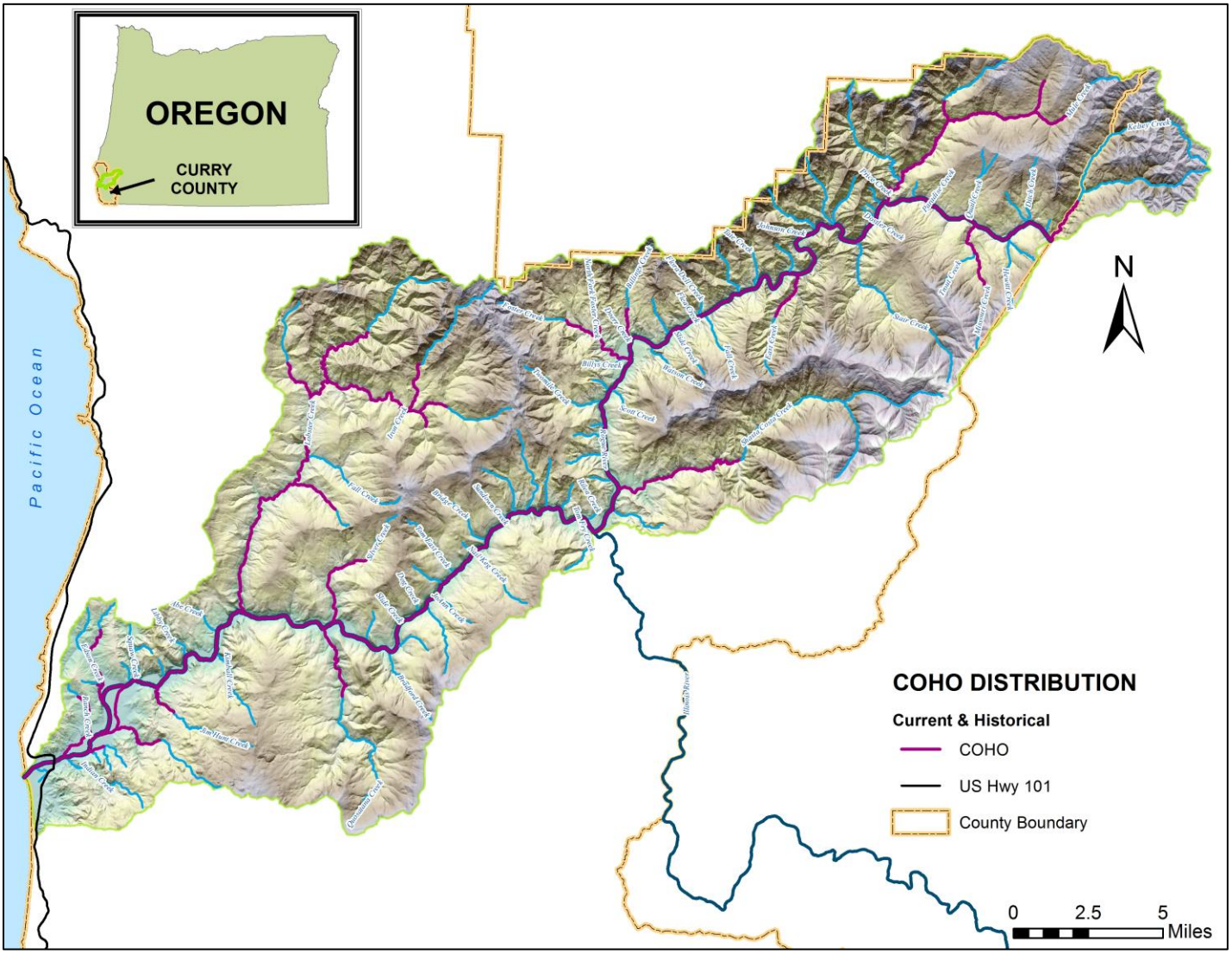


Figure 6: Summer and winter steelhead distribution in the lower Rogue

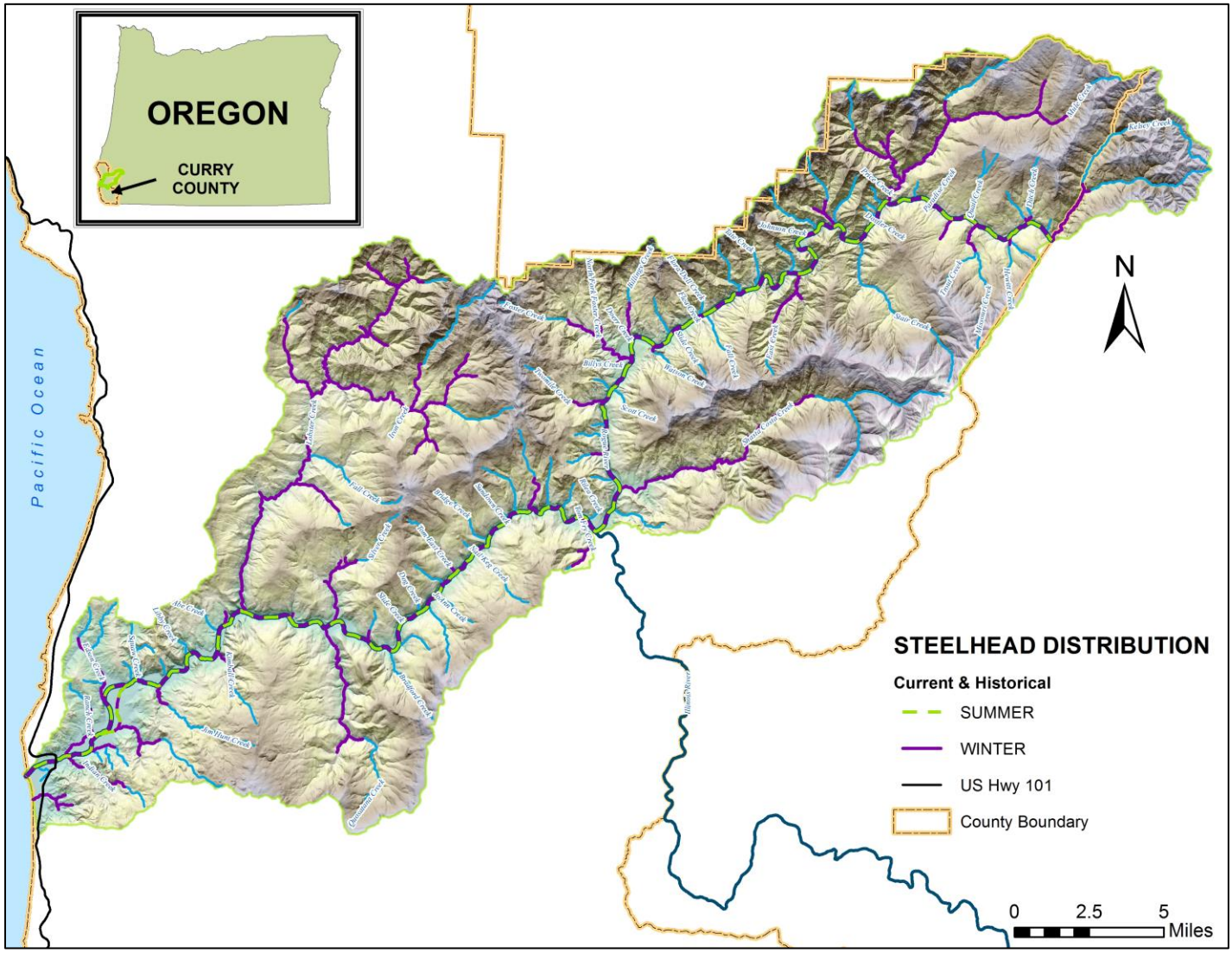


Figure 7: Restoration projects in the lower Rogue watershed

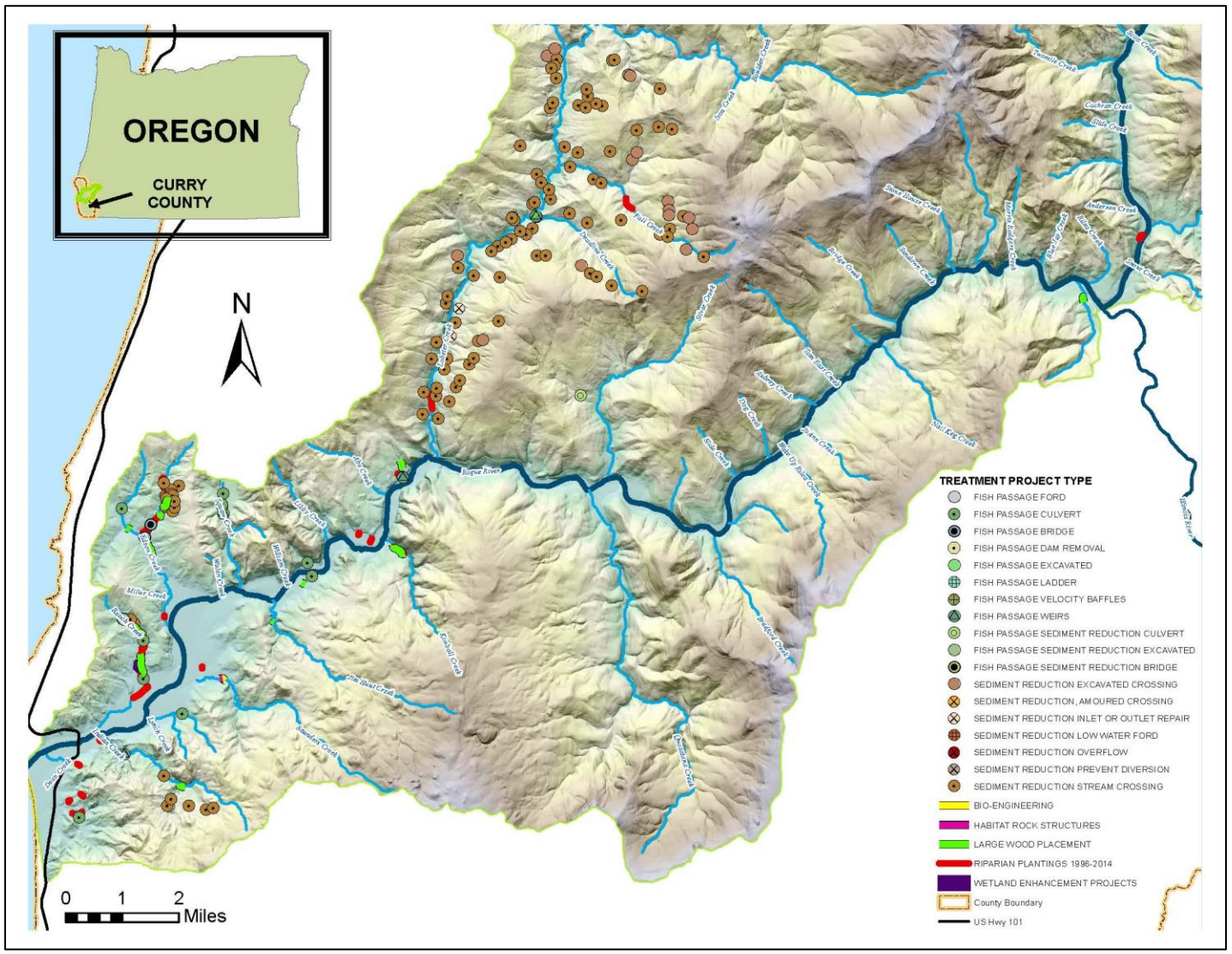


Figure 8: Level of existing riparian shade on streams within the lower Rogue River watershed.

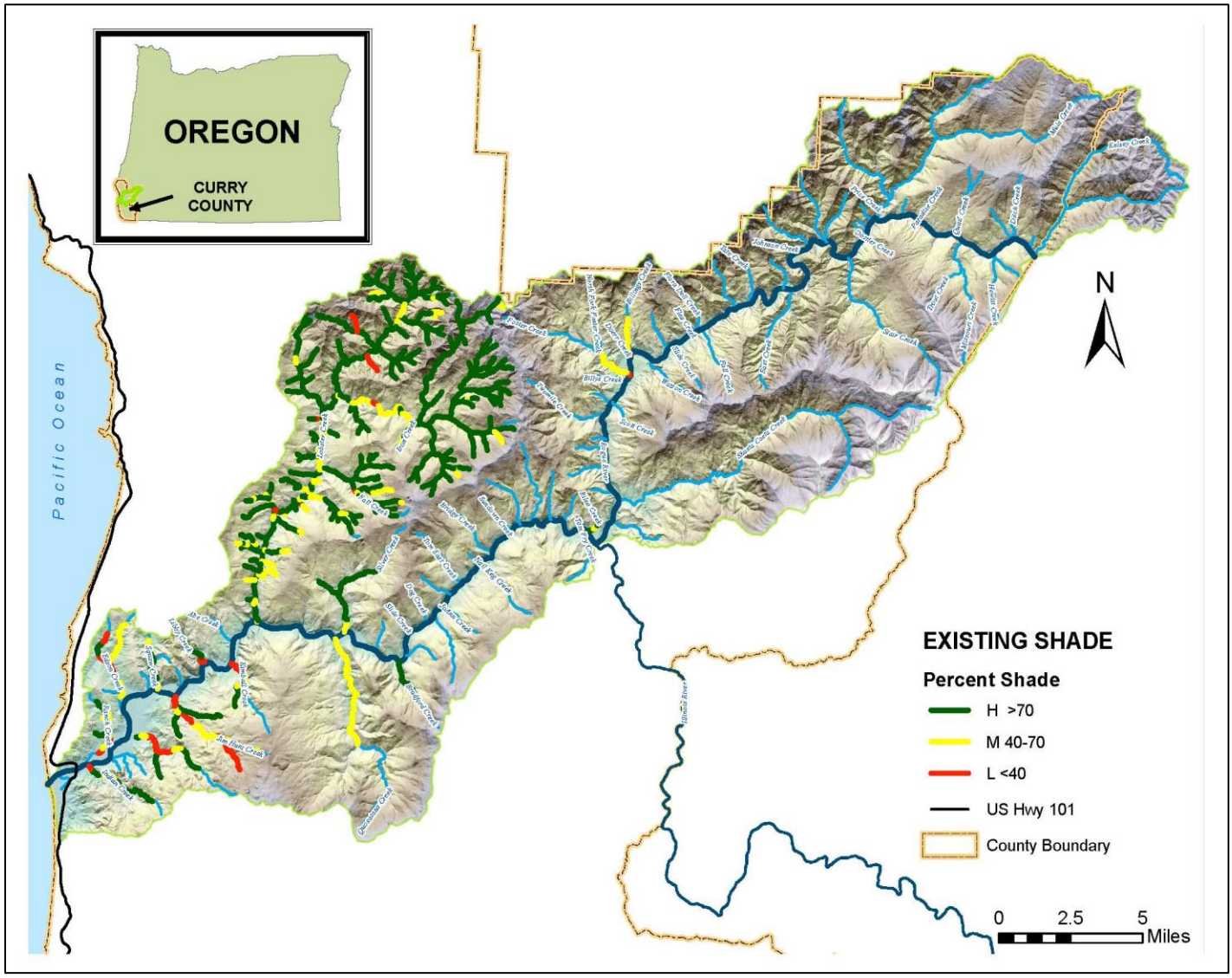


Figure 9: Existing shade on Lobster Creek and its tributaries.

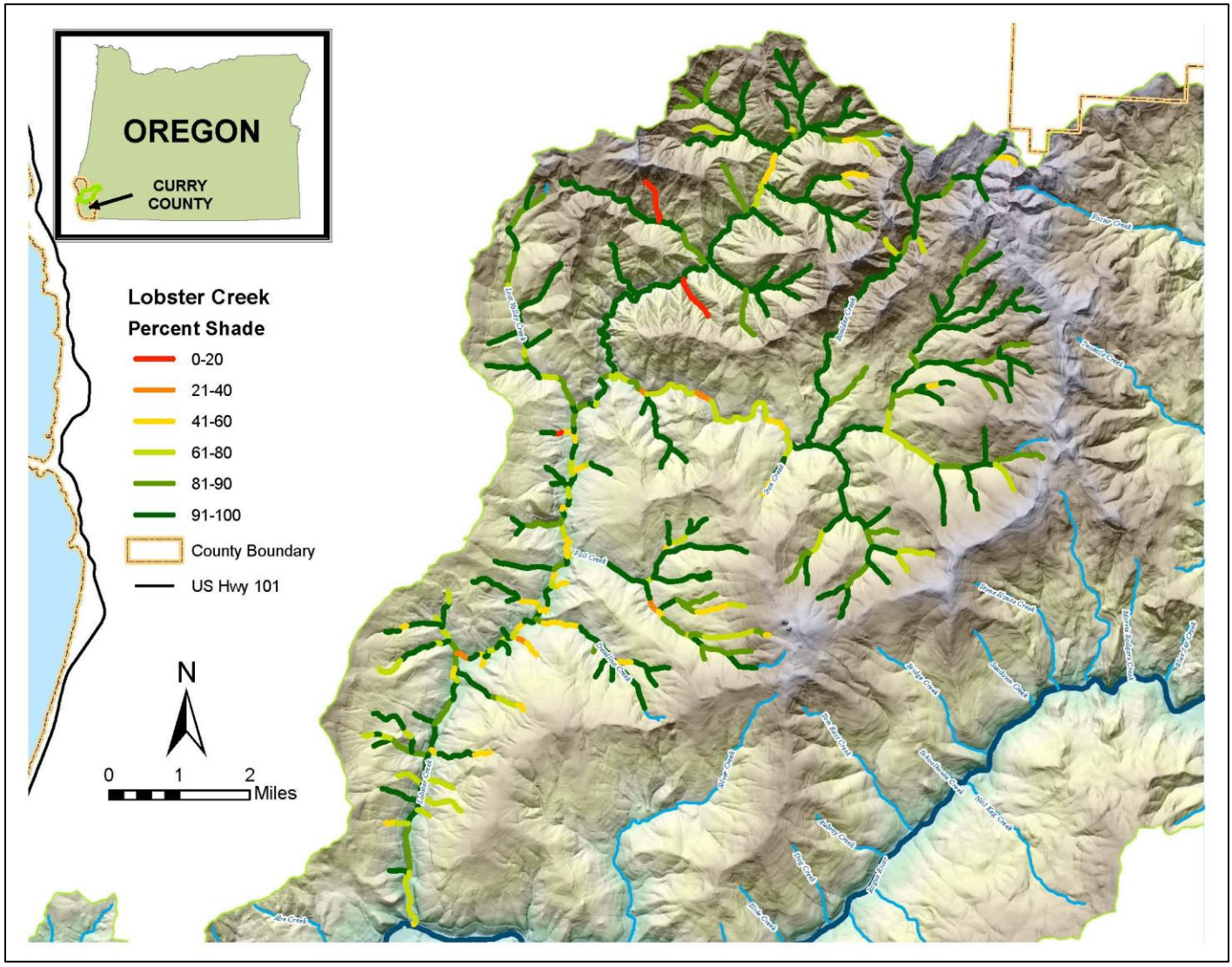
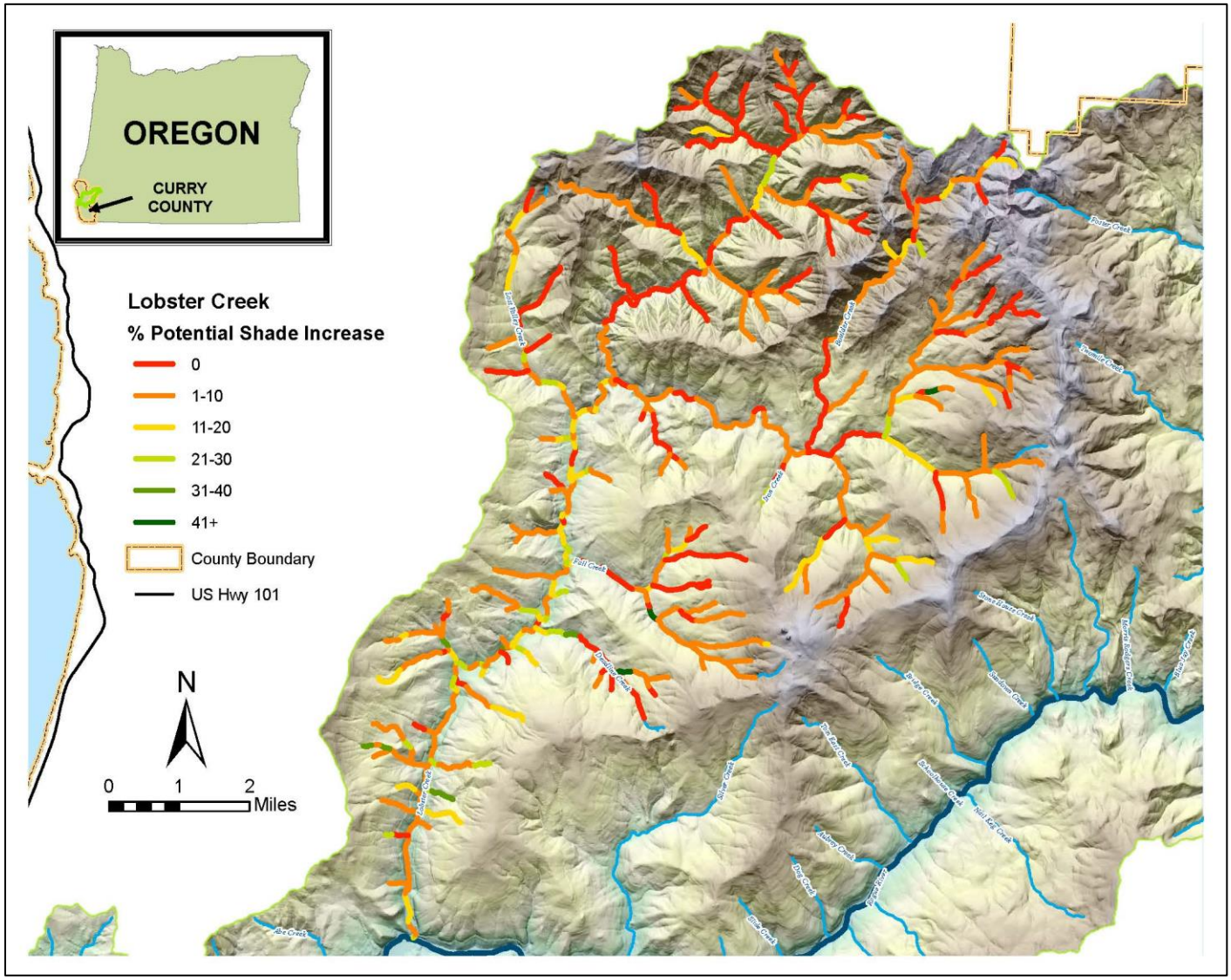


Figure 10: Potential shade on Lobster Creek and its tributaries.



Appendices

Appendix A

A Summary of Projects and Future Needs for the Lower Rogue River
Information compiled by Swanson Ecological Services and the Curry Soil & Water Conservation District

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Fish Passage Projects
Approximately 27 fish passage projects have been implemented on tributaries of the Lower Rogue River. Project types include:

- Boulder Weirs – constructed to reduce jump heights into culverts or over dams
- Culverts with Baffles or Weirs – baffles/weirs are mounted at regular intervals to reduce velocity inside culverts that are too long and/or too steep
- Countersunk (Embedded) Culverts – the culvert is installed with the invert below the (*anticipated*) new channel profile so bed material can accumulate inside the culvert and simulate a natural stream bed
- Bridges – if the span is long enough, bridges will eliminate artificial constrictions on both the stream channel and the floodway; making them the preferred structure

Implementation has occurred in the following tributaries:

- Ranch Creek – Private Roads (5 sites, 6 projects)
- Edson Creek – County Road, Multiple Private Crossings (6 sites)
- Indian Creek – Knox Property (3 sites)
- Deadline Creek (Lobster) – FSR3310 (1 site, 2 projects)
- Silver Creek (LR) – Menasha's Forest Access Road (1 site)
- Coyote Creek – County Road (1 site)
- Schoolhouse Creek – County Road (1 site, 2 projects)
- Schneidea Creek – County Road (1 site)
- Krambeal Creek – County Road (1 site)
- Squaw Creek – County Road, Private (4 sites)

Fish Passage projects have been monitored using multiple methodologies, including:

- Physical Evaluations of the structures to determine if they meet ODFW's jump height and swim speed criteria, and if they constrict the channel – see *2003 Fish Passage Project Effectiveness Monitoring* report
- Salmon Spawning Surveys are conducted upstream of the structure to determine if adult fish are recolonizing/using the available habitat – see *2010 and 2013 Coho Salmon Spawning Survey Results* reports
- Juvenile Presence/Absence surveys are conducted to document passage, by species – see *2007 Fish Passage Juvenile Presence/Absence Surveys* report

- Habitat Assessments were conducted to characterize the habitat that was made accessible and to identify upstream barriers – see *Fish Passage Habitat Evaluation Project 2010* report

Instream Wood Placement Monitoring

Approximately 13 instream wood placement projects have been implemented in tributaries of the Lower Rogue River. Implementation has occurred in the following streams:

- Edson Creek – 1 project on the mainstem and 1 project in the East Fork
- Ranch Creek – 2 projects on the mainstem
- Indian Creek – 2 projects on the mainstem
- Jim Hunt Creek – 1 project on the mainstem
- Saunders Creek – 1 project on the mainstem
- Kimball Creek – 1 project (2 phases) on the mainstem
- Deadline Creek – 1 project on the mainstem
- Tom Fry Creek – 1 project on the mainstem
- Schoolhouse Creek – 1 project on the mainstem

Additional projects in Quosatana, Foster, Jim Hunt, and Saunders Creeks were considered, but an initial on-the-ground assessment of conditions (morphology, access, risk, etc.) led to the conclusion that these sites were not cost-effective, posed too much risk, or required extensive development due to NEPA, etc. (see *Lower Rogue Tributary Large Wood Final RAC Report)*. Following this assessment, multiple attempts were made to fund technical assistance to engineer wood placements in Saunders Creek, to address bank erosion on private land, but none of these proposals were awarded. Of these sites, Quosatana Creek is the most worthy for reconsideration.

Instream Wood Placement Projects have been monitored using juvenile snorkel surveys (Kimball), pool metrics (Ranch, Edson, Schoolhouse, Coyote, Kimball), ODFW AIP stream survey (Indian), and visual observations (most sites). See monitoring reports for more detail.

Road Inventory and Sediment Abatement Projects
Approximately 154.27 miles of road in the Lower Rogue have been inventoried for sediment sources using an in-house protocol that evaluates drainage, road fill stability, and road-stream crossings; data is stored in an in-house database. Road Inventory has taken place in the following subwatersheds:

- Lobster Creek – 83 miles of private, 132 Forest Service crossings (see *Lobster Creek Partnership* reports for more information)
- Silver Creek (LR) – 27.36 miles
- Edson Creek – 4.4 miles
- Ranch Creek – 4.48 miles
- Indian Creek – 9.85 miles
- Saunders Creek – 11.2 miles
- Kimball Creek – 1.90 miles

- Jim Hunt Creek – 0.77 miles
- Libby Creek – 1.61 miles
- Miscellaneous Rogue Frontage – 9.70 miles

Road Inventory data is analyzed for both chronic sources of sediment and the risk of road fill and road-stream crossing failure, and sites are prioritized based on the likelihood and volume of delivery. The results of the analysis are used to develop Sediment Abatement Project Plans that are used to secure funding and to implement projects. Sediment Abatement projects have been implemented in the following subwatersheds; additional information can be found in the Lobster Creek Partnership reports, project effectiveness monitoring reports, and the restoration grants' final reports:

- Lobster Creek – multiple projects have led to the treatment of most High and Medium priority sites on private lands (~ 83 miles of road), and to a much lesser extent, sites on Forest Service and Bureau of Land Management lands. Details can be found in the Lobster Creek Partnership reports
- Ranch Creek – multiple High priority sediment sites were addressed through the implementation of fish passage projects
- Edson Creek – a segment of Bonneville Power Administration access road and approximately 4 miles of private road were comprehensively treated
- Indian Creek – two projects treated most High and some Medium priority sites on 9.85 miles of private road; questions remain, though, whether the second phase of treatment was ever fully implemented
- Rogue Frontage (FSR3533) – road drainage was improved by replacing and adding ditch relief culverts on approximately 3.5 miles of road
- Reese Gulch – one High priority stream crossing culvert was replaced

Riparian Restoration Projects
- Comprehensive riparian monitoring
- Planting associated with projects
- Cottonwood plantation on Elephant bar
- Hardwood conversion/interplanting on Lobster and its tributaries

Bio-Engineering Projects
- Projects driven by Oregon State University (OSU)
- Failure on mainstem during 1996 flood
- Work on Saunders created ongoing problems – led council to steer clear of bank stabilization projects in 2012

Miscellaneous Projects
- Indian Creek Wetlands
- Stream Survey on Saunders

Future Monitoring and Assessment Needs

- Assess juvenile salmonid use (summer and winter) in backwater areas and in tributary channels that cross the Rogue River floodplain (i.e. rearing habitat)
- Road inventory to address sediment delivery to key mainstem rearing habitat (see Future Projects for further discussion)
- Ground truth fish distribution in Silver Creek (LR) and assess opportunities for instream and fish passage projects
- Assess instream project opportunities in Coyote, Schneidea, upper Ranch, Edson Mainstem, NF Edson, EF Edson, Deadline, and SF Lobster Creeks & tributaries, Boulder Creek & tributaries (Lobster), and Fox Creek
- Assess riparian restoration opportunities on private land in Foster Creek
- Assess lower Ranch Creek for fish passage impediments associated with Tidewater's operation

Future Project Needs

- Fulfill the Lobster Creek Partnership's mission – address remaining sediment abatement priorities on private ground; assist the USFS implement the findings of the 2011 reassessment of their road-stream crossings
- Create, enhance, and restore backwater areas (e.g. Elephant Bar slough) and tributary channels where they cross the Rogue River floodplain (e.g. Ranch, Edson, Krambeal, Coyote, Jerry's flat meadow stream, north bank tributaries near Tu Tu Tun, tributaries around Agness and Illahe, etc.)
- Restore riparian vegetation (i.e. cottonwoods, ash, conifers) on the Port owned islands and point bars
- Work with Freeman and Tidewater to integrate habitat creation in conjunction with gravel extraction; identify sensitive areas on their properties for restoration or avoidance
- Purchase property within the Rogue River floodway for conservation (e.g. Elephant Rock bar, wetlands and pasture circa mouth of Edson and the mouth of Ranch, pastures near Jerry's Flat, riverside of the North Bank road around Tu Tu Tun)
- Conduct road inventory and sediment abatement projects on non-county residential roads and driveways that feed backwater areas and tributaries with Rogue River floodplain habitat (i.e. God Wants You watershed, Rogue Hills, North Bank driveways feeding Edson, driveways feeding tributaries around Tu Tu Tun, Saunders Creek)
- Manage English ivy and other invasives in the existing and future riparian floodplain reserves (e.g. Elephant Bar, Indian Creek wetland)
- Instream wood placements in Edson Creek mainstem, Quosatana Creek, and Fox Creek

Appendix B

Lower Rogue Potential Projects
Based on Prioritization of Restoration Actions

Council Priority # 1 Rogue River Estuary	Title: Elephant Bar Estuary Habitat creation using sand and gravel extraction Objective: Create additional off-channel habitat for anadromous fish Responsible Parties: Elephant Bar Committee (OSU, WC, GBHS, Freeman Rock)					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Initial assessment & design complete; possibly include in FIP?	Create/expand off-channel estuary habitat for anadromous fish in Rogue River estuary	ODFW, OSU Extension, Freeman Rock, Gold Beach High School, ODFW, DOGAMI	• Final design, adaptive monitoring strategy • Assessments • Permits • Habitat creation • Model for habitat creation/enhancement using gravel extraction • Survey/monitoring methodology • Educational/monitoring and research opp. for GBHS, OSU	Obtain funding for project Design and approval of design, monitoring strategy Obtain permits (DSL, ACOE) Complete design Final approval Final report Monitoring	DSL, NOAA, USFWS, OWEB

Council Priority # 1 Rogue River Estuary	Title: Rogue River Boat Basin Enhancement Objective: Maintain/enhance estuary habitat Responsible Parties: LRWC, Port of Gold Beach, ODFW					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Seek grant funding; possibly include in FIP?	Create and/or enhance estuary habitat within and adjacent to boat basin and lands belonging to Port of Gold Beach	Port of Gold Beach, OSU Extension, ODFW, ACOE, NMFS	• Assessment of habitat use and value • Coordinated plan for maintaining and/or enhancing habitat	Contract assessment Develop plan Public outreach Seek funding for implementation	Port of GB, ODFW (R&E)

Council Priority # 1 Estuary Restoration	Title: Riley Creek Estuary Restoration Objective: Restore functioning estuary at mouth of Riley Creek Responsible Parties: City of Gold Beach					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Ongoing, Working with the city of GB and OSU to prepare planting plan and educational work with Riley Creek Elementary	Restore estuary form and function to Riley Creek in two acres of land at mouth of creek; remove invasive species and replace with scrub/shrub native vegetation; increase awareness of invasive species; develop educational opportunities for schools in estuary	Central Curry School District, City of Gold Beach, Curry County, OSU Extension, Curry SWCD, State Parks, Port of Gold Beach, Gold Beach Visitors Center	• Remove invasive species; restore native scrub/shrub vegetation • Restore estuary function for fish and other estuary organisms • monitoring opportunities for K-12 Increased access for citizen/tourist education and viewing	Develop monitoring plans/class outlines Assist in planting plan Public outreach Monitoring	Handled by City of GB through a contract

Council Priority # 2 Channel Structure & Floodplain Development	Title: Ranch Creek Fish Passage & Enhancement Objective: Improve habitat in Ranch Creek for anadromous fish Responsible Parties: LRWC, property owners, ODFW					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Ongoing; looking for funding and better landowner relations	Improve habitat by increasing large wood in system, increasing stream complexity, access to off-channel habitat, and maintaining riparian areas	Landowners, ODFW, Tidewater	• Permits • Contract • Fish passage at high flows with natural stream bed • Seek enhancement designs • Public outreach	Obtain funding for projects Obtain project designs Award Contracts Final report Monitoring	OWEB BLM USFS RAC USFWS

Council Priority # 2 Channel Structure & Floodplain Development	Title: Indian Creek Wetland Enhancement Objective: Enhance wetland habitat for anadromous fish; update/restore educational kiosk and trail system Responsible Parties: LRWC, 'Friends of Indian Creek'					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Educational kiosk is now complete; Project Is possibly include in FIP?	Enhance wetland area at Indian Creek; long-term trail maintenance, kiosk restoration, and landscaping	Port of Gold Beach, CAF, ODFW, Rotary Club, Muscle Busters	• Improvements and maintenance of Indian Creek • Design for wetland enhancement/ contract package • Permits • Enhanced habitat for anadromous fish • Remove invasive weeds from site	Obtain funding for project Outreach to students Gauge volunteer interest Final approval Complete project Monitoring	OWEB City of GB Curry County USFWS ODFW (R&E) DSL USFS RAC

Council Priority # 2 Channel Structure & Floodplain Development	Title: Kimball Creek large wood placement Objective: Enhance stream form and function using large wood Responsible Parties: LRWC, Swanson Ecological Services, property owner					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
med	Change of landowner; work on new landowner relationship	Enhance stream form and function in by placing large wood in lateral 'log jams' a braided stream complex; create pools, habitat, and maintain summer flows in stream	ODFW, USFS, property owner, Swanson Ecological Services	• Final design and contract package • Permits • Improved summer flows • Enhanced stream stability and structure • Improved fish habitat	Form relationship with new landowner Locate large-diameter wood Obtain a design for LWD placement	USFW RAC ODFW

Council Priority # 3 Sediment Supply	Title: Jim Hunt Bar culvert replacement Objective: Replace failing, under-sized culvert on tributary of Rogue River Responsible Parties: Watershed Council, Port of GB					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
med	Bridge completed, large wood installed; continuing work on invasive weed removal and planting	Replace a failing, under-sized culvert to an intermittent tributary to the Rogue with a fish passage culvert; remove invasives; Connect wetlands to adjacent stream that flows into the Rogue	Port of Gold Beach, Curry County, ODFW	• Culvert sized for higher flows • Invasive species (blackberries, English ivy, vinca, etc.) removed • Plant trees/native plants in riparian area • Partnerships	Final report Monitoring Weed maintenance	OWEB Small Grant & ODFW R&E (Both grants secured)

Council Priority # 3 Sediment Supply	Title: Saunders Creek Sediment Monitoring Objective: Monitor stream for macroinvertebrate community and sediment sources Responsible Parties: LRWC, property owner(s), ODFW					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Ongoing; looking for funding and acknowledging that there are MANY landowners	System produces a lot of sediment; we want to look at point source inputs. Set up turbidity sites; look at the macro communities, shade, and perform RBS transects at several locations.	Saunders Creek property owners, ODFW, USFWS, OWEB, DEQ	• Check point and non-point sources of sediment input • Create transects through Saunders drainage • Lay out quadrants for macro monitoring • Record shade/temp at sites	Obtain funding for project Outreach to high school students Final approval Complete project Monitoring	OWEB ODFW DEQ USFS RAC

Council Priority # 4 Water Quality & Quantity	Title: Edson Creek Objective: Monitor previous project work for increased water quality in watershed Responsible Parties: LRWC, ODFW, landowners					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Ongoing; Seek funding	Check effectiveness of past projects. Have had large wood placement, riparian plantings, fenced livestock out, and more. Is it working?	LRWC, ODFW, Swanson Ecological Services, landowners	• Monitor project effectiveness • Continue to foster landowner relationships	Determine which projects to monitor Find willing landowners Obtain project funding Draft effectiveness report	USFS RAC BLM RAC OWEB

Council Priority # 4 Water Quality & Quantity	Title: Agness Integrated Vegetation Strategy Objective: Increase water storage capacity in uplands using timber management strategies Responsible Parties: USDA FS Gold Beach, CFPA, Watershed Council					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Ongoing; Seek funding for grant	Identify non-federal streams that could be improved by conversion to conifers, inter-planting, large wood placement, road work, thinning uplands to promote late-seral forest; reduce wildfire risk	USDA FS Gold Beach, CFPA	• IDT plan for lower Rogue Basin integrating all natural resource disciplines • Project proposals • Build partnerships	Work with IDT to identify potential areas of concern Work with IDT to identify potential project areas EIS Project funding	RAC, USDA FS (Wyden Amendment)

Council Priority # 4 Water Quality & Quantity	Title: Ray's Market Runoff Bioswale Objective: Improve water quality by treating parking lot runoff using bioswales and vegetated riparian areas Responsible Parties: C&K Markets, LRWC, OSU Extension, Riley Creek School					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	This is a need to treat the parking lot water before it enters Riley Creek; have not applied for funding yet	Help to promote use of bioswales (rain gardens) to treat stormwater runoff where applicable	C&K Markets, OSU Extension , Riley Creek School	• Awareness of importance of functioning riparian areas • Public outreach and education • Protection of water quality to Riley Creek	Replant riparian Maintain existing trees Install bioswale Plant bioswales Final report	Wild Rivers Community Foundation, OWEB Small Grant

Council Priority # 5 Invasive Species & Increase Riparian Buffers	Title: Invasive Species Monitoring and Education Objective: Monitoring and education on invasive plants and animals in the Rogue Watershed Responsible Parties: LRWC, CWPT, Weed Board, OSU Extension, LRWC					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	On-going	Monitor for presence and identify sites with invasive plants and animals; outreach and education for property owners, contractors	Curry SWCD, Riley Creek School, CWPT, OSU Extension	• Determine presence and extent of invasive species • Work with South Coast and LRWC Watershed Education Program manager to help eradicate weeds in our watersheds	Survey watershed Outreach for volunteers to help pull weeds Connect with agencies on invasive animal data Continue public education Work with City of GB to post 'no dumping of yard waste' signs	Ongoing

Council Priority # 6 Outreach and Education	Title: Watershed Education Objective: Provide watershed education to **Grades 4 – 8** in Curry County Schools Responsible Parties: South Coast & Lower Rogue Watershed Councils, Central Curry School District					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	On-going	Provide in-class and outdoor education on watersheds for grades 4 – 8, working with teachers to meld instruction with State standards and requirements	Statia Ryder, Watershed Education Director, Central Curry School District, South Coast WC, CSWCD	• Increase knowledge & appreciation for watersheds & riparian areas • Hands-on experience with water quality, riparian, fish, & invasive species issues • Student ownership in healthy watersheds	Support Statia with grant funding Volunteer time Review curriculum requirements and changes	ongoing

Council Priority # 6 Outreach and Education	Title: Watershed Education Objective: Provide watershed education to **Grades 9-12** in Curry County Schools Responsible Parties: South Coast & Lower Rogue Watershed Councils, Central Curry School District					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
emerging	No ongoing program in the **high school**, but teachers have shown interest in wanting to continue the watershed education	Think of new ways to partner with the high school on in-class and outdoor fieldtrips, working with teachers to meld instruction with State standards and requirements	Central Curry School District, South Coast WC, CSWCD	• Increase knowledge & appreciation for connection to watershed • Hands-on experience with water quality, riparian, fish, & invasive species • Student ownership in healthy watersheds	Support teachers with grant funding Volunteer time Review curriculum requirements and changes	ongoing

Council Priority # 6 Outreach and Education	Title: Foodshed Education Objective: Provide foodshed education to **Grades 4 – 8** in Curry County Schools Responsible Parties: South Coast & Lower Rogue Watershed Councils, Central Curry School District					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	On-going	Provide in-class and outdoor fieldtrips on foodsheds for grades 4 – 8, working with teachers to meld instruction with State standards and requirements	Cathy Boden, Foodshed Education Director, Central Curry School District, South Coast WC, CSWCD	• Increase knowledge & appreciation for food sources and food growers, and connection of food to your watershed • Field trips to local lambing, cranberry, & beef operations • Student ownership in healthy living and healthy watersheds	Support Cathy with grant funding Volunteer time Review curriculum requirements and changes	ongoing

Council Priority # 6 Outreach and Education	Title: Rogue River Cleanup Objective: Organize school/community trash pickup along roads and gravel bars on lower Rogue River Responsible Parties: Watershed Council, SOLV, Trash Dogs, Riley Creek Watershed Education Director, Surfriders					
Priority	Status	Description	Partners	Deliverables	Tasks	Potential Funding
high	Annual event	Organize students and community volunteers with jet boat drivers for a one-day litter pick on the lower river; organize lunch and educational and/or inspirational speaker for students	SOLV, Freeman Marine, Trash Dogs, Gold Beach Rotary, Riley Creek Watershed Education, Curry Reporter, Curry County, OR State Police, USDA FS Gold Beach, Jerry's Jets, Mailboats, CTR, Surfriders	• Awareness of how litter and trash reach gravel bars • Hands-on experience with preserving health and beauty of river • Student ownership in clean, healthy watersheds	Outreach for funding and participants Coordinate timing with other community events Enlist jet-boat drivers Advertise to students and community Plan logistics and food Enlist volunteers	Rotary Trash Dogs Freeman Marine Thrivent SOLVE City Of GB Donors

Oregon Water Quality Index - Rogue River at Lobster Point Bridge

	Overall OWQI			Temperature			pH			DO			BOD			Total Solids			Nitrogen			Phosphorus			Bacteria		
Year	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend	Score	Cond	Trend
2009	87	Good	Dec	74	Poor	NT	91	Excellent	NT	92	Excellent	NT	82	Fair	Dec	85	Good	Dec	94	Excellent	NT	82	Fair	NT	96	Excellent	NT
2010	87	Good	NT	74	Poor	NT	93	Excellent	Inc	91	Excellent	NT	82	Fair	Dec	85	Good	Dec	94	Excellent	Inc	82	Fair	NT	96	Excellent	Dec
2011	87	Good	NT	75	Poor	NT	94	Excellent	Inc	91	Excellent	NT	82	Fair	Dec	85	Good	Dec	94	Excellent	Inc	83	Fair	NT	96	Excellent	NT
2012	88	Good	NT	77	Poor	NT	96	Excellent	NT	91	Excellent	NT	82	Fair	Dec	84	Fair	NT	94	Excellent	Inc	82	Fair	Inc	96	Excellent	NT
2013	88	Good	NT	78	Poor	NT	96	Excellent	NT	92	Excellent	NT	81	Fair	Dec	84	Fair	NT	95	Excellent	NT	82	Fair	Inc	96	Excellent	NT

Legend

WQ Condition	Score
Excellent	90-100
Good	85-89
Fair	80-84
Poor	60-79
Very Poor	10-59

The Oregon Water Quality Index provides a score for general water quality conditions, based on the water quality parameters shown above. Results from each parameter are converted into subindex scores using relations depicted on graphs such as the one below for pH. The overall Oregon Water Quality Index is calculated by combining all of the subindexes with a formula to give a single water quality index score, ranging from 10 to 100.

- Water temperature on the Rogue is elevated by daily heating inland. Summer daily maximum temperatures regularly reach 75°F and daily minimum temperatures exceed 65°F.
- In 2009, the pH subindex score of 91 was close to the "Good" range (table above). The score of 91 corresponds to a pH of approximately 8.2 on the graph to the right. The pH score rose through the years as the pH declined. If the original pH were less than 7.0, the declining pH would cause poorer water quality conditions.
- Biochemical oxygen demand (BOD), is a measure of organic matter in the water column. The multi-year increase in BOD coresponds with decreasing pH, likely due to the organic acids contained in the organic matter.
- Organic matter isn't concentrated enough to change the overall dissolved oxygen level, except in areas where the water is stagnant, for example in the sloughs and boat basin.
- Total Solids showed a declining trend. Also, for 1980-1998, the subindex score for this station was 81.5, compared with these data at 84.4-85.3. However total solids data are skewed by samples collected during storms, so further analysis is needed.
- Nitrogen condition is Excellent. Ocean upwelling is a source for the estuary
- Phosphorus is elevated, resulting in a Fair condition. E.coli bacteria levels in mainstem are excellent, more pollutants downstream
- Comparing results with other Rogue sampling stations would provide more insight into natural and anthropogenic sources of impairment.