



Salmonid Restoration Federation

22nd Annual Coho Confab on the Klamath River

Klamath River—Coho Habitat Restoration in the Era of Dam Removal and Megafires

August 23-25, 2019

Salmonid Restoration Federation (SRF) is coordinating the 22nd Annual Coho Confab that will take place August 23-25 in the mid-Klamath region in Humboldt County. The Coho Confab is a field symposium to learn about watershed restoration and techniques to restore and recover coho salmon populations. The Confab provides an ideal opportunity to network with other fish-centric people and to participate in field tours that highlight innovative salmon restoration practices. This year, SRF is collaborating with several groups to produce this educational event including Mid-Klamath Watershed Council, the Yurok Tribe Fisheries Program, the Karuk and Hoopa tribes, and Fiori GeoSciences.

The Coho Confab will open Friday evening, August 23 with a community

dinner and inspiring keynote presenters, including Will Harling, Executive Director of Mid-Klamath Watershed Council (MKWK), who will give a presentation about what the Klamath community has learned after a decade of restoration. Toz Soto, Karuk Fisheries Program Manager, will expound on coho ecology studies in the Mid-Klamath in this time of climate change and efforts to create cold water habitats with groundwater. Additionally, Amy Cordalis, General Council and Mike Belchik, Senior Scientist, both with the Yurok tribe will share a *Yurok Perspective on the Science and Progress Made Toward Dam Removal on the Klamath River*.

On Saturday, MKWK will offer two full-day tours including a tour of in-channel and off-channel projects in Seiad Creek and a tour of coho salmon

recovery efforts in Horse Creek to address the cumulative impacts of mining, channelization, human development, and fire.

In the morning, Justin Alvarez from the Hoopa tribe will lead a stream and valley floor restoration tour in Klamath tributaries. Additionally, there will be an afternoon tour of Beaver Dam Analogues (BDA) planning projects and thermal refugia in Boise Creek, a tributary to the Klamath River.

Participants will return from an exciting day seeing exemplary field sites, in time for a Klamath Dam Removal Open Forum at Sandy Bar Ranch to discuss the status, timeline, and restoration opportunities. The Open Forum will include representatives from the Yurok and Karuk tribes as well as a representative of the Klamath River Renewal Corporation.

The last day of the Confab will include two concurrent field tours, including a tour to explore the use of BDA as a restoration tool in McGarvey Creek in the Lower Klamath led by geologist Rocco Fiori and Sarah Beesley from the Yurok Fisheries Program and a tour of Trinity River Restoration Projects sites from Lewiston to Junction City.

To register for the Confab or to view the full agenda please visit our website: www.calsalmon.org.



The 22nd Annual Coho Confab will take place at Sandy Bar Ranch on the banks of the mid-Klamath.
Photo: Mark Dupont, Sandy Bar Ranch

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SRF received the 2019 Annual Water Stewardship Award from the NCRWQCB.



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CA Legislative Strides in a Time of Federal Rollbacks

A recent *New York Times* article (June 7, 2019) outlined the Environmental Rules rolled back under the current federal administration including rollbacks on rules governing air and pollution standards, drilling and extraction, water pollution, and species conservation. This audit concluded that 49 rollbacks are completed and 34 are in process totaling 84 rollbacks to legislation.

California is leading the way on environmental protections and legislation to protect wilderness, resources, wildfire, and drought planning, and to fund the tools required to measure and understand river conditions. This legislative season, there are a record number of watershed bills. Here are a few and to see more, please visit the SRF website at www.calsalmon.org

Northwest California Wilderness, Recreation, and Working Forests Act

Congressman Jared Huffman (D-San Rafael) introduced legislation to protect communities against wildfires, provide local jobs, restore lands impaired by illegal marijuana growing operations, and permanently protect many of northwest California's spectacular wild places and pristine streams. Senator Kamala Harris (D-CA) introduced the companion legislation in the Senate. Huffman's *Northwest California Wilderness, Recreation, and Working Forests Act* includes several innovative new programs to increase fire resilience, restore forests and fish habitat, stimulate local economies through forest stewardship programs, and enhance recreational opportunities including through trails and visitor centers. The legislation would not limit hunting or fishing, close any legally open roads or trails to vehicles, or affect access to or the use of private property. The wilderness designations and Wild and Scenic River designations do not impact existing rights and would not limit access.

Wildfire, Drought, and Flood Protection Bond Act of 2020

SB 45–Allen (D-Santa Monica)

This bill would enact the *Wildfire, Drought, and Flood Protection Bond Act of 2020*, which, if approved by the voters, would authorize the issuance of bonds in an unspecified amount pursuant to the State General Obligation Bond Law to finance projects to restore fire damaged areas, reduce wildfire risk, create healthy forest and watersheds, reduce climate impacts on urban areas and vulnerable populations, protect water supply and water quality, protect rivers, lakes, and streams, reduce flood risk, protect fish and wildlife from climate impacts, improve climate resilience of agricultural lands, and protect coastal lands and resources. This bill is currently stalled in Senate Appropriations Committee.

Water Resources–Stream Gages

SB 19–Dodd (D-Senate District 3)

This bill would require the Department of Water Resources to develop a plan to deploy a network of stream gages that includes a determination of funding needs and opportunities for modernizing and reactivating existing gages and deploying new gages. In California, only 54% of the 3,600 stream gauges are active and operational. The lack of funding and maintenance for stream gauges affects the understanding of river conditions, flows, and impacts of water diversions throughout the state. Stream flow data is essential for drought allocations, flood protections, identifying infrastructure needs, and monitoring groundwater-surface interactions. This bill was introduced in December 2018 and amended in February 2019.

Redwood Creek and Marshall Ranch, SF Eel Flow Enhancement Efforts

Since 2013, Salmonid Restoration Federation has been conducting low flow monitoring in Redwood Creek and analyzing the feasibility of creating a suite of flow enhancement projects that would enhance instream flows for salmon and provide water security for rural landowners. In 2018, the Wildlife Conservation Board awarded SRF two planning grants that have greatly advanced our planning efforts.

Redwood Creek is a critical tributary for juvenile salmonids in the South Fork Eel watershed. For over five years, Salmonid Restoration Federation (SRF) has been conducting low flow monitoring in order to understand low flow patterns and prioritize water conservation efforts in this impaired watershed that is home to hundreds of residents, as well as threatened species like coho salmon.

SRF recently began our 2019 low-flow monitoring season. With late rains, flows at the end of May were approximately 30,000 gallons per minute (GPM), one week later they were approximately 14,000 GPM. From previous data collection years, we can anticipate that flows may be less than 100 GPM in July and potentially less than 5 GPM in August when we usually observe disconnected pools that cause stranding of juvenile salmon.

SRF will continue our outreach campaign in Redwood Creek in an effort to identify and provide assistance to landowners who are interested in building sufficient water storage to be able to forgo diverting water in the summer months when flows are critical for aquatic species. Water storage and flow enhancement opportunities include rainwater catchment ponds, tank farms, and groundwater recharge.

A feasibility study and engineering design is currently underway on a large flow enhancement project on the Marshall Ranch near the town of Briceland, in Southern Humboldt County. Stillwater Sciences is the technical lead on the project with support from SHN Engineers and



Hydrology graduate student, Katrina Nystrom, conducting low flow monitoring in Redwood Creek.

Geologists (Geotechnical Engineering and Water Conveyance Infrastructure), William Rich and Associates (Cultural Resources), and Hicks Law (Water Rights and Legal Consulting).

At this time, the project has been advanced through a feasibility study and alternatives analyses with a selected preferred alternative of a 16 million gallon pond on an upper terrace and infiltration gallery on a lower terrace. The objective is to deliver approximately 50 gallons per minute of flow augmentation to Redwood Creek during the 5-month dry season. One hundred percent of this flow augmentation is intended to benefit fish and wildlife. Water from the pond will be piped to the infiltration gallery with a control valve regulating flow releases. The pond will be filled from direct rainfall (~6 million gallons), hillslope runoff (~1 million gallons), and water pumped into the pond from Redwood Creek during the wet season (~9 million gallons). The project is also likely to have a fire fighting component whereby some water from the system can be used for emergency fire suppression in the event of a wildfire.

In February 2019, a Technical Advisory Committee meeting was held

with agency staff from CDFW, NOAA Fisheries, North Coast Regional Water Quality Control Board, and Wildlife Conservation Board (WCB). All agency staff was supportive of moving the preferred alternative forward to subsequent design phases and the project team is currently working on technical details to advance the project design. The project team aims to submit an implementation grant to WCB in September 2019 to secure implementation funds for the project. The earliest possible construction start date target is June 2021.

This would be the largest flow enhancement project of its type in the South Fork Eel River watershed and aims to significantly improve dry-season conditions in Redwood Creek to allow for salmon migration and over-summering.

SRF is currently participating in the South Fork Eel Salmon Habitat Restoration Priorities process initiated by NOAA Fisheries and CDFW. Despite cumulative impacts that have impaired sections of Redwood Creek, it still ranks as a priority tributary to the SF Eel for biological importance, habitat condition, optimism, and potential.

Is Restoring Fire Process the Highest Priority for Coho Salmon Habitat Restoration and Protection?

By Will Harling, Director, Mid Klamath Watershed Council

Fisheries biologists, by necessity, are being forced to learn about fire and how to protect fish habitat from the effects of increasing high severity wildfire across California. And it's not just excessive sediment, it's highly toxic ash from burned homes and infrastructure that is being carried by winter rains into our streams and waterways. But fire was also used as a powerful tool to manage instream and upslope habitats for increased salmon production. If recent history is a guide, restoring fire process across California may be the single biggest action to restore and protect coho and Chinook salmon habitat.

After a century of fire exclusion and industrial forest management that created a contiguous fuelbed across the whole of the Klamath Mountains, wildfires are returning with a size and severity not seen since the last Ice Age, overwhelming the largest firefighting force in the world and threatening communities and ecosystems. Before European contact, indigenous peoples used fire as their primary management tool to maximize resource abundance and diversity. Fires were self-limiting at small scales, as any fires that started, either by humans or lightning, quickly bumped into recent fire footprints and

went out. Even in the middle of summer! Most people who now live in California have a hard time even imagining that fires could burn throughout the summer months without causing impacts to humans and the environment. But here on the Klamath River, the Karuk Tribe and other neighboring tribes have retained this knowledge of how, where, when, and why to burn for a staggering number of specific outcomes.

Here on the southern range of salmon, the Klamath River gets lethally hot nearly every summer, forcing fish into tributary mouths and other thermal refugia to survive. The Karuk Tribe utilized landscape scale ceremonial fires to put smoke into the Klamath Canyon and cool the river, allowing the Fall-run Chinook to enter the river earlier and migrate upstream to their spawning grounds. These fires, lit on Black Mountain near Orleans in August, and on Offield Mountain near Somes Bar in September, created smoke inversion layers that cooled the rivers several degrees. This phenomenon was recently documented in *David et al.* 2018 paper entitled "Wildfire smoke cools summer river and stream water temperatures," and shows proof of concept for future fisheries management with managed wildfires, prescribed fires, or ceremonial burns.

In addition to cooling rivers in the heat of summer, frequent historic fires also significantly reduced forest density and decreased the number of trees and shrubs transpiring water in dry months. This greatly increased summer base flow. There are currently 3-4 times as many trees in our forests compared to a century ago. There were generally larger, older trees at wider spacing across the landscape, with a grass and shrub understory. Recent studies from Washington state also show that this broken canopy in the high country maximized snow retention

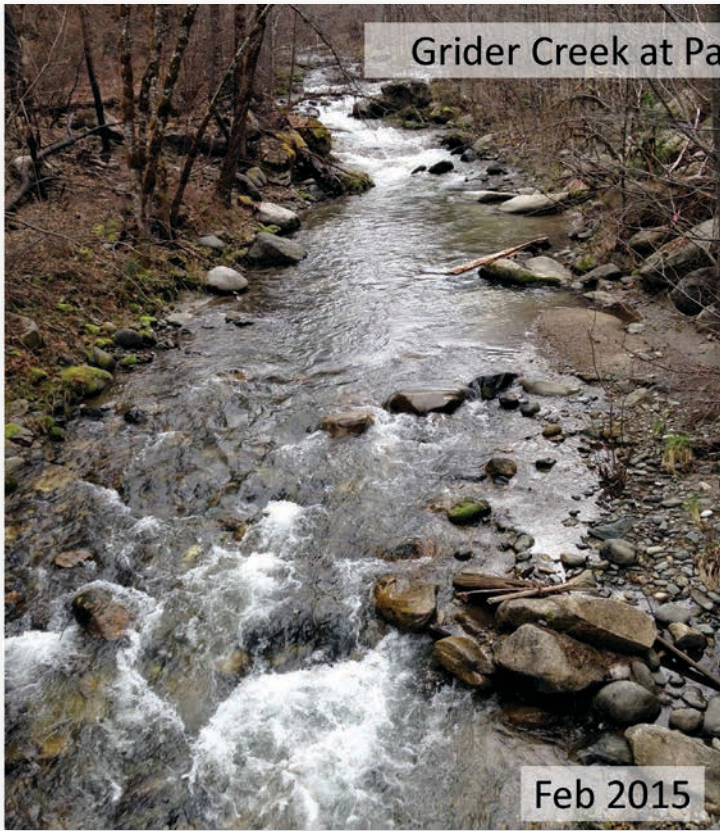


Stender Off-Channel Pond on Seiad Creek
August 2012: Post-Debris Flow

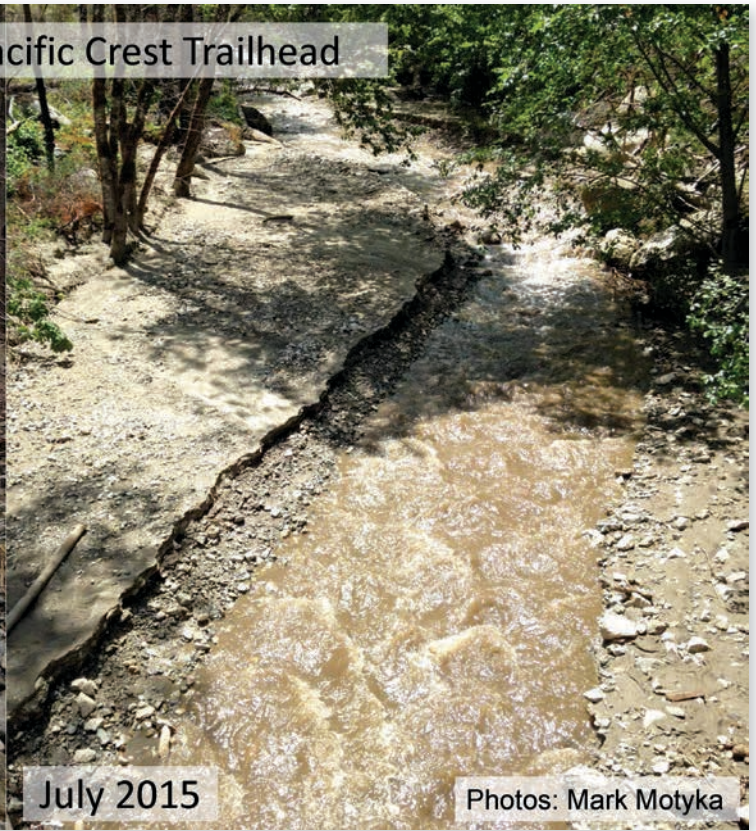


Stender Off-Channel Pond on Seiad Creek
October 2012: After Re-excitation

Grider Creek at Pacific Crest Trailhead



Feb 2015



July 2015

Photos: Mark Motyka

through the summer by allowing snow to accumulate on the ground while still being partially shaded.

While many streams have too much sediment in coastal watersheds from historic logging and other causes, some inland streams are sediment starved from a lack of fire. Historically, fires metered out wood and sediment, that provided pulses of structure and spawning gravels. Streams that have not seen fire in a long time can be lacking in spawning gravels and large wood, and tend to be incised as streambank vegetation gets large enough to armor the banks. Frequent fires thinned the willows and allowed smaller flood events to occupy the floodplain and create side-channel and off-channel habitats. In the past seven years, all of the major coho tributaries in the Middle Klamath have experienced high severity wildfires.

In 2012, a constructed off-channel coho pond on Seiad Creek was filled with sediment from a debris flow originating from the 2012 Goff Fire. The debris flow travelled through the landowner's chicken coop before flowing into the pond. Ironically, after the pond was re-excavated, coho numbers doubled!

Whether this was due to increased nutrients or other factors is still unclear.

Following the 2014 Happy Camp Complex fires that burned through Elk Creek, Grider Creek, and Beaver Creek, Grider Creek was impacted by a July 2015 thunderstorm that caused severe debris flows that filled the entire channel with sediment for approximately 15 miles to the mouth. While there were significant impacts to spawning and rearing coho in Grider Creek, this debris flow did connect the stream to the floodplain again immediately, setting the stage for future habitat development. The concerning piece of this puzzle is that while streams historically blinked

off and on from high to low quality and back again, we are seeing all our major coho streams blink off at the same time. With a depressed coho population, this can lead to localized extinctions and decreased genetic fitness.

Here on the Klamath River, we have been wrestling with restoring fire process for two decades, and linked this with instream habitat restoration through the Western Klamath Restoration Partnership. Part of this year's Coho Confab will be exploring how the negative effects of fire on coho habitat can be mitigated, and the positive effects of fire can be maximized.

Will Harling (left) is the Executive Director of Mid-Klamath Watershed Council and an advocate of prescribed burns. Harling will be providing one of the keynote addresses at the Confab and will be leading the Seiad Creek tour.

Photo: MKWK photo archives



37th Annual Salmonid Restoration Conference April 23-26 in Santa Rosa, CA

Drought, Fire, and Floods—Can Salmon and the Restoration Field Adapt?

In April of 2019, the Salmonid Restoration Federation produced the 37th Annual Salmonid Restoration Conference in Santa Rosa, California, which was attended by over 680 people from over 36 counties in California and people from 9 states from Maryland to Alaska. The theme of the conference was *Drought, Fire, and Floods—Can Salmon and the Restoration Field Adapt?* The conference agenda focused on a broad range of salmonid and watershed restoration topics of concern to restoration practitioners, watershed scientists, fisheries biologists, resource agency personnel, land-use planners, and landowners. The conference agenda highlighted pressing issues that affect the future of the salmonid restoration field, including life-cycle modeling, salmonid foodscapes, the importance of freshwater-estuary transition zones, post-fire watershed recovery planning, and the impacts of cannabis cultivation on fisheries recovery.

Workshops included a discussion on the practice of restoration of whole valley floors to a Stage 0 condition; an interactive look at assessing ecological risks from streamflow diversions by applying riffle crest thalweg rating curves; exploring innovative approaches to urban stream restoration, and a workshop on the impacts of cannabis on instream flows.

Field tours included an overview of integrating flood management, steelhead, beaver and wildlife habitat restoration in the Napa River watershed; a tour of the Santa Rosa burn zone recovery, natural regeneration and active restoration in Sonoma County watersheds; and instruction on PIT antenna technology through a review of an array of applications in the Russian River watershed. Additional tours examined habitat restoration and streamflow improvement projects in Dry Creek, Dutch Bill Creek, and Lagunitas Creek watersheds, as well as an exploration of a Stage 0 valley.

Concurrent sessions included a biology track with sessions focused on salmonid foodscapes in river networks,



Conference participants toured an array of PIT tag projects in the Russian River watershed as part of the Annual Salmonid Restoration Conference.

Photo: Will Boucher



Anna Halligan and Mary Ann King of Trout Unlimited received the illustrious Restorationist of the Year award. Anna and MAK manage a mind-boggling number of projects to enhance flows and create habitat for salmonids.

salmon life histories and habitat use, and Spring-run Chinook salmon genetics. A habitat restoration track explored innovations in the science and management of dry season water supply for salmonid recovery, stage zero design and implementation, and strategies for improving streamflow. Additionally, a landscape track featured sessions focused on planning and actions for watershed resilience, the function of floodplains in salmonid restoration, salmonid survival and ecosystem response at the base of the hydrograph, and new approaches to investigate salmon-habitat relationships in hydrologically altered river basins. Finally, a session entitled “Let the River Run” highlighted new insights into understanding the Klamath River basin, which provided essential knowledge to restoration practitioners as they work to prepare for dam removal.

The plenary session began with Representative Jared Huffman, who serves California’s 2nd District. The Congressman highlighted the numerous accomplishments and opportunities in the effort to restore California’s fisheries, including the prospect for new fish passages at Scott Dam on the Eel River, the impending removal of dams on the Klamath River, and his newly introduced Northwest California Wilderness, Recreation, and Working Forests Act, which if passed will create

special restoration areas for salmon. The plenary also featured Langdon Cook, author of *Upstream: Searching for Wild Salmon from River to Table*. Mr. Cook spoke about his experience exploring the connections between salmon and people, highlighting work by certain fishers to implement more sustainable harvest practices and efforts by scientists and conservationists to communicate the importance of salmon in areas like the Delta where there are many competing interests. Dr. Gordon Reeves of the U.S. Forest Service and Oregon State University also presented on approaches to conserving salmonids in the face of an increasingly extreme climate, and Dr. Ellen Hanak of the Public Policy Institute of California’s Water Policy Center discussed the reforms that will be necessary to reduce the vulnerability of California’s water to climate pressures, including the potential new approach of granting the environment a water budget similar to that of other water users.

Videos of the Plenary session and other presentations are available at www.calsalmon.org

Update on the Klamath Dam Removal

Throughout the United States, large dams built for hydroelectric power generation have created impassable barriers on rivers, reducing accessibility to large areas of prime fish habitat. Here in Northern California, several PacifiCorps dams along the Klamath River were recently due for relicensing. Instead, the 2016 amended Klamath Hydroelectric Settlement Agreement (KHSA) transferred ownership of the dams to the Klamath River Renewal Corporation (KRRC).

The KRRC was formed in 2016 as an independent non-profit to oversee the decommissioning of four PacifiCorps dams on the Klamath River (JC Boyle, Copco, No. 1 & 2, and Iron Gate). Two other dams (Link and Keno) will remain in place on the upper Klamath River to provide irrigation and flood control benefits for residents of the basin. The KRRC is funded by California Proposition 1 water bond funds and PacifiCorp customer surcharges. They are responsible for the dam removal, restoration of associated areas within the Klamath River, and mitigation of dam removal activities.

In March of 2018, the Federal Energy Regulatory Commission (FERC) transferred ownership of the four dams to the KRRC. On June 28, 2018, the KRRC submitted the “Definite Plan for the Lower Klamath Project” with the Federal Regulatory Energy Commission (FERC) for the proposed removal of

J.C. Boyle, Copco 1, Copco 2, and Iron Gate dams. The Draft Environmental Impact Report (DEIR) was released by the California State Water Resources Control Board (SWRCB) on December 27, 2018. For more educational materials related to the project, you can visit www.klamathrenewal.org/project-materials.

Currently, KRRC, in cooperation with various agencies and other groups, is coordinating baseline monitoring and field studies, and beginning preliminary work related to dam removal. Over the next few years, they will need to complete many key steps, starting with hatchery modifications to Iron Gate and Fall Creek hatcheries and dam infrastructure modifications to allow reservoir drawdown. These dam modifications will include sediment removal, gate demolition, and restructuring. According to Klamath River Renewal Corporation “KRRC is making great progress on a complicated project subject to extensive regulatory review. Although FERC will ultimately determine the project timeline, KRRC and Kiewit stand ready to begin drawdown in 2021. KRRC hopes to have a better sense of the project timeline later this year.”

After dam removal is complete, it will be necessary to stabilize the reservoir sediments and restore the areas exposed by reservoir drawdown to pre-dam habitats. Ongoing monitoring and adaptive management will include specific measures to reduce impacts on aquatic resources, including removing sediment and debris from mainstem spawning areas and tributary confluences, salvaging 311 juvenile coho salmon if turbidity or water temperatures exceed thresholds, and the relocation of Klamath suckers and freshwater mussels.

Renewal of the Klamath River will bring many benefits to the local environment, economies, and communities. Removing the reservoirs associated with each of these dams



Iron Gate dam on the Klamath River
Photo by Thomas B. Dunklin

will improve water quality by reducing blue-green algae and lowering water temperatures. Restoring the river will benefit the health and economic well-being of Klamath Basin residents, including the Native American communities that have resided there since time immemorial. Finally, removing these dams is a huge step in improving watershed health and restoring habitat for populations of native salmonids. The Klamath and Trinity Rivers historically supported large populations of both fall and spring-run Chinook salmon, providing a crucial food source for local indigenous people and supporting commercial and recreational fisheries. Since the 1990s, Spring-run Chinook numbers have dramatically declined compared to the fall-run. Dam removal will provide access to over 400 miles of historic spawning and rearing habitat for Chinook, coho, steelhead, and lamprey. Many groups are hopeful that dam removal and related activities will improve river temperatures, habitat, and fish passage issues, thereby improving the outlook for these species.



