YBIP Highlights

2021

YAKIMA BASIN

BUILDING A FUTURE FOR WATER, WILDLIFE & WORKING LANDS

www.yakimabasinintegratedplan.org

Welcome to the Yakima Basin Integrated Plan 2021 Highlights

This was a topsy-turvy year for the Yakima River basin. Snowfall in winter was prodigious, lending confidence that all would be well in this valley that supports agriculture, tribal and recreational fisheries, communities, and industries.

Then it was hot—early and record breaking. The snow rapidly melted. Farmers faced stunted and withered crops. Salmon struggled to migrate through high river temperatures. It was dry, causing parched soil and hardship for these farmlands.

While producers relying on irrigation from large reservoirs had normal water deliveries, tributaries that fish and farmers depend on dried up. It was smoky. Wildfires, both local and distant, made the air dense and dangerous.

These conditions started early in spring and lingered into fall and are the very circumstances we're tackling through the Yakima Basin Integrated Plan. Both short-term drought and long-term impacts of climate change are at stake. We know we must make the best use of every drop of water, for both fish and farms.

The 2021 water year is not an aberration. It's the future playing out now.

We're planning for loss of snowpack, by making overall water management more efficient, and increasing storage in surface and groundwater reservoirs. We're constructing passage for fish, so they can reach cold-water, high-elevation refuges, and successfully move through the hot lower valley rivers more quickly. And, we are addressing forest health to reduce fire damage and supply colder, more reliable, stream flows through the Teanaway Community Forest and other projects.

Congress worked hard this year on legislation to support infrastructure throughout our country. Washington's Congressional delegation knew that YBIP and its projects are well positioned to compete for funding from this legislation and included water, ecosystem restoration and salmon recovery programs. With enactment of the Infrastructure Investment and Jobs Act, we have projects identified, designed and ready to go.

These highlights show there is great promise ahead and progress is being made. People from all walks of life are working together to achieve common goals.

YBIP is the way forward—the vision of robust water and natural resources resiliency in Washington's fertile Yakima River basin is becoming a reality.

As you read these highlights, note the "seven elements" of the YBIP that are crucial to the success of the plan and note that each project falls into one of these elements:

Reservoir Fish Passage – Upstream and downstream passage for anadromous and resident fish will be established at all Bureau of Reclamation reservoirs, allowing access to high-quality, cold-water habitat essential for restoring depleted runs of fish.

Modernization Measures – such as improving canal efficiency, balancing reservoir levels, improving fish passage, and making operational changes—benefit both the fish populations and the agricultural water supply.

Surface Water Storage – Water projects in the first ten-year Initial Development Phase include accessing 200,000 acre-feet of water already stored at Kachess Reservoir via a new pumping plant facility, and 14,600 acre-feet from raising the level of the Cle Elum Reservoir. Building new reservoirs and expanding an existing reservoir are proposed for later YBIP phases.

Groundwater Storage – Additional water supplies will be gained by intentionally storing water in aquifers and then either pumping it or allowing it to return to the river to improve flows, meet demands and reduce water temperatures.

Habitat/Watershed Protection – Fish and wildlife habitat enhancements in the basin include floodplain restoration, flow improvement, fish passage barrier removal, screens for diversion, and land and river corridor protection.

Enhanced Water Conservation – Conserving up to 170,000 acre-feet of water per year is the goal on the agricultural side of this program, allowing better instream flows for fish and more precise water delivery and use. Local governments actively encourage improvements in water conservation from individual homeowners for indoor and outdoor use.

Market Reallocation – YBIP proponents are developing short- and long-term strategies to increase market reallocation of water during droughts while minimizing adverse effects on other water users and the environment.

Cover:
Top photo – Aerial view of Nelson Dam. *Photo credit: Nate Herbeck*
Middle photo – Bull trout. *Photo credit: Todd Newsome*
Bottom photo – Pumpkin field. *Photo credit: The Patch, Ellensburg, Wash.*

Major milestone completed for Cle Elum fish passage

Element: Reservoir Fish Passage

Tunneling operations at intake level 6 (this is the lowest intake elevation).
Photo credit: Richard Visser

Sockeye on the Cooper River, above Cle Elum Reservoir.
Photo credit: Joye Redfield-Wilder

The Cle Elum watershed historically produced a thriving sockeye salmon population vital to the livelihood of the Confederated Tribes and Bands of the Yakama Nation. However, they were extirpated, and their spawning grounds and "nursery" lake blocked when a crib dam was constructed at the lower end of Cle Elum Lake in 1908. Soon, the fish were completely wiped out from the watershed.

As part of its responsibility to support listed species, such as steelhead and bulltrout as well as the goals of YBIP, Reclamation is working with the Yakama Nation and the State of Washington to restore fish access to Cle Elum Reservoir.

Construction is well underway to remedy conditions and provide upstream and downstream passage, restore damaged habitat, and return sockeye to their historical home. The Cle Elum Fish Passage Facilities and Reintroduction Project includes an innovative helix system that will transport juvenile fish downstream from the Cle Elum Reservoir.

A major milestone this year was the completion of the 1,250-foot bypass tunnel in March 2021. The tunnel excavation and construction run from the base of the Cle Elum Dam to the bottom of the secant vault, where the soon-to-be installed helix will deliver downstream migrating fish.

Tunnel construction included an outer steel plate liner and the placement of the inner smooth concrete liner approximately 6.5 feet in diameter. This concrete will become a very slick surface that will provide a safe slide downstream for passing fish. The tunnel outfall will be completed as part of the Adult Collection Facility Construction with an additional 200 feet of constructed tunnel.

The Yakama Nation, Bureau of Reclamation, Washington State departments of Ecology and Fish and Wildlife are collaborating on this massive project, and construction is slated for completion by 2025. When it is finished, an additional 29 miles of tributary habitat will be available to the sockeye to reproduce in the upper Cle Elum watershed.

Installing a side liner for intake 6 crest gate, looking out at Cle Elum Reservoir.
Photo credit: Richard Visser

Partners work toward restoring Gold Creek

Element: Habitat/Watershed Protection

At the Yakima River headwaters, Gold Creek flows unimpeded from the Alpine Lakes Wilderness Area and passes under Interstate 90 east of Snoqualmie Pass to Keechelus Reservoir.

Gold Creek was once a healthy wetland and creek habitat, a robust ecosystem filled with salmon, steelhead and bull trout that thrived in the cold, clean, fast-flowing water. Then, during the building of Interstate 90, it became a water-filled gravel pit. Today, the creek's ecosystem is dangerously out of balance. The salmon and steelhead are gone, and only a few bull trout return each year to spawn.

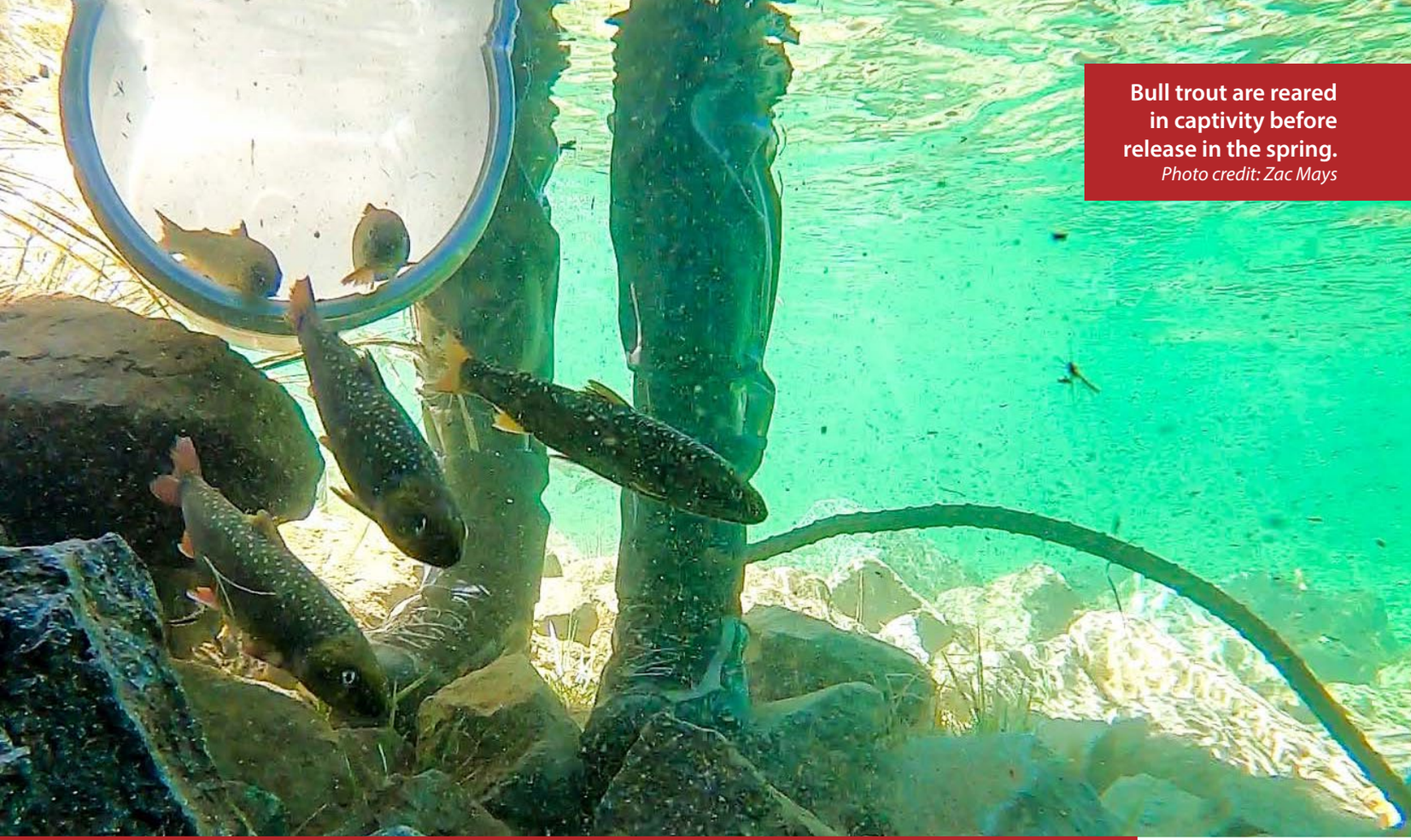
That is changing now. A broad coalition is working to return Gold Creek Pond to its natural state.

Kittitas Conservation Trust, in partnership with the U.S. Forest Service, Yakama Nation and the Washington Department of Fish and Wildlife, studied the area for years before creating the Gold Creek Valley Restoration Project in 2013.

New kiosks, interpretive panels, and trail loop signs help to tell the story of the creek, from the impacts of the gravel operation to warming temperatures and the critters that rely on the area, all thanks to funds through Conservation Northwest.

Full restoration is under consideration, and a new recreation trail and day-use features are planned. Additional interpretive signage will describe what a healthy and recovered habitat means for all of the creatures in the Gold Creek ecosystem.

Photo credit: Laurel Baum, Conservation Northwest



Bull trout are reared in captivity before release in the spring.
Photo credit: Zac Mays

Yakama Nation finds success with bull trout captive rearing

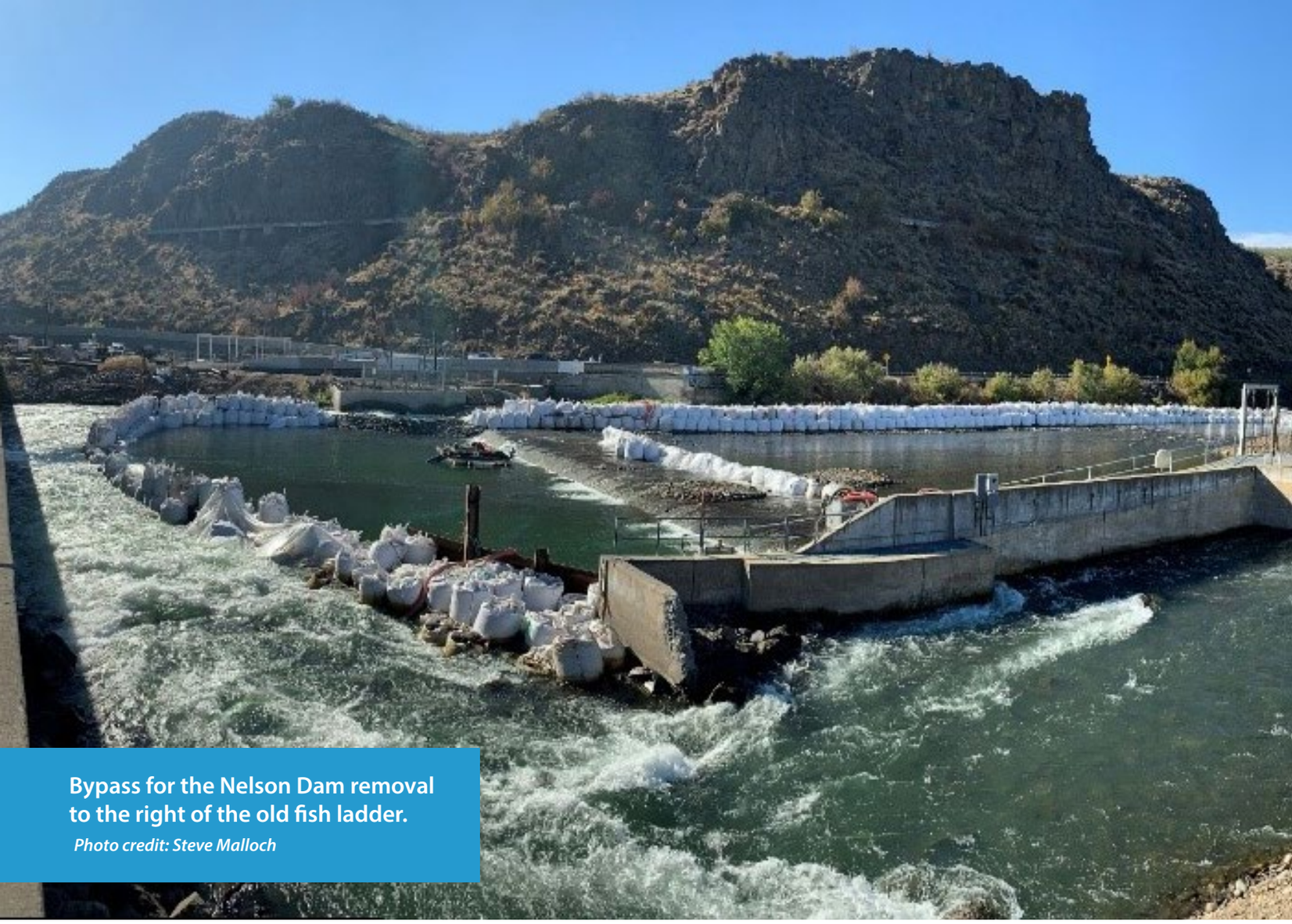
Element: Habitat and Watershed Protection

To return bull trout numbers to self-sustainable levels, Yakama Nation Fisheries and its partners released 531 bull trout into Kachess Reservoir and 61 bull trout into Gold Creek, a tributary to Keechelus Reservoir. This year's releases were a great success with increased survival rates ranging from 89% to 95%.

This is the second season biologists have rescued juvenile bull trout from isolated pools within the dewatering reaches of Gold Creek and the upper Kachess River, reared them in tanks over the winter, and released them in the spring.

The goal of this adaptive management approach is to maintain bull trout viability, while the Yakima Basin Integrated Plan works to restore degraded spawning and rearing habitat.

The project has made substantial gains, and Yakama Nation biologists and partners hope to expand operations and begin to reintroduce bull trout into additional tributaries by 2023.



Bypass for the Nelson Dam removal to the right of the old fish ladder.
Photo credit: Steve Malloch

Nelson Dam removal makes room for modern diversion

Element: Habitat/Watershed Protection

Removing Nelson Dam on the Naches River is one component of a large effort to reduce dangerous flood hazards and restore important habitat in the Naches River.

Site preparation began in July 2021, with actual dam removal in late 2021 and construction continuing into early 2023. Replacing the dam with a modern nature-like channel will allow unimpeded fish passage to 309 miles of habitat, reduce flood risk for local communities, consolidate four diversions into one, and more effectively serve irrigation needs in the City of Yakima.

Over the years, the current dam and infrastructure affected upstream and downstream reaches as well as a downstream tributary. The proposed replacement diversion will change the sediment transport dynamics to allow for habitat recovery and reduce flood risk. The design of the new roughened channel takes into consideration physical and biological conditions with the objective of restoring ecosystem processes while maintaining the diversion needed by the City of Yakima.

Many stakeholders and community groups are providing funding for the $24.7 million project, including the City of Yakima, Yakima County, Ecology's Floodplain by Design, Brian Abbott Fish Barrier Removal Board, Resources Legacy Fund and Bureau of Reclamation have all contributed or earmarked funds for current and future phases of the project.

Nelson Dam before removal.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Shoreline stabilization underway in anticipation of pool raise

Element: Structural and Operational Changes

Wish Poosh campground sits near the southeastern shore of Cle Elum Reservoir in the Okanagan-Wenatchee National Forest off of Highway 903. Wildly popular with anglers and campers of all ages, it is most known for its peace and quiet and spotlessly clean facilities.

Due to the Cle Elum Pool Raise Project at the nearby Cle Elum Reservoir, modifications are needed at the campground and beach area. To allow the reservoir pool to be raised up to three additional feet for storage, the surrounding areas need to be protected from the increase in water levels.

In spring 2021, shoreline protection work began at USDA Forest Service facilities at Wish Poosh Campground. Construction has been completed at Cle Elum River Campground and Speelyi Beach Day Use Area and boat launch.

Campground improvements include a new access road to the campground's well house, repaving the existing parking lot and boat launch, a new vault toilet, and a new culvert to promote fish year around migration up Davis Creek. The construction is on schedule and is slated for completion in spring 2022. The vegetation planting of native plants will take place in 2023.

Under the Yakima Basin Integrated Plan, the Cle Elum Reservoir Pool Raise Project will raise the full pool water surface elevation by three feet. This modification allows an additional 14,600 acre-feet of storage. This additional water will be used to augment instream flows for fish and to improve aquatic resources for fish habitat, rearing, and migration in Cle Elum River and upper Yakima River.

To raise the surface water three feet, modifications to the existing spillway radial gates were needed; that construction was completed in 2017. Shoreline protection work began that same year and has been ongoing.

Collaboration identifies new opportunities for conservation

Element: Habitat/Watershed Protection

The Watershed Lands Conservation Plan, began in 2019, is an integral part of the Habitat and Watershed Protection and Enhancement element of the Yakima Basin Integrated Plan. Conserving, restoring, enhancing, and protecting the forested headwaters, tributary/floodplain, and shrub steppe habitat lands of the Yakima basin are essential to achieving the ecological restoration and climate resiliency tenets of YBIP.

The Phase 2 Lands Plan was developed by the Watershed Lands Conservation Subcommittee over the course of late 2020 and 2021. It was approved by the executive committee in August 2021. Phase 2 is an effort to update, refine, and adaptively manage changing circumstances and increasing knowledge added to the original plan established in 2012. Without the ability to manage these lands to achieve the ecosystem and water supply goals of YBIP, all of the work on the other YBIP elements would be at risk of failing.

In addition to deepening the collaborative partnerships among the diverse members of the Watershed Lands Conservation Subcommittee, the Phase 2 Plan provides for expanded collaboration with the Tapash Forest Health Collaborative, the East Cascades Recreation Partnership, the Cascades Checkerboard Partnership, and the Teanaway Community Forest Local Advisory Committee. Through identifying shared opportunities for additional land conservation, healthy forest management, and collaborative approaches to federal lands designation the Phase 2 Plan represents how working collaboratively can identify new creative opportunities across the Yakima basin.

The Phase 2 Plan will help YBIP advance toward additional lands conservation, a proposed federal lands designation package for the Integrated Plan, and better coordination of forest land management in the Yakima basin.

Page 9 images:

1. An excavator leveling out a gravel access road to the pump house at Wish Poosh Campground and Boat Launch. ***Photo credit: Chris Garent***

2. A construction worker compacts base course where accessible parking will be located. ***Photo credit: Chris Garent***

3. Davis Creek Culvert at Wish Poosh Campground. ***Photo credit: Dave Empel***

4. A finished wall at Wish Poosh Campground and Boat Launch. ***Photo credit: Chris Garent***

5. Construction near restroom facility. Stone veneer being applied to a wall by construction workers at Wish Poosh Campground and Boat Launch. ***Photo credit: Chris Garent***

6. A finished vault toilet at Wish Poosh Campground and Boat Launch. Beside the toilet is a prepped area for accessible parking. ***Photo credit: Chris Garent***

Horseshoe wetland before restoration.

Horseshoe wetland after restoration.

Partners celebrate completion of the Schaake Habitat Improvement Project

Element: Habitat/Watershed Protection

Construction is complete on one of the largest floodplain restoration projects in the Yakima River basin at the former Schaake feedlot property near Ellensburg. In 2003, Reclamation purchased the 280-acre Schaake property under the authority of the Yakima River Basin Water Enhancement Project for its high potential to benefit fisheries and to advance the goals of YRBWEP. Historically, the site was used for cattle, feedlot, and packing-house operations.

Project benefits include the following:

- Create and maintain refuge and rearing habitat for juvenile salmonoids.
- Promote natural river processes while reducing ongoing maintenance needs for flood control features.
- Create and enhance 40 acres of wetlands.
- Maintain protection for infrastructure from inundation and erosion.
- Maintain or decrease the risk of flooding.

Construction took place over the last three years. The first year, completed in 2019, included constructing a flood protection berm away from the river; removing nearly one mile of existing levee; floodplain recontouring; and initial seeding of native grasses for site stabilization.

The second year, completed in 2020, included additional floodplain recontouring, construction of a new wetland, partial excavation of the new side channels and seeding and planting with native species.

The third year included finishing construction of the side channels and opening them to the Yakima River; placing large wood in the floodplains; removing remaining infrastructure (roads, asphalt, staging areas) and ongoing revegetation, which will continue through 2024. Construction was completed in October 2021, and a virtual event was held late October to celebrate this important milestone.

Over time, these actions will help restore natural floodplain processes and provide critical off-channel habitat for juvenile salmonids.

Reclamation would like to thank the Yakama Nation, Ecology and over 40 stakeholders, including city, county, state, federal, and tribal agencies; water users; local industry; and nearby landowners for their support and contributions to the critical project.

Building a better market strategy

Element: Market Reallocation

Water—vital to the health and well-being of environmental, cultural, economic, and agricultural stakeholders in the Yakima basin—is often a source of conflict. Creating a market-based transfer tool for reallocating water is one way to alleviate conflict, especially during times of shortage.

The Yakima basin has an existing water market. Market-based reallocations are moving water to areas of need to provide agricultural producers additional flexibility by facilitating continued irrigation in downstream areas during drought years. Past market water transfers also have helped to enhance ecosystem restoration while replenishing streams and private homes.

Kittitas Reclamation District and Trout Unlimited are developing a Yakima basin "smart" market framework that automates as many transfer steps as possible and then efficiently matches buyers and sellers.

The partners plan to deliver a report that provides guidance for how to implement a smart market that streamlines and makes the process more transparent. Along the way, the partners will identify market participation limitations, past market activity, and impacts of water supply changes with an expectation of building a better strategy for the Yakima basin.

Yakima Valley orchard near Wapato, Wash.

Demonstrating efficient irrigation technology within Wapato Irrigation Project

Element: Enhanced Water Conservation

Irrigation system watering crops.

Photo credit: Reclamation

To find cost-effective and efficient ways to improve water supplies along the Wapato Irrigation Project, the Yakama Nation is undertaking the South Ahtanum Irrigation Demonstration Project.

Rolled out in phases, the project will exhibit state-of-the-art irrigation methods and conservation projects. The Tribe aims to accomplish this by installing a combination of lifts and laterals, as well as reconditioning parts of the current Wapato Irrigation Project.

It also will include a phased farming expansion to provide future sustainable economic benefit by taking advantage of the south facing slope for maximum sun absorption, remarkable soils, and air movement.

KRD: Fish and farms benefit through water conservation

Element: Enhanced Water Conservation

Yakama Nation Fisheries employee working with Kittitas Reclamation District to relocate coho for spawning into Tucker Creek.

Photo credit: Kittitas Reclamation District

In 2021, Kittitas Reclamation District received $2 million from state and federal grants to install 2,300 feet of 7-foot piping on the South Branch Canal that supports the KRD Tributary Supplementation program. Since 2014, KRD has installed 9.1 miles of lining and piping—aggressive water conservation projects that resulted in a water savings of 6,109 acre-feet. This installation benefited fish through the KRD Tributary Supplementation Program and farms through a more efficient water delivery system.

Farms benefit from water conservation in drought years through more efficient delivery. Conservation also frees canal space used to convey water for the KRD Tributary Supplementation Program which increases flow in selected streams.

The KRD Tributary Supplementation Program, initiated during the 2015 drought, is yielding fish benefits through enhanced streamflow. Tributary flow augmentation using the KRD canal water delivery system has improved the salmonid migration corridor, allowing fish to move freely between the Yakima River mainstem to the cooler headwater reaches of these tributaries. Salmonid spawning and rearing habitat also have improved.

In July 2020, KRD partnered with the Yakama Nation's Yakima/Klickitat Fisheries Project to release 1,000 tagged juvenile Coho salmon into Tucker Creek. The results showed flow augmentation improved fish migration in May and June that otherwise would have been limited or non-existent. Tucker Creek also had its first documented Coho redd in modern times.

Pumpkin patch at Hunter Farms, Ellensburg, Wash. *Photo credit: Hunter Farms*

Little Creek delivery at the Main Canal.
Photo credit: Kittitas Reclamation District

Kachess drought relief pumping plant study continues

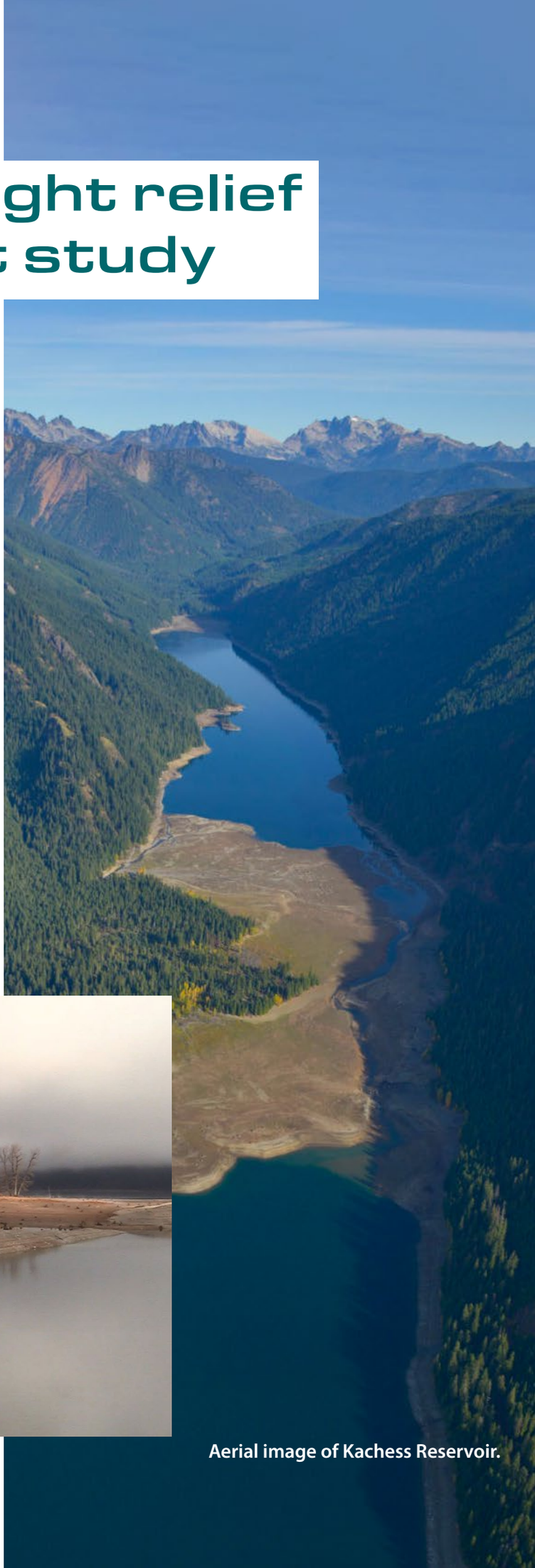
Element: Enhanced Water Conservation

Consideration continues for a proposed floating pumping plant at Kachess Reservoir to help pro-ratable water users during years of drought. The Kachess Reservoir plant would access water stored below the reservoir's current outlet.

Roza Irrigation District, in coordination with Reclamation and the Washington Department of Ecology, is currently preparing a feasibility design option to be considered as part of the Tier 2 Environmental Impact Statement of the floating pumping plant alternative for the Kachess Drought Relief Pumping Plant. Once design options are ready, Reclamation and Ecology will prepare the Tier 2 EIS for public review and comment, anticipated in 2022.

Roza, and other proratable waters users that participate in the project (likely Kittitas Reclamation District, Wapato Irrigation Project, and Kennewick Irrigation District), would fund, design, construct, and operate the drought relief pumping project.

Kachess Reservoir drawdown.
Photo credit: Tim Poppleton, Washington Department of Ecology



Aerial image of Kachess Reservoir.

Wapato Irrigation Project improves irrigation deliveries and fish passage

Element: Enhanced Water Conservation

Work is underway to improve irrigation deliveries and stream flows to support fish and habitat along Lower Toppenish Creek.

Water has been diverted along Toppenish Creek since construction of the Wapato Irrigation Project, which began in 1933. During drought and low flows, there is not enough water in the creek to satisfy the irrigators who rely on the Unit 2 pump house of the Toppenish Creek diversion within the boundary of the Yakama Nation. Additionally, the intervening years have seen a decline in fisheries, flora, and fauna at this important juncture of the creek.

Originally, the intent was to capture Toppenish Creek water along with agricultural drain water upstream and pump it uphill and then by gravity help hydrate other crops.

The proposed solution means building a new diversion that would pump water from the Marion drain directly to the Unit 2 feeder canal. This operation would minimize diversions from Toppenish Creek and eliminate water mixing in the creek from the Marion drain. Ultimately, the upstream drains would be routed to Marion drain for pumping to Unit 2.

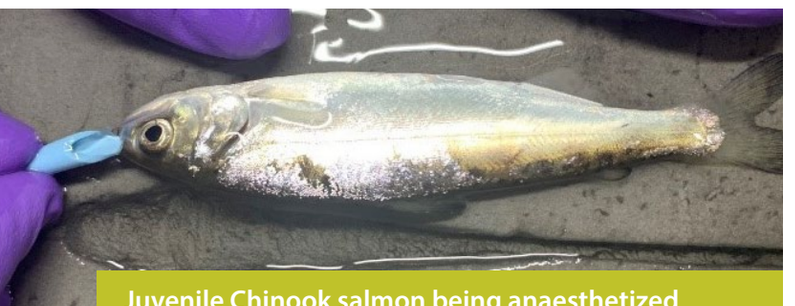
The selected alternative comprises concrete weirs in a concrete-lined channel combined with a radial gate for flushing flow. Provisions were made in the diversion to pump water underneath the diversion to eliminate mixing project water with Toppenish Creek. Construction was completed October 2021.

The total estimated construction cost is $3.7 million, which is funded by the Washington State Department of Ecology and Reclamation.

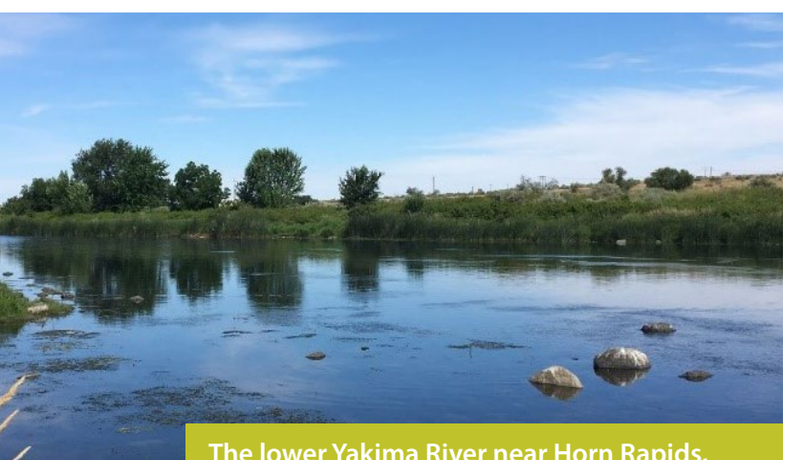
Toppenish Diversion
Photo credit: Richard Dills

Smolt survival in the lower Yakima River

Element: Structural and Operational Changes



Juvenile Chinook salmon being anaesthetized before tagging. *Photo credit: Tobias Kock, USGS*



The lower Yakima River near Horn Rapids, Benton County, Wash.

A causeway to the left of Bateman Island creates hot and predator-filled back water. *Photo credit: Jason Jaacks*

Projects designed to improve fish survival supports the salmon and steelhead enhancement goals of YBIP. In the lower Yakima River, salmon populations traveling to and from the ocean rely on the reach from Union Gap to the confluence with the Columbia River. However, predators, poor water quality, low river flows, irrigation diversions, and hydroelectric facilities threaten their journey along the way. Studies and projects are underway to understand and address many of these factors.

Methods to improve fish passage at the confluence of the Yakima and Columbia rivers is the focus of the **Bateman Island Causeway** project. The removal of a causeway that connects Bateman Island to the mainland, which causes warm water conditions that can affect migration, is under evaluation.

River flows, facilities, and predators can collectively impact smolt survival. Preliminary results in the **Lower Yakima River Smolt Survival Study** show survival declined when river flows were lower, warmer, and predators more active, and smolts diverted through canal bypasses had lower survival than fish remaining in the river. In 2021, these results led to the installation of a fish guidance boom at Sunnyside Dam to improve fish survival.

Adult salmon face different challenges, so monitoring their migration through the lower Yakima River also is occurring. Water quality monitoring and water temperature modeling efforts will help guide future water management objectives such as releasing flows from reservoirs to aid fish migration.

Water stargrass, a native aquatic plant, becomes overgrown in the lower Yakima River, where it negatively impacts salmon habitat. Harvest and removal of water stargrass from key locations are being evaluated to improve habitat conditions.

These lower Yakima River studies and projects are supported by many entities, including Benton Conservation District, Yakama Nation Fisheries, Washington Departments of Fish & Wildlife and Ecology, irrigation districts, Mid-Columbia Fisheries Enhancement Group, Bureau of Reclamation, U.S. Geological Survey, and U.S. Army Corps of Engineers. Funding comes from a wide variety of sources, including YBIP.

YBIP Social Media News

Ecology - Central Region @ecyCentral · Nov 18

Partnerships through the @YakimaBasinPlan restored this former cattle feedlot next to Yakima River into prime fish habitat & natural flood control area, cleaner water yakimaherald.com/sports/outdoor... via @Yakima_Herald

yakimaherald.com

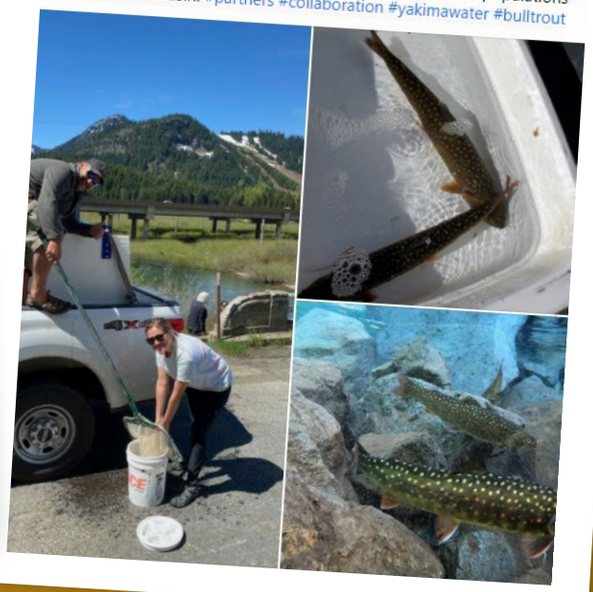
Floodplain restoration project creates new fish habitat, cleaner water

ELLENSBURG — Thanks to significant rain over the past week, plenty of water flowed rapidly through two new Yakima River side channels ...

Yakima Basin Integrated Plan

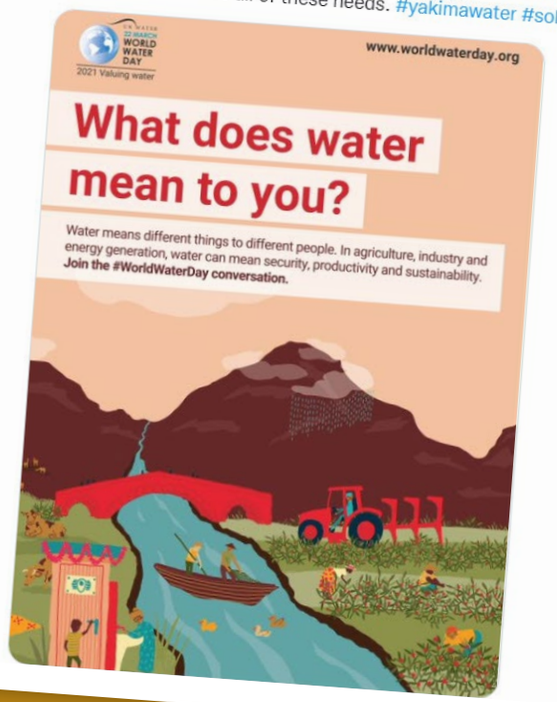
May 30 ·

This amazing work is happening in collaboration with Integrated Plan partners, and is an important step in recovery of bull trout populations in the Yakima basin. #partners #collaboration #yakimawater #bulltrout



Yakima Basin Integrated Plan @YakimaBasinPlan · Mar 22

Today is #WorldWaterDay! 💧 The theme of 2021 is 'Valuing Water', which recognizes the many needs for water. In the Yakima Basin water is crucial for fish, farms, families and forests, and the @YakimaBasinPlan seeks solutions to address all of these needs. #yakimawater #solutions



Yakima Basin Integrated Plan

September 30 ·

As part of the Yakima/Klickitat Fisheries Project, a habitat restoration project in the North Fork Teanaway wrapped up in August. The project entailed removing sections of a relic dam and using the gravels for instream replenishment, in addition to installing engineered/loose wood to the channel and floodplain, this will increase instream habitat complexity, add needed spawning gravels and improve floodplain function for native fish. This is the third and final phase of restoration in this reach of the Teanaway.

#restoration #habitat #fish

Participants tour the Schaake property

Participants tour the Schaake property on Oct. 20 while listening to Assistant YRBWEP Manager Jeanne Demorest explain the features of the completed floodplain restoration project. More about the Schaake Habitat Improvement Project on page 11.

Photo credit: Reclamation