

YBIP Highlights

2022

Overview	1
Dam modifications increase juvenile salmon survival	3
Cle Elum Pool Raise –Wish Poosh Campground renovations completed	4
Cle Elum continues work toward fish passage	5
Reconnecting fish habitat from the Tieton River headwaters to the Pacific Ocean	7
KRD increases canal capacity and conserves water as it pursues its modernization program	8
Bull trout rescue and rearing increases survival	9
Studies and collaboration provide insights into how to improve the lower Yakima River	11
Improved steelhead passage at Simcoe Creek	12
Bateman Island Causeway and Delta restoration will improve ecological function	13
Nelson Dam removal provides water supply, riverine process, and fish passage benefits	14
Wapato Irrigation Project improves irrigation deliveries and safety	15
Making a robust Yakima basin water market “smart”	16
Aquifer replenishment on the Yakama Reservation	17
Meeting surface water storage goals	18
News and events	19



YAKIMA BASIN
BUILDING A FUTURE FOR WATER,
WILDLIFE & WORKING LANDS

Welcome to the Yakima Basin Integrated Plan 2022 Highlights

Welcome to the 2022 issue of the YBIP Highlights newsletter!

I'm Jennifer Carrington, and I began serving as Reclamation's Columbia–Pacific Northwest Regional Director earlier this year. However, the Integrated Plan is not new to me. Having worked for Reclamation in the region for many years, I have watched this program grow, and I am so pleased with the unprecedented amount of collaboration, support, and partnership occurring in the Yakima basin with the Integrated Plan. The New York Times referred to it as, "A blueprint for ensuring a reliable and resilient water supply for farmers, municipalities, natural habitats and fish, even in the face of continued warming and potentially more droughts." And, it is just that. The collaborative planning and efforts of the YBIP members are noticed as a benchmark best practice on a national level and is a proven model with documented successes.

Funding mechanisms such as the Bipartisan Infrastructure Law and the Inflation Reduction Act can help further the activities of the Integrated Plan, and I look forward to our combined efforts as we address focus areas such as reservoir fish passage, structural and operational changes, surface water storage, groundwater storage, habitat/watershed protection, enhanced water conservation, as well as market reallocation.

The Bipartisan Infrastructure Law, which just celebrated its one-year anniversary, isn't just an inside-the-beltway program. We are seeing funding in this basin that will make notable progress in realizing the seven elements of the Integrated Plan. Several categories of the BIL funding could further Integrated Plan progress in the remaining years of the law's funding cycle.

Cover:

Top photo: Sunnyside Valley Irrigation District crews installing the fish guidance boom in spring 2021.

Middle photo: Bull trout underwater.

Bottom photo: Congresswoman Kim Schrier, M.D. visits canal lining project on Kittitas Reclamation District South Branch with KRD Secretary/Manager, Urban Eberhart to see the progress being made with FY22 CR Drought Funding.

- Available FY23 aging infrastructure funding is set at \$649M, compared to \$200M in FY22. With this increase, we should see more funding available for more projects this fiscal year.
- The Water Marketing Strategy Grants program includes planning activities to develop water marketing strategies that establish or expand water markets or water marketing activities among willing participants.
- The Applied Science Grants program funds projects to develop hydrologic information and water management tools and to improve modeling and forecasting capabilities.
- WaterSMART funds continue to have a huge impact on water users. The small-scale water efficiency projects, water and energy efficiency grants, and drought resiliency projects provide areas of funding opportunities.
- Finally, the Aquatic Ecosystems Restoration Projects program is newly established under the BIL to fund actions including design, study, and construction to improve habitat, including restoration, passage, or barrier removal.

This investment in the future of American infrastructure is an exciting time for Reclamation and its federal partners, all of whom have important infrastructure programs that are funding Integrated Plan projects at all levels.

The Inflation Reduction Act is a historic and transformational investment toward achieving President Biden's ambitious goals to tackle the climate crisis while lowering costs for working families and creating good-paying jobs. Combined with the Bipartisan Infrastructure Law, these two initiatives represent the largest investments in climate resilience in the nation's history and provide a once-in-a-generation opportunity. They will enable Reclamation and our partners to meet the need for long-term adaptation for drought and a changing climate.

—Jennifer Carrington



Dam modifications increase juvenile salmon survival



Sunnyside Valley Irrigation District crews installing the fish guidance boom in spring 2021.



New sluice gate, fully operational, with surface flow for fish passage.

Improving smolt survival in the lower Yakima River is essential to meeting YBIP fisheries restoration goals. As salmon populations travel to the ocean, they pass by the Roza Diversion Dam and navigate their way over several diversion dams located along the lower Yakima River, from Union Gap to the Columbia River confluence. Challenges for out-migrating smolts include predators, poor water quality, low riverflows, irrigation diversions, and hydroelectric facilities.

The lower Yakima River Smolt Survival Study has been monitoring smolt survival since 2018, with the last full season of fieldwork in 2022. Efforts are underway to complete data analysis and modeling of chinook salmon and steelhead survival in various river reaches associated with water diversions, riverflow, water temperature, and other important variables. Preliminary results showed fish survival was higher when riverflows were higher and water temperatures were cooler. At times, high numbers of migrating smolts were diverted into canals at Wapato, Sunnyside, and Prosser dams where they had lower survival than fish remaining in the river.

The study results were used to help develop the boom fish guidance system and sluice gate project at Reclamation's Sunnyside Dam with the installation of the sluice gate completed in February 2022, which is intended to reduce the number of fish entering the Sunnyside Canal. Preliminary monitoring data indicate the Sunnyside Dam boom and gate combination are effective at reducing the number of fish being diverted into the canal; however, 2022 was an exceptionally high flow year. Data analysis, modeling, and reporting of the study results are expected to continue through 2023.

At Reclamation's Roza Dam, Yakima Field Office staff reviewed gate operations with the System Operations Advisory Committee, Roza Irrigation District, and others to determine alternative gate operations that could improve fish passage and survival while maintaining water deliveries for irrigation and hydroelectric power production. Once operational improvements were agreed on, the gate operations were reprogrammed to increase the amount of water being spilled over the dam, which correlates to higher fish survival. Reprogramming was made possible by new gate automation software developed by Reclamation's Roza Power staff and is an example of using data from fish survival studies to implement cost-effective solutions using existing infrastructure. Because new fish screens will be installed at Roza Dam in 2024–2025, Reclamation plans to evaluate the modified gate operations and fish screens for fish survival benefits in 2025–2026.

Cle Elum Pool Raise – Wish Poosh Campground renovations completed

The Wish Poosh Campground and boat launch are located in the Okanogan-Wenatchee National Forest near the southeastern shore of Cle Elum Reservoir. Wildly popular with anglers and campers of all ages, it is known for its peace and quiet and spotlessly clean facilities.

The Cle Elum Pool Raise project will increase the full pool elevation of the reservoir by three feet. This modification allows an additional 14,600 acre-feet of storage. Additional stored water will be used to augment instream flows for fish and to improve aquatic resources for fish rearing, habitat, and migration in the Cle Elum and upper Yakima rivers.

Raising the pool elevation of the reservoir, however, affects the U.S. Department of Agriculture, Forest Service's Wish Poosh Campground and boat launch area. Construction to address the increased storage capacity began in spring 2021 and was completed in May 2022. Campground improvements include a new access road to the campground's well house, a new camper watering station, a new vault toilet, a new culvert to promote fish migration up Davis Creek, anchored habitat logs, and repaving the road to the boat launch. Two aging pit toilets and the original access road to the well house were removed. The Forest Service's Restoration Services Team is restoring the construction zone using native plants selected for their ability to thrive and contribute to the natural setting of this popular recreation site.

Although the Wish Poosh Campground and boat launch are the last of three Forest Service facilities, the overall Cle Elum Pool Raise project has several shoreline protection areas and realty acquisitions that need to be completed prior to raising the pool. By 2027, all shoreline protection work is anticipated to be completed allowing the additional reservoir water storage capacity to be used.



Repaved Boat Launch Road.



Davis Creek concrete box culvert installed under Boat Launch Road to allow fish passage.



New plantings installed by the U.S. Forest Service.



Newly installed wall in the boat launch parking lot to prevent reservoir inundation.



Cle Elum continues work toward fish passage

Left: View from the lowest level of the helix chamber showing the structural steel support system for the concrete flume. The inner steel ring is complete and placement of the outer ring is just beginning.

Top: Close-up view of the guard gate that will be used to fully close off flow from each intake level when not in use and below the reservoir water level.

Bottom: View of Intakes 2 and 3 at various stages of forming, rebar, and concrete placement. Intakes 4 through 6 are in the background.

Cle Elum Fish Passage is a signature Yakima Basin Integrated Plan project that will provide innovative juvenile salmonid safe passage downstream as the irrigation reservoir levels rise and fall.

Since its construction, Cle Elum Dam has impeded salmon and steelhead populations from reaching their spawning grounds that lie above the Cle Elum Reservoir. Currently, reintroduced sockeye can only pass downstream when the reservoir is full, with water flowing over the spillway. When complete, the collaborative fish passage project will restore fish runs for native fish species that once thrived in the watershed. The project was started in 2015 and anticipated to be operational in Spring 2026.

In 2022, construction activities began with the completion of the second of six intake penetrations through the secant shaft wall for Intake 5, the second lowest elevation intake. These intakes will lead juvenile salmonids to enter the spiral structure that carries them to the downstream foot of the dam. Work to complete the Intake 4 penetration was halted in February due to rising reservoir elevations, but resumed in September as levels receded for the year. Cast-in-place concrete work for Intakes 2 and 3 began mid-year and will continue through the end of the year. Earthwork on Intakes 4 through 6 continues for erosion control measures due to wave action adjacent to the structures.

Significant quantities of excavation material that were once removed from the interior of the secant shaft were imported back to the site and placed adjacent to the outer secant wall. An area approximately 200 by 200 feet was backfilled and compacted to 8-10 feet deep to construct a fenced facility yard that will house a water tank and pump for fire suppression purposes, a generator for emergency backup power, and a transformer.

Work inside the gate chamber portion of the secant shaft included installation of the structural steel floor system. Utility installation in the gate chamber, including electrical, pneumatic, ventilation, fire protection, and SCADA infrastructure, proceeded throughout the year. The gate chamber roof also was completed, which will provide a level of protection from the elements when winter weather arrives for the 2022–23 season.

Work inside the helix chamber began with the construction of the access structure that will house the elevator and stairway. With the completion of the access structure, an exciting milestone was reached when the first pieces of structural steel for the helix structure itself were assembled and placed within the helix chamber. The first sections of the precast flume were placed in late September and will proceed through the end of the year as the outer structural ring progresses.



1. View of the Intake 5 steel conduit penetrating through the secant wall before being fully sealed off with grout.
2. View of the structural steel erection and floor pan placement for level 4 in the gate chamber.
3. View of the structural steel placement for the gate chamber roof.
4. View of the first precast concrete sections being placed on the structural steel columns and framework.



Reconnecting fish habitat from the Tieton River headwaters to the Pacific Ocean



The South Fork Tieton Bridge Replacement increases operational flexibility in Rimrock Reservoir for more normative flows in the Tieton River. It also eliminates the potential hazard of a 40-foot waterfall that bull trout must navigate upon returning to Rimrock after spawning.

(U.S. Fish and Wildlife, Craig Haskell)

As part of the Yakima basin Integrated Plan’s (YBIP) goal to restore ecological health, the Tieton Fish Passage Complex is a collective restoration project that will reconnect and provide access to 36 miles of fish habitat, which is currently the largest mileage of habitat blocked by Reclamation dams.

Historically, the Upper Tieton River basin in central Washington supported snowmelt-driven ecosystems containing salmon, steelhead, bull trout, and an array of other aquatic species. However, in the early 20th century, habitat was fragmented due to the construction of Clear Creek and Tieton dams and other associated actions that blocked anadromous migrants and isolated bull trout.

Restoration actions under the YBIP seek to restore and reconnect these natal habitats through a series of three interrelated projects slated for construction over the next five years: (1) Clear Creek Dam Fish Passage, (2) South Fork Tieton Bridge Replacement (see accompanying story on this project), and (3), the Tieton Dam Fish Passage Project. Collectively, the Tieton Fish Passage Complex will reconnect critical habitat from the headwaters of the Upper Tieton River basin to the mainstem Yakima River and, ultimately, the Pacific Ocean.



Large adfluvial bull trout, like this one collected below Clear Creek Dam, spawn in Rimrock tributaries in the North Fork and South Fork Tieton Rivers and Indian Creek, but during winter, in Rimrock Reservoir.

(U.S. Fish and Wildlife, Craig Haskell)

Rimrock Reservoir, impounded by Tieton Dam, is one of Reclamation’s five reservoirs in the Yakima Project irrigation system. Fish passage construction at the dam benefiting salmon, steelhead, and bull trout is planned to begin in 2026. The two upstream projects (South Fork and Clear Creek) will open habitat for these species, are planned to begin in 2023 and 2024, respectively. Funding is currently being sought for the construction of a new bridge at the South Fork Tieton River mouth that will eliminate a waterfall—a potential hazard for bull trout—that forms between September and April. More important, the project will increase flexibility for managing water in Rimrock Reservoir and allow for a more normative flow regime downstream in the Tieton River. At Clear Creek Dam, one mile upstream of Rimrock Reservoir on the North Fork Tieton River, designs for a fish ladder and cool water intake pipe are now complete. Although the ladder system was designed for bull trout, it will be suitable for salmon and steelhead as well.

KRD increases canal capacity and conserves water as it pursues its modernization program

The Kittitas Reclamation District (KRD) aggressively continues its pursuit of a modernization program to conserve water in Kittitas County.

In December 2021, KRD was awarded \$5 million dollars as part of the fiscal year 2022 Continuing Resolution (FY22 CR) Drought Funding, which accelerated the KRD water conservation project on the South Branch Canal. This made a total of \$7.5 million in grant funds accessible, which allowed construction to continue through the winter and spring of 2022. An additional \$1 million of FY22 CR Drought Funding was awarded in the summer of 2022.

Modernization of the KRD water delivery system is essential, providing the means to increase canal capacity and enlarge the conservation water bucket. During the 2015–2022 period, eight canal lining and piping projects were completed totaling 8.7 miles. This has resulted in an increased canal capacity of 16.3 cubic feet per second and an annual conserved water savings of 5,805 acre-feet. KRD’s goal is to conserve and store approximately 123,000 acre-feet of water annually in the future.

KRD’s water conservation and ecosystem restoration projects are providing a more consistent water supply for its customers and are restoring instream flows in upper Yakima River basin tributaries. KRD water conservation simultaneously reduces irrigation water loss through canal seepage and provides significant instream flow benefits for fish, wildlife, and the environment, including Endangered Species Act (ESA)–listed steelhead and bull trout. Proactively building infrastructure to help with climate resiliency for the KRD also will help with the survival of fish, farms, and the ecosystem in the future.

Readily available designed conservation projects such as canal lining and piping projects that are scalable and limited only by funding are an integral part of KRD’s success. In any given year, KRD can put tens of millions of dollars to work. Because conservation is critical to creating canal capacity for storage projects, providing water to tributaries, and making the best use of available water, these types of projects are a great investment for the future of the Yakima River basin.

1. **Congresswoman Kim Schrier, M.D. visits canal lining project on KRD South Branch with KRD Secretary/ Manager, Urban Eberhart to see the progress being made with FY22 CR Drought Funding.**
2. **KRD South Branch Canal Lining in process.**
3. **Completed KRD South Branch Canal Lining delivering irrigation water.**



Bull trout rescue and rearing increases survival



Adaptive management increases bull trout survival—six-year highlights (2017–2022)

The Yakama Nation Fisheries Program and its partners—the Bureau of Reclamation, U.S. Fish and Wildlife Service, Washington Dept. of Fish and Wildlife and the Kittitas Reclamation District, Mid-Columbia Fisheries, and other agencies—are implementing habitat restoration, fish passage, and survival improvement projects designed to facilitate bull trout recovery throughout their native range in the Yakima River basin. Implementation of several innovative projects and experimental recovery actions are anticipated to improve conditions for bull trout survival with the goal of establishing long-term, self-sustaining populations.

Beginning in 2017, large-scale fish rescues began in Gold Creek and the upper Kachess River in the summer months, when flows decrease and strand bull trout. In 2019, a captive-rearing and release program for juvenile bull trout was created and continues today. This program is designed to rear captured bull trout juveniles in a reconditioning facility, so they can be later released at larger sizes with higher survival rates in their native watersheds. Data on captive rearing and reconditioning of these fish through 2022 have shown very positive results. Using adaptive management, survival rates of fish reared in captivity at Yakama Nation–operated reconditioning facilities have increased to as high as 98% (table 1).

Table 1. Survival of captively reared fish from Gold Creek and Kachess River local populations reconditioned at Yakama Nation reconditioning facilities in the Yakima basin between 2020 and 2022.

Gold Creek			Kachess River		
Year	Released	Survival	Year	Released	Survival
2020	78	73%	2020	152	14%
2021	63	98%	2021	531	89%
2022	84	98%	2022	466	96%

All fish are passive integrated transponder (PIT) tagged prior to release and monitored throughout their life using PIT tag arrays that are located at key locations throughout the Yakima basin. Some fish also are fitted with hydroacoustic tags that allow for enhanced tracking of tagged fish. Monitoring efforts will help determine the survival of captively reared fish released into the wild and their contributions to at-risk populations.

Based on the initial success of the rearing program to date, the Yakima basin bull trout workgroup is exploring additional actions to further enhance bull trout recovery in the Yakima basin. The next proposed phase of the captive rearing project will be to construct the Easton Research Facility (figure 1), a joint project by KRD, Yakama Nation, and Reclamation, with financial support from an approved, congressionally

directed spending request sponsored by Senator Patty Murray. This facility will be used to rear and conduct future research on Yakima basin Endangered Species Act (ESA)-listed bull trout, specifically on reintroducing captively reared bull trout into additional watersheds within the basin to help in their range-wide recovery. Education and outreach also will be a large part of facility operations. The Yakama Nation Fisheries Program will operate the facility with support from KRD, Ecology, and Reclamation.

The overall goal is to help save and restore current bull trout populations and to establish new, self-sustaining populations in critical habitats within the Yakima basin, and to help keep existing populations healthy. Four tributaries have been chosen for the first rounds of reintroduction: North Fork Teanaway River system, North Fork Taneum Creek, Waptus Lake and River system, and Big Creek. These tributaries were selected because they historically supported bull trout populations and have habitat conditions that are suitable for successfully supporting reintroduced bull trout populations. Reclamation and the Yakama Nation Fisheries Program are discussing the permitting requirements for these innovative bull trout recovery actions with USFWS and members of the Yakima basin bull trout workgroup.

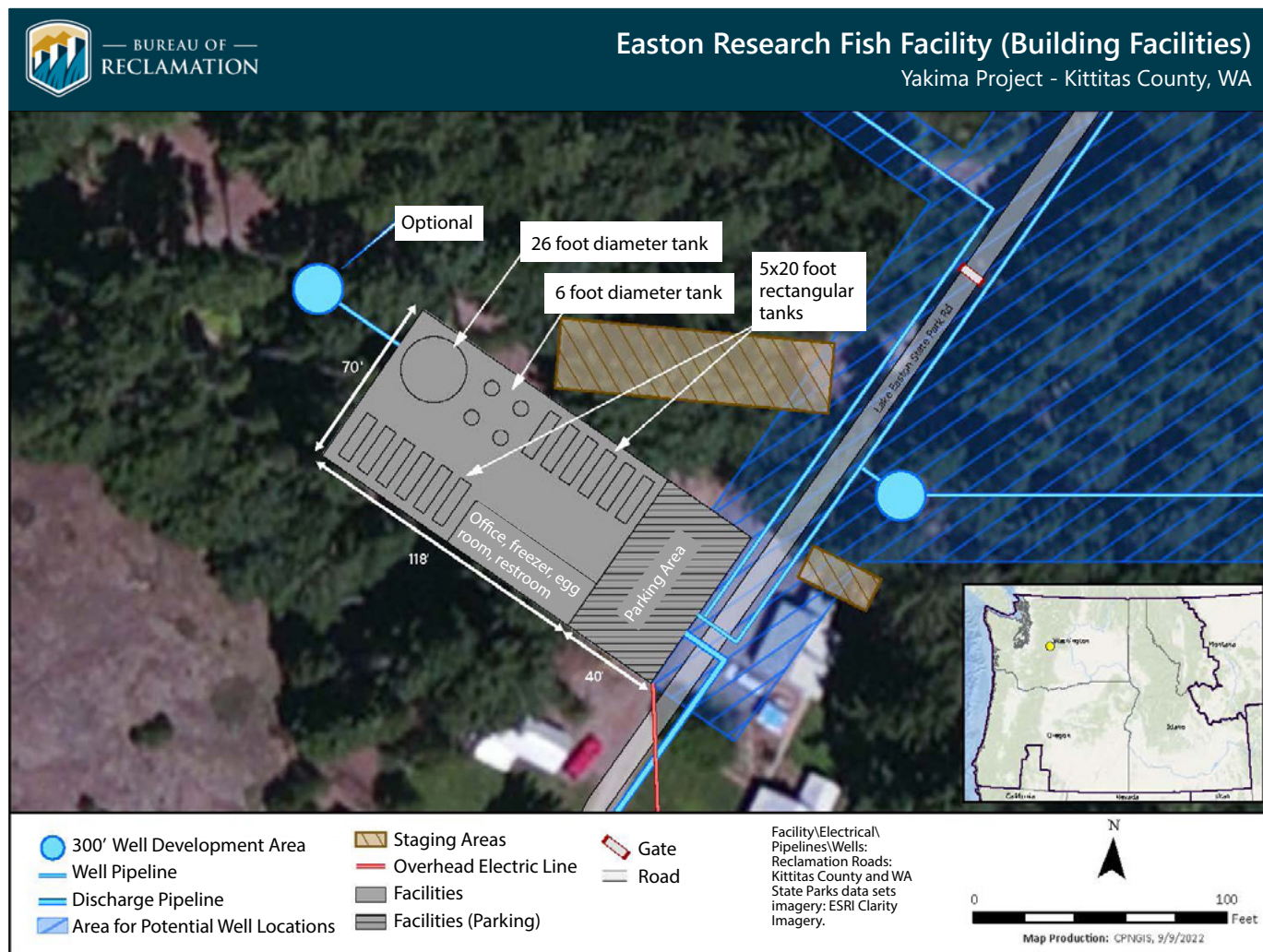


Figure 1. Draft conceptual design of the Easton Research Fish Facility.

Studies and collaboration provide insights into how to improve the lower Yakima River



Lower Yakima River looking downstream at the Wapato Diversion Dam.

High Yakima River water temperatures, dissolved oxygen, and pH are problematic for smolt and adult migration in the lower Yakima River.

The lower Yakima River basin has been a recent focal point of research over the past few years, and efforts are beginning to translate into actions. One of the most illuminating studies has been research into out-migrating smolt survival. Preliminary results from this study have shown the significant effects of diversion structures, fish predation, and river temperature on smolt survival. Lower river stakeholders are working tirelessly together to forge solutions to low smolt survival, and recent actions include the fish guidance boom at Sunnyside Dam, enhanced predation control measures, infrastructure improvements, and timing of flow releases from reservoirs.

Despite these actions, high river temperatures remain a vexing problem not only for smolts but also adult migration. Recent research into Yakima River sockeye salmon has shown that high water temperatures in the lower Yakima River create a thermal barrier that can make the river impassable to adult sockeye during a majority of the summer months. Collaboration among stakeholders has thus far resulted in two large projects to address high water temperatures in and near the Yakima River Delta: (1) removal of the Bateman Island Causeway and (2) enhancement of thermal refuge created by Amon Creek. New research led by Reclamation is focused on developing a water quality model that can be used in real time to predict the best time to release pulses of water to improve migration conditions. This model also may lead to additional insights into the lower river thermal regime that could inform future river restoration strategies that reduce stream temperatures.

Along with high stream temperatures, other water quality parameters, such as dissolved oxygen and pH, can also cause difficulty for migrating fish. Research by the U.S. Geological Survey and Washington State University has suggested that water stargrass contributes to poor water quality conditions. Dense mats of water stargrass also cover spawning gravels for fall chinook salmon and can clog diversion structures. Efforts are underway to study the effects of removing stargrass with a commercial harvester and to determine other options to control its growth.

Each of these problems, as well as their solutions, are interconnected; therefore, continued collaboration among stakeholders (Benton Conservation District, Yakama Nation Fisheries, Washington Departments of Fish & Wildlife and Ecology, irrigation districts, Mid-Columbia Fisheries Enhancement Group, Reclamation, U.S. Geological Survey, and U.S. Army Corps of Engineers) is key to improving lower Yakima River conditions.

Improved steelhead passage at Simcoe Creek

Restoration actions at Simcoe Creek reduce infrastructure risk, flooding, fish passage barriers, and provide ecological uplift.

Simcoe Creek is the largest tributary to Toppenish Creek and is used by Endangered Species Act (ESA)–listed Middle Columbia River steelhead during all life stages. Simcoe Creek is a primary focus for restoration opportunities on the Yakama Reservation. The Simcoe Creek South Channel project area includes 0.4 river miles of channel, its abandoned side channels, and the abandoned flood plain. Prior to restoration, the Hawk Road culvert was blocked with sediment and confined the channel. The two adjacent box culverts on West White Swan Road split the flow and exacerbated inconsistent flow, confined Simcoe Creek, and created fish passage barriers during high and low flows. For this project, Yakama Nation Fisheries addressed infrastructure constraints by completing instream habitat restoration to provide benefits for steelhead.



Crews work in Simcoe Creek to add large wood structures.

In 2022, a 50-foot-long, precast concrete bridge was installed just west of the eastern box culvert on West White Swan Road. This, in addition to the instream restoration actions, this project will reduce infrastructure risk and flooding events, which can overtop the roads, remove fish passage barriers/constraints, and provide ecological uplift.

On completion of the bridge, the following restoration activities are scheduled:

- Installation of bridge with a fish-passable roughened channel
- Installation of culvert aprons that are fish passable
- Installation of 41, engineered large wood structures
- Grade flood plain benches and vertical bank lay-back control head-cut/incision
- Revegetation of native plant installation of exclusion fencing
- Reconstruction of six side channels

Bateman Island Causeway and Delta restoration will improve ecological function



View of Bateman Island with the Yakima River entering from the upper left and the Columbia River on the right. Bateman Island Causeway spans from the left bank to the island upstream of the marina.

Photo credit: Jason Jaacks

The causeway at Bateman Island creates degraded water quality and flows.

Bateman Island is located at the confluence of the Yakima and Columbia rivers. The causeway on the south side of the island blocks cooling Columbia River flows, thereby creating a backwater habitat that forms a thermal barrier that hinders salmon and steelhead from migrating up the Yakima River. In addition to stalling salmon and steelhead migration, the warm backwater habitat is ideal habitat for non-native fish that prey on out-migrating juvenile salmonids. High water temperatures also encourage algal blooms and invasive water stargrass growth, both of which create ideal conditions for mosquitoes and disease pathogens. Overall, this causeway has led to severely degraded water quality and flows.

In 2019, the U.S. Army Corps of Engineers (Corps) formally accepted the Yakima River Delta Ecological Restoration Project under Section 1135 of the Water Resources Development Act 1986 ecological restoration authority, with the Washington Department of Fish and Wildlife acting as the non-federal sponsor. The first phase of the project included an assessment, called the feasibility phase, a three-year study to understand the delta ecologically, recreationally, and economically, as well as a list of remedies needed to restore and even improve ecological function.

The results of the study are planned for an early 2023 release, followed by a comment period, with the report being finalized sometime during 2023.

To date, almost \$1 million has been committed to remove the causeway and support ecological improvements in the delta, with the next phase of Corps-led design and construction slated for completion perhaps as early as 2025.

This project has been made possible through the full support of partners from many entities, including the Benton Conservation District; Yakama Nation; Washington Departments of Fish and Wildlife, and Ecology; irrigation districts; Mid-Columbia Fisheries Enhancement Group; Reclamation; U.S. Geological Survey; and the Corps.

Nelson Dam removal provides water supply, riverine process, and fish passage benefits

Restoration of the Nelson Reach creates unimpeded fish passage, reduces flood risk, and improves recreation access.

The city of Yakima, Yakima County, and other partners are restoring the Nelson Reach of the Naches River by replacing Nelson Dam with a modern “nature-like channel” structure that allows continued diversion of irrigation water and provides a variety of other benefits: unimpeded fish passage to about 300 miles of habitat, reduced flood risk for local communities, and improved recreation access.



Construction of the city of Yakima's new diversion structure.

Construction of this project began in July 2021. The dam, diversion facilities, and fish ladder already have been removed; the center section of the nature-like channel has been completed and is in use; and most of the new diversion facilities have been constructed. The western portion of the roughened channel is slated for completion in February 2023.

The project is anticipated to be completed in April 2023.



Nelson Dam removal project in November 2022, with the dam and fish ladder removed and the river channel being reshaped. The City of Yakima's new diversion structure is under construction to the right of the Naches River.

Wapato Irrigation Project improves irrigation deliveries and safety

Top photo: View of a section of the irrigation system before improvements were made. Bottom photo: Completed update of the same section of irrigation system as shown above.



The Wapato Irrigation Project (WIP), located on the Yakama Reservation, is the largest irrigation project in the Yakima River basin. In addition to irrigation development, WIP and Yakama Nation Engineering are also responsible for promoting economic opportunities and public safety.

As part of the irrigation project's modernization plan, WIP is replacing infrastructure with updated canal control structures that improve system efficiency. Upgrades and automation make the irrigation project more efficient and improve safety, not only for WIP employees but for the public too.

This year, Yakama Nation Engineering and WIP replaced an existing control structure on Track Lateral with a new intake, an emergency overflow weir, a larger trashrack, a long-crested weir, and flowmeter delivery. This project links two previously connected pipelines and improves the management of water through the system. This project also involves setting the control structure further from the county road, which reduces the risk to drivers and workers.





Making a robust Yakima basin water market “smart”

During times of drought, moving water from willing sellers to buyers helps to improve performance and economic resiliency. Additionally, the system must be more transparent and streamlined. As climate change alters the hydrograph in the Yakima River basin, work continues to implement all of the elements of the Yakima Basin Integrated Plan (YBIP), including water marketing.

Changes in timing and types of precipitation are making it necessary to efficiently reallocate the water supply as part of the effort to provide water for fish, farms, and communities. Without better tools in place, reallocating water will continue to be a time-consuming process. Currently, in times of drought, the transfer process is simplified; however, it still needs improvement. Through a YBIP-supported water market research effort, the Kittitas Reclamation District, in partnership with Trout Unlimited, ERA Economics, and others, researched market needs and developed a strategy for implementation.

The project partners looked at market-based reallocation processes to identify inefficiencies and develop a strategy for improvements. Research indicated several key items: (1) transfers are more common in water short years and the process, though streamlined, is time-consuming and carries significant uncertainties; (2) competition between instream and out-of-stream uses exists but may be reduced through a simple step; and (3) significant coordination with water managers is necessary to ensure transferred water is adequately protected. Ultimately, the research resulted in a “smart” market strategy for short-term transfers.

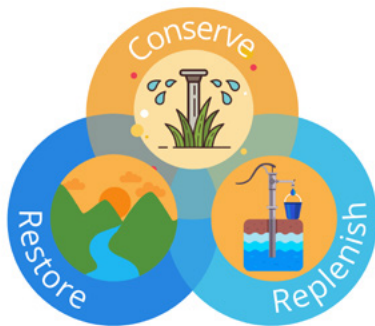
A smart market uses computer-based algorithms built on basin-specific water transfer rules to efficiently match buyers and sellers, and facilitate transfers. The smart market strategy will allow for greater buyer/seller access through a centralized online system. The smart market is ideally suited for short-term transfers in the future; however, the technology could be modified to allow longer term transfers if desired.

With the smart market strategy complete, the next step will be implementation. Implementation will require coordination between the project team and water managers to resolve water protection questions, outreach to help stakeholders understand the smart market and how to use it, and technical updates to ensure the market has the most recent water right information.

The smart market strategy may not fit all water right transfers, but it will provide a readily accessible tool to move water during drought years that will help fish, farms, and ultimately communities. A final version of the technical report and market strategy can be found at <https://yakimabasinwatermarketing.org/>.

Aquifer replenishment on the Yakama Reservation

Yakama Nation Water Planning Initiatives



The replenishment of aquifers is critical to maintaining water supplies and ecosystems. Continued groundwater use can place aquifer sustainability at risk. Since time immemorial the Yakama people have been stewards of land and water. They are responsible for guarding and wisely using water, so clean water remains to sustain all things.

The initial construction of the Wapato Irrigation Project (WIP) impacted the natural balance and resources important to the Yakama people. Nearly a century later, deferred maintenance led to unreliable water delivery. Instead of rebuilding an inefficient and leaky system, the Yakama Nation and WIP are reimagining water management and building a future that is sustainable and resilient to climate change.

Aquifer replenishment is a critical component of future water management on the Yakama Reservation. Starting with the Toppenish Fan Shallow Aquifer Recharge Project that was implemented in 2015, the Yakama Nation developed the first indigenous-led, regional-managed aquifer recharge program. A suite of aquifer recharge projects has been developed to sustain water supply for future habitat and irrigation needs.

The Yakama Nation and WIP partners, including federal and state agencies as well as irrigation districts, are collaborating to improve the reliability of municipal and domestic water supply, restore deeper aquifers and plan for aquifer depletion due to climate change, and reduced recharge due to more efficient irrigation delivery methods. Together, they are working to manage water for the benefit of current and future generations.

A view of Reclamation's Heart K property from the top of Taneum chute.



Additional YBIP groundwater storage projects currently in development:

- Kittitas Reclamation District Taneum shallow aquifer recharge
- Kittitas Reclamation District Basalt aquifer storage and recovery assessment
- City of Ellensburg aquifer storage and recovery assessment
- Rattlesnake Ridge aquifer storage and recovery assessment

Meeting surface water storage goals

Additional water storage is essential to meeting three goals of the Yakima Basin Integrated Plan (YBIP)—improving potable water supply for irrigation, increasing additional municipal/domestic water supplies, and providing instream flow objectives.

Implementing the Initial Development Phase of the YBIP was authorized in 2019, which allows storage and water supply projects future access to 200,000 acre-feet of inactive storage water at Kachess Reservoir via a new pumping plant facility (Kachess Drought Relief Pumping Plant Project) and 14,600 acre-feet of water by raising the pool level of Cle Elum Reservoir (Cle Elum Pool Raise Project).

During implementation, an adaptive approach was sought and is being used to assess progress toward meeting the water use goals. The amount of additional water supply required depends on the effectiveness of projects implemented as part of the YBIP, how the Yakima basin economy develops over time, and the timing of and manner in which climate change affects water supply availability. However, the usefulness of the adaptive approach was highlighted in 2022 when the property needed for the proposed construction of Wymer Reservoir became unavailable at this time.

New projects continue to be identified and considered through a formalized process. In December 2021, participating partners agreed to begin formal development of the Yakima Tieton Irrigation District's proposal as part of the YBIP, which consists of changing their point of diversion to the Wapatox Diversion Dam and then removing the Tieton Diversion Dam. The Kittitas Reclamation District Upper Yakima System Storage was also approved for formal development as part of the YBIP.

YBIP participating partners continue to pursue alternative sites for surface water storage for agricultural and municipal/domestic water supplies and instream flow reliability and are committed to meeting the YBIP goal of 450,000 acre-feet of storage.

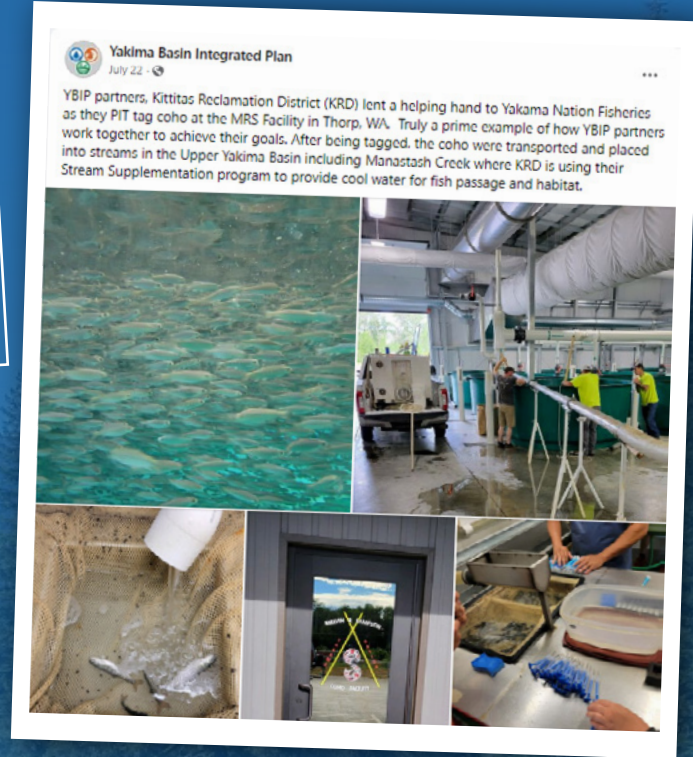


An aerial view of the proposed North Fork Cowiche Creek Reservoir and French Canyon Dam and Reservoir.

News and events



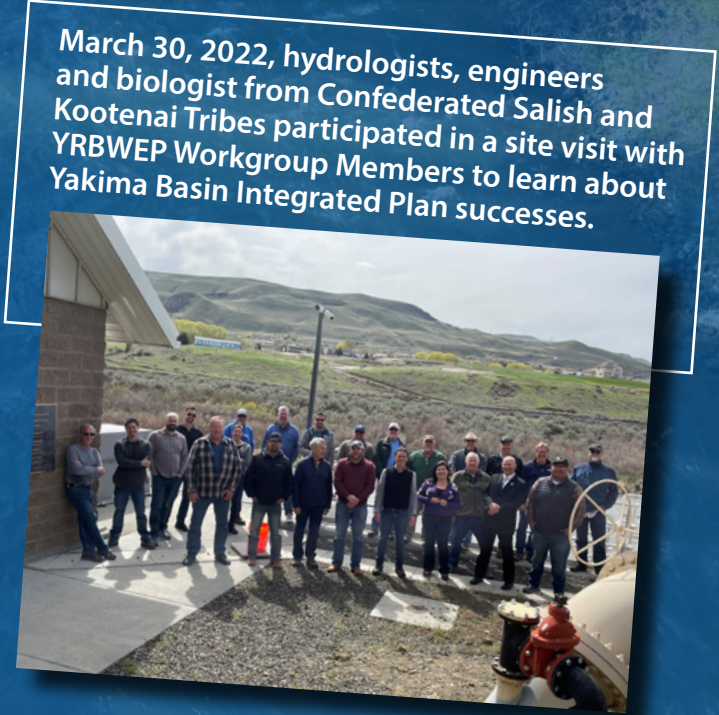
September 1, 2022, Yakama Nation's Iksiks Washanahl'a (Little Swans) share a traditional dance at the honoring Chamna Event.



September 30, 2022, Assistant Secretary for Fish, Wildlife, and Parks Shannon Estenoz hosts round table discussion with YBIP partners to celebrate BIL funding for South Fork Tieton fish passage project.



September 2, 2022, Ecology and Kittitas County celebrated a mitigation milestone for water security with Yakama Nation and other partners at the Melvin R. Sampson Coho facility.



March 30, 2022, hydrologists, engineers and biologist from Confederated Salish and Kootenai Tribes participated in a site visit with YBWP Workgroup Members to learn about Yakima Basin Integrated Plan successes.