DEPARTMENT OF ECOLOGY
State of Washington

Yakima River Basin Integrated Water Resource Management Plan

2019 Implementation Status Report

April 2020
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Publication and Contact Information

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For more information contact:

Office of Columbia River
1250 West Alder Street
Union Gap, WA 98903-0009
Phone: 509-454-4239

Washington State Department of Ecology — www.ecology.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Photo: North Fork Teanaway River large wood floodplain restoration staging area, Teanaway Community Forest.

Yakima River Basin Integrated Water Resource Management Plan

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Office of Columbia River
Washington State Department of Ecology
Union Gap, Washington

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
1250 West Alder Street ● Union Gap Washington 98903-0009 ● (509) 575-2490

April 15, 2020

The Honorable Jay Inslee, Governor
Honorable Members of the Washington State Legislature
Olympia, Washington

RE: 2019 Implementation Status Report for the Yakima River Basin Integrated Water Resource Management Plan

Prepared by the Department of Ecology for you and the Legislature as required under RCW 90.38.100, this 2019 *Implementation Status Report for the Yakima River Basin Integrated Water Resource Management Plan*, documents progress made on implementing projects under the Initial Development Phase (first 10-year phase) of this 30-year effort. This report is now available at this website: https://fortress.wa.gov/ecy/publications/summarypages/1912005.html.

In 2019, the Yakima Basin Integrated Plan hit a major milestone securing the federal authorization necessary to see the Initial Development Phase of the Yakima River Basin Integrated Water Resource Management Plan to completion, providing water resiliency and ecological restoration throughout the Yakima River Basin.

If you have any questions regarding this report or would like more information, please contact me by phone at (509) 574-3989 or by email at: thomas.tebb@ecy.wa.gov. If you would like hard copies of the report, contact Colleen Smith by phone at (509) 454-4239 or email at: colleen.smith@ecy.wa.gov.

Sincerely,

G. Thomas Tebb, L.Hg., L.E.G.
Director
Office of Columbia River

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Statutory Directive

RCW 90.38.100

Report to the legislature and governor. (Expires December 31, 2045.)

1. By December 1, 2015, and by December 1st of every odd-numbered year thereafter, and incompliance with RCW 43.01.036, the department, in consultation with the United States bureau of reclamation, the Yakama Nation, Yakima river basin local governments, and key basin stakeholders, shall provide a Yakima river basin integrated water resource management plan implementation status report to the legislature and to the governor that includes:

    a. A description of measures that have been funded and implemented in the Yakima river basin and their effectiveness in meeting the objectives of chapter 11, Laws of 2013 2nd sp. sess.,
    b. A project funding list that represents the state's percentage cost share to implement the integrated plan measures for the current biennium and cost estimates for subsequent biennia,
    c. A description of progress toward concurrent realization of the integrated plan's fish passage, watershed enhancement, and water supply goals
    d. An annual summary of all associated costs to develop and implement projects within the framework of the integrated water resource management plan for the Yakima river basin.

2. The status report required in this section for December 1, 2021, must include a statement of progress in achieving the water supply facility permit and funding milestone, as defined in RCW 90.38.010. If, after a good faith effort to achieve the water supply facility permit and funding milestone, it appears that the milestone cannot or may not be met, the department, in consultation with the United States bureau of reclamation, the Yakama Nation, Yakima river basin local governments, and key basin stakeholders, shall provide a detailed description of the impediments to achieving the milestone, describe the strategy for resolving the identified impediments, and, if necessary, recommend modifications to the milestone.

3. This section expires December 31, 2045.

[2013 2nd sp.s. c 11 § 9.]

Executive Summary

Water supplies have been a source of conflict for decades in the Yakima River Basin, a watershed that supports an important agricultural economy and endangered natural ecosystem. Two pathways tend to persist in the face of resource challenges, opposition or collaboration. In 2009, the stakeholders in the Yakima River Basin came together with a desire to collaborate and build a framework for implementing integrated water management solutions. It is here that the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) was born. The Integrated Plan demonstrates a successful, commonsense approach to providing water security for farms, fish, and families.

Ecology's Office of Columbia River (OCR), in partnership with the US Bureau of Reclamation (Reclamation), Yakama Nation and other stakeholders, made tremendous progress in 2017 through 2019 to implement tasks within the Integrated Plan, in line with the funding and strategies agreed upon by the plan's partners.

In accordance with RCW 90.38.100, this biennial report describes how we advanced each of the Integrated Plan's seven elements since the previous 2017 status report, and how the Integrated Plan is achieving its fish passage, habitat/watershed enhancement, and water supply goals.

Project highlights for this report include:

- Progress on various stages of fish passage construction at Cle Elum reservoir; the secant vault, intake ramps, adult collection facility and juvenile passage tunnel to the Cle Elum River.
- Habitat preservation in the Teanaway Community Forest continued with large wood replenishment and completion of both summer and winter recreation plans.
- Groundwater monitoring wells drilled in the Toppenish Alluvial Fan allows for monitoring aquifer recharge.
- Water conservation projects, specifically the Wapato Irrigation Project and the completion of a new five-mile long pipeline.
- Progress on shoreline stabilization work along the Cle Elum reservoir.
- Completion of the Supplemental EIS for the Kachess Drought Relief Pumping Plant and Keechelus-to-Kachess Conveyance Project.
- Market Driven Reallocation work steadily progressing with a basin wide water banking analysis.

Passed by Congress in February 2019 and signed by President Trump in March 2019, the sweeping public lands package known as the John D. Dingell, Jr. Conservation, Management, and Recreation Act included federal support to see the Integrated Plan through its first 10-years, known as the Initial Development Phase.

Since 2013, the legislature has appropriated funds for the implementation of the Yakima Basin Integrated Plan: $143 million for the 2013-2015 biennium; $30 million for the 2015-2017 biennium; $32.6 million for the 2017-2019 biennium; and $40 million for the 2019-2021 biennium.

Yakima River Basin and the Integrated Plan

Located in the heart of Washington, the 6,155 square-mile Yakima River Basin is home to approximately 370,000 people, including around 10,000 members of the Yakama Nation (Figure 1). It is also one of the top agricultural producing regions in the state[1], yielding up to $4.5 billion from crops such as Timothy hay, apples, cherries, wine grapes, and hops.

Figure 1 Map of the Yakima River Basin

Families, farms and fish depend on cool, clean and reliable water supplies that suffer from decades of over allocation in the Yakima River Basin. At the same time, the entire ecosystem reveals the effects of climate change. Snowpack levels in the upper reaches of the Cascades are declining. It is theorized that reduced snowpack is due to increasing temperatures causing more precipitation to fall as rain instead of snow, and snowmelt to occur earlier in the year.

These changes to snowpack levels have led to higher flows during times when water is in low demand and water shortages during times of higher water demand. This shift in water supply is amplified during ever-increasing times of drought as water shortages can result in restricted water use among junior water right holders (water rights established after May 1905).

Overview of the Integrated Plan

As the third phase of the federal Yakima River Basin Water Enhancement Program (YRBWEP) (see Figure 2 next page), the Integrated Plan focuses on developing sustainable water supplies for farms, families, and fish at a watershed-scale.

The Integrated Plan is laid out as a 30-year plan that is implemented in three 10-year phases. The first phase of the Integrated Plan, known as the Initial Development Phase, concentrates on a wide range of projects, large and small, covering all seven elements of the Integrated Plan as laid out in the Yakima River Basin Integrated Water Resource Management Plan Programmatic Environmental Impact Statement[2] (Integrated Plan PEIS). These projects include improving stream flows for fish, and constructing a "first of its kind" down-stream juvenile fish passage structure at Cle Elum reservoir. Other significant investments have been made in water conservation across the Yakima River Basin, and pursuing the next step for water storage.

Integrated Plan Goals

- Providing opportunities for comprehensive watershed protection and ecological restoration that address instream flows, aquatic habitat, and fish passage.
- Improving water supply reliability during drought years for agricultural and municipal needs.
- Developing a basin-wide approach for water conservation for irrigated agriculture, municipal and domestic uses, and power generation.
- Improving the ability of water managers to respond and adapt to the potential effects of climate change.
- Contributing to the vitality of the regional economy and sustaining the riverine environment.

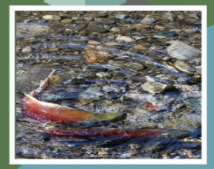
[1] U.S. Department of Agriculture. July 25 2019. 2017 Census of Agriculture. Watershed Profiles. https://www.nass.usda.gov/Publications/AgCensus/2017/

[2] US Bureau of Reclamation. March 2 2012. Yakima River Basin Integrated Water Resource Management Plan Programmatic Environmental Impact Statement. https://www.usbr.gov/pn/programs/yrbwep/reports/FPEIS/fpeis.pdf

From YRBWEP to Integrated Plan

1979 - Studies Authorized

The Yakima River Basin Water Enhancement Project began after devastating drought in the 1970s when Congress authorized a study to find solutions to the basin's water supply problems.



1984 - YRBWEP Phase I - Fish Passage

Early studies identified fish passage issues. Fish screens and ladders were built at diversion dams to help fish move freely upstream to spawn.

1994 - YRBWEP Phase II - Conservation

The next phase conserved water for agriculture and instream flows; acquire and restore important habitat in the Yakima River watershed.

2009 - YRBWEP Phase III - Integrated Plan

The Integrated Plan is a watershed-scale, balanced approach to sustainable water supply for families, farms, and fish.

Integrated Plan

The Integrated Plan is comprised of seven elements. The map below shows the location of a few example projects from each element.

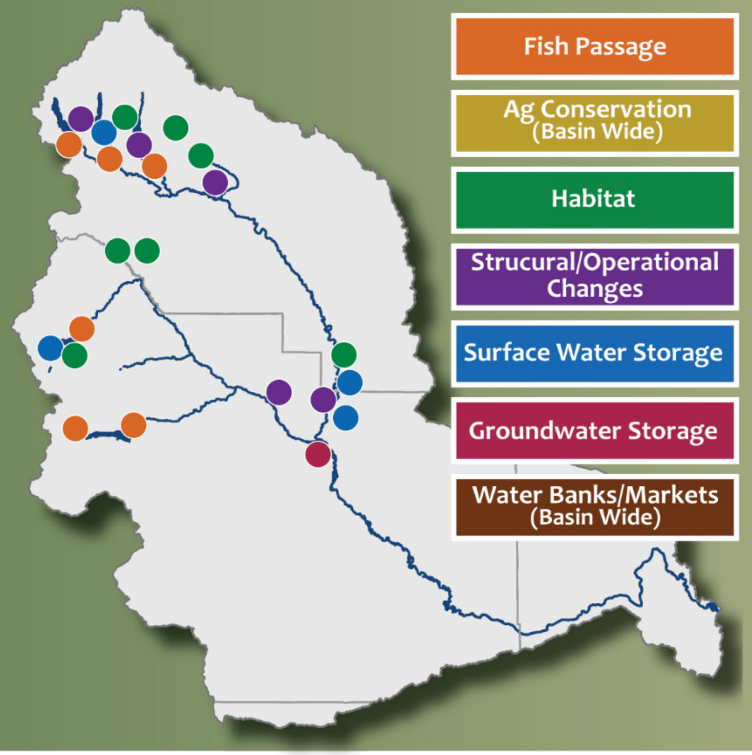


Figure 2 YRBWEP to Integrated Plan

Program Oversight and Coordination

The success of the Integrated Plan is a testament to our dedicated partners, US Bureau of Reclamation (Reclamation), the Yakama Nation, and a range of stakeholders comprising the YRBWEP Workgroup (page 30), innovative funding opportunities, and the adaptive management approach of the plan. Projects are carefully vetted by working group subcommittees and the public through environmental review and open meetings, to ensure they meet one or more goals of the Integrated Plan. This coordinated approach results in tangible large-scale water supply and environmental improvements to the entire Yakima River Basin. Benefit details are included in each project section.

Integrated Plan Committees and Workgroups

- Yakima River Basin Water Enhancement Project Workgroup
- Executive Committee
- Implementation Committee
- Water Use Subcommittee
- Habitat Subcommittee
- Groundwater Subcommittee
- Bull Trout Working Group
- Watershed Lands Subcommittee
- Outreach Subcommittee
- Economic Subcommittee
- Lower River Subgroup
- Municipal Water Use Subgroup

Seven Essential Elements

OCR, Reclamation, and its partners are working with the YRBWEP Workgroup Executive Committee to develop a process of qualitatively and quantitatively evaluating new and modified projects. This evaluation process, once finalized, will be used to verify that projects are meeting the goals of the Integrated Plan. All projects are associated with one or more of seven essential watershed improvement elements identified in the integrated Plan that workgroup members have committed to moving forward simultaneously. The Integrated Plan's seven (7) elements are as follows:

1. Habitat/Watershed Protection and Enhancement - Protect and enhance critical habitat for anadromous and resident fish and wildlife through land acquisition, watershed protection and habitat protection and/or enhancement.
2. Fish Passage - Provide upstream and downstream fish passage at all major Yakima River Basin storage reservoirs.
3. Enhanced Water Conservation - Aggressively implement water use efficiency measures to improve instream flows on critical stream reaches, increase water delivery precision, and achieve drought resiliency.
4. Structural and Operational Changes - Promote operational efficiency and flexibility at existing in-basin water supply and water conveyance infrastructure facilities.
5. Surface Water Storage - Develop an additional 450,000 acre-feet (ac-ft) of surface water storage for supporting instream and out-of-stream water uses.
6. Groundwater Storage - Recharge aquifers with surface water for storage for later withdrawal and use and passive aquifer recharge/infiltration for improved aquatic habitats.
7. Market Driven Reallocation - Create conditions and remove barriers to allow for efficient water right trading between willing parties to improve water supplies and stream flow conditions.

Enhanced Water Conservation

Projects under the Enhanced Water Conservation Element focus on improving more precise water delivery and water use to achieve improved instream flows in critical stream reaches, operational efficiencies and water reliability. Water conservation projects include the promotion of low water use landscaping, sealing and lining leaky irrigation canals, converting open ditches to pipe systems, and upgrading water measurement devices.

Water system managers in the YRBWEP Municipal Subgroup are tackling water conservation and education projects that benefit communities served by municipal water supplies. Water savings gained through these efforts provide communities more reliable water supplies in times of drought, as well as extending existing water supplies for future community growth.

Photo: Low water use garden in the City of Yakima

Water Wise Landscaping

The Integrated Plan is promoting water savings through the replacement of high water use vegetation with low water use planting and landscaping practices.

City of Yakima Low Water Use

The City of Yakima's Public Works Department (City Public Works) converted over 35,000 square-feet (sq-ft) of landscaped area at the City's Public Works Complex and 3,000 sq-ft of landscaped area along the east side of North 2nd Street to low water use landscaping in the spring of 2018.

Work at both sites included clearing existing landscaping, replacing existing irrigation systems with drip lines and re-planting the sites with low water use plants and mulch cover. Signage at both sites provide public education on the benefits of low water use landscaping at residential properties.

This project not only provides water saving for the City Public Works, it also demonstrates that water wise landscaping can be as aesthetically pleasing as traditional landscaping.

Installation of the City of Yakima's low water use demonstration garden.

Heritage Garden Workshop

In partnership with Benton Conservation District and Columbia Basin Chapter of the Washington Native Plant Society, the North and South Yakima Conservation Districts held two free public heritage garden and low water use workshops in the spring and fall of 2019.

Attended by more than 100 people, these workshops provided a wide range of information on the benefits of planting heritage gardens in conjunction with utilizing efficient irrigation practices. Heritage gardens in the Yakima River Basin honor natural and culturally significant plants that thrive in the dry and extreme temperature range of the region's arid climate.

Example of a residential heritage garden in Yakima.

Wapato Irrigation Project

The Yakama Nation and the Bureau of Indian Affairs continued water conservation efforts on the Wapato Irrigation Project (WIP) by constructing the L672 pipeline in 2019. This five-mile long pipeline replaces an aging and leaky concrete pipeline. The new pressurized PVC pipe reduces leaks, conserving over 1,000 ac-ft of water annually. Much of WIP's existing water delivery infrastructure is beginning to fail or has failed, losing water through leaky pipes and porous open ditch delivery systems at an excessive rate. By improving and modernizing existing water delivery infrastructure, WIP will conserve approximately 4,023 ac-ft of irrigation water annually.

Ongoing work includes:

- Replacing over 52,000 feet (ft) of aging lateral pipelines.
- Installation of magnetic flowmeters to allow for precise monitoring and data collection for improved management of irrigation water deliveries.
- Lining 2,900 ft of open ditch water delivery systems with plastic geomembrane covered in rock riprap.

Improving the existing water delivery infrastructure not only reduces water loss, but it will also increase water delivery reliability, and improve overall drought resiliency. Toppenish Creek streamflows will also benefit from these efforts as farmers will be able to rely on water provided by WIP canal systems and thereby depend less on water provided by Toppenish Creek.

Kittitas County Conservation District

The Kittitas County Conservation District and their partners, Washington Water Trust and Trout Unlimited, continue reaching out to Kittitas County farmers to promote on-farm irrigation and conveyance efficiency upgrades. This effort is expected to save approximately 166 ac-ft of water every year by converting 133 acres of farmland from flood irrigation to sprinkler, or from open canal to pipe deliveries. Water savings will be put towards augmenting instream flows of tributaries in the upper Yakima River Basin.

Roza Irrigation District

Roza Irrigation District (Roza) has completed the first three phases of its on-going main canal concrete sealing and lining project. To date, upgrades to approximately nine miles of the 20 mile-long concrete lined portion of the main canal are complete. By sealing the existing cracks and joints on the concrete lined portions of Roza's main canal, the irrigation district expects to save approximately 693 ac-ft of water annually.

Toppenish to Teanaway Conservation Partnership Program

The Kittitas County Conservation District and the Yakama Nation, with the help of the US Department of Agriculture Regional Conservation Partnership Program, continue to engage private landowners interested in improving irrigation efficiencies. Project development continues on potential sites located in key watersheds such as Naneum Creek, Dry Creek, and Taneum Creek in Kittitas County. Depending on negotiations with landowners, efficiency improvements to irrigation systems could begin in the spring of 2020. Water savings gained by increasing irrigation efficiency will augment instream flows, reduce soil erosion, and enhance water quality and fish habitat in priority stream reaches.

Groundwater Storage

The Groundwater Storage Element focuses on storing water within underground aquifers throughout the Yakima River Basin. The idea is to capture excess surface water during times of high flows and inject it into aquifers where it can be later withdrawn or released into the system during times of low stream flows. Aquifer storage requires less infrastructure and has fewer environmental impacts than creating surface water storage. These projects are viable in urban and developed areas, dependent on local geology.

Ecology and Reclamation continue to invest in studies throughout the Yakima River Basin to locate potential sites for groundwater storage projects as well as identify how shallow aquifer recharge and aquifer storage and recovery might influence groundwater interactions with interconnected wetlands, floodplains, rivers, and streams.

Photo: Toppenish fan groundwater monitoring well drilling.

Aquifer Storage and Recovery

Due to the potential low cost and multiple benefits of Aquifer Storage and Recovery (ASR), the number of ASR projects in the state is growing. ASR (Figure 3) takes advantage of excess water during high instream flows by capturing and injecting it into a local aquifer. When surface water availability begins to decline, the aquifers can be tapped to augment streamflows, and for out-of-stream uses.

ASR also provides instream benefits by shifting water dependence from surface to groundwater sources. This shift in water source dependence lets water users rely more on stored water during drier times, which in turn allows more water to remain instream.

City of Yakima ASR

The City of Yakima's (City) ASR program is now operational, allowing the City to store water from the Naches River underground during low demand periods (winter), and accessed via the city's groundwater wells for use in low water years.

Drought conditions such as those experienced in 2019 provide a good example for why the City, through the Integrated Plan, is implementing ASR. The City was able to capture nearly 96 ac-ft of water and pump it into wells during high flows, providing streamflow benefits at critical times in the summer months (i.e. July, August and September).

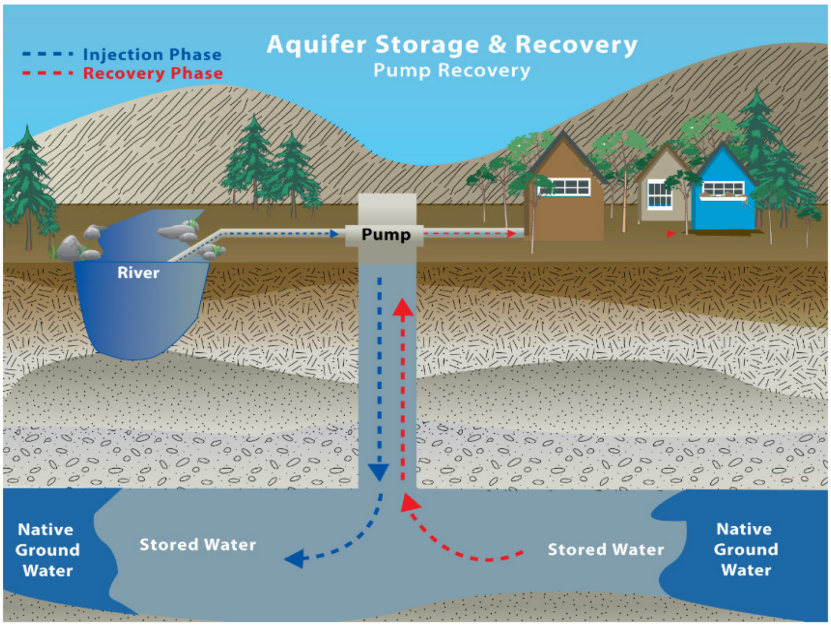


Figure 3 Aquifer Storage and Recovery

Due to the generally mild 2019 drought conditions in the Yakima River Basin, the City was able to meet all of its municipal demands without having to recover any injected water over the summer. This water will be available for use should another drought occur in the future.

Kittitas Reclamation District

The Kittitas Reclamation District (KRD) is investigating potential sites for managed aquifer recharge within its service area and throughout Kittitas County. As part of the site ranking process, KRD must estimate annual storage volume of the aquifer, possible effects on instream flows, evaluate and prioritize project sites for feasibility, produce a cost-benefit analysis, and develop a permitting strategy to implement aquifer recharge projects.

Shallow Aquifer Recharge

Shallow Aquifer Recharge (SAR) projects supplement the natural seasonal groundwater recharge, typically provided by rain and snowmelt, by diverting surface water to an upland recharge site. Providing enhanced recharge to an aquifer helps mitigate the impacts of increased droughts and climate change.

Successful SAR projects benefit both aquatic and riparian habitats by increasing groundwater levels and allowing for the natural infiltration of cooler groundwater into adjacent wetlands and streams.

Benefits of SAR include:

- Fewer environmental impacts.
- No impediments to fish passage.
- Aid in the stabilization of groundwater levels.
- Boost cool groundwater discharge into adjacent wetlands and streams.
- Provide cool water runoff from streams and creeks downstream.
- Lower construction costs than traditional surface storage reservoirs.

Toppenish Shallow Aquifer Recharge Project

The Toppenish Shallow Aquifer Recharge Project is one component of the Yakama Nation Water Resource Program (YNWRP) habitat enhancement Toppenish Creek Corridor Enhancement Project. The goal is to restore meandering of Toppenish Creek, reconnect the floodplain, and improve groundwater stores that will, in turn, discharge into adjacent wetlands, springs and creeks.

The YNWRP, with continued support from Ecology and Reclamation, hit a milestone in 2019 with the installation of monitoring wells in the Toppenish alluvial fan. Data collected from these monitoring wells will be used to analyze the effectiveness of spring aquifer recharges. An estimated 5,000 ac-ft of groundwater replenishment is expected to be captured by this project.

Surface Water Storage

Additional surface water storage is needed to meet both current and future instream and out-of-stream demands in the Yakima River Basin. Potential storage projects include accessing the inactive pool in the Kachess Reservoir, increasing the storage capacity of Bumping Reservoir, and creating a new (Wymer) reservoir on Lmuma Creek.

By developing 450,000 ac-ft of new surface water storage, this element will provide greater water supply reliability for farmers and communities improve streamflows and increase the basin's economic and environmental resiliency.

Photo: Boat ramp at Kachess Reservoir during the 2019 fall drawdown.

Kachess Drought Relief Pumping Plant

On March 15, 2019, Ecology and Reclamation released the Kachess Drought Relief Pumping Plant (KDRPP) and Keechelus Reservoir-to-Kachess Reservoir Conveyance (KKC) Final Environmental Impact Statement (FEIS).

In this FEIS, seven different alternatives were evaluated, including a "no action" alternative. After extensive research, analysis, public outreach and comment consideration, and coordination with our partners and stakeholders, Ecology and Reclamation identified Alternative 4 as the Preferred Alternative.

Under Alternative 4, KDRPP provides 200,000 ac-ft of water currently held in the existing Kachess Reservoir below the dam outlet works, making this water inaccessible/inactive. Water would be withdrawn from the inactive pool from a floating pumping station located near the existing outlet channel. The floating platform will allow the pumping plant to move up and down with the fluctuating water level of the reservoir (Figure 4).

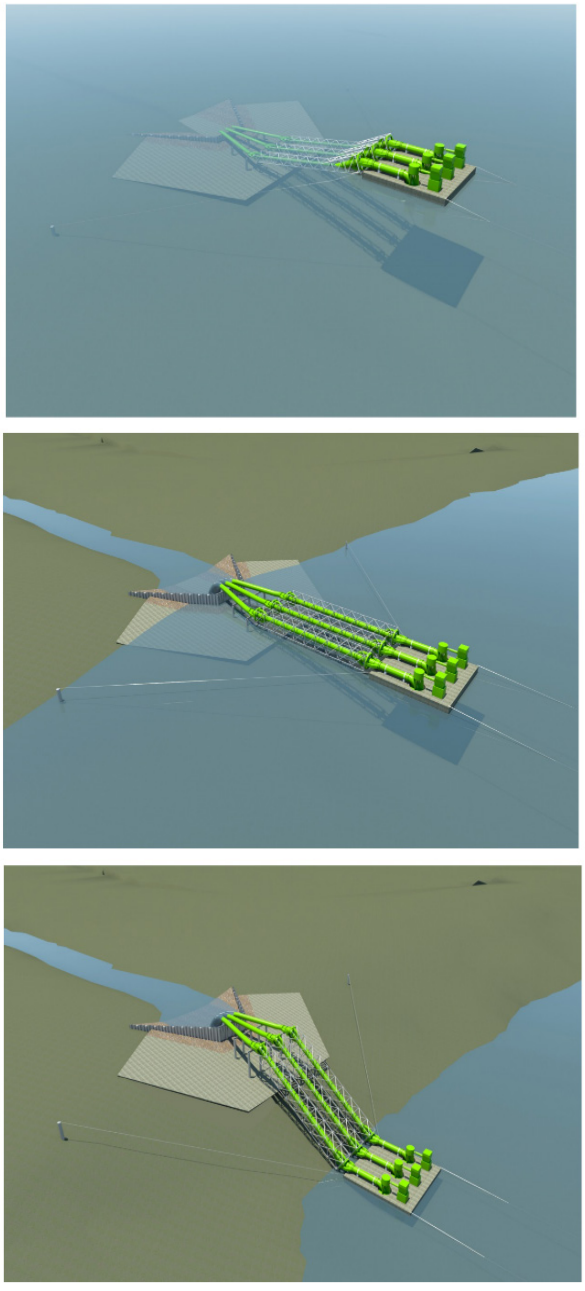


Figure 4 Floating Pumping Plant Variable Reservoir Levels

Reclamation's Record of Decision (released April 26, 2019), discusses the need for further analysis (Tier-2 EIS) of issues specific to each alternative, focusing on the site specified under Alternative 4. The remaining alternatives, including the KKC, will not be carried forward into the Tier-2 EIS.

The proposed Tier-2 EIS, equivalent to a supplemental EIS under the State Environmental Policy Act, will analyze several issues in more detail, including potential impacts on bull trout, other critical fish habitat, groundwater wells and visual aesthetics that could affect property values.

Pumping of the inactive pool would only take place if irrigation districts receive less than 70% of their Reclamation water supply, which is likely to only occur during severe droughts. The pumping plant will convey water from the inactive pool to the Yakima River for distribution to participating pro-ratable irrigation districts, with the potential option of leaving a portion of this water instream to enhance stream flows.

Yakima River Basin pro-rationed water users have committed to paying for a large portion, if not all of the construction, financing and operation and maintenance costs of KDRPP. Overall, the water supplied by the KDRPP aims to minimize drought related impacts to the Yakima River Basin's $4.5 billion agricultural economy.

Wymer and Bumping Surface Water Storage Projects

With KDRPP contributing up to 200,000 ac-ft of new surface water storage, additional surface water storage projects are necessary to meet the Integrated Plan's 450,000 ac-ft surface water storage goal. The Wymer Dam and Reservoir project and the Bumping Reservoir Enlargement project would collectively provide enough surface water storage (250,000 ac-ft) to meet, if not exceed, the 450,000 ac-ft goal. The evaluation of site requirements for both Wymer Dam and Reservoir and Bumping Reservoir Enlargement projects are ongoing.

Wymer Dam and Reservoir

Construction of an off-channel mid-basin dam near the confluence of Lmuma Creek and the Yakima River will create a new reservoir called Wymer Reservoir in the Yakima River Basin. This new reservoir will have a storage capacity of up to 162,500 ac-ft and will hold water pumped from the Yakima River during times of high system flows.

Water will be released on an annual basis during July and August to meet irrigation demands and provide instream flow benefits. During times of drought, water will also be released to improve water supplies for proratable water right holders.

Lmuma Creek at I-82 between Ellensburg and Yakima

Bumping Reservoir Enlargement

Enlarging the Bumping Lake Reservoir requires construction of a new dam and fish passage facilities that will be located approximately 4,500 feet downstream of the existing dam that was constructed in 1910.

By replacing the aging dam with a new dam downstream, this project will increase the storage capacity of the reservoir from 33,700 ac-ft to 190,000 ac-ft.

Bumping Dam

Habitat/Watershed Protection and Enhancement

Protection, restoration, and enhancement of critical habitats are vital to maintaining healthy populations of resident and anadromous fish, including sockeye salmon, and federally listed bull trout and steelhead.

The Habitat/Watershed Protection and Enhancement Element addresses the need to protect and enhance vital habitats through land acquisition, watershed protection, and habitat restoration and enhancement projects.

Floodplain restoration is a significant component of this element, as it restores and enhances both upland and instream habitats, aiding in the recovery of fish including bull trout, steelhead, coho, sockeye and chinook.

Photo: North Fork Teanaway River, Teanaway Community Forest.

Floodplain Restoration

Floodplains are an integral part of healthy riverine ecosystems. These wide, flat areas act as a sponge during flood events, absorbing and slowing down water that breaches banks. Allowing a river to utilize its floodplain provides several benefits including reduced potential for bank incisement, increase sediment deposition, provide nourishment to both upland and aquatic habitats, and recharging groundwater that will slowly infiltrate cool water back into the stream during low flows.

Today, floodplains are vital not only to the ecosystem but also to urban and rural developments. Floodplains buffer impacts of flood events, reducing financial risks associated with crop losses and infrastructure damage.

Large Wood Floodplain Restoration

Historically, natural logjams dotted rivers and streams throughout the Yakima River Basin, providing the ingredients for a waterbody to naturally create and maintain a functional floodplain. Logjams can also create shade and deep cool water pools ideal for spawning resident and anadromous species. At the turn of the previous century, loggers began to remove these logjams so they could easily float logs downstream to local mills. Once removed, floodplains slowly degrade and their naturally adaptive benefits disappear.

Photos of the August 2019 Large Wood placement in the Teanaway Community Forest

In 2014, the Yakama Nation, Reclamation, Washington Department of Fish and Wildlife, in US Forest Service, The Nature Conservancy, Washington Department of Natural Resources, and multiple local organizations, began floodplain restoration efforts in several locations in the Teanaway Community Forest. By November 2018, over 5,000 logs, harvested from local forest thinning projects intended to increase forest resiliency against wildfires, were placed. Logs were placed in strategic locations throughout the basin's tributaries to provide the floodplain with the material it needs to begin restoring itself. Flood waters will create logjams during flood events. In time, we anticipate these logjams will restore the floodplain to healthy conditions and provide the benefits discussed above. Wood placement methods vary from helicopter to heavy machinery as shown in the above photos.

Large wood floodplain restoration work is now complete at several sites throughout the Yakima River Basin, including Umtanum Creek, Little Rattlesnake Creek, Satus Creek, Little Naches River, and North Fork Manastash Creek. Additional project sites within the Teanaway Community Forest include Jungle Creek, Rye Creek, Indian Creek, First Creek, Middle Creek, Dicky Creek, Jack Creek, and Lick Creek. We anticipate restoration work for Carlson Creek, in the Teanaway Community Forest, to commence in 2020.

Gap-to-Gap Ecosystem Restoration

Yakima County's largescale Yakima River Gap-to-Gap Ecosystem Restoration project spans from Selah gap to Union gap. This project aims to restore local Yakima River floodplain function through property acquisition, levee setback or removal, side channel excavation to reconnect the floodplain to the river, and riparian plantings to increase floodplain vegetation diversity.

Approximately 700 acres of floodplain will be reconnected to the Yakima River, which in turn will enhance floodplain function to an additional 700 acres of Reclamation land adjacent to the river, reduce flood damage risks, and improve fish habitat.

Contributing agencies include Reclamation, US Army Corp of Engineers, Washington State Department of Transportation, the Yakama Nation, Yakima County Flood Control Zone District, the City of Yakima, and other local entities.

Completed project components include:

- Acquiring the former KOA and Greenway properties.
- Removing and setback of county and state owned levees.
- Excavating side channels.
- Riparian planting on approximately 40 acres of Yakima River floodplain.

Before (top) and after (bottom) photos of the Y-9 Levee cobble bar removal and new channel excavation.

Naches-Cowiche Flood Risk Reduction and Floodplain Restoration

Yakima County, in cooperation with the City of Yakima, Ecology's Floodplains by Design program[3], and private funders, are restoring 82 acres of floodplain along 8,000 ac-ft of Cowiche Creek and the Naches River. The project will also reestablish fish passage in the Naches-Cowiche confluence, and reduce flood risks to adjacent agriculture lands, the City of Yakima, Powerhouse Rd, and US Highway 12.

Island Road – Toppenish Creek

The Yakama Nation, in partnership with the US Fish and Wildlife Service, plans to restore 1,000 acres of floodplain along Toppenish Creek by increasing channel roughness and breaching levees along the creek. Once completed, this project will increase floodwater storage along the creek, enhancing fish and wildlife habitat. Construction is anticipated to begin in the summer 2020.

[3] More information on Ecology's Floodplains by Design program can be found online at: https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Floodplains-by-design

Yakima River Mile 89.5 Levee Breach

The Yakama Nation will breach a levee and install grade controls along river mile 89.5 in an effort to reconnect a 1.5-mile side channel and the 200 acre floodplain on the Yakima River near Toppenish. Construction will continue in phases through summer 2020.

Toppenish Creek 3-way Levee Setback

Over a half-mile of levee along Toppenish Creek will be set back to increase habitat area for mid-Columbia steelhead within a critical spawning and rearing reach. Construction on the set back of the levee is underway and is expected to be complete by the end of 2021. By moving the levee back 500 feet and adding large wood to the creek, this project enhances future stream function by removing the tight constrictions of the creek currently created by the levee.

Other Floodplain Restoration and Enhancement projects

- Upper Yakima Floodplain Land Acquisition and Enhancement Design on Ringer Loop Road.
- Trout Meadows Floodplain Land Acquisition and Enhancement.
- Yakima River Floodplain Restoration along the Wapato Reach of the river.

Bull Trout Enhancement

Signed in October 2015, the Bull Trout Enhancement (BTE) Memorandum of Understanding (MOU) provides a foundation for improving communication and coordination of water and fish managers throughout the Yakima River Basin. Working through the Integrated Plan processes and committees, the parties[4] continue to develop actions aimed at improving and increasing the resiliency of bull trout populations in the Yakima River Basin.

Photo credit WA Department of Fish and Wildlife, bull trout at Deep Creek.

In 2017, the parties developed the BTE framework as an action plan that identifies specific projects benefiting the upper Yakima River Basin bull trout populations. These projects include fish passage, habitat protection, restoration and enhancement projects, and other population management actions.

Bull trout enhancement efforts currently underway include:

- Habitat restoration and enhancement work in Gold Creek, Upper Kachess River, and Box Canyon Creek.
- Engineering designs for the South Fork Tieton and Gold Creek bridges to improve fish passage.
- Continued public outreach and education, recreation rock dam removal, population and passage condition monitoring, and other project assistance provided by the Bull Trout Task Force.

The Integrated Plan continues to provide support for the Bull Trout Working Group, which in turn offers project recommendations to the Habitat subcommittee.

[4] Bull Trout Enhancement Memorandum of Understanding was signed by Ecology, Reclamation, Washington Department of Fish and Wildlife, the Yakama Nation, US Forest Service and US Fish and Wildlife Service (the parties).

Improving Water Temperatures

Yakima Delta Ecosystem Restoration

At the confluence of the Yakima and Columbia Rivers, a causeway (constructed around 1940) connecting Bateman Island to the shoreline hinders Columbia and Yakima River flows from mixing near the mouth of the Yakima River.

Without this mix of water, the warmer flows from the Yakima River accumulate behind the causeway at Bateman Island, creating a pool that is too hot for salmon to migrate through. Due to this area of high temperature, large numbers of salmon migrating to spawning grounds in the Yakima River Basin are forced to wait in the Columbia River until conditions improve, becoming the ideal prey for opportunistic predators. The Yakima Delta Ecosystem Restoration project will improve habitat and water quality within the Yakima River Delta by reconnecting the Yakima River and Columbia River flows.

One alternative being analyzed by the Yakima Delta Ecosystem Restoration Project partners is the breaching of the Bateman Island Causeway. As seen in Figure 5 provided by the Bateman Island Causeway Modification Conceptual Design Report[5], removing the causeway will allow water to flow around the island. Once water can flow around the island the warm Yakima River flows will be able to mix with the cooler water in the Columbia River. This mixing of warm and cool water will provide the conditions needed by salmonids to enter the Yakima River by:

- Reducing water temperature
- Increasing dissolved oxygen levels
- Reducing turbidity
- Flushing out toxic algae

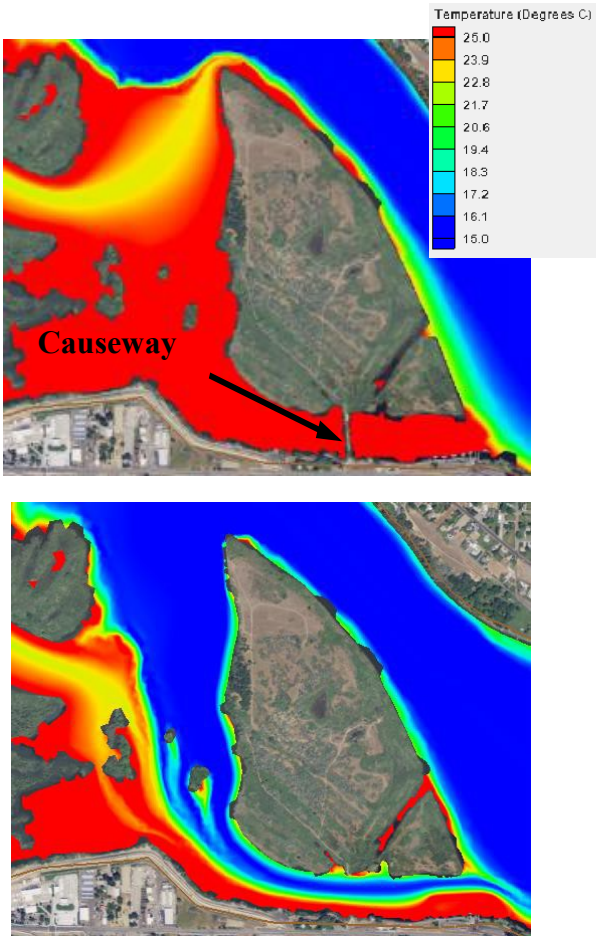


Figure 5 Simulated Temperature for Columbia River Flows at the Yakima River Delta (2012)

Top: Existing conditions.

Bottom: Alternative 8, Full causeway removal with a breakwater around the marina.

Yakima Delta Ecosystem Restoration Project partners include representatives from the City of Richland, federal and state fishery managers, irrigation districts, environmental and commercial interest groups, Ecology, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Mid-Columbia Fisheries Enhancement Group, US Army Corp of Engineers, the Yakama Nation, and the Confederated Tribes of the Umatilla Indian Reservation.

[5] Full Mid-Columbia Fisheries Enhancement Group January 2016 Bateman Island Causeway Modification Conceptual Design Report can be found online at http://midcolumbiafisheries.org/wp-content/uploads/2014/02/Bateman_Design_Report_compressed.pdf

Lower Yakima River Temperature Monitoring and Fish Migration Tracking

In the summer and early fall of 2018, Benton County and the Yakama Nation completed a longitudinal thermal profile in the lower Yakima River from Wapato to Mabton and from Prosser to Bateman Island. The USGS is currently analyzing the data collected.

Teanaway Community Forest

Purchased from a private landowner by the State of Washington in 2013, the 50,241-acre Teanaway Community Forest[6] (TCF) is one of the largest community forests in the State. Throughout the last century, humans have altered the forest to meet the needs of loggers, ranchers, and farmers, significantly affecting the forest's ecosystem. Through the Integrated Plan's targeted watershed protection and enhancement program, tracts of land are acquired to protect critical habitats and headwaters through sustainable management practices. Protecting and restoring watershed functions help maintain water supply and quality by preventing potential impacts that can degrade downstream waters. Acquiring land provides additional floodplain restoration opportunities.

TCF co-managers, Washington Department of Natural Resources and Washington Department of Fish and Wildlife, continue to work with the Teanaway Community Forest Advisory Committee on developing and implementing sustainable management plans covering a range of activities including grazing and forestry practices, protecting and expanding a wide variety of recreational opportunities, and habitat enhancement and restoration efforts. Protecting and expanding recreational opportunities support local economies and provide a wide variety of recreation opportunities.

Accomplishments made since 2017

- Finalized the Recreation Plan portion of the Teanaway Community Forest Management Plan including:
    - Hiking, mountain biking, and horseback riding trails ranging from interpretive trails to backpacking trails.
    - Multiuse trail connections to and from the forest to Cle Elum, Roslyn, and Ronald, as well as connections to adjacent national forest lands.
    - Non-motorized winter recreation opportunities, including cross-country skiing and snowshoe trails.
    - Parking and restrooms near high use trailheads.
    - Campground improvements for 29 Pines, Teanaway, and Indian camps.
- Installed fencing to keep cattle out of sensitive habitats.
- Improved or closed existing trails and roads, reducing sediment runoff into adjacent waterways.
- Installed large log and root balls at strategic points in creeks and streams throughout the forest for floodplain restoration.

Efforts to restore the Teanaway Forest are paying off with a beaver dam sighted near one of the piles of woody material placed in the North Fork of the Teanaway in 2019. Success is measured in many ways, and comes with continued effort by TCF co-managers and the Advisory Committee to ensure a future of sustainable forest practices to include both summer and winter recreation opportunities.

[6] The Teanaway was designated by the Legislature as a community forest in 2013 following the State's purchase of the land.

Fish Passage

For decades, dams, reservoirs, water diversion, and development have contributed to the loss of salmon and steelhead populations to the point of extinction in several runs. Thankfully, the many tributaries, streams, and creeks that run through the Yakima River Basin hold great promise for fish recovery. Access to high quality, cold-water spawning and rearing habitat is essential for restoring fish runs in the Yakima River Basin.

The Yakama Nation, which holds treaty rights to both water and salmon harvest, continues working with Reclamation and Ecology to reestablish fish access to these historic spawning grounds, taking steelhead, bull trout, and other salmon one step closer to recovery. Projects under the Fish Passage Element provide both upstream and downstream fish passage at six dams (Bumping Lake, Kachess, Keechelus, Cle Elum, Clear Lake, and Tieton) within the Yakima River Basin.

Photo: Cle Elum Fish Passage

Cle Elum Dam Fish Passage

Steady progress continues at Cle Elum Dam to restore historic fish passage for important sockeye salmon species. A unique helix designed passage facility provides juvenile salmon the ability to out-migrate at a range of water levels.

A secant vault to house this complex was completed in 2018. Now construction shifts to the ramp intakes, gate, helix, and tunnel structures with the lowest level intake completed at the end of 2019.

Since the early 1930s, the Cle Elum Dam has impeded fish migration both to and from their historic spawning grounds, contributing to the extinction of the largest sockeye salmon run in the lower 48 states.

Cle Elum Fish Passage construction, June 2019

The next phase of this project focuses on the construction of the juvenile fish passage structures consisting of a series of intake tunnels that deliver fish to the helix. The intake tunnels will be constructed at various depths in the reservoir to allow juvenile fish access to the helix in a pool that can fluctuate up and down approximately 63 feet during their migration period.

The helix, commonly compared to the spiraling ramp of a large parking garage, is an innovative design measuring 48 feet in diameter. The spiraling shape of the helix slows the speed of juvenile fish traveling from the reservoir to the bypass tunnel located 80 feet down from the intake ramps. From there, the juvenile fish are released to the Cle Elum River, where they will make their way to the Pacific Ocean.

Construction of the adult fish collection facility will occur during the final phase of this project. Adult fish migrating upstream will enter the collection facility below the dam, where they will be tagged and trucked for release at the reservoir and other upstream tributaries.

With an anticipated completion date around 2024, the Cle Elum Fish Passage project promises to reopen almost 30 miles of upstream spawning and rearing habitat and, in turn, will restore salmon, steelhead, and other fish populations in the Cle Elum River.

Not only will this improve the fishery to meet federal treaty obligations, but it will also enhance migration numbers to the Pacific, which, in turn, can increase food stores for larger predators including, orcas, dolphins, and porpoises. In 2020, we look forward to the completion of the remaining intake levels, tunnel, and gates, as well as seeing significant progress made on the helix structure.

Rimrock Reservoir above Tieton Dam

Tieton Dam

Year-round fish passage at Rimrock Reservoir and the South Fork Tieton River along White Pass will benefit bull trout and other salmonids. This project will allow prey species into the reservoir and will eliminate fish mortality associated with the current waterfall created when the pool is less than full.

Installing new fish passage will also give Reclamation more flexibility in how it operates by removing the need to hold the reservoir at full pool every August (necessary to allow bull trout passage from the reservoir to South Fork Tieton River). Removing this requirement will benefit instream flows and out-of-stream uses during times of low system flows and will be extremely beneficial during drought years. Yakima County continues to work on designs for the Tieton Reservoir Road Bridge, which is one component of this project.

Clear Creek Dam

In September 2018, Reclamation, in coordination with Ecology, the Yakama Nation, Washington Department of Fish and Wildlife, US Fish and Wildlife Service, and other stakeholders, completed an appraisal level design for fish passage at Clear Creek Dam, above Rimrock Reservoir.

This traditional pool and weir-style fishway design will include a steel bulkhead that will draw cool water in from the deeper areas of the reservoir. Drawing in cooler water will allow the fishway to maintain a suitable water temperature range for bull trout. For now, bull trout continue to be trapped and hauled around the dam to allow fish to reach their spawning grounds in the North Fork Tieton River.

Structural and Operational Changes

The Structural and Operational Changes Element focuses on improving efficiency and increasing flexibility of water deliveries using existing facilities while removing impediments to fish passage, and creating reliable water supplies for instream and out-of-stream needs.

Increasing storage capacity at existing reservoirs and moving points of diversion to improve streamflows in certain reaches of the Yakima River are examples of structural changes we are implementing. Operational changes include augmenting instream flows by reducing water diversions for power generation in the spring.

Photo: New ADA accessible ramp Speelyi Beach Day Use Area.

Cle Elum Pool Raise Project

The Cle Elum Pool Raise Project increases the storage capacity of the Cle Elum reservoir by 14,600 ac-ft by extending the Cle Elum dam radial gates by three feet (completed in 2017). This increased storage will satisfy obligations to meet instream flow augmentation, providing resident and migrating fish with clean cool water imperative to their survival.

Fallen trees, harvested from the Cle Elum Fish Passage construction site, installed as shoreline stabilization, effectively minimize erosion by breaking up wave action and capturing sediment that otherwise washes away, while providing an unobtrusive and natural look.

Shoreline stabilization work is complete at the Cle Elum River Campground and is in progress at both the Wish Poosh Campground and Speelyi Day User Area. Ecology and Reclamation continue to work with private landowners on installing shoreline stabilization along privately owned lands over the 2019-2021 biennium. Shoreline stabilization work is essential before the Cle Elum reservoir can hold the additional 14,600 ac-ft of water.

KRD Canal Modifications and Tributary Supplementation

In April 2017, Kittitas Reclamation District (KRD) completed its 2.7-mile lining of North Branch Canal, conserving an estimated 2,773 ac-ft of water annually. KRD continues lining work of the 2.5-mile portion of KRD's South Branch Canal. Once lining of the South Branch Canal is complete, it is estimated that 1,585 ac-ft of water will be conserved annually. Both canal lining projects include the installation of new valves, overflows, and turnouts. In total, approximately 4,358 ac-ft of water will be conserved annually that will go towards augmenting instream flows of upper Yakima River tributaries.

KRD, and their partner Trout Unlimited, continue to support Yakima River tributaries with water saved through KRD's structure and operational improvements. Tributaries receiving this water include Big, Little, Manastash, Taneum, Tillman and Tucker creeks. Evaluation of Nelson and Swauk creeks for potential future flow supplementation are underway.

Projects Assessed by the YRBWEP Workgroup

- KRD's Upper Yakima System Storage – assessing potential sites for new small surface water storage site in the upper Yakima River Basin.
- Yakima-Tieton Irrigation District – upgrading canal infrastructure and changing the point of diversion.
- KID's Subordination of Power Generation at Chandler - ongoing project feasibility studies, concept designs, and efforts to secure funding.

Market Driven Reallocation

The aim of the Market Driven Reallocation Element of the Integrated Plan is to make it easier to move water from one use to another or from one location to another. Streamlining the process of transferring and reallocating water allows for more effective water delivery to where and when it's needed while protecting both junior and senior water rights This process takes advantage of improving transactions between willing buyers and sellers of existing water rights.

Photo: Yakima River, Yakima County.

Water markets provide the means for water right holders to buy, sell, or lease water from one another on a temporary or permanent basis. In a closed system where every drop of water is accounted for, the use of water markets makes sense.

Water markets offer a wide variety of benefits that include:

- Providing a means to move water from low-value uses to high-value water uses during times of low system flows.
- Providing financial incentives for water right holders to adopt water conservation measures, allowing conserved water to be sold or leased by the water right holder.
- Allowing communities to grow by acquiring water or mitigation credits necessary to enable property development.

We estimate a range of 30,000 to 60,000 ac-ft of water that could make up a market-driven reallocation program within the Yakima River Basin.

In the near-term, we are building on existing water market programs while taking additional steps to reduce barriers to water transfers. In the long-term, we are evaluating regulatory changes to existing laws and policies to streamline the ability for water transfers between irrigation districts within the basin.

Current Actions

Using Reclamation's WaterSMART grant awarded in 2017, Kittitas Reclamation District and partners, Trout Unlimited and Mammoth Trading, continue their analysis of water banking and market based reallocation of water within Kittitas County. The goal is to develop a comprehensive strategy to reduce water transaction barriers, increase market accessibility by simplifying the process of transferring water for interested stakeholders while advancing transactions that include environmental benefits for the Yakima River Basin. A final water marketing report under the WaterSMART grant is anticipated by fall 2020.

Integrated Plan Project Funding

In Table 1, funding for the Yakima Basin Integrated Plan's Initial Development Phase is broken down into State, Federal, and other funding sources for individual projects within each element. Project costs are best available estimates based on up-to-date information and are subject to change as project feasibility and design are further refined.

Table 1 Breakdown of Project Funding under the Initial Development Phase of the Integrated Plan

Amount in Millions (blank cells denote "0" funding or request)					Appropriated State Funding				Anticipated State Funding Requests	Federal & Other Sources of Funding	
Integrated Plan Elements	Projects	Projected Funding Requests from all Sources 2013-2023	Anticipated Federal & Other Share 2013-2023	Anticipated State Share 2013-2023	2013-2015	2015-2017	2017-2019	2019-2021	2021-2023	2014 - 2019	2020-2023[a]
Habitat	Teanaway Forest Acquisition	99.3		99.3	99.3						
	Teanaway Forest Planning & Operations (non-Ecology)	7.0		7.0	1.0	0.5	1.5	1.8	2.2		
	Kittitas County impacts offset for Teanaway Forest	10.0	5.0	5.0	5.0						5.0
	Other State Land Acquisitions[b]	14.0	8.2	5.8	5.8					8.2	0.0
	NRCS RCPP - Yakama Nation Projects[c]	22.6	22.6							7.6	15.0
	NRCS EQIP[c]	20.5	20.5							5.0	15.5
	NMFS Pacific Coastal Salmon Recover Fund	20.4	20.4							7.2	13.2
	USACOE levee reconfig., setback & removal	13.2	13.2							4.7	8.5
	BPA NPCC Fish and Wildlife Program	94.3	94.3							94.3	0.0
	Tributary/Mainstem Habitat Restoration Projects	28.9	9.7	19.2	2.4	2.5	5.4	4.1	4.8	2.0	7.7
	Bull Trout Enhancement	13.4	6.7	6.7		1.7	1.7	1.6	1.7		6.7
	Federal, Tribal, Local Habitat Actions & Land Acquisitions[d]	19.4	19.1	0.3		0.3				19.1	0.0
Fish Passage	Cle Elum Dam	131.5	71.9	59.6	8.8	9.0	9.0	20.0	12.8	56.0	15.9
	Tieton Dam	44.0	22.0	22.0	0.6	0.5			20.9		22.0
	Clear Lake Dam passage	7.8	3.9	3.9			1.5	0.9	1.5		3.9
	Box Canyon Creek	TBD	TBD	TBD				TBD	TBD		TBD
	USFWS National Fish Passage Program funds	1.0	1.0							1.0	0.0
Structural	Keechelus to Kachess Conveyance Project	89.0	43.7	45.3	0.5	4.2		0.0	40.6	1.0	42.7
& Operational	Cle Elum Dam/Pool Raise	26.6	13.4	13.2	2.8	1.0	3.0	3.1	3.3	2.0	11.4
Modifications	Roza Power Subordination[e]	0.2		0.2	0.2						0.0

	Chandler Power Subordination[e]	TBD	TBD	TBD				TBD	TBD		TBD
	Kittitas Reclamation District Canal Modifications	TBD	TBD	TBD				TBD	TBD		TBD
	Upper Yakima System Storage	4.4	2.5	1.9				1.9			2.5
Surface Storage	Kachess Drought Relief Pumping Plant (KDRPP)[f]	236.2	218.6	17.6	12.6	4.3	0.7			6.0	212.6
	Wymer Dam and Reservoir	10.3	3.5	6.8	0.5		3.0	3.3			3.5
	Bumping Reservoir Enlargement	1.0	0.5	0.5	0.5						0.5
Groundwater	Regional Storage Options	7.0	3.5	3.5	0.2	0.5	1.1	0.6	1.1		3.5
Storage	Municipal ASR Projects	0.4	0.2	0.2	0.2						0.2
Water Conservation	Agricultural Conservation Projects	54.7	26.2	28.5	2.4	4.8	5.0	4.3	12.0	3.8	22.4
	Municipal/Domestic Conservation Programs	1.2	0.6	0.6	0.1	0.2	0.1	0.1	0.1		0.6
	BIA WIP improvements	9.5	9.5							9.5	0.0
Market Driven	General support for markets and banking	3.1	1.5	1.6	0.4	0.5	0.6	0.1		0.1	1.4
Water Reallocation											
Total		**990.9**	**642.2**	**348.7**	**143.3**	**30.0**	**32.6**	**41.8**	**101.0**	**227.5**	**414.7**
Percentage Share		**100%**	**64.8%**	**35.2%**	**14.5%**	**3.0%**	**3.3%**	**4.2%**	**10.2%**	**23.0%**	**41.9%**

Notes:

1. RCW 90.38.120 - Legislative Intent - Cost to implement integrated plan states: (1)(a) It is the intent of the legislature for the state to pay its fair share of the cost to implement the integrated plan. At least one-half of the total costs to finance the implementation of the integrated plan must be funded through federal, private, and other nonstate sources, including a significant contribution of funding from local project beneficiaries. This section applies to the total costs of the integrated plan and not to individual projects within the plan.
2. RCW 90.38.120 - Legislative Intent - Cost to implement integrated plan states: (1)(b) The state's continuing support for the integrated plan shall be formally reevaluated independently by the governor and the legislature if, after December 31, 2021, and periodically thereafter, the actual funding provided through nonstate sources is less than one-half of all costs and if funding from local project beneficiaries does not comprise a significant portion of the nonstate sources.
3. The projects and specific costs are subject to change or modification as new information becomes available over the course of the 30 year implementation schedule of the Yakima Integrated Plan. The state and non-state cost share is yet to be defined. This estimate is guided by the projected state support provided over the next three biennia. If non-state funding was increased during this time, the required state funding might need to be increased to conform to RCW 90.38 and in conformance with agreed upon cost-share methodology. The estimates provided in this projection illustrates a possible state and non-state cost share approach and may not be consistent with other published cost estimates for the overall integrated plan.
4. Costs do not include inflation. They are listed in dollars from the most recent study available (typically 2012 to 2015 dollars) and are subject to change as new information becomes available through additional feasibility and design studies and/or changes by the YRBWEP Workgroup.

    a. The funding estimate for 2016-2023 federal and other sources is projected to be equivalent to the anticipated state share of funding for the 2013-2023 timeframe. The specific amount dedicated to each project is yet to be determined for the federal and other sources of funding.
    b. Includes Tieton Cattle Co./North Fork Cowiche Creek; and Heart of the Cascades/Manastash Block.
    c. Natural Resource Conservation Service (NRCS) RCPP and EQIP funds are matched with WA State capital dollars in 2015-2017, 2017-2019 and 2019-2021 biennia under HABITAT Tributary/Mainstem Habitat Restoration Projects and WATER CONSERVATION Agricultural Conservation Projects.
    d. Funded by LWCF in 2014 and 2015. Includes acquisitions in Naches watershed; Cabin Creek, Log/Thetis Creek. Some of these went beyond "primary" YBIP goals.
    e. Funding for power subordination costs and KRD canal modification costs are listed as TBD due to insufficient information to reasonably cost-out. Inclusion of costs for these three items will increase the total state and non-state share of overall funding.
    f. Includes funds spent by Roza ID on Kachess Emergency Floating Pumping Plant - cost assumes floating plant alternative. Timeliness of relevant policy and budget decisions and the effectiveness of cross-organizational collaboration.

Washington DC Leadership Group

The Yakima River Basin embarked on a new path in 2009 and developed a robust vision. While state legislation and funding authorized in 2013 allowed many projects to be move forward over the past 6 years, other activities require long-term feasibility, planning and leadership at many levels of government.

An effort of this magnitude requires major coordination among our partners with the US Department of Interior and other natural resources entities within the federal government.

Sen. Maria Cantwell and Rep. Dan Newhouse at Ecology's Central Regional Office signing celebration of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (March 12, 2019).

As a result, in 2013, with the help of Reclamation and the members of the Yakima Basin Integrated Plan's Implementation Committee developed the DC Leadership Group. This team engages senior-level executives within the federal government and coordinates natural resource activities and investments in the Yakima River Basin.

Led by the Department of Interior's Assistant Secretary of Water and Science, the DC Leadership Group assists the Implementation Committee by answering questions of national policy, clarifying and strategizing on authority issues, and identifying potential funding opportunities.

Today, the DC Leadership Group and the YRBWEP Workgroup are working to mesh state and federal authorities under new federal legislation passed in early 2019 to move forward the next 10 years of the Integrated Plan. This partnership enhances the timeliness of relevant policy and budget decisions and the effectiveness of cross-organizational collaboration.

After five years of dedication and hard work and numerous trips by the Implementation Committee (IC) to Washington DC, the Yakima River Basin Water Enhancement Project phase III legislation was included in the sweeping lands package, known as the John D. Dingell, Jr. Conservation, Management, and Recreation Act.

DC Leadership Group

- Bureau of Reclamation
- US Fish and Wildlife Service
- Bureau of Indian Affairs
- Bureau of Land Management
- US Forest Service
- Natural Resources Conservation Service
- National Oceanic and Atmospheric Administration Fisheries
- US Army Corps of Engineers

The lands package approved by Congress authorizes the first phase (first 10 years) of the Yakima Basin Integrated Water Resource Management Plan. That same day, Governor Inslee sent a congratulatory letter to the YRBWEP Workgroup, voicing his ongoing support and encouragement for the Yakima Basin Integrated Plan, as both a former member of Congress and now as Governor.

The Yakima River Basin Integrated Water Resource Management Plan was a signature piece of state legislation that Governor Inslee's administration passed after taking office in 2013.

Conclusion

The Yakima River Basin Integrated Water Resource Management Plan has made incredible progress in the last biennium to restore ecosystem health and support a vital agricultural economy in this dynamic watershed. Ecology's Office of Columbia River continues working closely with the Bureau of Reclamation, the Yakama Nation, and the Yakima River Basin Water Enhancement Project Workgroup (YRBWEP Workgroup) to achieve a balanced approach to meeting water supply demands in the face of climate change, drought, declining fisheries and reduced ecosystem function.

Yakima River Basin Water Enhancement Project Workgroup

In 2019, the YRBWEP Workgroup celebrated the 10-year anniversary that launched what would become the collaborative success of the Integrated Plan (2009-19). This diverse workgroup includes farmers, and environmental and natural resource interest groups as well as local, state and federal government, and the Yakama Nation representatives.

These members share a collective vision for the future of water in the Yakima River Basin, one in which secure and reliable water will be available for farms, families, forests and fish during both normal and drought water supply conditions. YRBWEP Workgroup meetings take place quarterly to discuss work planning, potential changes to Integrated Plan policies, major project updates, subcommittee updates, and determining project success by comparing achievements to predetermined/set metrics.

In October 2019, YRBWEP Workgroup members and interested stakeholders held a full-day planning workshop that celebrated 10 years of working together and focused on planning needs for the next 10 years. It was an opportunity to recognize the significant progress and investments made on watershed scale ecosystem health and improving critical infrastructure that supports a sustainable agricultural economy.

YRBWEP Workgroup Members

- Wendy McDermott, American Rivers
- Jerome Delvin, Benton County Commissioner
- Seth Defoe, Kennewick Irrigation District
- Cory Wright, Kittitas County Commissioner
- Urban Eberhart, Kittitas Reclamation District
- Dale Bambrick, NOAA Fisheries Service
- Scott Revell, Roza Irrigation District
- Ron Cowin, Sunnyside Valley Irrigation District
- Lisa Pelly, Trout Unlimited
- Dawn Wiedmeier, US Bureau of Reclamation
- Jim Craig, US Fish and Wildlife Service
- Erick Walker, US Forest Service
- Jaclyn Hancock, WA Dept. of Agriculture
- Bret Walters, US Army Corps of Engineers
- Tom Tebb, WA Dept. of Ecology
- Mike Livingston, WA Dept. of Fish and Wildlife
- Josh Wilund, WA Dept. of Natural Resources
- Phil Rigdon, Yakama Nation
- Dave Fast, Yakama Nation Fisheries
- Alex Conley, Yakima Basin Fish and Wildlife Recovery Board
- Sid Morrison, Yakima Basin Storage Alliance
- Ron Anderson, Yakima County Commissioner
- Carmen Mendez, Yakima City Council
- Rick Dieker, Yakima-Tieton Irrigation District

Table 2 Ecology's Objectives and the Integrated Plan Element Equivalents.

Department of Ecology Objective	Equivalent Integrated Plan Elements
Protection, mitigation, and enhancement of fish and wildlife habitat.	Fish Passage, Habitat/Watershed Protection and Enhancement, and Enhanced Water Conservation.
Improvement of water availability and reliability, which includes improvements to water delivery efficiency.	Surface Water Storage, Groundwater Storage, and Enhanced Water Conservation.
Increasing water market efficiency.	Market Driven Reallocation.
Improve operational efficiency and flexibility at existing water supply and conveyance infrastructure and facilities.	Structural and Operational Improvements.

As the YRBWEP Workgroup looks to the future with the same determination and optimism that created the plan, we recognize the challenges ahead in obtaining further investment and capacity to realize the full-scale and vision of the Integrated Plan.

Through the YRBWEP Workgroup's collective collaboration, projects under each of the seven elements continue to advance simultaneously, bringing the Integrated Plan ever closer to meeting its legislative objectives and ensuring continued success. Significant increases in investment is needed to keep pace with ongoing construction and risk management with the Kachess Drought Relief Pumping Plant as the key water supply project for the Initial Development Phase and water supply target of 214,000 ac-ft by 2025.

Furthermore, as the Integrated Plan moves closer to meeting its objectives, it simultaneously moves OCR closer to achieving their own legislative goals. In October, YRBWEP Workgroup members and interested stakeholders held a full-day planning workshop that celebrated 10 years of working together and focused on planning needs for the next 10 years. It was an opportunity to recognize the significant progress and investments made on watershed scale ecosystem health and improving critical infrastructure that supports a sustainable agricultural economy.

Over the next several years, we look forward to the completion of the:

- Cle Elum Pool Raise shoreline stabilization efforts.
- Kachess Drought Relief Pumping Plant Tier 2 EIS.
- Cle Elum Fish Passage tunnel and intakes.
- Kittitas Reclamation District/Trout Unlimited analysis of water banking and market reallocation of water within Kittitas County.

We are also looking forward to continued work on:

- Additional large wood floodplain restoration work throughout the Yakima River Basin.
- Feasibility studies on potential groundwater storage sites in the Yakima River Basin.
- Public education and outreach efforts on the benefits of low water use and heritage gardens in Yakima and Kittitas counties.

As the YRBWEP Workgroup looks to the future with the same determination and optimism that created the plan, we recognize the challenges ahead in obtaining further investment and capacity to realize the full-scale and vision of the Integrated Plan.

The success of the Yakima River Basin Integrated Water Resource Management Plan is an extremely effective model, solving complex natural resource challenges. In 2019, the Integrated Plan celebrated 10 years of work on addressing these complex issues including; drought and declining snowpack, fisheries restoration, water security and ecosystem restoration. With state and federal legislation now in hand, the Yakima River Basin Integrated Water Resource Management Plan will move forward to plan and implement projects with our partners to achieve a reliable water future for the Yakima River Basin.