2022 Columbia River Basin Water Supply Inventory Report

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

April 2025, Publication 22-12-007

DEPARTMENT OF ECOLOGY
State of Washington

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/summarypages/2212007.html

Cover photo credit

- Lined water canal in the Icicle Creek sub-basin, near Leavenworth, WA
  Photo credit: Ingrid Ekstrom (OCR), 2022

Contact Information

Office of Columbia River

Central Regional Office
1250 W Alder St
Union Gap, WA 98903-0009
Phone: 509-575-2490

Website[1]: Washington State Department of Ecology

ADA Accessibility

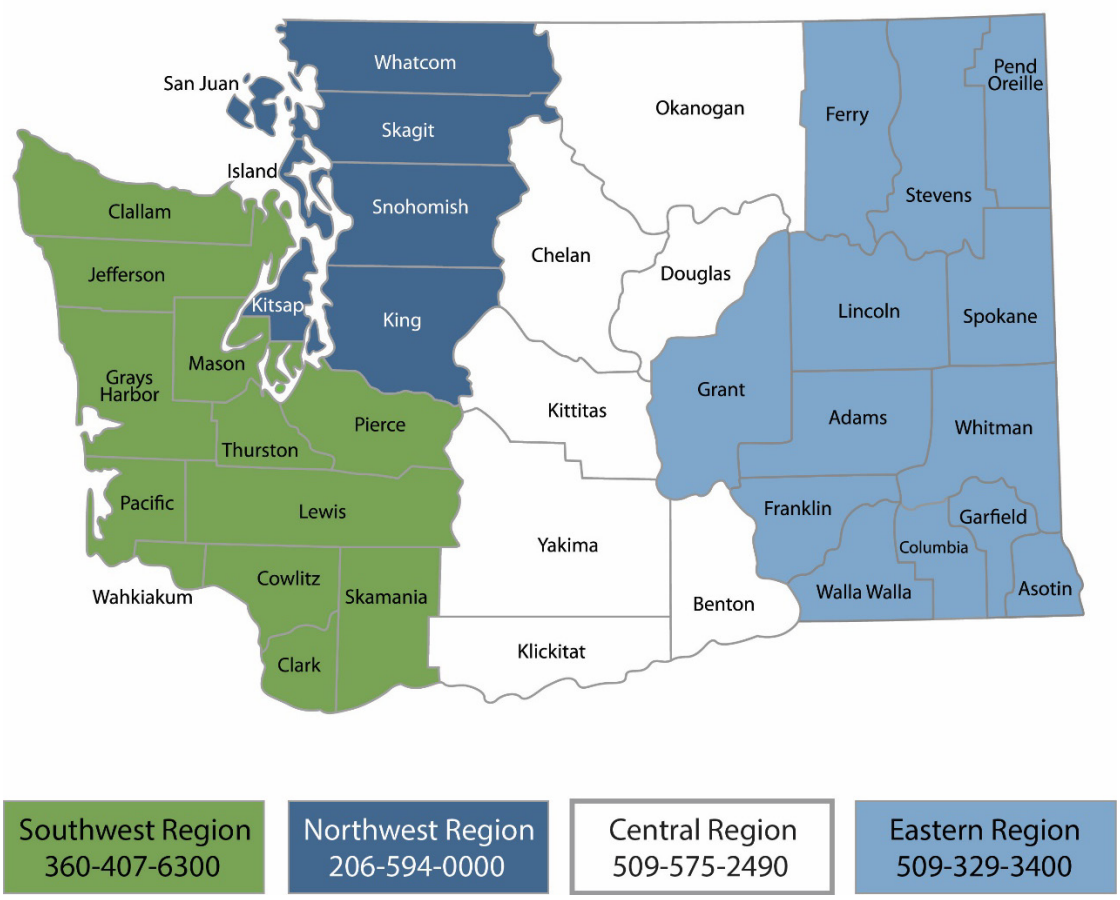
The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 509-454-4241XXXX or email at Tim.Poppleton@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

[1] www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

2022 Columbia River Basin Water Supply Inventory Report

Office of Columbia River
Washington State Department of Ecology
Central Regional Office
Union Gap, WA

April 2025 | Publication 22-12-007

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
1250 W Alder St • Union Gap, Washington 98903-0009 • (509) 575-2490
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

April 9, 2025

The Honorable Bob Ferguson, Governor
Honorable Members of the Washington State Legislature
Olympia, Washington

RE: Columbia River Basin Water Supply Inventory Report

The Department of Ecology's Office of Columbia River is pleased to present the 2022 *Columbia River Basin Water Supply Inventory Report* to the Legislature, meeting the requirements under RCW 90.90.040. This report is now available at the following website: https://apps.ecology.wa.gov/publications/SummaryPages/2212007.html

This annual Columbia River Basin Water Supply Inventory Report provides an updated summary of water supply development project progress, project milestones met over the past year, and an inventory list of water supplies developed since 2006.

The Icicle Creek Water Resource Management Strategy workgroup was able to complete three projects in 2022, bringing the total number of completed projects to six. With 13 more projects ongoing, the Icicle Strategy will develop approximately 32,000 acre-feet of reliable and sustainable water supplies for meeting instream and out-of-stream demands.

By the end of 2022, our team developed 516,641 acre-feet of sustainable and reliable water supplies for instream and out-of-stream needs throughout central and eastern Washington. With ongoing projects set to provide up to an additional 288,084 acre-feet, we envision the development of 804,725 acre-feet in water supplies over the next ten years.

If you have any questions regarding this report or would like more information, please contact me by phone at (509) 907-1340 or by email at larry.mattson@ecy.wa.gov. If you would like hard copies of the report, contact Cotton Ely by phone at (509) 506-2154 or by email at cotton.ely@ecy.wa.gov.

Sincerely,

Larry Mattson
Director
Office of Columbia River

Table of Contents

List of Figures and Tables

Figures

Tables

RCW 90.90.040

Columbia river water supply inventory—Long-term water supply and demand forecast.

(1) To support the development of new water supplies in the Columbia river and to protect instream flow, the department of ecology shall work with all interested parties, including interested county legislative authorities and watershed planning groups in the Columbia river basin, and affected tribal governments, to develop a Columbia river water supply inventory and a long-term water supply and demand forecast. The inventory must include:

- (a) A list of conservation projects that have been implemented under this chapter and the amount of water conservation they have achieved; and
- (b) A list of potential water supply and storage projects in the Columbia river basin, including estimates of:
    - (i) Cost per acre-foot;
    - (ii) Benefit to fish and other instream needs;
    - (iii) Benefit to out-of-stream needs; and
    - (iv) Environmental and cultural impacts.

(2) The department of ecology shall complete the first Columbia river water supply inventory by November 15, 2006, and shall update the inventory annually thereafter.

(3) The department of ecology shall complete the first Columbia river long-term water supply and demand forecast by November 15, 2006, and shall update the report every five years thereafter.

[2011 c 83 § 6; 2006 c 6 § 5.]

RCW 90.90.020

Allocation and development of water supplies.

(1) (a) Water supplies secured through the development of new storage facilities made possible with funding from the Columbia river basin water supply development account, the Columbia river basin taxable bond water supply development account, and the Columbia river basin water supply revenue recovery account shall be allocated as follows:

(i) Two-thirds of active storage shall be available for appropriation for out-of-stream uses; and

(ii) One-third of active storage shall be available to augment instream flows and shall be managed by the department of ecology. The timing of releases of this water shall be determined by the department of ecology, in cooperation with the department of fish and wildlife and fisheries comanagers, to maximize benefits to salmon and steelhead populations.

(b) Water available for appropriation under (a)(i) of this subsection but not yet appropriated shall be temporarily available to augment instream flows to the extent that it does not impair existing water rights.

(2) Water developed under the provisions of this section to offset out-of-stream uses and for instream flows is deemed adequate mitigation for the issuance of new water rights provided for in subsection (1)(a) of this section and satisfies all consultation requirements under state law related to the issuance of new water rights.

(3) The department of ecology shall focus its efforts to develop water supplies for the Columbia river basin on the following needs:

(a) Alternatives to groundwater for agricultural users in the Odessa Subarea aquifer;

(b) Sources of water supply for pending water right applications;

(c) A new uninterruptible supply of water for the holders of interruptible water rights on the Columbia river mainstem that are subject to instream flows or other mitigation conditions to protect streamflows; and

(d) New municipal, domestic, industrial, and irrigation water needs within the Columbia river basin.

(4) The one-third/two-thirds allocation of water resources between instream and out-of-stream uses established in this section does not apply to:

(a) Applications for changes or transfers of existing water rights in the Columbia river basin; or

(b) Applications for water rights in the Walla Walla river basin implementing the Walla Walla water 2050 plan adopted June 30, 2021.

[2023 c 239 § 1; 2011 c 83 § 4; 2006 c 6 § 3.]

Executive Summary

This 2022 Columbia River Water Supply Inventory Report summarizes OCR's water supply development and delivery milestones and successes achieved during the 2022 calendar year. Since OCR's inception in 2006, we have invested in a wide range of water development projects, including surface water storage, water use efficiency and conservation, fish passage, aquifer storage, instream flow enhancements and locally managed integrated water resource management plans. This project variety has led us to a high rate of success in providing water supply solutions specific to each basin's unique and complex water supply and demands.

At the end of the 2022 calendar year, our projects and programs have developed 516,641 acre-feet (ac-ft) of sustainable and reliable water supplies for instream and out-of-stream uses. Our near-term projects are set to provide 288,084 ac-ft. in additional water supplies. This will be accomplished through the construction of a new surface water storage reservoir in the Yakima Basin, expanding ASR project sites across eastern Washington, continued implementation of progressive water conservation measures, and creating new watershed-wide integrated water resource supply solutions. We envision reaching 804,725 ac-ft. in total water supplies developed in the next 10 years.

Future water supply and demand findings in our 2021 Long-term Supply and Demand Forecast report suggest Washington state will continue to experience more frequent times of drought with continued shifts in temperatures and precipitation. We are seeking resiliency in the face of drought and climate change which threaten water availability for communities, industry, agriculture and fish species throughout the region. With these forecasted dynamic conditions, the development of new water supplies will be vital to meeting future out-of-stream demands while maintaining healthy instream flows and improving drought resiliency across eastern Washington.

Aerial photo of the Odessa Groundwater Replacement Program's East Low 86.4 lateral canal.

Introduction

This 2022 Columbia River Basin Annual Water Supply Inventory Report summarizes project accomplishments and milestones met during the 2022 calendar year.

Ecology's Office of Columbia River

Ecology's Office of Columbia River (OCR) was established in 2006 following the passing of Chapter 90.90 Revised Code of Washington (RCW), by the state Legislature. Our office's mission is to aggressively pursue the development of water supplies to benefit both instream and out-of-stream uses (RCW 90.90.020), with the goal of reaching 1 million acre-feet (ac-ft.) by the end of 2025.

It is through this mission that we aim to realize our vision of preserving and enhancing the standard of living for the people of Washington by strengthening economic conditions and restoring and protecting the Columbia Basin's unique natural environment.

By the end of the 2022 calendar year, our office developed 516,641 acre-feet (ac-ft.) of sustainable and reliable water supplies. Ongoing projects and programs are set to provide another 288,084 ac-ft. of water, bringing total developed water supplies to 804,725 ac-ft. (or 80% of our 1 million ac-ft. goal).

This developed water goes towards hydrating interruptible water right holders, mitigating new water right permits, hydrating pending water right applications, providing relief on groundwater dependence in the Odessa Subarea, and helping to maintain healthy streamflows during drier times of the year.

In reading this report, you will notice icons (Figure 1) accompanying our project and program updates. Each of these icons represents our office's legislative mandate (RCW 90.90.040) that a particular project or program meets.

Throughout the report, these symbols are used to identify the legislative directive that the project addresses:


: Alternatives to groundwater for Odessa Subarea


: Pending water right applications


: Future water supplies for interruptible water right holders


: Future water supplies for municipal, domestic, industrial and irrigation


: Instream benefits

Figure 1. Icon legend

2022 Accomplishments

In 2022 our office saw many accomplishments, including:

- Transitioned from 100% telework to part/full-time in office.
- Completed three major projects completed for the Icicle Creek Water Resource Management Strategy.
- Delivered surface water to the Odessa Subarea for the 2022 irrigation season.
- Issued nine water right change application decisions for water right holders in the Odessa Subarea.
- Drafted proposed WA legislation for implementation of the Walla Walla strategic plan.
- Continued construction for the Cle Elum Fish Passage Project.

Future needs and drought resiliency

As the climate continues to change, Washington state is starting to experience severe drought conditions on a more frequent basis. Since 2000, our state has experienced dry conditions on an annual basis[2]. In the fall of 2021, much of central and eastern Washington experienced a level D4 (exceptional) drought, similar to the one experienced in 2015. A category D4 drought[3] is defined as the most extreme drought conditions experienced by a region, causing exceptional and widespread crop and pasture losses, exceptional fire risk, and shortages of available water supplies causing water availability emergencies. More statewide drought information can be found on Ecology's website[4].

Our water development projects and integrated water resource management strategies help to improve drought resiliency by ensuring sustainable and reliable water supplies for families, farms, and fish across eastern Washington.

To secure water supplies for today and the years to come, we must understand how water supplies and demands will shift in the years ahead. To do this, our office publishes the data-driven Long-term Supply and Demand Forecast report every five years, providing a clear picture of the vulnerabilities facing our communities over the next 20 years. The 2021 Long-term Supply and Demand Forecast[5] found surface water supplies shifting with run-off peaking earlier in the year, declining groundwater levels, increasing instream and out-of-stream demands. Each watershed is anticipated to experience supply and demand fluctuations unique to their own basin.

OCR's role in Ecology's 2023-2025 Strategic Plan

Every two years, Ecology publishes an agency Strategic Plan that summarizes how the agency will address ongoing environmental challenges. These environmental challenges include impacts due to climate change and pollution, as well as the protection and restoration of vital ecosystems.

Meeting these challenges head-on is one key to Ecology realizing our mission of protecting, preserving, and enhancing Washington's environment for current and future generations.

For Ecology's 2023-2025 Strategic Plan, our office continues to meet strategic plan's Goal 1 (support and engage our communities, customers, and employees), Goal 2 (reduce and prepare for climate impacts), and Goal 4 (protect and manage our state's waters) by:

- Listening carefully, communicating in a responsive and timely manner, and valuing experience and expertise. (Goal 1)
- Planning and forecasting future water supply needs, accounting for climate change and aging infrastructure, and ecosystem restoration. (Goal 2)
- Aggressively pursuing and developing water supplies for families, farms, and fish. (Goal 4)

[2] In 2011, Washington state experienced an abnormally wet conditions, breaking a ten-year drought streak.
[3] drought.gov/explaining-drought-category-maps
[4] ecology.wa.gov/water-shorelines/water-supply/water-availability/statewide-conditions/what-is-drought
[5] apps.ecology.wa.gov/publications/SummaryPages/2112006.html

- Building innovative partnerships to deliver integrated water management solutions across central and eastern Washington. (Goal 4)

Through our ongoing contributions to multiple key agency strategies and by setting a standard of performance, we continue to lead the way in water supply development.

Growing and growing

With the successful development and delivery of water supplies since 2006, as well as managing multiple integrated strategic plans, our office is entrusted with managing more and more capital funds over the years. As our capital funding and project portfolio continues to grow, our team will also need to expand so we may maintain timely support to private, local, state, federal, and Tribal project partners. Additionally, our team must maintain adequate staff to continue processing water right applications in a timely manner.

By the end of 2022, OCR's staff has increased to 24 FTE positions which included bringing on additional administrative, permitting, project management, contract, financial and program management staff. In addition to our project management and operations staff, OCR's grants and contracting team is now at 100% FTE capacity overseeing over 110+ OCR agreements. Additional FTE capacity will ensure timely permit processing, as well as managing millions of dollars of state capital funding to provide the public with increased water supply and economic certainty. We look forward to continuing the development of reliable water supplies for the families, farms, forests, and fish across eastern Washington.

Walla Walla River during a period of low water supplies
Photo Credit: Tim Poppleton, 2019

Water Supply Development by the Office of Columbia River - 2022

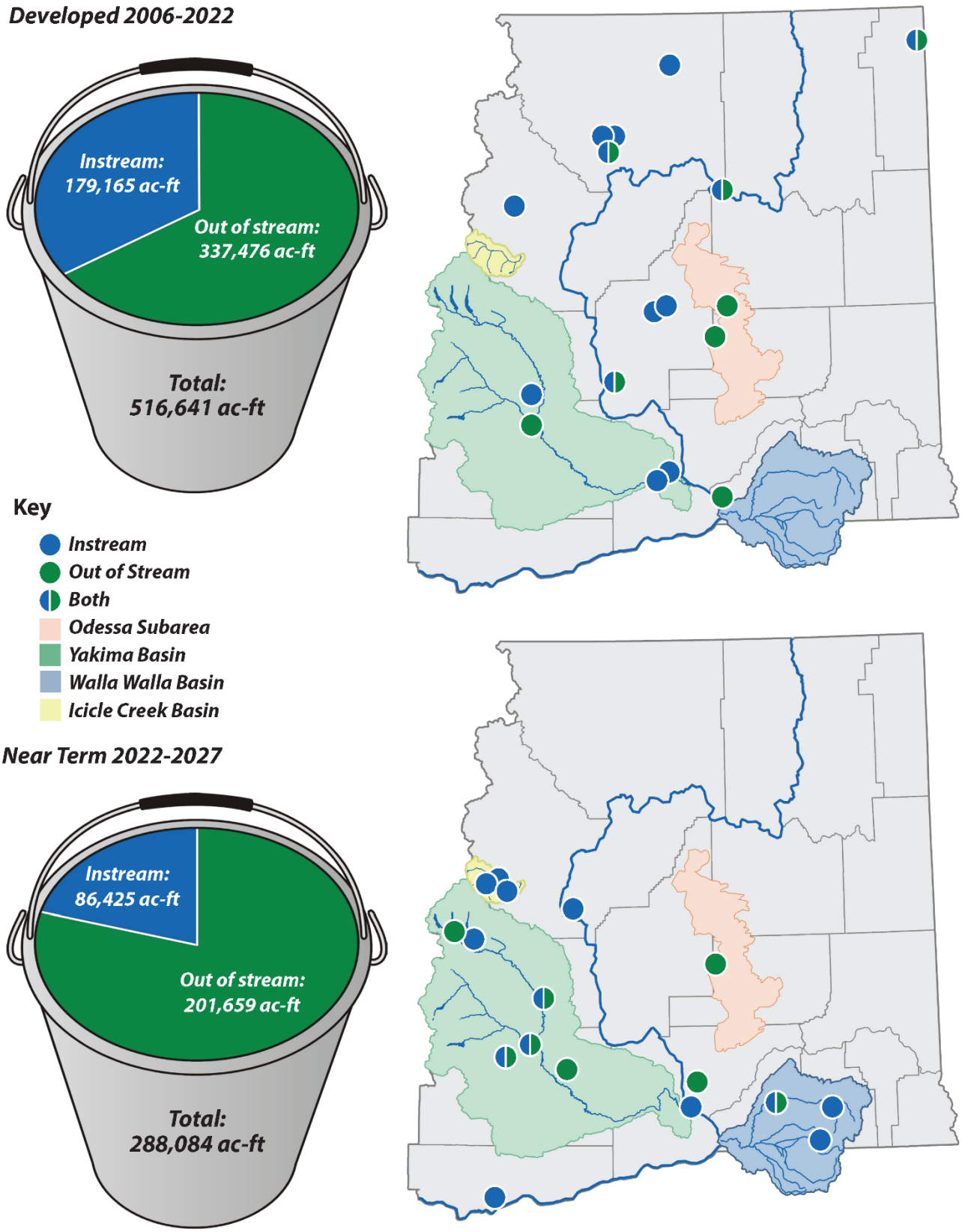
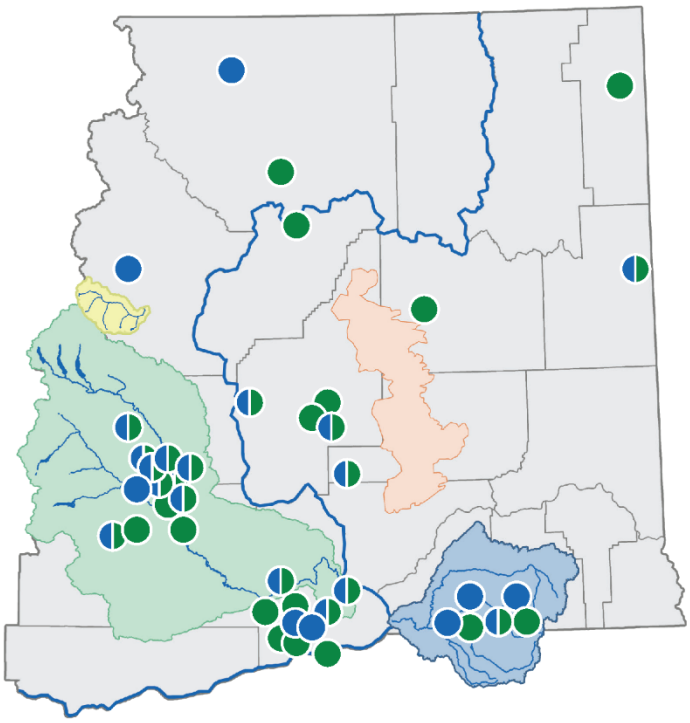
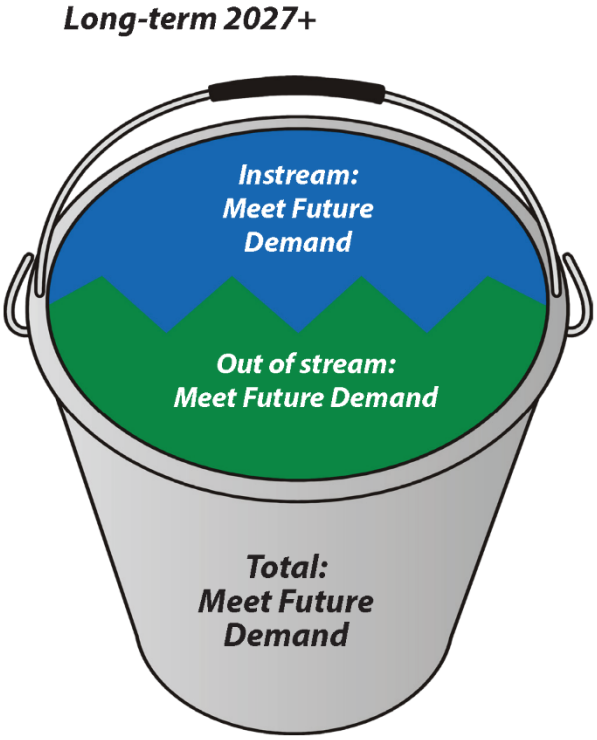


Figure 2. Water supply development - 2022





Projects

Developed

- Auvil Shadecloth Conservation Project, 4,294 ac-ft
- Barker Ranch: 6,436 ac-ft
- Columbia Basin ID Piping: 35,000 ac-ft
- City of Kennewick ASR: 1,456 ac-ft
- City of Yakima ASR: 10,000 ac-ft
- Conservation Commission Irrigation Efficiency: 3,476 ac-ft
- Cascade Orchards Irrigation Company Improvements: 4,012 ac-ft
- Donations: 57,045 ac-ft
- East Low Canal Widening: (conveyance)
- KID/Red Mountain: 11,005 ac-ft
- Kennewick General Hospital 4,000 ac-ft
- Lake Roosevelt: 132,500 ac-ft
- Lower Wenatchee Piping: 7,823 ac-ft
- Manastash: 1,300 ac-ft
- Methow Trust Water Acquisition: 79 ac-ft
- Methow Projects: 2,854 ac-ft
- Odessa Subarea: 164,000 ac-ft
- Pasco Mini Improve/Piping: 5,000 ac-ft
- Peshastin ID Piping: 360 ac-ft
- Pine Creek Acquisition: 900 ac-ft
- Sullivan Lake: 14,000 ac-ft
- Port of Walla Walla Leases: 4,170 ac-ft
- Upper Kittitas Tributary Enhancement (conveyance)
- Weber Siphon (conveyance)
- YBIP Water Conservation: 46,931 ac-ft

Near-term

- City of White Salmon ASR: 600 ac-ft
- Cle Elum Pool Raise: 14,600 ac-ft
- Coppei Creek Streamflow Restoration: TBD
- Kachess Drought Relief Pumping Plant: 200,000 ac-ft
- Icicle Creek Water Management Strategy Projects: 20,000+ ac-ft
- IPID Irrigation Efficiencies: TBD
- Jones Shotwell Conservation: 2,000 ac-ft
- Kittitas Managed Aquifer Recharge: TBD
- Leavenworth National Fish Hatchery Conservation: TBD
- Mill Creek Streamflow Restoration: TBD
- Pasco Basin Water Supply: TBD
- Pasco Municipal Supply Improvements: 5,000 ac-ft
- Potholes Feed Route (conveyance)
- SVID: 7,815 ac-ft
- Yakima Basin Enhanced Conservation: 38,069 ac-ft
- Yakima Basin Shallow Aquifer Recharge: TBD

Long-term

- Alpine Lakes Automation: TBD
- Barkley Irrigation Company: TBD
- City of Dayton ASR: TBD
- City of Ellensburg ASR: TBD
- City of Goldendale ASR: TBD
- City of Moses Lake ASR: TBD
- City of Moxee ASR: TBD
- City of Othello ASR: TBD
- City of Pasco ASR: TBD
- City of Peshastin Pump Exchange: TBD
- City of Prosser ASR: TBD
- City of Quincy ASR: TBD
- City of West Richland ASR: TBD
- City of Walla Walla ASR: TBD
- Conservation Commission Retiming: TBD
- Cowiche Creek South Fork MAR: TBD
- CWU Alluvial Fan Storage: TBD
- Farmland Reserve Water Bank: TBD
- Horse Heaven Hills: 61,000+ ac-ft
- Kittitas Distributed Off-Channel Small Storage: TBD
- KRD Basalt Storage: TBD
- KRD Springwood MAR: TBD
- KRD Springwood Reservoir: TBD
- KRD Tributary Supplementation Evaluation: TBD
- KRD Whiskey-Currier MAR: TBD
- Lincoln CD Passive Rehydration: TBD
- Mill Creek Storage: 2,000 to 11,000 ac-ft
- Rattlesnake Ridge MAR: TBD
- Spokane-Rathdrum ASR: TBD
- Switzler Off-Channel Storage: 44,000 ac-ft
- Taenum Creek MAR: TBD
- Tuusi Wana Streamflow Restoration: TBD
- Upper Yakima System Storage: TBD
- Walla Walla Flow Enhancement Pump Exchange: TBD
- Walla Walla River RM 32.5 Streamflow Restoration: TBD
- Yakama Nation Groundwater Replenishment: TBD
- Yakama Nation Wanity Slough MAR: TBD
- Yakima Basin Integrated Plan Projects: 150,400+ ac-ft
- YTID Surface Water Diversion and Storage: TBD

Integrated Solutions to Complex Water Problems

Complex water shortage problems require creative and innovative solutions. The following strategies, programs, and plans integrate a suite of projects that, as a whole, provide watershed-wide benefits.

Icicle Creek Water Resource Management Strategy

The Icicle Creek watershed spans 212 square miles of Chelan County and is a tributary of the Wenatchee River. Previous water management practices in the Icicle Creek Sub-basin (Icicle Creek) consistently struggled to meet out-of-stream demands and instream[6] needs. To improve the sustainability and reliability of water resources in Icicle Creek, the Icicle Creek Workgroup (formed in 2012), and co-conveners (Chelan County and Ecology) continue to implement an array of projects that work together to meet short-term and long-term water supply needs of this watershed.

The Icicle Creek Water Resource Management Strategy (Icicle Strategy) will provide enough water to meet the short-term goal of 100 cfs and the long-term 250 cfs instream flows by implementing water-saving measures, water quality improvements and removing barriers for migrating fish. In total, approximately 32,000 ac-ft. of reliable and sustainable water supplies will be available to meet instream and out-of-stream demands.

By the end of the 2022 calendar year, the Icicle Creek Strategy workgroup completed 6 projects and continued work on 13 projects.

Completed projects

- Fish passage project at Boulder Field.
- Fish screen replacement for the City of Leavenworth.
- Fish screen replacement Icicle Peshastin Irrigation District.
- Flow meters installed for the City of Leavenworth.
- Snow Creek Trail Bridge modification.
- Installation of the intake fish screens for the Leavenworth National Fish Hatchery Surface Water Intake Fish Screens.
- Installation of flow meters for the city of Leavenworth.

Boulder Field before removing barriers to migrating fish, Icicle Creek
Photo Credit: Tim Poppleton, 2017

[6] Minimum instream flows established in Chapter 173-545 Washington Administrative Code (WAC).

Icicle Strategy projects fall within one or more of the Icicle Strategy guiding principles (Figure 3, page 9). These principles outline where Icicle Strategy projects should focus on. As a whole, Icicle Strategy projects will provide 32,000 ac-ft. of reliable and sustainable water supplies, remove barriers to migrating fish, and improve water conservation measures.

Guiding principles of the Icicle Strategy

- Alpine Lakes Reservoirs Optimization, Modernization, and Automation
- Icicle-Peshastin Irrigation District Irrigation Efficiencies
- Cascade Orchards Irrigation Company Irrigation Efficiencies and Pump Exchange
- Domestic Conservation Efficiencies
- Eightmile Lake Dam Reconstruction and Restoration
- Protect Tribal and Non-Tribal Fisheries
- Habitat Protection and Enhancement
- Instream Flow Rule Amendment
- Leavenworth National Fish Hatchery Conservation and Water Quality Improvements
- Fish Passage within Icicle Creek
- Fish Screening
- Water Marketing

On-going projects

- Environmental review including Environmental Impact Statement of the Eightmile Dam Reconstruction and Restoration Project.
- Draft environmental review for Leavenworth National Fish Hatchery fish passage project.
- Icicle-Peshastin Irrigation District water conservation improvement measures.
- Design infrastructure for automated water releases at the Alpine Lakes.
- Constructing and piloting circular tanks at the Leavenworth National Fish Hatchery.
- Sitting a new SNOTEL site in the headwater area of the basin.
- Design for several riparian improvement projects.
- Cascade Orchard Irrigation Company Irrigation Efficiency and Pump Exchange Project.
- Tribal fishery effectiveness monitoring.
- WaterSmart landscaping program for the City of Leavenworth.
- Leavenworth source replacement study.
- Assessment of fish passage barriers and Beaver Dam Analog[7] structure suitability in the basin.
- Leavenworth National Fish Hatchery Surface Water Intake Fish Screens (completed) and Fish Passage Project (ongoing).

[7] A Beaver Analog structure is a man-made structure designed to mimic the form and function of a natural beaver dam.

Figure 3. Icicle Creek sub-basin map and strategy goals

Odessa Groundwater Replacement Program

For approximately 60 years, farmers in the Odessa Subarea have relied heavily on groundwater as the primary source of irrigation water. Odessa aquifers do not recharge fast enough to continue meeting irrigation demands, causing groundwater levels to severely decline. In some areas, groundwater declines are over 125 feet (Figure 4, next page), forcing farmers to drill deeper and deeper wells. While farmers can drill deeper wells, the water they reach is usually too salty and warm to adequately irrigate crops, and the pumping costs also increase. Irrigation is not the only demand for this water. Municipal entities, commercial businesses, food processing, and residents all rely on these same groundwater sources.

Securing sufficient, reliable and timely surface water is one of the first steps in removing groundwater dependence in the Odessa Subarea. In 2004, Ecology, the Department of Interior's US Bureau of Reclamation (BOR) and the East Columbia Basin Irrigation District (ECBID) entered into a Memorandum of Understanding allowing OCR to secure enough water to convert 87,700 acres of farmland irrigation from declining groundwater to surface water sources. Broken down by source: the Lake Roosevelt Incremental Storage and Releases Program (10,000 acres), Odessa Subarea Special Study (70,000 acres), and the Columbia Basin Project's[8] Irrigation District Coordinated Conservation Program (7,700 acres).

The Odessa Groundwater Replacement Program[9] (OGWRP) has been in the works since 2004, as a part of the 2001 Columbia River Initiative Memorandum of Understanding, starting with the special study, engineering design work and ultimately construction on the East Low Canal. These decade-long projects lay the foundation to remove groundwater use and dependency off the Odessa Subarea. Current projects range from enlarging canals, modifying county bridges, construction of new pumping plants, electrical grids, lateral pipelines, and on-farm system modifications.

At the start of the 2021 irrigation season, the East Low[10] (EL) 47.5 pumping plant and delivery system came online, meeting a major milestone for OGWRP. As the first of the eight planned water delivery systems constructed, EL 47.5 provides enough water to convert 8,600 acres of irrigated farmland from groundwater to surface water with an approximate 2,000 acres of additive future capacity. After two irrigation seasons (2021-2022), the EL 47.5 system is bringing reliable surface water supplies to the region, reducing the risk of economic loss to the region due to declining and failing groundwater wells.

It has taken monumental efforts by all parties (BOR, ECBID, Columbia Basin Conservation District, Grant and Adams counties) to provide relief to Odessa Subarea aquifers. These efforts will need to continue to reduce irrigation dependence on local aquifers, in addition to improving drought resiliency and preparing for other climate change impacts. The Columbia Basin Conservation District, Columbia Basin Sustainable Water Coalition and Washington State College are coordinating on a study that will track aquifer recovery and stabilization in the subarea as groundwater wells are removed from local aquifers.

[8] www.usbr.gov/pn/grandcoulee/cbp/index.html

[9] www.ecology.wa.gov/water-shorelines/water-supply/water-supply-projects-ew/columbia-river-basin-projects/odessa-groundwater-replacement

[10] East Low Canal mile markers read ELXX and refer to the number (XX) of miles down canal from the headgate.

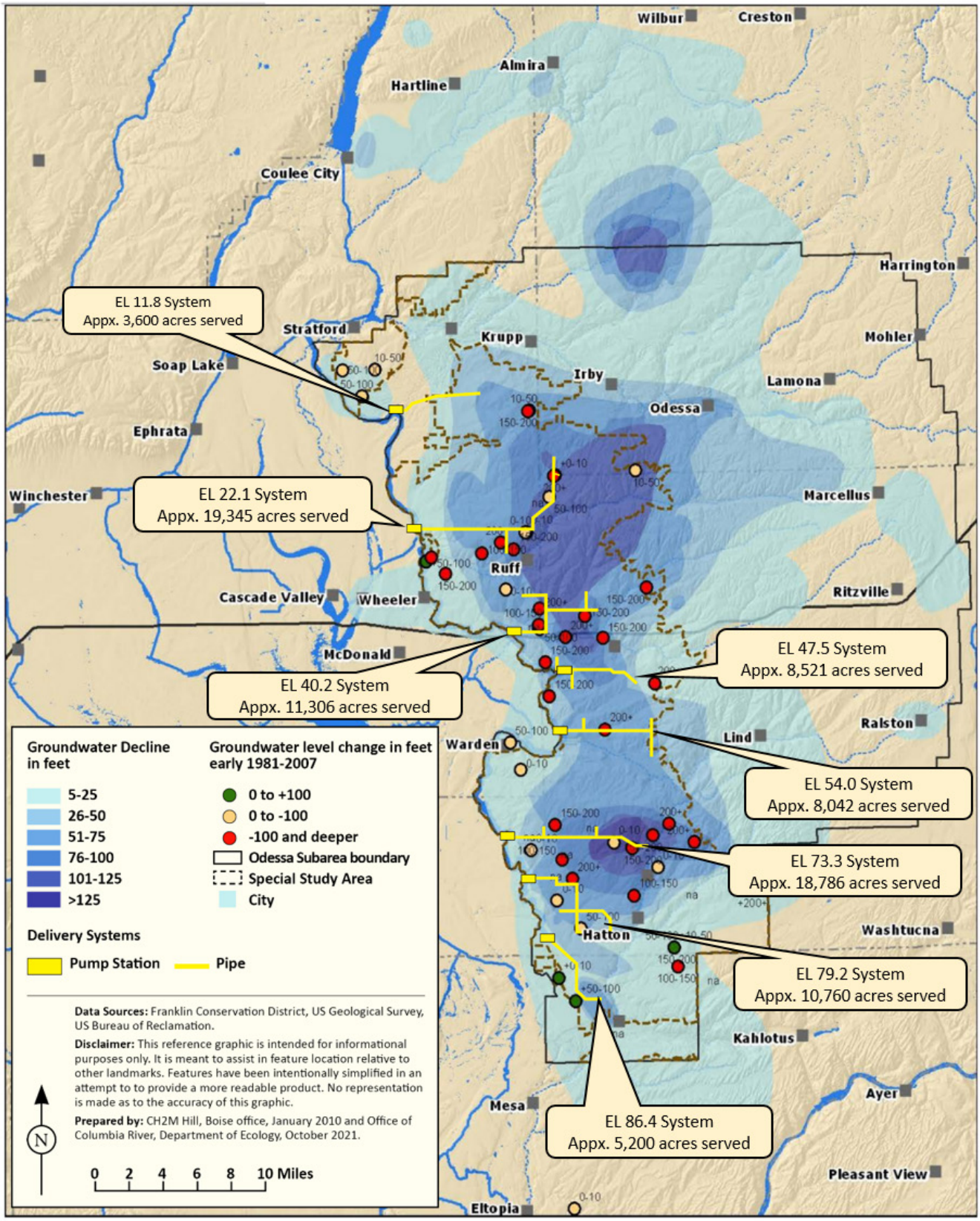


Figure 4. Odessa Groundwater Replacement Program map of proposed pumping plant and delivery systems, and service areas
Source credit: East Columbia River Basin Irrigation District

Objectives

- Develop and deliver enough surface water to convert 87,700 acres of irrigated cropland from declining groundwater sources to federal surface water.
- Construct siphons, pumping plants, and other infrastructure required for the delivery of the increased amount of surface water to the Odessa Subarea.
- Provide an easy transition for landowners to change their existing water rights from groundwater to surface water.

Surface water sources

- Lake Roosevelt Incremental Storage and Releases Program – 10,000 acres.
- Odessa Subarea Special Study – 70,000 acres.
- Coordinated Conservation Program – 7,700 acres.

2022 milestones

- Advanced designs to 30% on the East Low (EL) 11.8, EL 79.2[11], and EL 86.4 systems.
- Commenced design on EL 22.1 power grid substation.
- Installed three of the five remaining radial gates within East Low canal.

Anticipated 2023 milestones

- Advance designs to 60% on the EL 11.8, EL 22.1, EL 79.2, and EL 86.4 systems.
- Finalizing funding packages for the two EL 79.2 systems and the EL 86.4 system.
- Install the remaining two radial gates at EL 71.5.

EL 47.5 Pumps
Photo Credit: Tim Poppleton, 2021

[11] The EL 79.2 system is being designed as two separate systems (EL 80.6 and EL 84.7) to reduce overall costs.

Walla Walla Basin Watershed Strategy

The Walla Walla River Basin is a complex watershed spanning 1,758 square miles across southeastern Washington and northeastern Oregon (Figure 6, page 15). Overallocation of the limited water supplies in this watershed has led to dried-up streambeds and inadequate water supplies to meet out-of-stream demands. These limited water supplies are stretched even further during the summer when water demands are at their highest.

The Walla Walla Water 2050 (WWW2050) Strategic Plan[12] (WWW2050) was born out of the continuous collaborative work across state lines to meet the water needs of fish, families, and forests (Figure 5) in the Walla Walla Basin. The WWW2050 Strategic Plan employs an integrated water resource management approach to provide improved, reliable and sustainable water supplies to the basin for meeting instream needs and out-of-stream demands.

Figure 5. New Walla Walla Basin Watershed Strategy logo

The Walla Walla Watershed Management Partnership pilot program expired on June 30, 2021, and Ecology emerged as one of the leads for water resource management in the watershed. In 2021, Ecology, the Oregon Water Resources Department, and the Confederated Tribes of the Umatilla Reservation reaffirmed a Tri-Sovereign coalition for water management. These three governments now manage the bi-state watershed and provide leadership and guidance in successfully navigating complex legal, technical, and funding challenges, which is necessary for implementing the WWW2050 Strategic Plan. In September 2022, Ecology and the WWW2050 Basin Advisory Committee began working on legislation to amend RCW 90.90 to authorize Ecology to implement the WWW2050 Strategic Plan. The legislation (HB1322) was passed by the State Legislature in the spring of 2023, which provides the framework to allow Washington to protect instream water that Oregon bypass across the state line.

During this implementation phase of the WWW2050 Strategic Plan, we continue working with various stakeholders to identify and address data gaps, continue moving forward on the development of a long-term governance structure, and refine water management strategies. One example of filling a data gap is understanding the hydrogeology and hydrology of the basin. The US Geological Survey (USGS), in close cooperation with Washington and Oregon state agencies and stakeholders, is conducting a basin-wide groundwater study. This study will provide water resource managers and decision-makers a better understanding of the extent and connectivity of geology and groundwater in the basin, the impacts of pumping on groundwater levels, stream reach gains and losses, and groundwater recharge and discharge locations and quantities.

[12] ecology.wa.gov/Water-Shorelines/Water-supply/Water-supply-projects-EW/Walla-Walla-2050/Strategic-plan

Successful implementation of the WWW2050 Strategic Plan will take many years and requires all parties to collaborate their efforts across state lines. Working together, the Walla Walla Basin will start to recover from previous overallocation of water supplies.

Goals and objectives of the WWW2050 Strategic Plan

- Holistically address the basin's longstanding struggle to balance instream and out-of-stream uses and future demand to ensure enough water for fish, farms, and people.
- Identify and prioritize strategies, projects, initiatives, and/or programs to address challenges and achieve both short- and long-term goals for the watershed.
- Develop an organizational structure that ensures accountability and implement the WWW 2050 Strategy.
- Achieve clarity around the legal framework and regulatory scheme, including bi-state coordination and water rights management.
- Obtain adequate/dedicated funding to support WWW 2050 implementation.

2022 milestones

- Successfully passed the new WA legislation for implementation of the WWW2050 Strategic Plan.
- Organized the new Walla Walla Basin Advisory Committee (BAC) and Working Group (WG).
- Secured facilitation services through 2024.
- Secured technical support services for the Flow Study through the beginning of 2024.
- Drafted proposed WA legislation for implementation of the strategic plan (HB1322).
- Created criteria to rank potential projects for OCR funding.
- Started to draft strategy scoping memos for project implementation that focus on:
    - Improving floodplain, habitat, and fish passage.
    - Monitoring and metering streamflows, groundwater supply, and water quality.
- Continued working with the USGS and Oregon Water Resource Department on the Basin Groundwater Study.
- Applied for a BOR WaterSMART Basin Study grant.
- Identified funding opportunities for project proponents.

Continued actions

- Funding the implementation of 14 projects in support of the WWW2050 Strategic Plan[13].
- Enter into a Memorandum of Agreement with BOR to complete the WaterSMART Basin Study.
- Continue the Basin Groundwater Study data gathering and review.
- Advancing the Flow Study to evaluate the performance of the alternatives.
- Conducting the BAC and WG meetings as needed.
- Developing communications and outreach plans for work in the basin.

[13] *Update:* For the 2023-2025 Biennium, OCR received $2.2 million in capital dollars in funding for WWW2050 Strategic Plan projects.

Next Steps

- Complete the final report for this phase, including a Walla Walla Basin Water Study (WWBWS) Implementation Plan.
- Evaluate the BAC and WG structures to prepare for the next phase of implementation.
- Secure facilitation and technical support services beyond 2024.
- Conduct public outreach through workshops, open houses, and material distribution.
- Draft a report to the WA legislature recommending a bi-state legal regulatory framework (due by June 2025).
- Identify a preferred alternative for the Flow Study.
- Continue working with US Bureau of Reclamation on the Basin Study and groundwater modeling.
- Continue working with USGS and Oregon Water Resources Department on the Basin Groundwater Study.
- Manage the active grants in support of WWBWS implementation.

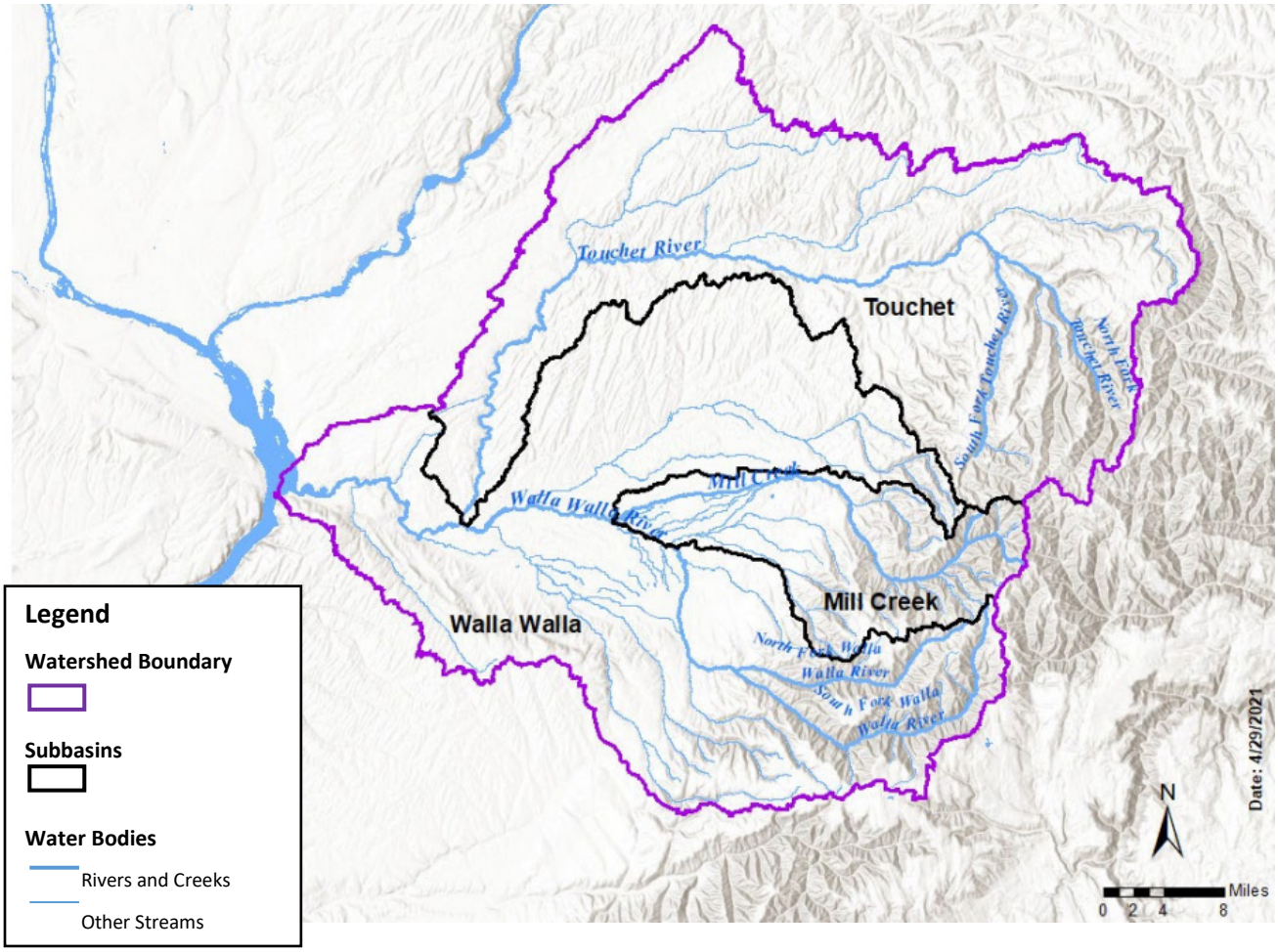


Figure 6. Map of the Walla Walla watershed and subbasins

Yakima River Basin
Integrated Water Resource Plan

The goals of the Yakima River Basin Integrated Water Resource Management Plan[14] (YBIP) is to provide water for the farms, families, and fish in the Yakima River Basin. Laid out as a 35-year plan, the Integrated Plan is divided into Initial, Middle, and Final Development Phases. More information regarding YBIP projects is available in the 2021-2022 Yakima River Basin Water Resource Management Plan Report[15].

Seven elements of the Integrated Plan

- Habitat/Watershed Protection and Enhancement
- Reservoir Fish Passage
- Enhanced Water Conservation
- Structural and Operational Changes
- Surface Water Storage
- Groundwater Storage
- Market Reallocation

Milestones achieved in 2022

- Secured 69% of the 85,000 ac-ft. water conservation requirement set by the federal 2019 lands package (S.4710).
- Released 550 Bull Trout (84 in Gold Creek and 466 in the Kachess River).
- Installed fish guidance boom and sluice gate at Sunnyside Dam in response to the findings from the USGS Lower Yakima River Smolt Survival Study.
- Removed and rebuilt the Yakama Nation Unit 2 Diversion dam.
- Completed construction of the Cle Elum Fish Passage Facility 1,250-foot downstream bypass tunnel and several reservoir intake ramps.
- Completed Yakima Basin Managed Aquifer Recharge Assessment, identifying and ranking potential groundwater storage opportunities in the Upper Yakima Basin.
- Released the Yakima Basin Water Marketing Technical Report and Market Strategy[16].

Anticipated work for 2023

- Complete the Nelson Dam Removal Project.
- Advance the Kachess Drought Relief Pumping Plan Tier 2 Environmental Impact Statement towards draft review and comment period.
- Purchase Springwood Ranch property.
- Floodplain restoration work and other habitat projects.

[14] YBIP is the third phase of the federal Yakima River Basin Water Enhancement Project (YRBWEP).
[15] apps.ecology.wa.gov/publications/SummaryPages/2112009.html
[16] yakimabasinwatermarketing.org/yakima-basin-water-market/outreach/

Water Supply Development Projects

Aquifer storage and recovery

Municipalities across eastern Washington are becoming more aware of the need for secondary water sources that can be tapped during drier times of the year. Aquifer storage and recovery (ASR) projects usually require minimal infrastructure (such as installing new or retrofitting existing piping and pumps) and take advantage of a native aquifer's existing storage capacity. These projects can be a cost-effective alternative to traditional surface water storage reservoirs. ASR captures water during times when supply exceeds demand and injects this water into the native aquifer (Figure 7) where it is held until peak periods of need. When annual storage exceeds annual withdrawal, ASR can help slow or reverse declining aquifers.

ASR can often be utilized where traditional surface water reservoirs cannot, such as agriculture and residential/urban areas, and is a more environmentally friendly alternative to surface water storage reservoirs, as they do not require damming water and inundating upland habitats. To help applicants through the ASR permitting process, OCR published the Underground Artificial Storage and Recovery Reservoir Permit Pre-application Process flowchart[17]. This flow chart provides a high-level step-by-step process for aquifer storage and recovery projects to identify predictable outcomes in the permitting process.

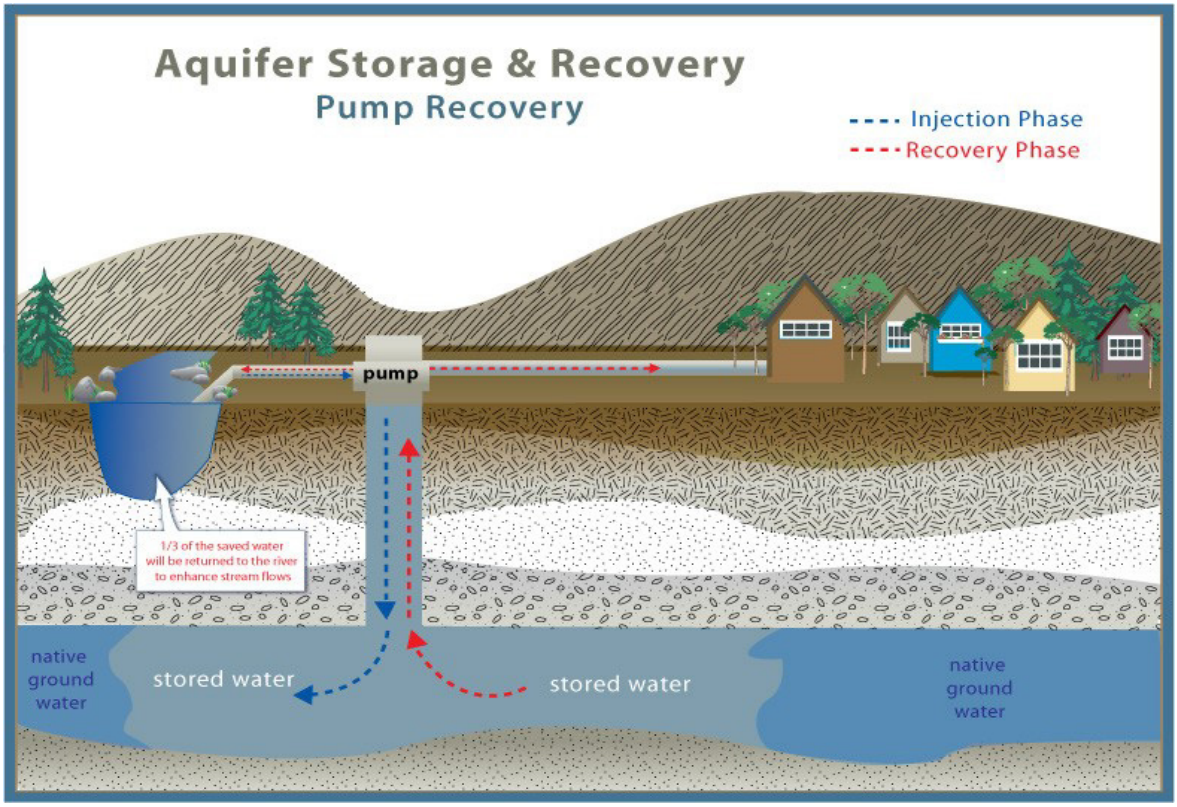


Figure 7. Aquifer storage and recovery schematic

[17] fortress.wa.gov/ecy/publications/SummaryPages/2212003.html

Objectives

- Explore and evaluate potential locations throughout the Columbia River Basin/eastern Washington where geology and aquifer conditions could support ASR operations.
- Provide permitting guidance, and technical and financial assistance to develop suitable ASR systems.

Benefits

- Cost-effective, requires minimal infrastructure.
- Maintains cool water temperatures due to the natural insulating properties of aquifers.
- Can be employed where traditional surface water reservoirs cannot, such as in urban and residential areas.
- Can re-time water supply by storing water during high flows and withdrawing stored water during the peak demand season.
- Relieve demands on surface water storage supplies.

Issued permits

Currently, there are two cities in eastern Washington, the City of Kennewick and the City of Yakima, that are fully permitted to actively inject water into their associated aquifers. Surface water is diverted during times of high flows into associated aquifers where it is stored until needed later in the year. Water is withdrawn from the aquifer during times of increased water demands that usually occur during the driest times of the year. The City of White Salmon is currently operating their ASR program under a temporary permit and will pursue a full permit as its next step.

Several cities are in the process of conducting ASR feasibility studies. These cities include Pasco, Othello, Quincy, West Richland, Prosser, Goldendale, Moxee, and Ellensburg. The City of Othello is in a Phase 2 pilot test monitoring the long-term aquifer recharge with treated surface water. In Othello, surface water is being treated to meet applicable water quality criteria before it is injected into the local aquifer. The city can then tap into this water for municipal use in the future. The City of Pasco is currently identifying potential well sites and surface water sources.

Ecology and the Department of Health (DOH) coordinate the development of new ASR projects and the status of existing ASR projects. One step in ensuring that the water injected into and recovered from is of the highest quality of drinking water for Washingtonians is for annual monitoring and reporting for active ASR projects required to be submitted to Ecology. More information regarding ASR is available on our website[18].

[18] ecology.wa.gov/water-shorelines/water-supply/water-recovery-solutions/aquifer-storage-recovery-recharge

Pasco Basin

Established in 1967 under Chapter 508-14 WAC, the Pasco Basin area is located in the southern portion of the Columbia Basin Project area. Over the past 70 years (since 1952), water provided under the federal Columbia Basin Project (CBP) has irrigated approximately 680,000 acres annually. Runoff from inefficient irrigation practices and leaky conveyance systems has seeped into the groundwater. This artificial recharge from the federal CBP is mixing with state groundwater.

An Ecology funded USGS study[19] found that groundwater storage in the aquifer increased by 6.8 million ac-ft. since the start of the CBP. To manage this mixed state and federal water, Ecology and the BOR have entered into an agreement to cooperatively manage this groundwater within the Pasco Basin. In 2022, the BOR began the process of expanding this study to incorporate the hydrogeologic complexities and existing conditions of the aquifer. The results of this expanded study will provide a better understanding of how much of this water could be available for instream and out-of-stream uses, and aid in the rulemaking process for the co-management of this water. While we wait for the results of this study, Ecology has begun moving forward with the boundary designation process for the Pasco Basin[20].

Proposed Switzler Reservoir Storage Project

In a joint effort to increase water supplies in the lower Columbia River Basin, Ecology, Benton County, and Klickitat County are working together to evaluate a new surface water storage reservoir that would be located directly south of the City of Kennewick, in Switzler Canyon. The proposed Switzler Reservoir (Switzler) would be created by constructing a 325-foot-high concrete-faced rockfill dam and will have the potential to store up to 44,000 ac-ft. of water for mitigation of new out-of-stream uses. The Environmental Impact Statement (EIS) for this project is expected to be finalized in 2025. This EIS will address the requirements of the Washington State Environmental Policy Act (SEPA) and further aid in determining alternatives for the project.

Objectives

Evaluate a new surface water reservoir in Switzler Canyon capable of storing up to 44,000 ac-ft. of water for:

- Augmenting instream flows on the Columbia River mainstem below McNary Dam.
- Mitigating new out-of-stream uses including the irrigation of between 12,000 to 28,000 acres of new farmland and water supply for up to 1,000 new homes.
- Mitigating potential impacts of curtailing interruptible water rights on the Columbia River mainstem.

[19] Charles E., Sue C. Kahle, Theresa D. Olsen, James D. Patterson, and Erick Burns. "Simulation of Groundwater Storage Changes in the Eastern Pasco Basin, Washington." 2016, USGS Publications Warehouse: doi.org/10.3133/sir20165026.

[20] ecology.wa.gov/issues-and-local-projects/environmental-projects/pasco-basin-groundwater

Permittable Water Supply Inventory

As forecasted in our 2021 Long-term Supply and Demand Forecast[21], water demands in eastern Washington will continue to rise while water supplies remain unchanged. This means that more water will need to be developed to meet future needs, both instream and out-of-stream. We have developed 38,504 ac-ft. (Table 1) of water since 2016. Today, water developed under the Sullivan Lake Water Supply Program Irrigation bucket and Lake Roosevelt Incremental Storage Release Program are fully allocated, leaving only 3,825.4 ac-ft of water, from the Sullivan Lake Water Supply Program M&I bucket and the Port of Walla Walla Lease Program, available for new out-of-stream use.

With only 3,825.4 ac-ft of water left, the need to develop additional water supplies is urgent.

We have processed over 200 applications (issued, withdrawn, or canceled) and issued a total of 60 permits for water developed under our programs from 2016 to the end of the 2022 calendar year. Broken down by program, 20,841 ac-ft. of water has been allocated from the Lake Roosevelt Program (an additional 4,159 ac-ft. pending), 1,959.9 ac-ft. from the Sullivan Lake Program (an additional 3,995.7 ac-ft. pending), and 3,723 ac-ft from the Port of Walla Walla Program.

Current available water supplies by program

- Lake Roosevelt Incremental Storage Release Program (total supply, 25,000 ac-ft.)
  - M&I – 0 ac-ft.
- Sullivan Lake Water Supply Program (total supply, 9,332 ac-ft.)
  - M&I - 3,378.4 ac-ft.
  - Irrigation - 0 ac-ft.
- Port of Walla Walla Lease Program (total supply, 4,170 ac-ft.)
  - Irrigation – 447 ac-ft.

Table 1. Water permits by source

Mitigation Bucket	Total developed water (ac-ft.)	Permits issued	Allocated water (ac-ft.)	Water requests currently processing (ac-ft.)	Water requests currently in queue (ac-ft.)	Remaining available water (ac-ft.)
Sullivan Irrigation	4,666	3	671	3,995	0	0
Sullivan Municipal	4,666	3	1,288	0	0	3,378
Lake Roosevelt M&I	25,000	51	20,841	1,128	3,031	0
Port of Walla Walla	4,170	3	3,723	0	0	447
Totals	38,504.0	60	26,523	5,123	3,031	3,825

[21] apps.ecology.wa.gov/publications/SummaryPages/2112006.html

Lake Roosevelt Incremental Storage Release Program

Built in the 1930s, Grand Coulee Dam expanded the potential storage capacity of Lake Roosevelt[22] up to 9 million ac-ft. of water. Utilizing water already stored in the lake, the Lake Roosevelt Incremental Storage Release Program provides up to 132,500 ac-ft. of water for maintaining healthy instream flow, removing groundwater dependency in the Odessa Subarea, and meeting other out-of-stream demands.

The Lake Roosevelt Incremental Storage Release Program provides 82,500 ac-ft. of water annually for augmenting instream flows (27,500 ac-ft.), removing groundwater dependence in the Odessa Subarea (30,000 ac-ft.), and providing new municipal and industrial (M&I) uses (25,000 ac-ft.).

During drought years, an additional 50,000 ac-ft. of released water helps to minimize drought-related impacts to instream flows (17,000 ac-ft.) and increase water supplies for those Columbia River interruptible water right holders[23] (33,000 ac-ft.).

To offset development costs associated with implementing this program, permit holders incur a fee of $35 per ac-ft. annually.

Improving drought resiliency

Approved by Congress in 2020, the Washington State Drought Contingency Plan[24] streamlines the state's request for federal drought relief by eliminating the BOR and Bonneville Power Administration drought coordination requirement. Removal of this requirement allows for a timelier release of the 50,000 ac-ft. of water provided by the Lake Roosevelt Program during drought years. The next step is for BOR and Ecology to agree on the terms of the Lake Roosevelt drought releases.

Lake Roosevelt water at a glance

- Annual Water Releases
  - Odessa Subarea - 30,000 ac-ft.
  - Instream flow augmentation - 27,500 ac-ft.
  - M&I - 25,000 ac-ft.
- Additional Water Releases during drought years
  - Instream flow augmentation - 17,000 ac-ft.[25]
  - Interruptible water right permits - 33,000 ac-ft.

[22] www.nwcouncil.org/reports/columbia-river-history/lakeroosevelt

[23] Interruptible water rights are junior in priority date to the Columbia River instream flow rule (WAC 173-563) and first in line for curtailment in times when the Columbia River falls below minimum instream flow values.

[24] apps.ecology.wa.gov/publications/SummaryPages/1811005.html

[25] Additional amount of water released during drought years, totaling 44,500 ac-ft. of water allocated for instream flows.

Objectives

- Permit all 25,000 ac-ft of water for municipal and industrial uses.
- Provide drought-year water to interruptible water right holders.
- Provide surface water for the Odessa Subarea.
- Provide water to augment instream flows.

Permits issued as of December 31, 2022

- Instream flow – 27,500 ac-ft.
- Odessa – 30,000 ac-ft.
- M&I – 20,841 ac-ft.
    - Quad cities (Kennewick, Pasco, Richland, and West Richland) - 4,014 ac-ft.
    - Pasco - 10,000 ac-ft. (5,000 ac-ft. permitted with another 5,000 ac-ft. in the final steps of the permitting process).
    - All other permits (49 in total) - 6,827 ac-ft.

Pipes moving irrigation water from Lake Roosevelt at Grand Coulee Dam to Banks Lake
Photo Credit: Tom Tebb, 2018

Sullivan Lake Water Supply Project

The Sullivan Lake Water Supply Project provides 14,000 ac-ft. of water overall for both out-of-stream uses (9,333 ac-ft.) and instream benefits (4,667 ac-ft.) annually. Out-of-stream uses are limited to Douglas, Ferry, Lincoln, Okanogan, Stevens, and Pend Oreille counties in northeast Washington. The Sullivan Lake Water Supply Project provides new water supply by retiming water already stored in the reservoir. Retiming water releases from when it was originally scheduled to be released (October through December) to being released during the drier times of the year (June through September) provides water during periods of low instream flows when fish need it the most, and offsetting impacts associated with new water right permits.

Water users are charged a one-time fee of $1,500 per ac-ft. (or a repayment plan of $60 per ac-ft. for 25 years) to offset development costs associated with this program.

Sullivan Lake at a glance

- **Annual water releases**
  - 4,667 ac-ft. - Instream flows
  - 4,666 ac-ft. – M&I
  - 4,666 ac-ft. – Irrigation

Objectives

- Permit the 9,333 ac-ft. of water developed through this project for municipal, industrial, and irrigation uses.
- Provide water to augment instream flows.

Stipulations

As outlined in RCW 90.90.110, the out-of-stream uses for Sullivan Lake water are limited to Douglas, Ferry, Lincoln, Okanogan, Stevens, and Pend Oreille counties in northeast Washington.

Permits issued as of December 31, 2022

- Irrigation - Three permits totaling 4,666 ac-ft.
- M&I - Three permits totaling 1,288 ac-ft.

Available water for allocation

- Irrigation - 0 ac-ft.
- M&I - 3,378 ac-ft.

Port of Walla Walla Lease Program

The Port of Walla Walla Lease Program provides 4,170 ac-ft. for water for out-of-stream uses with a fee of $120 per ac-ft. fee to offset development costs. With this short-term program set to expire in November 2020, Ecology and the port were able to renegotiate a new agreement before the expiration date, extending the program benefits another 10 years (December 31, 2030). This lease agreement has the possibility to be extended an additional five years (December 31, 2035).

This water is secured via a lease agreement between Ecology and the Port of Walla Walla, to temporarily lease water designated for use at a proposed business park, currently in its development and construction phase. The water offered under this program is meant to aid water users in bringing new irrigation projects online, bringing unauthorized water users into compliance, and providing time for water users to find permanent sources of water.

As of the end of the 2022 calendar year, three short-term permits have been issued, allocating 3,723 ac-ft. of water developed under this program. Leaving a remaining quantity of water at 447 ac-ft.

Port of Walla Walla water at a glance

- 4,170 ac-ft. for temporarily out-of-stream uses.

Objectives

- Provide a temporary water supply that:
  - Allows for new short-term irrigation projects.
  - Allows water users time to find permanent water supplies.
  - Brings unauthorized water users into compliance.

Permits issued as of December 31, 2022

- Sunheaven Farms, LLC – 2,500 ac-ft.
- WA Department of Natural Resources – 1,178 ac-ft.
- Flat Top Ranch – 45 ac-ft.

Trust Water Rights Program

Trust Water Right Program (TWRP) enables Ecology to place and hold existing water rights in Trust, where they are protected from relinquishment and enhance instream flows. This program is very useful for water right holders who wish to conserve water but do not want to lose their water rights.

In addition to being safe from relinquishment, water rights placed in Trust retain their original priority date, contribute to augmenting streamflows, recharging groundwater aquifers, and sometimes can mitigate new beneficial uses. Water can be temporarily or permanently donated to the TWRP. But a trust water right can only be protected and used for mitigation if it is conveyed to Ecology by the water right holder, accepted by Ecology into the TWRP, and documented in a water banking agreement or other Trust Water Right agreements.

Surface water donations to the TWRP now total over 93,000 ac-ft. This water remains instream and contributes to maintaining healthy streamflows. Additionally, over 7,800 ac-ft. of groundwater rights have been donated to the program, further benefitting groundwater recharge. This means that over 100,000 ac-ft. of water is in temporary donation status within the TWRP in eastern Washington.

A recent public-private partnership, Auvil Fruit Company Ranch 2, LLC ("Auvil") successfully developed an innovative approach to water conservation by modifying and modernizing its farming practices and land use on its Ranch 2 orchard located south of Vantage, Washington. Auvil made infrastructure improvements to each field within the places of use for ten of its water rights.

A co-funded scientific study jointly performed in 2019 by Ecology and Aspect Consulting showed that Auvil's consumptive use had been reduced by 50% as a result of these improvements, saving approximately 4,300 ac-ft. of water annually. We purchased approximately one-third of the saved water Auvil permanently transferred the remaining conserved water into a water bank for instream flow and mitigation purposes.

Auvil's improvements include:

- Expansive coverage of orchards with shade cloth (beginning in 2006 and incrementally increasing to near 100% complete ranch coverage in 2017) to reduce crop evapotranspiration, the need for over-tree cooling irrigation, and the need for vegetated windbreaks.
- Improvements to water application and delivery methods.
- Addition of intensive soil moisture monitoring.
- Removal of vegetative windbreaks.

These improvements have provided many benefits in addition to enhanced water use efficiency including, higher crop yields of healthier fruit, less sun damage, reduced wind speed, increased relative humidity, and improved worker safety during times of extreme heat (by creating shaded work areas).

Auvil's water conservation advancements could be applied to a variety of crops, making it a great model for other farms to follow. By enhancing water conservation and placing saved water into trust, water right holders are not only benefiting crops and their bottom line, but also enhancing instream flows, water management, and aquatic habitats.

Improving Drought Resiliency

In 2018, Ecology published an updated Washington State Drought Contingency Plan (DCP)[26] with the help of a federal WaterSMART grant. The DCP provides state agencies with a suite of emergency response tools to use during water supply shortages most commonly seen during drought conditions. This includes streamlining the release of the 50,000 ac-ft of water provided by the Lake Roosevelt Program during drought years (page 21). The DCP also included the ability for Ecology to issue drought advisories, emergency water right permits, and transfers and provide funds for public entities with public emergency infrastructure needs in a timely manner.

During dry conditions, Ecology can provide 54,667 ac-ft. of water through the Sullivan Lake (4,667 ac-ft.) and Lake Roosevelt (50,000 ac-ft.) programs. This water provides relief to interruptible water right holders experiencing water supply shortages and argument instream flows for fish. In addition to providing secure water supplies through our Sullivan Lake (page 23) and Lake Roosevelt (page 21) programs, we implement multiple integrated water resource management planning programs that increase overall drought resiliency for the Icicle Creek (page 7), Walla Walla (page 13), and Yakima River Basin (page 16) watersheds.

Forecasting future water supplies and demands

In addition to providing water to meet instream needs and out-of-stream demands during times of drought, Ecology's OCR also publishes a Long-term Supply and Demand Forecast report every five years. The 2021 Columbia River Basin Long-term Water Supply and Demand Forecast[27] provides a system-wide, quantitative assessment of how future environmental and economic conditions and human responses are likely to influence water supplies and demands over the next 20 years.

A better understanding of where water supplies will need to be developed provides us with the information to strategically fund water supply projects by individual watersheds located across eastern Washington.

Findings from the most recent, 2021 Columbia River Basin Long-term Water Supply and Demand Forecast, include the following:

- The timing of surface water supplies is shifting to earlier in the season, especially in the snowmelt-dominated Cascades watersheds.
- Future changes in population and agriculture in eastern Washington could lead to increases in instream and out-of-stream demands for water.
- Local increases for out-of-stream demands are expected, converging with local decreases in water supply, such as in the Yakima River Basin.
- Groundwater levels are declining in most aquifers and groundwater subareas across eastern Washington. Some groundwater subareas are calculated to drop 25% in available saturated thickness before 2031 (Figure 8).

[26] apps.ecology.wa.gov/publications/SummaryPages/1811005.html
[27] apps.ecology.wa.gov/publications/SummaryPages/2112006.html

These findings highlight not just where water supplies are vulnerable, but also where deficits in the summer and low flow years occur which may lead to strategies to modernize water storage and water delivery infrastructure. The next forecast is due in 2026 and will cover any new insights on water supply and demand changes across eastern Washington arming decision makers and water managers with key information to begin planning for future water supply challenges.

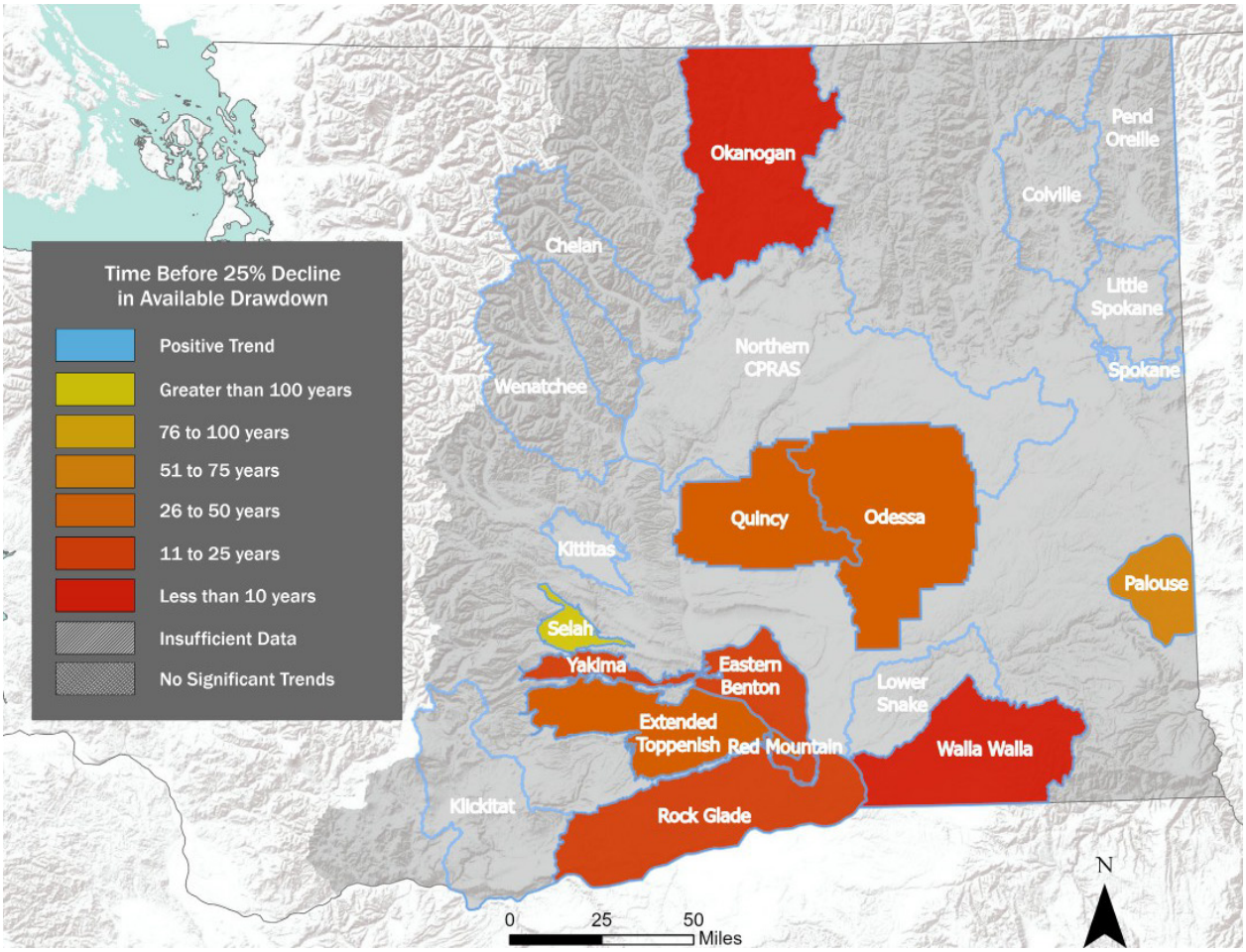


Figure 8. Time aquifers are calculated to experience a 25% decline in available saturated thickness.

The darker the orange to red, the faster an aquifer will see a 25% decline with the Okanogan and Walla Walla expected to see this drop before 2031; followed by Eastern Benton, Yakima and Rock Glade. (2021 Columbia River Basin Long-term Supply and Demand Forecast)

Budget Sustainability

***Due to the timing of the publication of this report, the following section highlights the final 2023-2025 legislative appropriations.**

Ecology's OCR capital budget appropriation for the 2023-2025 Biennium was $60.7 million with a $32.8 million proviso for the Odessa Subarea. An additional $5.5 million was appropriated in the 2024 supplemental capital budget specifically called out for the construction of the Odessa East Low (EL) 22.1 pipeline turnouts project. Other 2023-2025 capital budget appropriations that OCR oversees include $49 million for continued implementation of the Yakima River Basin Integrated Water Resources Management Plan and $3.246 million for continued implementation of Yakima River Basin Water Enhancement Project Phase II Conservation (aka Sunnyside Valley Irrigation District Water Conservation). Table 2 provides a breakdown of funding by account and sources.

Access to reliable funds is key to many large-scale project successes. The $200 million in general obligation bonds originally allocated to OCR ran out during the 2017-2019 Biennium. Since then, OCR has transitioned to a less reliable, pay-as-you-go (pay-go) funding model. Pay-go requires the State Legislature to approve and appropriate funds for Ecology every biennium versus the general obligation funds OCR had access to regardless of budgetary cycles. Under the pay-go model, project funding is less reliable simply due to the potential of funds not being approved by the State Legislature. This lack of reliability in funding puts long-term and large-scale projects, that take more than a single biennium to be completed, at risk of being delayed and incurring more costs.

While not a substitute for allocated funds, there are alternative funding solutions. These solutions include utilizing Ecology capital dollars to match local, federal, and other state funding opportunities including grants and in-kind services. Projects benefitting streamflows, habitat, and water quality can also qualify for funding through Ecology's Streamflow Restoration Program (Water Resources), Floodplains by Design (Shorelands and Environmental Assistance), and Water Quality competitive grant opportunities. Longer-term funding opportunities include federal assistance programs and public-private partnerships, cost recovery fees, and water service contracts with water right holders benefitting from water developed under one or more of OCR's projects and programs. Cost recovery fees and water service contacts spread out repayment costs over an extended period of time for a water user (ex. See Sullivan Lake repayment, page 23).

Table 2. Breakdown of Columbia River Basin Water Supply Development (CRBWSD) funding sources including 2023-2025 appropriations as of December 2024.

	CRBWSD Account	CRBWSD Recovery Account	Other State Funding Sources	TOTAL
Prior Biennia Expenditures	$200,000,000	$8,100,000	$97,900,000	$306,000,000
2023-2025 Appropriations		$1,500,000	$59,200,000	$60,700,000
2024 Supplemental Appropriation			$5,500,000	$5,500,000
TOTAL	**$200,000,000**	**$9,600,000**	**$162,600,000**	**$372,200,000**

Partnerships and Public Outreach

Building and maintaining strong partnerships with stakeholders across the greater Columbia Basin is the backbone of Ecology's success. These partnerships paved the way for other programs to create innovative collaborations in other river basins in the state using our blueprints. Forming working groups creates an opportunity for cohesion and a willingness to reach a common goal of the development of secure and reliable water supplies. Development of water supplies that provide and maintain healthy streamflows and meet out-of-stream demands has driven the success of our projects, programs, and strategic management strategies in basins experiencing chronic water shortages.

OCR working groups include:

- Columbia River Policy Advisory Group (CRPAG).
- Yakima River Basin Water Enhancement Project Workgroup (Integrated Plan Workgroup).
- Icicle Strategy Workgroup.
- Walla Walla Water 2050 Basin Advisory Group.
- Columbia River County Commissioner Caucus.

Each of these groups consists of representatives from Tribal, federal, state, and local governments, as well as stakeholders from local municipal, industrial, and agricultural interests, local community members, and environmental and recreational groups.

The public is also encouraged to attend these meetings and provide input. Our quarterly working group meetings provide our stakeholders an opportunity to discuss current issues, ongoing project needs, as well as possible program policy updates and fiscal concerns.

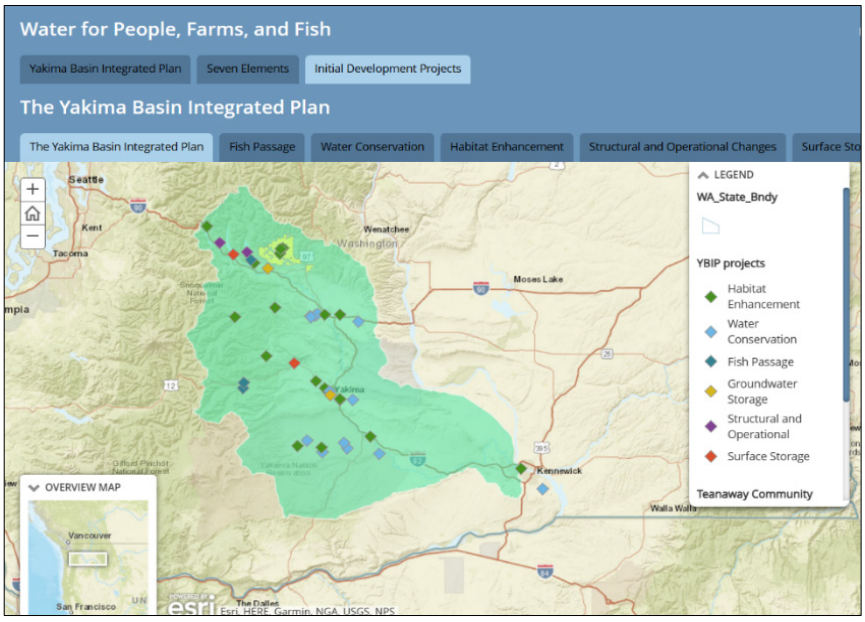


Figure 9. Screenshot of the Yakima River Basin Integrated Plan StoryMap

Another outreach tool OCR employs is the use of ArcGIS StoryMaps (Figure 9). This is a visual online tool that walks users through the multiple projects and programs OCR manages. Current OCR StoryMaps can be found online[28] at Ecology's StoryMap series site. This platform helps to share the challenges and successes we face in the water supply development realm.

[28] waecy.maps.arcgis.com/apps/MapSeries/index.html?appid=2d43dd9b743346729897a4841b40f5d7

Conclusion

This 2022 Columbia River Water Supply Inventory Report summarizes OCR's water supply development and delivery milestones and successes achieved during the 2022 calendar year. We have found that investing in a wide range of water development, storage, and conveyance projects, and locally managed integrated water resource management plans have a high rate of success in providing water supply solutions specific to each basin's unique and complex water supply and demands.

Since OCR's inception in 2006, our projects and programs have developed 516,641 ac-ft. of sustainable and reliable water supplies for instream and out-of-stream uses. Over the next decade, OCR aims to develop 288,084 ac-ft. in additional water supplies. OCR plans to accomplish this through the construction of a new surface water storage reservoir in the Yakima Basin, expanding ASR project sites across eastern Washington, continued implementation of progressive water conservation measures, and creating new watershed-wide integrated water resource supply solutions. Our office envisions reaching 804,725 ac-ft. in total water supplies developed in the next 10 years.

By the end of the 2022 calendar year, almost all of our developed water supplies have been allocated. Of the 34,333 ac-ft. of water available through the Sullivan Lake and Lake Roosevelt programs, only 3,378.4 ac-ft. are available for municipal use under the Sullivan Lake program. In the findings of our 2021 Long-term Supply and Demand Forecast report, Washington state will continue to experience harsher times of drought on a more consistent basis. With these forecasted conditions, the development of new water supplies will be vital to meeting future out-of-stream demands while maintaining healthy instream flows and improving drought resiliency across eastern Washington.

While water supplies developed under our projects and programs are a great start to meeting eastern Washington's needs, they are not enough to meet all of the future demands. That is why we continue to seek out new surface water and groundwater storage opportunities, continued support for new water markets, and options for implementing integrated water resource management in other watersheds (outside of the Yakima River, Icicle Creek, and Walla Walla basins) throughout the Columbia River Basin. In the future, OCR continues to explore the possibility of securing/accessing non-Columbia River treaty storage water (stored in British Columbia, Canada, and/or Oregon) as a supplement to the Lake Roosevelt Program.

Looking to the future, we will continue to meet our mission of developing water supplies to meet the instream and out-of-stream demands, improve drought resiliency, and implement multifaceted solutions to water-short watersheds across eastern Washington. We will not lose sight of our own vision of preserving and enhancing the standard of living for the people of Washington by strengthening economic conditions and restoring and protecting the Columbia Basin's unique natural environment.

Office of Columbia River Policy Advisory Group (PAG) Members[29]

Bonneville Power Administration
- Adriana Rasmussen

NOAA Fisheries-US Department of Commerce
- Justin Yeager

US Army Corps of Engineers
- Jeremy Weber

US Bureau of Reclamation
- Wylie "Chris" Duke

Confederated Tribes of the Colville Reservation
- Cody Desautel

Confederated Tribes of the Umatilla Indian Reservation
- Lisa Ganuelas

Spokane Tribe
- B.J. Kiefer

Yakama Nation
- Phil Rigdon

Oregon Water Resources Department
- Chris Kowitz

WA State Department of Fish and Wildlife
- Megan Kernan

WA State Conservation Commission
- Jon Culp

WA State Water Resource Association
- John Stuhlmiller

Benton County Commissioner
- Jerome Delvin

Franklin County Commissioner
- Clint Didier

Kittitas County Commissioner
- Cory Wright (alternate)

Klickitat County Commissioner
- Jacob "Jake" Anderson (alternate)

Lincoln County Commissioner
- Jo Gilchrist
- Scott Hutsell (alternate)

Stevens County Commissioner
- Wes McCart

Yakima County Commissioner
- LaDon Linde (alternate)

City of Moses Lake
- Richard Law

Walla Walla Conservation District
- Annie Byerley

East Columbia Basin Irrigation District
- Craig Simpson

American Rivers
- Sarah Drydahl

Columbia Basin Development League
- Mike Schwisow

Columbia-Snake Rivers Irrigation Association
- Darryll Olsen

Trout Unlimited
- Theo Burgoon

Other Vacancies
- Association of Washington Business
- Northwest Power & Conservation Council
- Environmental organization

[29] As of the publication date of this report.