



DEPARTMENT OF
ECOLOGY
State of Washington

2017 Columbia River Basin Annual Water Supply Inventory Report

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2017 Columbia River Basin Annual Water Supply Inventory Report

*Submitted by
The Office of Columbia River*

The Office of Columbia River
Washington State Department of Ecology
Olympia, Washington

Publication and Contact Information

This report is available on the Department of Ecology's website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1812001.html>

For more information contact:

Office of Columbia River
1250 West Alder Street
Union Gap, WA 98903

Phone: (509) 575-2490

Washington State Department of Ecology - www.ecy.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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Cover photo: Columbia River near Crescent Bar



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1250 West Alder Street • Union Gap, Washington 98903 • (509) 575-2490

January 26, 2018

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

RE: Columbia River Basin Annual Water Supply Inventory Report

The Office of Columbia River is pleased to present the 2017 *Columbia River Basin Annual Water Supply Inventory Report* to you and the Legislature, meeting the requirements under RCW 90.90.040. This report is now available at the following website:

<https://fortress.wa.gov/ecy/publications/SummaryPages/1812001.html>

This report is a continuation of our yearly documentation detailing ongoing efforts in our aggressive pursuit of water supply development to meet the economic and community development needs of people and the instream flow needs of fish. This report includes project details and an inventory of water developed through completed projects.

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, Director
Office of Columbia River

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Office of Columbia River

Statutory Directive

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](#).]

Vision

Preserve and enhance the standard of living for the people of Washington by strengthening the state's economy, and restoring and protecting the Columbia Basin's unique natural environment.

Mission

Aggressively pursue development of water supplies to benefit both instream and out-of-stream water uses.



East Low Canal

Executive Summary

This 2017 Columbia River Basin Annual Water Supply Inventory Report submitted to the Governor and legislature builds on the information provided in the last nine annual inventory legislative reports, and summarizes ongoing accomplishments of the Office of Columbia River in implementing the requirements of Chapter 90.90 of the Revised Code of Washington (RCW).

Shortly after the turn of the millennium it was recognized that the Columbia River Basin was suffering from immense water supply problems, including:

- Declining Odessa Subarea aquifers.
- Low stream flows impacting salmon and steelhead habitat.
- Interruptible water right holders subject to curtailment during droughts.
- Cities struggling to meet the demand for growing communities.
- And a backlog of new water right applications, many of which were for agricultural irrigation and industrial needs in Eastern Washington.

The Legislature passed RCW 90.90 in 2006 to address these critical water issues. This statute created an account to fund the development of new water supplies, with the account to be managed by the Department of Ecology (Ecology). Ecology created the Office of the Columbia River (OCR) with a targeted mission of aggressively pursuing development of water supplies to benefit both instream and out-of-stream uses. Water developed for instream uses include habitat restoration, water quality improvements and increasing instream flows for fish such as endangered bull trout and salmonids. Water developed for out-of-stream uses include water supply development projects for out-of-stream uses that benefit agriculture (irrigation), municipalities and/or domestic users, industry, and recreation.

As a program, OCR has evolved over the years by adapting our water supply project strategies to maximize local values and benefits, and minimize project expenses to achieve the desired water solutions within the basin. We find solutions that are multipurpose and integrated with other needs and activities in solving complex water resources issues. OCR will continue to evolve as we further our innovative partnerships to solve water supply needs, declining aquifers, address aging infrastructure, and protect the Columbia Basin's unique natural environment.

Our focus area has expanded over the past 11 years from the Columbia River mainstem plus a one-mile buffer along the river, to the Columbia River and its tributaries, up to the entire area of Eastern Washington. Taking on the tasks of managing a diverse water supply development portfolio throughout Eastern Washington include projects that increase water supply through expanding or modifying existing reservoirs, creating new groundwater and surface water storage, enhancing instream flows, increasing water conservation, and pump exchanges. All of this has been accomplished with just 20 dedicated employees (15 operating budget funded FTEs and 5 capital budget funded FTEs). This same group of employees manages permitting newly developed water supplies, compliance and metering oversight, publication and outreach development, as well as managing the Yakima River Basin Integrated Water Resource Management Plan implementation.

OCR is at a critical juncture with some of the major projects that were the framework for the Columbia River Initiative. During the last year, we have completed, from start to finish, the

installation of the Warden Siphon barrel and are nearly finished with the East-Low Canal widening. We have also seen the Methow Valley Irrigation District water conservation project come to fruition, secured Lake Roosevelt and Sullivan Lake water supplies, and have been able to conserve over 40,000 ac-ft. through other various piping, lining and pump exchange projects. Future conservation projects, currently in the feasibility stage, could yield up to 390,000 ac-ft. in conservation savings, once completed.

During the next year, we look forward to finalizing the Icicle Creek Water Resource Management Strategy programmatic environmental impact statement (PEIS), advancing groundwater monitoring efforts in Eastern Washington, finalizing the Cle Elum pool raise shoreline stabilization, and delivering groundwater replacement to water users in the Odessa subarea through the first landowner financed pumping plant. Governor Inslee's proposed 2017-2019 budget put forth \$33.8 million to finish these projects, but unfortunately the Legislature has not yet adopted a capital budget at this time. Since OCR's creation, we have developed over 410,000 ac-ft. of new water supply and aims to develop an additional 370,000 ac-ft. within the next 5 years.



Icicle Creek

Introduction

For decades, there has been little to no water available in Eastern Washington for new water right applicants, creating a backlog of pending new water right applications. This, coupled with limited reservoir capacity, population growth, declining groundwater levels in the Odessa Subarea, droughts, and climate change, means water is more scarce and in higher demand than ever before.

From 2002 to 2006, the Washington State Legislature and Governors Locke and Gregoire evaluated water supply needs throughout the Columbia River Basin. They determined that the development of new water supplies and water resource management was to be the highest priority. With the enactment of RCW 90.90, the Office of Columbia River (OCR) was formed with the objective to aggressively pursue water supply solutions in the Columbia Basin for both instream and out-of-stream benefits.

Annually, the Columbia Basin creates up to \$7.4 billion in crop revenue and 36,000 jobs¹ in the potato industry alone. For these and other crops, this arid Basin currently relies on snowpack supplying approximately 1/3 of irrigation water annually, as well as, replenishing surface storage supplies. Drought and low snow years have caused curtailment of junior water right holders, resulting in orchards producing marginal crops, or worse, tree mortality.

OCR continues to aggressively pursue water supply development benefiting both instream and out-of-stream uses and have already made a difference here in the Columbia Basin. Our water supply development projects include increasing storage capacity of existing reservoirs, augmenting seasonal instream flows, and increasing water conveyance capacity to areas such as the parched Odessa Subarea.

Since its creation, OCR has developed over 410,000 ac-ft. of water for both instream and out-of-stream use (for a detailed list of water projects, see Figure 1 2017 Water Supply Projects). One project, the Icicle Creek Water Resource Management Strategy, will more than double instream flows for fish during low flow periods while securing water supplies for future domestic and interruptible agricultural uses.

We also look forward to finishing the rock blasting and widening of the East Low Canal, continued progress on siphon construction, and seeing the first landowner financed pumping plant deliver replacement water to Odessa groundwater users. As the capital budget has not been passed by the legislature, the Department of Ecology has requested \$35 million in a 2018 supplemental capital budget request, to see these projects to completion.



¹ Tyler Tjomsland, Potato Farming In Washington Involves High-Stakes Investment Due To Competitive Market, Low Profit Margins, The Spokesman-Review, April 23, 2017, <http://www.spokesman.com/stories/2017/apr/23/a-year-in-the-fields-washington-potato-farmers/#/0>, accessed on December 8, 2017.

Water Project Solicitation, Selection, and Funding

Each year, OCR solicits new water supply project proposals. Through our biennial funding cycles and grant processes, we evaluate project proposals on a case-by-case basis as they are received and discuss them with the Columbia River Policy Advisory Group as part of a funding package. Projects are evaluated on their ability to deliver permittable water to the Columbia River or one of its tributaries and must meet one or more of OCR's statutory mandates. Permittable water is water that is stored, retimed, or conserved. Projects that can produce permittable water can include water conservation, increasing storage capacity of existing reservoirs, pump exchanges, aquifer storage and recovery and retiming water releases to benefit instream flows during low flow times.

One example of an early, successful conservation project is Barker Ranch. This project improved the Barker Ranch's water delivery system efficiency by converting 3 miles of an open canal into a piped system, allowing Barker Ranch to divert less water from the Yakima River. This added 6,436 ac-ft. of water to the lower Yakima River streamflows throughout the irrigation season. The Barker Ranch project highlights the multipronged benefits, of not only increasing Yakima River flows, but by delivering reliable water supplies to restored wetlands on the Ranch that supports at least 175 different species of birds as well as other terrestrial wildlife like coyotes, badgers, and deer. OCR is one of many project funders and often times our state funds help to leverage other federal/state/local funding sources. Since the \$200 million bonding authority appropriated (Table 1) is relatively small compared to the total costs to develop these projects, projects that leverage other federal, state and local funding sources are favored, as they maximize public return on investments.

We continue to refine our project list as further information on project feasibility is acquired. In 2015, the Washington State Legislature convened an interim task force on Washington Waters. This task force quantified the level of funding needed for continued investments in water supply, flood control and storm water runoff through fiscal year 2026. Then in 2016, the legislature directed the Office of Financial Management (OFM) to conduct a water infrastructure investment analysis, to inform future policy decisions about the scale and timing of new investments in flood risk reduction, water quality and storm water runoff, and water supply for both instream and out-of-stream uses. The analysis examined statewide economic implications of investing and not investing in long-term (20-year) water infrastructure and fisheries habitat restoration.

Table 1 Columbia River Basin Water Supply Development (CRBWSD) Funding Sources

	CRBWSD Account	CRBWSD Recovery Account	Other State Funding Sources	Biennia Total
Prior Biennia Expenditures	\$170,900,000			\$170,900,000
2015-2017 Appropriations	\$16,800,000	\$2,200,000		\$19,000,000
Requested 2017-2019 Capital Budget	\$12,300,000	\$2,000,000	\$20,700,000	\$35,000,000
TOTAL	\$200,000,000	\$4,200,000	\$20,700,000	\$224,900,000

This report² stated that: Failing to invest in these water infrastructure needs suggests that larger future expenditures will be needed to restore further degraded fish habitat, clean up contaminated waters, respond to catastrophic flood disasters, and support water dependent industries. In addition, failing to invest in water infrastructure suggests human health risks, economic shocks to water-dependent economies, constrained development, legal costs, and a decline in the quality of the natural environment. To summarize, the state of Washington needs to invest in these water development projects now in order to avoid higher future environmental and monetary costs. Many of the project needs on OCR's horizon for the next decade fall within the purview of this report.

Large scale water supply development projects financed by the state are done so through general large obligation bonds. These bonds pledge full faith, credit and taxing power to the payment of the bonds, or with lease/purchase financing contracts for the acquisition of real estate and equipment. Projects that require more than one biennium to be completed rely on a system of re-appropriations to carry forward the expenditure authority initially established.

The alternative to bond funding is to cash fund capital expenditures. This relies on appropriations of revenues received over time, or "pay- as-you- go" debt financing. This type of funding model is more difficult to fit large scale infrastructure projects into because it can be difficult to split a project into multiple phases to be accomplished in two year funding cycles and/or it adds risk to starting a project if you don't have funding secured for future phases. Overall project costs tend to rise under this model with large infrastructure projects either being fast tracked to fit into an aggressive two year implementation schedule (i.e. adding overtime costs to construction) or by splitting the project into multiple phases. Each biennial phase would have separate bidding and contracting needs likely adding to a contractor's construction mobilization and demobilization costs with each biennium.

At the end of the 2015-2017 biennium, the Office of Columbia River (OCR) has nearly exhausted its \$200 million bond authority with only \$12.3 million remaining. Without future/further/additional long term bonding authority, OCR will begin to operate under a "pay-as-you-go" model.

In an effort to offset development costs of our out-of-stream water supply projects, those out-of-stream water users are charged a yearly cost recovery fee which is then deposited in the Columbia River Basin Water Supply Revenue Recovery Account and is reinvested into future water supply projects. OCR is exploring additional funding strategies/opportunities, including public private partnerships (P3) and federal assistance programs.

There is more to be done and together with our partners, we will continue to work to secure the infrastructure and funding needed to develop integrated water solutions now, and in the face of climate change, to assure sustainable water supplies for our growing communities, rural economies, and natural environment.

² <http://www.ofm.wa.gov/reports/WaterInfrastructureReport.pdf>



The Office of
Columbia River
Water for Families, Farms, and Fish

2017

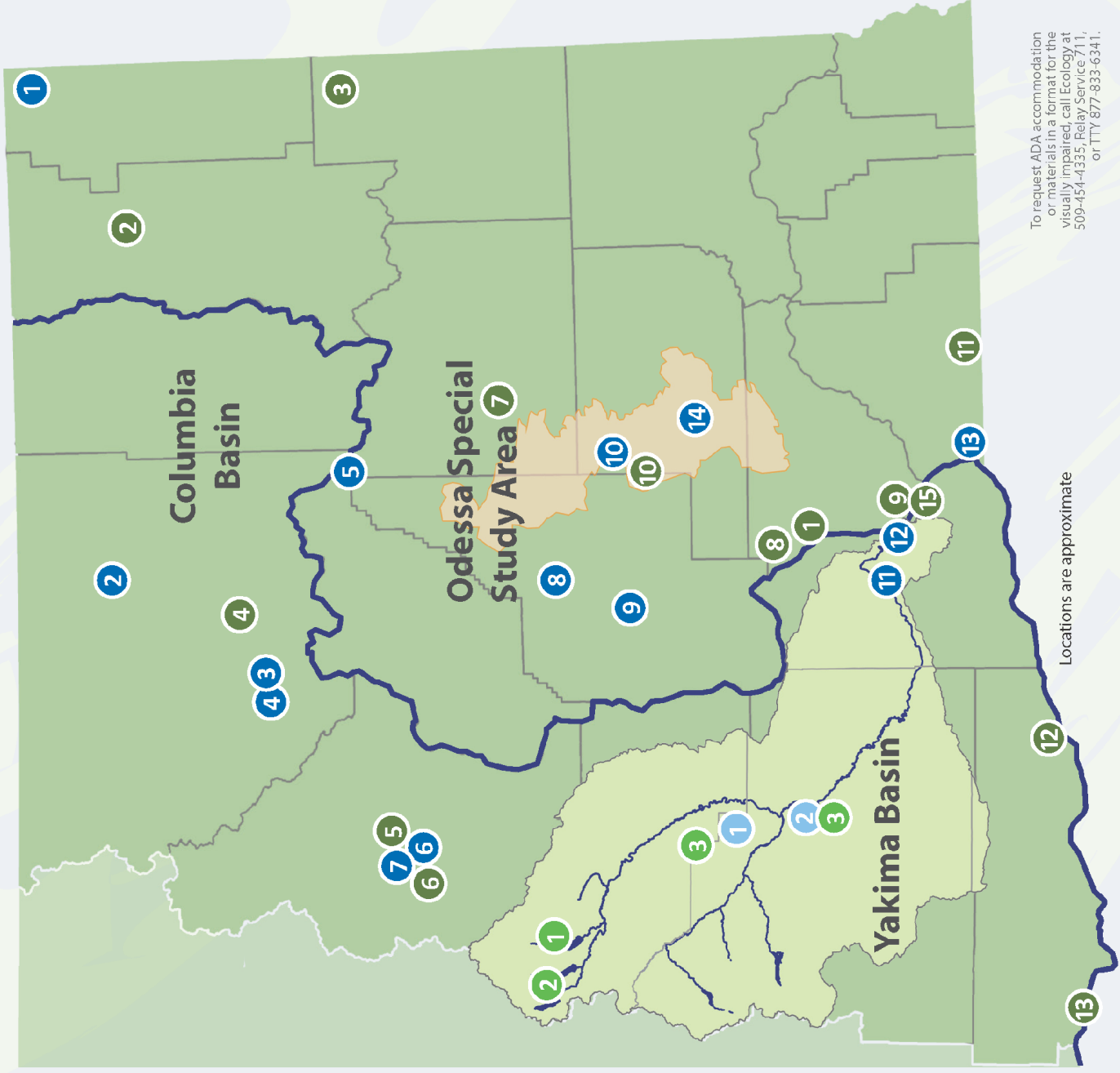
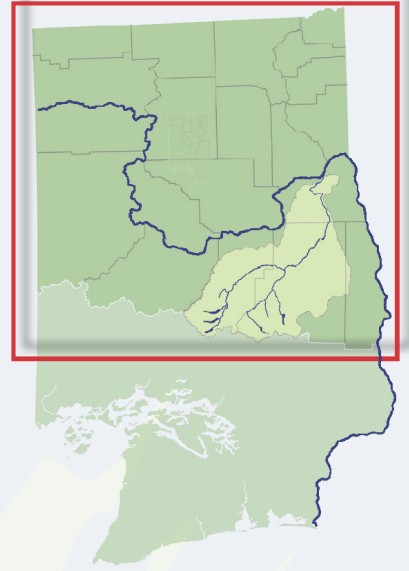
WATER SUPPLY PROJECTS

OCR Projects

- Completed, Developed
- Active, Under Development

YBIP Projects

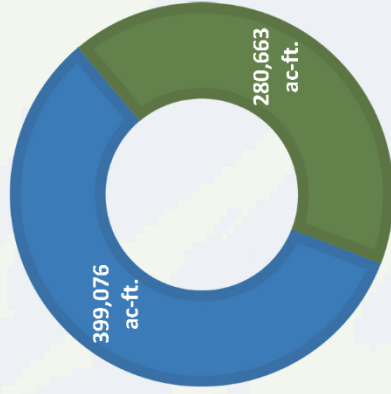
- Completed, Developed
- Active, Under Development



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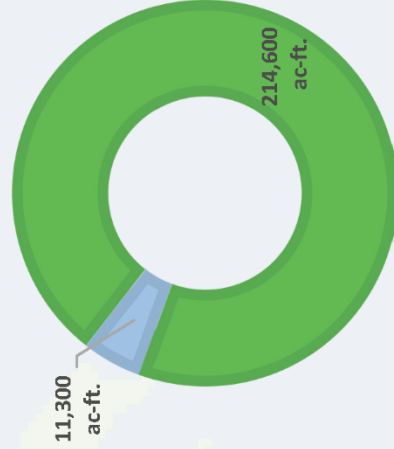
OFFICE OF COLUMBIA RIVER WATER DEVELOPMENT

■ Completed ■ In Progress



YAKIMA BASIN INTEGRATED PLAN WATER DEVELOPMENT

■ Completed ■ In Progress



COMPLETED OCR PROJECTS

1. Sullivan Lake Water Supply - 9,400 ac-ft. Out-of-stream / 4,600 ac-ft. Instream
2. Pine Creek Acquisition - 900 ac-ft. Instream
3. Methow Projects - 2,854 ac-ft. Instream & Out-of-stream
4. Methow Trust Water Acquisition - 79 ac-ft. Instream
5. Lake Roosevelt Incremental Storage Releases - 55,000 ac-ft. Out-of-Stream and 27,500 Instream/ Drought Years additional 33,000 ac-ft. Out-of-Stream and 17,000 ac-ft. Instream
6. Lower Wenatchee Instream Flow Enhancements - 7,823 ac-ft. Instream
7. Peshastin ID Piping - 360 ac-ft. Instream
8. Columbia Basin ID Piping - 33,822 ac-ft. Out-of-stream
9. Potholes Supplemental Feedroute- Conveyance
10. Weber Siphon - Conveyance
11. KID/Red Mountain - 11,005 ac-ft. Instream & Out-of-stream
12. Barker Ranch - 6,436 ac-ft. Instream
13. Port of Walla Walla Leases - 4,761 ac-ft. Out-of-stream
14. Odessa Subarea Groundwater Replacement - 164,000 ac-ft. Out-of-stream
15. Kennewick General Hospital - 4,000 ac-ft. Out-of-stream

REGION WIDE

- Conservation Commission Irrigation Efficiency - 3,476 ac-ft. Instream
- Donations - 13,060 ac-ft. Instream

COMPLETED YAKIMA BASIN INTEGRATED PLAN INITIAL DEVELOPMENT PROJECTS

1. Manastash Conservation and Tributary Enhancement - 1,300 ac-ft. Instream
2. Yakima City ASR - 10,000 ac-ft. Out-of-stream / Instream TBD

IN PROGRESS OCR PROJECTS

1. Pasco Municipal Supply Improvements - 5,000 ac-ft. Out-of-stream
2. Mill Creek Storage - 11,000 ac-ft. Instream & Out-of-stream
3. Spokane-Rathdrum ASR - 105,000 ac-ft. Instream & Out-of-stream
4. Goose Lake & Nine Mile Flat Storage - TBD
5. Peshastin Pump Exchange - TBD
6. Iccle Creek Management Strategy Projects - 20,000 ac-ft. for both Instream & Out-of-stream
7. Lincoln CD Passive Rehydration - TBD
8. WAC 508.14 Rule Change - TBD
9. Kennewick ASR - 318+ ac-ft. Out-of-Stream
10. East Low Canal Widening - Conveyance
11. Walla Walla Flow Enhancement - 30,000 ac-ft. Instream
12. Horse Heaven Hills - 105,000 ac-ft. Instream
13. White Salmon ASR - 145 ac-ft. Out-of-Stream

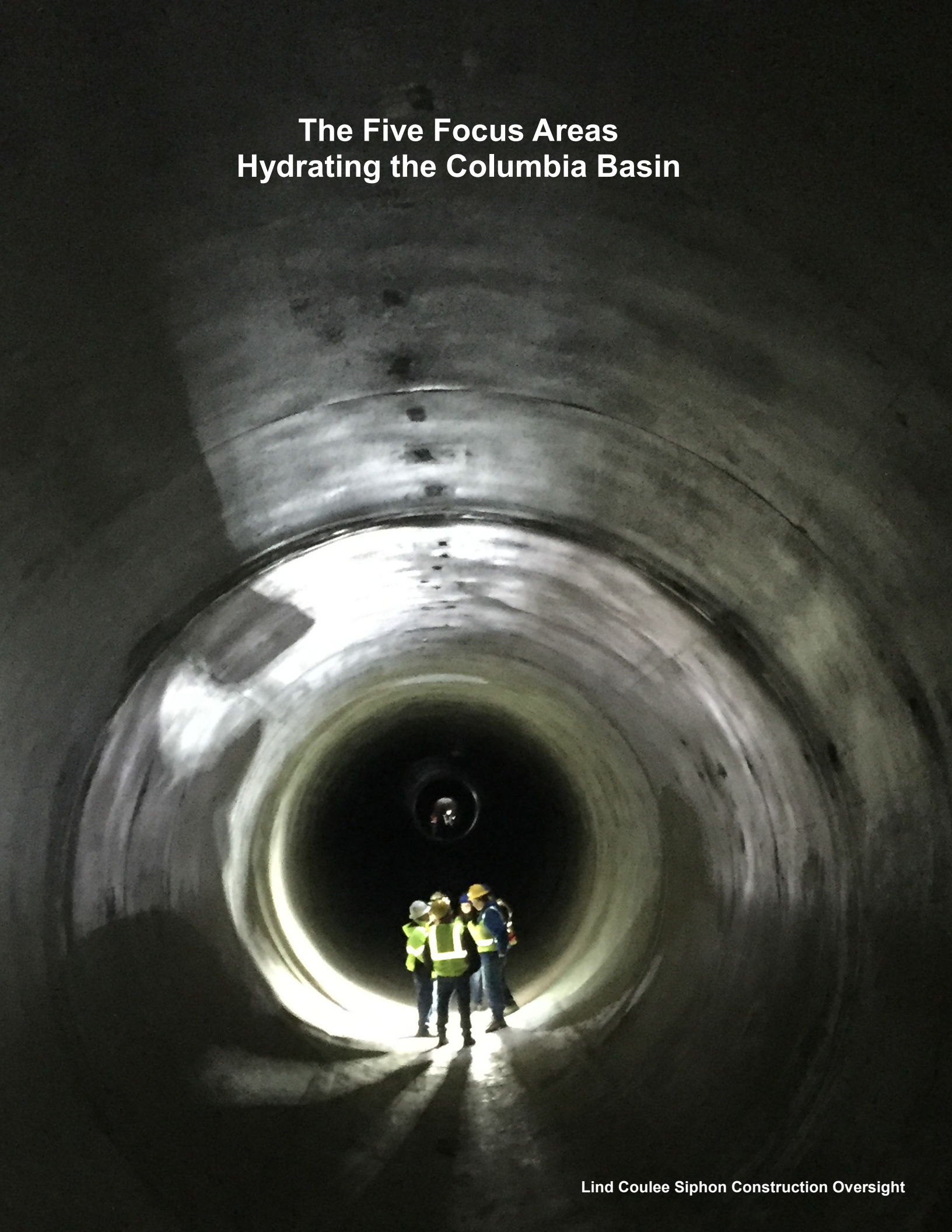
REGION WIDE

- Conservation Commission Retiming - TBD
- Regional Aquifer Storage and Recover - TBD

IN PROGRESS YAKIMA BASIN INTEGRATED PLAN INITIAL DEVELOPMENT PROJECTS

1. Cle Elum Pool Raise - 14,600 ac-ft. Out-of-stream
2. Kachess Drought Relief Pumping Plant - 200,000 ac-ft. Out-of-stream
3. Passive Aquifer Recharge - TBD ac-ft. Out-of-stream

The Five Focus Areas Hydrating the Columbia Basin



(1) Odessa Subarea

The Odessa Subarea lies within the heart of the Columbia Basin. Since the 1960's Odessa subarea farmers have been using groundwater for crop irrigation that was to be a temporary water supply until surface water from the federal Columbia Basin Project was available. After 50+ years of groundwater pumping, aquifer levels within Odessa subarea have been declining rapidly. Securing alternative water supplies to groundwater for water users in Odessa Subarea is of the utmost importance to avoid environmental and catastrophic economic losses.

Water Development

In 2006, OCR teamed up with the Bureau of Reclamation (USBR) and the three Columbia Basin Irrigation Districts to find solutions to the rapidly declining Odessa Subarea aquifer. A Final Environmental Impact Statement (EIS) for the Odessa Subarea Special Study was released in 2013, providing a "preferred alternative" to supply 164,000 ac-ft. of surface water from Banks Lake for irrigation of 70,000 acres of land currently dependent on groundwater. This effort is one of the major water supplies of the Odessa Groundwater Replacement Program (OGWRP). This targeted plan focuses its efforts to deliver federal Columbia Basin Project surface water to irrigators with eligible deep well irrigated lands within the Odessa Groundwater Management Subarea.

In addition to Banks Lake, OCR partnered with the three Columbia Basin Irrigation Districts (Quincy Columbia Basin Irrigation District, East Columbia Basin Irrigation District, and South Columbia Basin Irrigation District) in developing a Coordinated Conservation Plan. The water savings derived from piping and lining open irrigation canals within the Columbia Basin Project have secured an additional 30,000 ac-ft. of groundwater replacement.

The Lake Roosevelt Incremental Storage and Releases Project supplies another 30,000 ac-ft. of water supplies for Odessa Groundwater Replacement. Overall, these three projects provide an opportunity to replace irrigation of 90,000 acres from groundwater with surface water. Surface water from the Groundwater Replacement Columbia Basin Project, reaching Odessa Subarea irrigated lands increased in 2017 with 3,600 acres of groundwater irrigated lands being replaced with direct canal-side pumping from East Low Canal.



Construction of the first pumping plant delivery system at East Low (EL) Canal mile 47.5 began in November 2016 with the goal of the system being operational by the 2018 irrigation season. An additional 8,200 acres of irrigated land will be switched from groundwater to surface water on the landowner financed EL 47.5 system.

Through 2017, OGWRP water delivery infrastructure completed with state funding includes:

- Two Lind Coulee Siphon barrels.
- Sealing and testing the Lind Coulee siphons, as well as backfilling and reseeding over the siphons.
- East Low Canal widening (soil and rock excavation).
- Calloway & Leisle Road bridge improvements (canal excavation, installing retaining walls, rock dowels, rebar and shotcrete).
- Lind Coulee Siphon radial gate, hoist and motor installation.
- Lind Coulee Wasteway check structure and radial gate installation.
- Installation of O&M road paralleling widened canal sections.
- Prepping, dewatering and constructing of Warden Siphon.

The estimated cost by the US Bureau of Reclamation to build out this necessary infrastructure identified in the list above was \$58.641 million. The East Columbia Basin Irrigation District (ECBID) was the lead contractor (versus subcontracting the work out) for many of these projects, which reduced the final cost of these projects to \$26.107 million. The savings due to their efforts equate to \$32 million (see page 21). The slight overrun on the Lind Coulee radial gate was due to dated technology specified in the gate and hoist design, which was designed to match the original siphon barrel radial gate.

In 2018, ECBID will continue design and construction of the EL 47.5 pumping plant and delivery system with landowner financed bonds. OCR requested \$5 million in the 2017-2019 capital budget request that would be put toward the overall design and /or construction of these largely landowner financed pumping plants and water delivery systems.



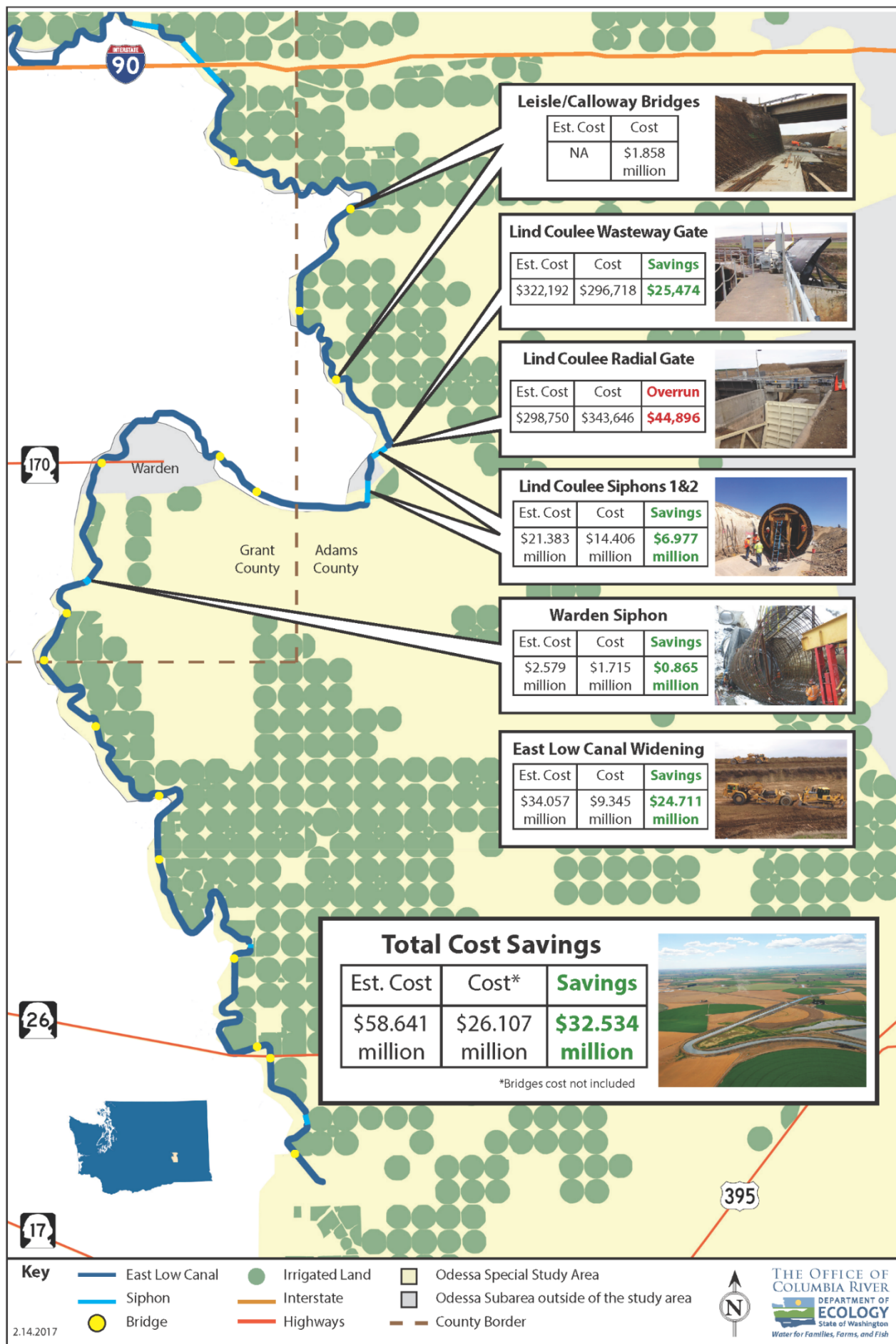
East Low 47.5 Pumping Plant Construction April 2017

Hopefully, ECBID will also continue to work on infrastructure improvements on the East Low Canal during 2018 and 2019. OCR's 2017-2019 capital budget request included an additional \$10 million dollars for continued East Low Canal infrastructure improvements including additional siphons, check structures, radial gates and hoists, and county road bridges.

Odessa Groundwater Replacement Program Cost Savings

Actual costs compared to original estimates

2012-2017



(2) Pending Applications

OCR is investing in a variety of projects to develop water for pending applications including: aquifer storage and recovery (ASR), increasing or modifying existing surface water storage, pump exchanges, and new reservoirs.

Walla Walla

With limited water resources in the Walla Walla Basin, OCR has been able to aid water users by issuing short-term permits totaling 4,496 ac-ft., with water leased from the Port of Walla Walla. There is 265 ac-ft. of water remaining for additional short-term permits. These short-term permits provide water on a temporary basis to seasonal water users, allowing time for these water users to find a permanent water supply.

In some cases these short-term permits are issued to unauthorized (non-compliant) users as a means to attain compliance. All of these short-term permits are set to expire on November 30, 2020 or sooner. Water users who obtain these short-term permits are required to pay an annual cost-recovery fee of \$105 per ac-ft. to offset Ecology's cost to develop this temporary water supply.

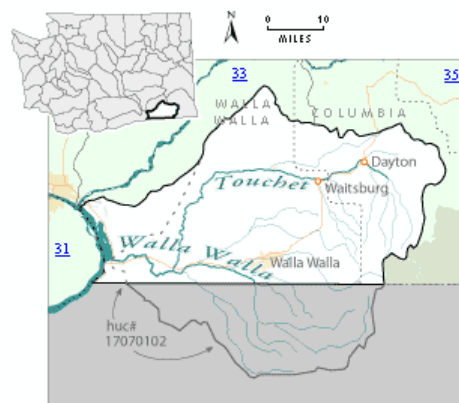
The Walla Walla Watershed Management Partnership (a Washington State based group) along with the Walla Walla Basin Watershed Council (an Oregon State based group) have been working on stream flow enhancement for over a decade. These groups consist of a collaboration of water users, environmental interests, tribes, federal, state and local governments, conservation districts and higher education focused on local water management issues in the Walla Walla River Basin. Their combined efforts created a steering committee to evaluate water management strategies to meet instream flow objectives while preserving existing out-of-stream diversionary requirements.

OCR has invested in these feasibility studies in both the 2013-2015 and 2015-2017 biennia. Operating budget funds from Washington State have been identified for the committee to continue its cooperative bi-state flow study in the Walla Walla River Basin in the 2017-2019 biennium. This bi-state flow study assesses the feasibility of restoring stream flows through several options including: water acquisition, water conservation, groundwater recharge, and replacing Walla Walla River irrigation water with Columbia River water (commonly referred to as a pump exchange).

Lake Roosevelt

OCR and the USBR continue to work closely to release water from Lake Roosevelt, located behind Grand Coulee Dam, as part of the Lake Roosevelt Incremental Storage and Release Program (LRISRP). Through LRISRP, we have been able to permit 40 water rights, totaling 6,080 ac-ft., some of which have been in queue since the 1980s. Permittees who receive water from the LRISRP are required to pay a cost-recovery fee associated with the development of the source water, at a rate of \$35 per ac-ft. per year. This program also provides additional water

Figure 3 Map of Walla Walla Basin



during droughts in an effort to reduce curtailment of junior water right holders and boost instream flows.

Sullivan Lake

Through a Memorandum of Understanding (MOU) between Ecology's Office of Columbia River and the Public Utility District (PUD) of Pend Oreille County, the Pend Oreille County PUD agreed to the retiming release of 14,000 ac-ft. of water from October through December to the drier summer months of June to September. Approximately 9,400 ac-ft. of this water will be available for pending water right applicants. The remaining water will be put to instream uses, benefitting fish and fish habitat. Water from the Sullivan Lake Water Supply Project is limited to applicants located within six northeastern Washington counties of Douglas, Ferry, Lincoln, Okanogan, Stevens, and Pend Oreille.

(3) Reducing Interruptions During Droughts

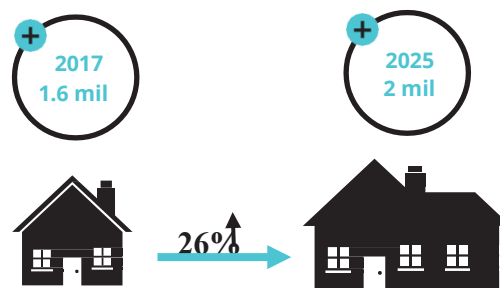
Currently, there are approximately 370 interruptible water right holders on the Columbia River mainstem (totaling about 300,000 ac-ft.) that can face curtailment during future low water supply years. OCR and the USBR continue to work together in defining the process and framework of releasing additional water released during low water years on the Columbia River. This water would be released from Lake Roosevelt according to an adaptive management strategy that will maximize fish benefits, with releases usually occurring from April to August. During drought years, LRISRP will provide 33,000 ac- ft. of water, as a non-interruptible source of water for these interruptible water right holders in an effort to minimize drought impacts to crops. LRISRP will also provide an additional 17,000 ac-ft. of water to aid instream flows.



**Roza Canal Pump House
during the 2015 Drought**

(4) Growing Water Needs

In Eastern Washington, the population is estimated to reach up to 2 million by 2025³. This potential 26% population increase, from 2017 to 2025, will be in competition for future agricultural and instream flow water needs from the already overtaxed water supplies in the Columbia River Basin. By forecasting how supplies will change and what new demands will come to fruition, OCR is working to predict and meet the long-term demand for water supplies in tandem with climate change forecasting. We have published three Columbia River Basin Long-Term Water Supply and Demand Forecast reports, including the most recent 2016 Columbia River Basin Long-Term Water Supply and Demand Forecast, which are available online⁴.



Some of OCR's projects address current needs, while other projects address future water needs. With a statutory mandate to meet future water needs, some of these projects are currently in various stages of feasibility and run the gamut of the types of projects that will help retime the hydrology curve that is predicted to come with climate change. These types of projects include; water conservation, aquifer storage, surface storage, water banking and marketing, water acquisitions, and pump exchanges.

The Switzler Reservoir Storage project, currently in the feasibility stage, is an example of one project that would create water for future needs within the Columbia River Basin. This storage project would be located within the Horse Heaven Hills area and is proposed to hold up to 44,000 ac-ft. of surface water. During times of high flow, surface water from the Columbia River would be pumped into the storage area, and then be released as needed during low flow periods.

Aquifer storage and recovery (ASR) projects continue to be studied throughout the Columbia Basin. Along with ongoing drilling, testing and analysis, our efforts aim to find suitable areas for new underground water storage project locations, which can offer a cost-effective method, compared to above ground surface storage, to store water for later use during drier times.



Switzler Storage Reservoir Site

Ecology has heard from ASR end users that streamlining the permitting process for ASR may help reduce the risk and therefore the cost of implementing ASR projects in the future.

OCR sees value in funding feasibility/exploratory projects and tackling policy and/or permitting issues, as the majority of water supply projects can take a decade or more from idea to implementation and stretch over several fiscal biennia.

³ <https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/2017-growth-management-act-population-projections>

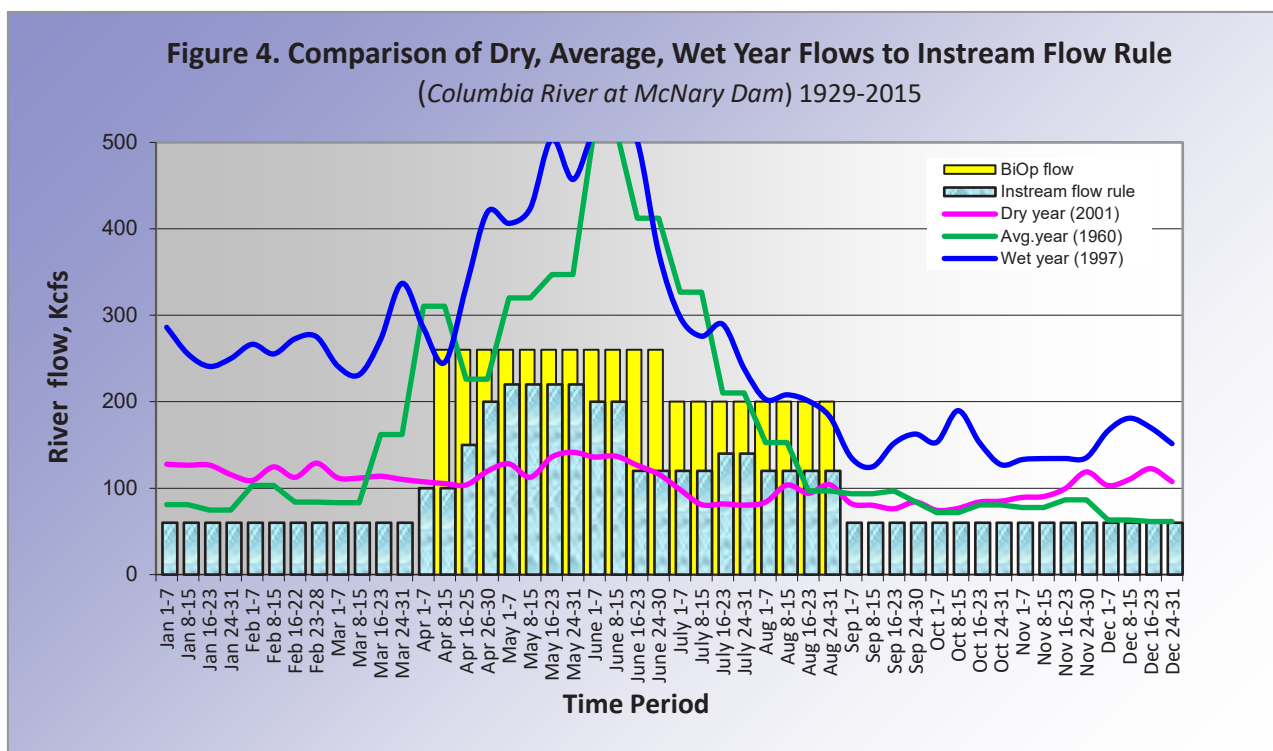
⁴ http://www.ecy.wa.gov/programs/wr/cwp/cr_07legrpt.html

(5) Keeping Our Streams Healthy

Keeping our streams healthy is one of many steps to achieve Ecology's mission to protect, preserve and enhance Washington's land, air and water for current and future generations. Historically, the Columbia River Basin possessed one of the most abundant salmonid runs in the United States⁵. Instream flows can be impacted by climatic changes as well as out-of-stream consumptive use. Unfortunately, if these fish basins continue to be impacted by increasing water temperatures and reduced stream flows, their numbers will likely fall. We are taking steps to rectify this with projects that provide cold water releases and streamflows necessary for salmon migration throughout all stages of life.

OCR projects develop water for both instream and out-of-stream uses. This developed water is divided into thirds with two-thirds for out-of-stream uses and one-third for instream flows. See page 17 for the complete list of OCR and Integrated Plan projects. In our efforts to improve instream flows we take into account both the state's instream flow rule as well as the federal biological opinion (BiOp) flow. Instream flows and BiOp flows are set to meet fish needs and are seen in Figure 4. During dry years the BiOp flow and instream flow rule levels are frequently not met from spring to fall. Even in an average year, the BiOp flow levels are not met during the later summer months.

Water for instream flow enhancement has been achieved through water right acquisition, trust water donations, as well as water conserved through conservation projects. Water conservation projects include upgrading/modernizing irrigation equipment, improving operational efficiencies (e.g. sealing cracks within a canal), and converting open ditch canals to pipe. Over the past decade, OCR projects have provided over 85,000 ac-ft. of water to for instream flows.



⁵ <https://www.nps.gov/lewi/learn/management/upload/Entire%20NHA%20Study%20-web.pdf>

Yakima River Basin Integrated Plan

Through active collaboration between OCR, USBR, and a range of stakeholders, OCR has embarked on an ambitious 30-year effort in solving the water and aquatic resource needs of the Yakima River Basin in south central Washington. In 2013, the state of Washington passed the Yakima River Basin Water Resources Management Act (Chapter 90.38 RCW) and the Yakima River Basin Integrated Water Resource Management Plan was created. The Integrated Plan is a comprehensive approach to water management and habitat enhancement in the Yakima River Basin. It provides opportunities to create and sustain jobs, build a sustainable environment and economy, and can be used as a collaborative model for other regions of the USA. One major accomplishment for the Integrated Plan in 2016 was the completion of the radial gate (pool raise) construction at Cle Elum Dam. This project will allow the Cle Elum reservoir to hold an additional 14,600 ac-ft. of water.

Ongoing Integrated Plan project efforts include:

- Continued shoreline stabilization of Cle Elum Lake.
- Continuing implementation of agriculture conservation.
- Continued construction of Phase II on the Cle Elum Dam fish passage facility.
- Continuing floodplain restoration and habitat enhancement projects.
- Kachess Drought Relief Pumping Plant (which will allow access to 200,000 ac-ft. in inactive storage) and Keechelus Reservoir-to-Kachess Reservoir Conveyance Supplemental Draft EIS, public release is expected before the end of the 2017 calendar year.
- Pneumatic fish transport system testing at Cle Elum Dam.
- Finalizing the City of Yakima Aquifer Storage and Recovery project water right permit.

In 2016, OCR released the first biennial Yakima River Basin Integrated Water Resource Management Plan Implementation Status Report⁶. The 2016 Cost Estimate and Financing Plan for the Yakima River Basin Integrated Water Resource Management Plan⁷ was released in 2017. These reports document cost estimates and financing plans for Integrated Plan projects, as well as project implementation status of ongoing and future projects.



⁶ <https://fortress.wa.gov/ecy/publications/SummaryPages/1612002.html>

⁷ <https://fortress.wa.gov/ecy/publications/SummaryPages/1612011.html>

Water Conservation

OCR continues to seek solutions to prevent excessive water use to ensure that every drop that is diverted from a river used efficiently. Historic unlined open ditch canals contribute to water loss through seepage and evaporation. Where there is antiquated equipment we see opportunities to upgrade to the latest technology with increased water saving measures built in. By upgrading equipment, improving operation efficiencies, and converting open ditch canals to pipe, we have been able to conserve over 49,000 ac-ft. of water since 2006.

Completed projects with water conservation components include:

- Columbia ID Piping – 33,822 ac-ft.
- Peshastin ID Piping – 360 ac-ft.
- Methow Projects – 2,854 ac-ft.
- Conservation Commission Irrigation Efficiency – 3,476 ac-ft.
- Barker Ranch – 6,436 ac-ft.
- Integrated Plan Projects – 2,099 ac-ft.

The Icicle Creek Water Resource Management Strategy workgroup and the Yakima Basin Integrated Plan are both currently working on projects that promote opportunities to further water conservation measures through improved infrastructure for optimizing and automating water releases, pump exchanges and improving irrigation efficiencies.

All water conserved through these combined efforts will benefit both instream and out-of-stream uses. With climatic changes and an overall growing need for water in mind, we will continue to seek innovative ways to conserve water with each project we fund.



**Quincy Columbia Basin Irrigation District
Water Conservation Piping Project Photos**

Icicle Creek Water Resource Management Strategy

Purpose

The Icicle Work Group¹ (IWG) is made up of a diverse set of stakeholders representing local, state and federal agencies, tribes, irrigation and agricultural interests and environmental organizations. The purpose of this work group is to develop a comprehensive Icicle Creek Water Resource Management Strategy through a collaborative process that will achieve diverse benefits defined by all of the Guiding Principles¹. The vision of IWG is to find collaborative solutions for water management within the Icicle Creek drainage to provide a suite of balanced benefits for existing and new domestic and agricultural uses, non-consumptive uses, fish, wildlife, and habitat while protecting treaty and non-treaty fishing interests. The workgroup will use best available science to identify and support water management solutions that lead to implementation of high-priority water resource projects within the Icicle Creek drainage.

Icicle Work Group 2017 Accomplishments

- Established an array of project alternatives and prepared a draft Programmatic Environmental Impact Statement (EIS).
- Partnered with UW Climate Impacts Group to further understand and plan for climate change impacts to the Icicle Creek watershed.
- Conducted outreach and tours with agency partners and IWG stakeholders.
- Established potential benefits to instream flows with 2017 Pilot Release Flow Augmentation Project.
- Scoped and delimited climatologic and hydrologic data needs for future planning.
- Continued feasibility analysis on the Cascade Orchard Irrigation Company pump exchange project.
- Provided group-level feedback to USFWS on the Leavenworth National Fish Hatchery US v Oregon Draft Implementation Plan.

Guiding Principles

1. Streamflow that provides passage and healthy habitat, serves channel formation function, meets aesthetic and water quality objectives, and is resilient to climate change.
2. Sustainable hatchery that provides healthy fish in adequate numbers, is resource efficient, significantly reduces phosphorus loading, has appropriately screened diversion(s), and does not impede fish passage.
3. Tribal Treaty and federally-protected fishing/harvest rights are met at all times.
4. Provide additional water to meet municipal and domestic demand.
5. Improved agricultural reliability that is operational, is flexible, decreases risk of drought impacts, and is economically sustainable.
6. Improves ecosystem health including protection and enhancement of aquatic and terrestrial habitat.
7. Comply with state and federal law.
8. Protect Non-Treaty harvest.
9. Comply with the Wilderness Act of 1964, the Alpine Lakes Wilderness Act of 1976, and the Alpine Lakes Wilderness Management Plan.

Conclusion

Since its creation in 2006, OCR has evolved as a program. Through adaptive project management approaches and strategies that maximize local values, we have been able to minimize project expenses and resource use to achieve the desired water solutions within the Columbia Basin. We aim for water supply solutions that are both multifunctional and integrated with the other needs and activities, currently solving complex water resources issues within the basin. Our project progress and evolution is a great model for other water supply development and conservation programs.

OCR has been hard at work over the past decade solving critical water supply needs in Eastern Washington. And due to these efforts, we have nearly expended our original \$200 million bonding authority. This places us at a critical juncture on securing a financial future and completing long term projects that were the foundation of OCR's creation. OCR requested a \$35 million appropriation in Ecology's 2018 supplemental budget request for the 2017-2019 biennium, which would allow OCR to see ongoing projects to completion. As previously noted in this report, the 2017-2019 biennial capital budget has not been adopted by the Legislature.

In comparison to other programs within the Department of Ecology, OCR consists of a much smaller number of staff dedicated to managing water supply development projects. Tasks are divided among us and include contracting and project management, permitting water supplies, ensuring water use compliance, assisting with environmental review, managing trust water rights and public outreach. Even with limited staff, we have been able to efficiently reduce our backlog of permit applications by issuing 169 application decisions and approximately 90% water usage on the Columbia River is metered.

As of today, OCR has been able to develop over 410,000 ac-ft. of water for both instream and out-of-stream uses within the Columbia Basin. In addition, another 370,000 ac-ft. of water



development is near completion, within a 3-5 year horizon. Our long-term projects are estimated to develop up to 475,000 ac-ft. of water, within a 10-20 year timeline. We aim to develop over 1 million ac-ft.⁸ of water by 2025, pending environmental reviews and future funding. Looking forward, we will continue our efforts with the Icicle Creek Water Resource Management Strategy, Odessa Groundwater Replacement Program, aquifer storage and recovery studies, and Walla Walla Instream flow enhancement.

Recent Washington State Supreme Court cases involving water resource disputes have caused uncertainty about the rules that apply to issuing new water rights, including permits issued from the Columbia River and connected groundwater bodies. In response to this, Ecology introduced agency request legislation during the 2017 legislative session to amend Chapter 90.90 RCW to clearly state that the Columbia River rules WAC 173-563 and WAC 173-531A are consistent with legislative intent based on the framework that has been in place since 1997. Through these rules, Ecology follows a consultation process with local, state, federal, and tribal, governments, water users, environmental groups and other stakeholders to ensure that the health of the river and other natural resources are not impacted as a result of approving a new water right application on the Columbia River mainstem. OCR remains interested in this legislation that will provide clarity and certainty around Columbia River water management and permitting requirements by affirming the state's existing authority to manage water consistent with the rules that have been in place for the past 20 years.

As population grows, the climate changes, and regulatory flow requirements increase, managing these increasing and competing demands for freshwater resources is a challenge. Our investments in water conservation and water supply development projects not only provide water for pending and new water right applications, but also aid in hydrating the Odessa subarea, help to reduce interruptions to junior water right holders during droughts, and aid streamflow water levels throughout Eastern Washington. OCR is dedicated to continue delivering integrated water supply solutions for families, farms and fish and will continue to aggressively pursue water supply development benefiting both instream and out-of- stream water uses.



**Columbia River facing south from the
Ginkgo Petrified Forest State Park**

⁸ Combined water supply through OCR and the Yakima Basin Integrated Plan projects.