2016 Columbia River Basin
WATER SUPPLY INVENTORY REPORT

Submitted to the Washington State Legislature Pursuant to RCW 90.90.040

DEPARTMENT OF ECOLOGY
State of Washington

THE OFFICE OF COLUMBIA RIVER
Water for Families, Farms, and Fish

July 2017 Publication No. 16-12-007

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

July 7, 2017

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

RE: Columbia River Basin Water Supply Inventory Report

The Office of Columbia River is pleased to present the 2016 *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://fortress.wa.gov/ecy/publications/SummaryPages/1612007.html.

This report complements a second report, the *2016 Columbia Basin Long-term Water Supply and Demand Forecast*, which estimates the amount of water needed to meet future Eastern Washington water demands.

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

2016 Report to the Legislature

DEPARTMENT OF
ECOLOGY
State of Washington

Columbia River Basin Water Supply Inventory Report

submitted by The Office of Columbia River

This Report is available on the Department of Ecology website at:
https://fortress.wa.gov/ecy/publications/SummaryPages/1612007.html

For Additional Copies of this publication, please refer
to Publication No. 16-12-007 and contact:

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This 2016 Columbia River Basin Water Supply Inventory Report
was prepared by The Office of Columbia River

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Cover photo: Odessa Groundwater Replacement Program – East Low Canal and Adams County Bridge
(bridge needing reconstruction/upgrades subsequent to East Low Canal widening)

Columbia River Policy Advisory Group

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Jim Brown, Washington State Dept. of Fish & Wildlife
Gregg Carrington, Chelan County PUD
Gary Chandler, Association of Washington Business
Kathleen Collins, Water Policy Alliance
Jon Culp, Washington State Conservation Commission
Carol Evans, Spokane Tribe
Jim Fredericks, U.S. Army Corps of Engineers
Holly Harwood, Bonneville Power Administration
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Gary Passmore, The Confederated Tribes of the Colville Reservation
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Phil Rigdon, Confederated Tribes of the Yakama Nation
Mike Schwisow, Columbia Basin Development League
Craig Simpson, East Columbia Basin Irrigation District
Rich Stevens, Grant County Commissioner
John Stuhlmiller, Washington State Farm Bureau
Jon Unger, Oregon Water Resources Department
N. Kathryn Brigham, The Confederated Tribes of the Umatilla Indian Reservation
Matt Watkins, City of Pasco
Dawn Wiedmeier, Bureau of Reclamation

Columbia River Basin

(260,452 square miles)

Scale 1:6,500,000

Miles

0 50 100

WASHINGTON STATE DEPARTMENT OF ECOLOGY

GIS Technical Services

12/16/02

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Hot air balloons over the Yakima River
"Photo: Brian Dewey, https://www.flickr.com/photos/bdewey/3961805524/ cc https://creativecommons.org/licenses/by-nc/2.0/"

Introduction

In 2006 the Washington State Legislature evaluated water supply needs throughout the Columbia River Basin and found that the development of new water supplies and water resource management to be the top priority with the passage of Chapter 90.90 RCW. Every year the Office of Columbia River (OCR) prepares a Water Supply Inventory Report (RCW 90.90.040(1)) identifying and reviewing current OCR water development efforts for Eastern Washington, as mandated under RCW 90.90.040(2).

On this 10 year anniversary of the passage of Chapter 90.90 RCW, and through OCR's diligent work with the aid of federal, state, and local entities; over 410,000 acre-feet (ac-ft.) of water for both in-stream and out-of-stream uses have been developed through funded projects. Within the next 3 years an additional 337,000 ac-ft. or more water will be made available through near-term water supply development projects.

These integrated water solutions aid farmers and help to support a $12 billion agricultural and food processing industry, growing communities, protect aquifer levels, and supporting endangered fish in key basins along 80 miles of river. With water availability concerns amplified due to climatic changes, highlighted by recent droughts throughout the Columbia River Basin, anticipating future water supply needs and securing water for drought relief and interruptible water users is of importance not only for agriculture and industry, but for towns like Twisp and Bridgeport, and cities such as White Salmon, Kennewick, and Pasco. In December 2016, OCR released its third Columbia River Basin Long-Term Water Supply and Demand Forecast, containing more detailed information on long-term water supply needs, which is available online at: *https://fortress.wa.gov/ecy/publications/SummaryPages/1612001.html*

RCW 90.90.040(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.

RCW 90.90.040(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.

In 2006, the Legislature tasked the Washington Department of Ecology to aggressively seek out new water supplies for both instream and out-of-stream uses.

Development vs. Delivery

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

The pursuit of developing new water supplies, since OCR's inception, has given insight that shapes the way funds are allocated and how projects are prioritized under RCW 90.90.020 directives. Consistent with these statutory directives, OCR is developing a portfolio of diverse projects including modification of existing storage, new storage facilities, conservation piping and canal lining, pump exchanges, aquifer storage and recovery, and water right acquisitions.

In line with RCW 90.90.020, the OCR directive is generally considered to be complete when developed water is physically and legally available for instream and out-of-stream allocation. This includes the finalization of the project development steps such as: project conceptualization, appraisal, feasibility study, pre-design, design, environmental review, stakeholder outreach, construction, and permitting to authorize the source of water.
Once a water supply is developed it then needs to be delivered to the end user. This may be simple for instream allocations, where few additional steps, if any, need to occur for delivery. However, for out-of-stream allocations, water delivery occurs when the project beneficiary physically and legally puts the developed water supply to beneficial use. Typically, the cost associated with out-of-stream water delivery is the responsibility of the project beneficiary. Delivery costs can include putting in a domestic well, building a home, or putting in irrigation infrastructure such as laterals, pump stations, and sprinkler systems.

The Odessa Groundwater Replacement Program (OGWRP) is one example of a water supply development project. The expanded Columbia Basin Project infrastructure will provide replacement surface water for up to 90,000 acres currently irrigated by groundwater from the declining Odessa subarea aquifer. Development of OGWRP consists of project identification, appraisal studies, feasibility studies, environmental review and permitting, construction of water infrastructure to the Columbia Basin irrigation districts, and mitigation. The estimated development costs for full implementation are approximately $175 million and water will be developed once it is available to the irrigation districts via the Columbia Basin Project main canals. Water delivery under OGWRP consists of building infrastructure from the Columbia Basin Project main canals to individual farms. In this case, the irrigation districts will design and build the water delivery systems (aka pumping plants and mainlines), that are funded by the landowners. The estimated delivery costs is approximately $198 million with full build out and delivery to all 90,000 acres expected by 2024.

Office of Columbia River

Water Supply Development - 2016

Developed
(2006-2016)

- Barker Ranch: *6,436 ac-ft*
- Columbia Basin ID Piping:33,*822 ac-ft*
- Conservation Commission Irrigation Efficiency: *3,476 ac-ft*
- Donations: *13,060 ac-ft*
- 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: *2854 ac-ft*
- Odessa Subarea: *164,000 ac-ft*
- Peshastin ID Piping: *360 ac-ft*
- Potholes Feed Route *(conveyance)*
- Pine Creek Acquisition: *900 ac-ft*
- Sullivan Lake: *14,000 ac-ft*
- Port of Walla Walla Leases: *4,761 ac-ft*
- Weber Siphon *(conveyance)*
- Yakima City ASR: *10,000 ac-ft*

Near-Term Development
(2016-2020)

- 508.14 Rule Change: *TBD*
- Cle Elum Pool Raise: *14,600 ac-ft*
- Columbia Basin ID Piping: *5000 ac-ft*
- Kachess Drought Relief Pumping Plant: *200,000 ac-ft*
- East Low Canal Widening: *(conveyance)*
- Icicle Creek Water Management Strategy Projects: *20,000+ ac-ft*
- Kennewick ASR: *318+ ac-ft*
- Pasco Municipal Supply Improvements: *5,000 ac-ft*
- SVID: *7,815 ac-ft*
- White Salmon ASR: *145 ac-ft*
- Yakima Basin Enhanced Conservation: *85,000 ac-ft*
- Yakima Basin Shallow Aquifer Recharge: *TBD*

Long-Term Development
(2020+)

- Regional Aquifer Storage and Recover: TBD
- Conservation Commission Retiming: *TBD*
- Goose Lake & Nine Mile Flat Storage: *TBD*
- Horse Heaven Hills: *105,000 ac-ft*
- Lincoln CD Passive Rehydration: *TBD*
- Mill Creek Storage: *2,000 to 11,000 ac-ft*
- Peshastin Pump Exchange: *TBD*
- Spokane-Rathdrum ASR: *105,000 ac-ft*
- Walla Walla Flow Enhancement: *30,000 ac-ft*
- Yakima Basin Integrated Plan Projects: *226,000 ac-ft*

DEPARTMENT OF ECOLOGY
State of Washington

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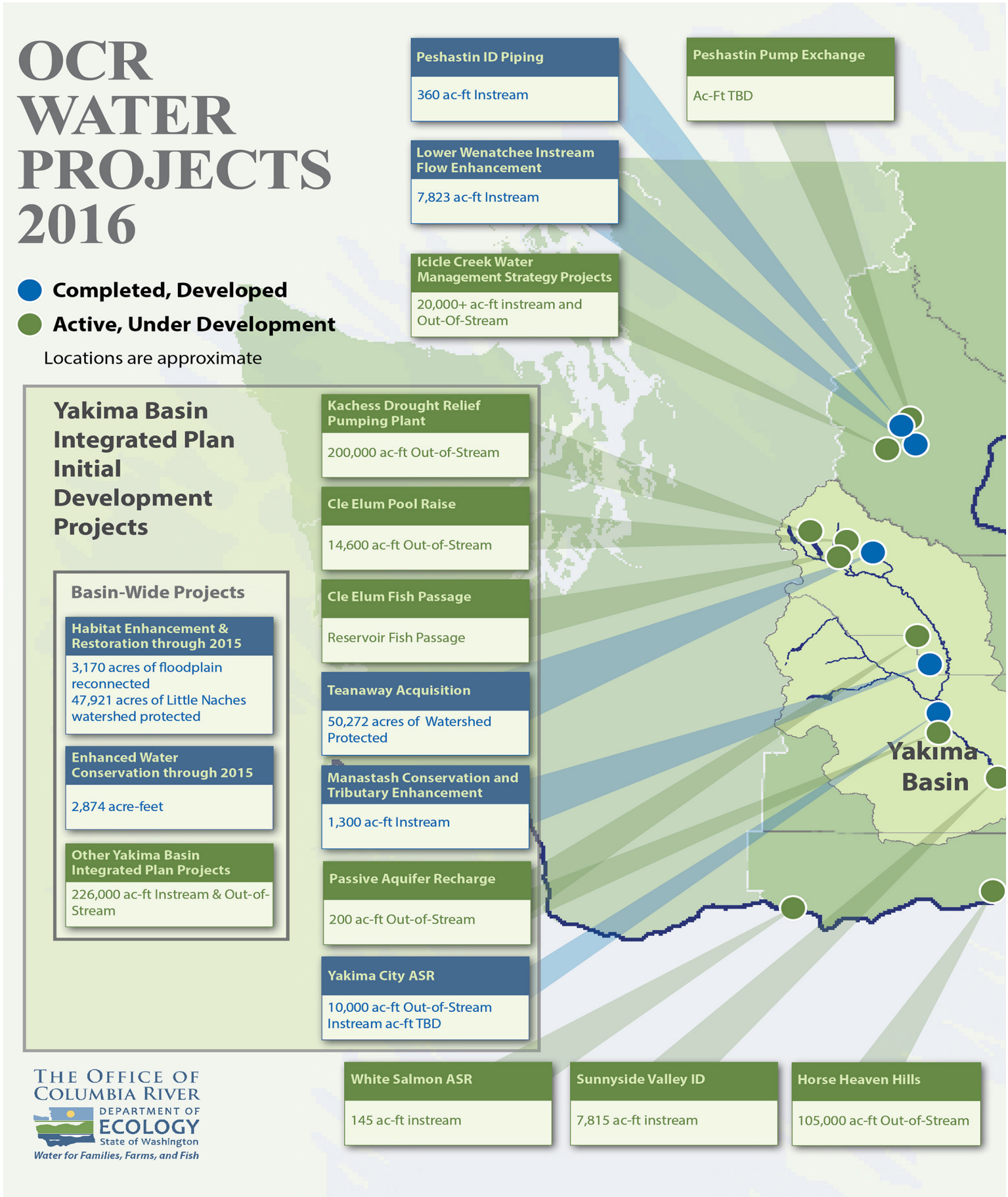
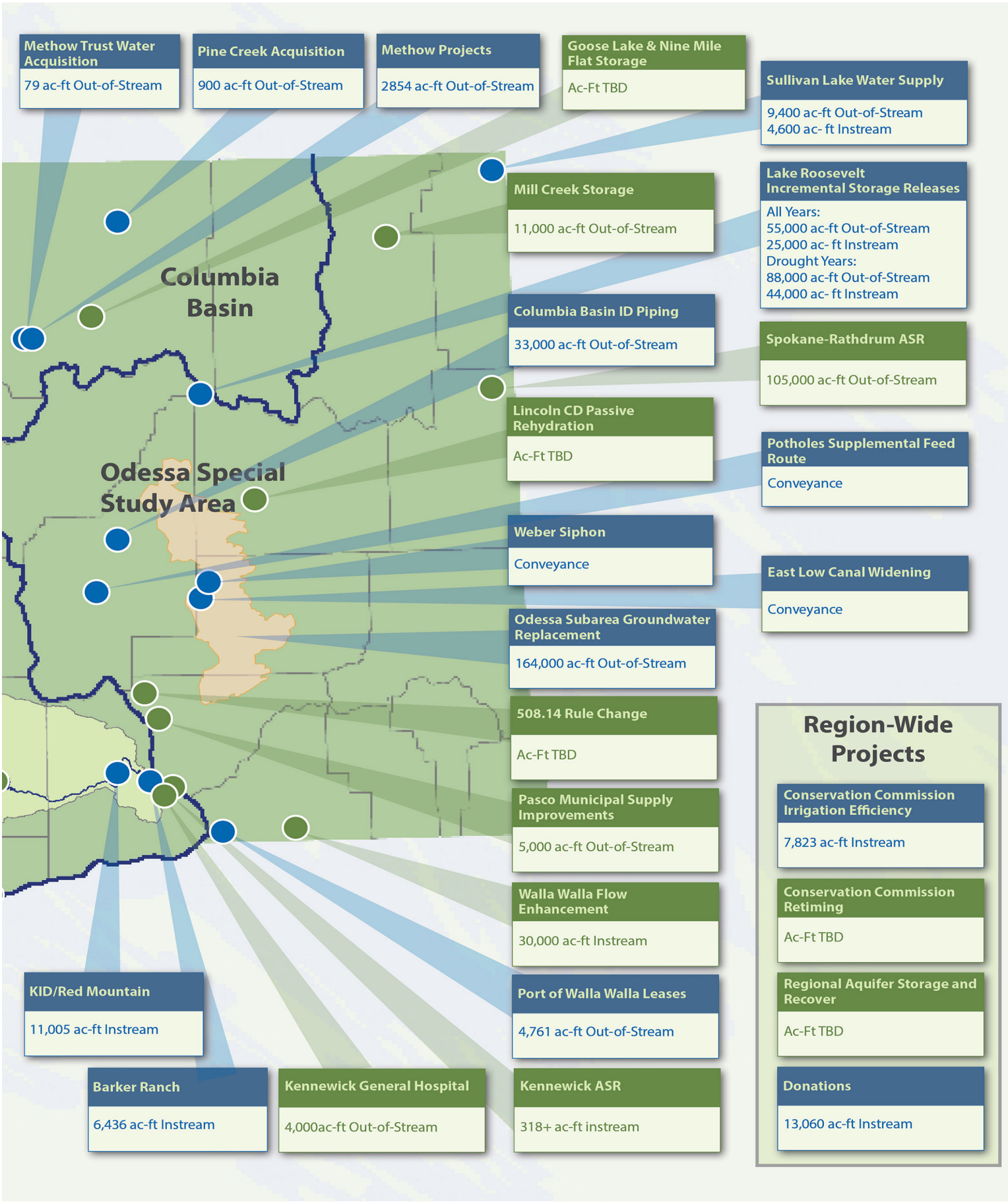
Rev. 08.19.16

The first bucket shows the total amount of water currently developed through new projects for out-of-stream and instream uses. The second bucket shows the amount of water expected to be developed within one to three years. The third bucket shows the amount of water expected to be developed beginning three or more years from now. Long term projects are either under study or awaiting federal or other approval. The results will determine if these projects move forward.

OCR WATER PROJECTS 2016

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Methow Projects
2854 ac-ft Out-of-Stream
Goose Lake & Nine Mile Flat Storage
Ac-Ft TBD
Sullivan Lake Water Supply
9,400 ac-ft Out-of-Stream
4,600 ac- ft Instream
Columbia Basin
Mill Creek Storage
11,000 ac-ft Out-of-Stream
Lake Roosevelt Incremental Storage Releases
All Years:
55,000 ac-ft Out-of-Stream
25,000 ac- ft Instream
Drought Years:
88,000 ac-ft Out-of-Stream
44,000 ac- ft Instream
Columbia Basin ID Piping
33,000 ac-ft Out-of-Stream
Spokane-Rathdrum ASR
105,000 ac-ft Out-of-Stream
Lincoln CD Passive Rehydration
Ac-Ft TBD
Potholes Supplemental Feed Route
Conveyance
Odessa Special Study Area
Weber Siphon
Conveyance
East Low Canal Widening
Conveyance
Odessa Subarea Groundwater Replacement
164,000 ac-ft Out-of-Stream
508.14 Rule Change
Ac-Ft TBD
Region-Wide Projects
Conservation Commission Irrigation Efficiency
7,823 ac-ft Instream
Pasco Municipal Supply Improvements
5,000 ac-ft Out-of-Stream
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4,000ac-ft Out-of-Stream
Kennewick ASR
318+ ac-ft instream

Project Updates and Achievements

Odessa Subarea Groundwater Replacement Program (OGWRP)

"Today beautifully illustrates how together we can achieve water solutions for farmers and growing communities, and benefit the natural environment. Through these siphons we will deliver water to farmers who need it; to support a $1.5 billion agricultural industry; to put good food on our tables, and protect a precious aquifer that has dropped by as much as 200 feet since 1980."

Maia Bellon, Ecology Director, on the Lind Coulee Siphons

The Odessa subarea aquifer has been declining yearly since the 1980s, with as much as 200 ft. declines in some wells. If declines continue at this rate, approximately 50 percent of the wells in this area will cease production by 2020. Finding secure and reliable alternative water supplies to declining groundwater is vital to the local, regional and state economies. In 2006, OCR teamed up with the Bureau of Reclamation and East Columbia Basin Irrigation District to investigate solutions to the problem.

The Odessa Subarea Special Study Final Environmental Impact Statement (EIS) was released in 2014, with the EIS providing a "preferred alternative," which would supply 164,000 ac-ft. of surface water from Banks Lake to irrigate 70,000 acres of land currently irrigated with groundwater. Additionally, water made available through the Lake Roosevelt Incremental Storage Release Project and the Columbia Basin Irrigation District's Coordinated Conservation Program will provide water to an additional 20,000 acres. In total, OCR plans to replace 90,000 acres of land irrigated with groundwater to Columbia Basin Project surface water.

Construction at East Low Canal

Progress on infrastructure improvements in 2016 included: the completion of two Lind Coulee Siphon barrels, sealing and testing the Lind Coulee siphons, backfilling and reseeding over the siphons; continued East Low Canal widening (soil and rock excavation); Calloway Road bridge improvements (canal excavation, installing retaining walls, rock dowels, rebar and shotcrete); Lind Coulee 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 the site and dewatering the area surrounding Warden siphon; and engineering design the East Low (EL) 47.5 delivery system. Additionally, the Potholes Supplemental feedroute progressed in 2016 with test flows being diverted down Crab Creek from January to August 2016 and Frenchman Hills Wasteway from March to May 2016.

In addition to the above-referenced improvements, the increment of water put to use under OGWRP has slightly expanded this year, replacing over 3,600 acres of groundwater irrigation with direct canal-side pumping of Columbia Basin Project surface water from East Low Canal. This direct canal-side pumping acreage is expected to increase slightly in 2017 as water service contracts are finalized between the district and landowners. The first pumping plant delivery system (aka EL 47.5) construction began in November 2016 with a goal of being operational by the 2018 irrigation season. EL 47.5 system will replace an additional 8,200 acres of declining Odessa aquifer irrigated lands.

Yakima River Basin Integrated Plan

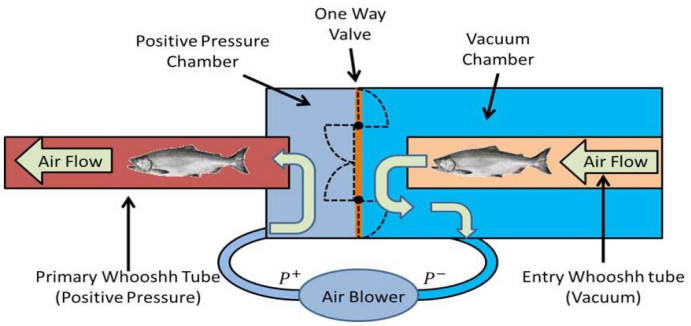
With the passage of the Yakima River Basin Water Resources Management Act (Chapter 90.38 RCW) in 2013, the State of Washington, through the OCR, embarked on an ambitious 30-year effort encompassing an unprecedented breadth of projects and programs designed to solve the water and aquatic resource needs of the Yakima River Basin in south central Washington. OCR has continued its collaboration with the Bureau of Reclamation and a range of stakeholders in implementing the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan).

Unfortunately, the federal bipartisan legislation (Senate Bill 1694 – Yakima River Basin Water Enhancement Project Phase III) introduced by Senator Maria Cantwell (WA) and Senator Lisa Murkowski (AK) in 2015 and attached to the Energy Bill, ultimately did not make it out of a House and Senate Conference Committee before the recess of the 114th Congress in December 2016. Congressmen Reichert and Newhouse have pledged to work with Senators Cantwell and Murkowski to pass the Yakima River Basin Water Enhancement Project Phase III Act into law during the next session of Congress.

Recently, the Yakama Nation in partnership with 12 other entities to successfully secure a Regional Conservation Partnership Program Grant (RCPP) for $7.5 million. The US Department of Agriculture and Natural Resources Conservation Service RCPP grant supports restoration of fish habitat, riparian vegetation, fish access, and grazing management in the Yakima River Basin from "Toppenish to Teanaway". Additionally, the grant will also support irrigation efficiency projects and conservation stewardship practices.

Over the last three years, the Integrated Plan workgroup has advanced a wide range of projects from planning, design, permitting, funding and construction as part of the first 10 years of project development (10-year Initial Development Phase). Project efforts in 2016 include: continued environmental review for the floating Kachess Drought Relief Pumping Plant (KDRPP) and the Keechelus to Kachess Reservoir Conveyance (K to K) projects, beginning construction of Phase II on the Cle Elum Dam fish passage facility, completing the radial gate (pool raise) construction on Cle Elum Dam, testing *Whooshh technology to transport fish, finalizing the City of Yakima Aquifer Storage and Recovery project water right permit, and continuing to implement agriculture conservation and habitat enhancement projects.

In 2016, OCR released its biennial Yakima River Basin Integrated Water Resource Management Plan Implementation Status Report, which is available online at: *https://fortress.wa.gov/ecy/publications/SummaryPages/1612002.html*, and the 2016 Cost Estimate and Financing Plan for the Yakima River Basin Integrated Water Resource Management Plan, which also was released in April 2017 is located online at: *https://fortress.wa.gov/ecy/publications/SummaryPages/1612011.html*

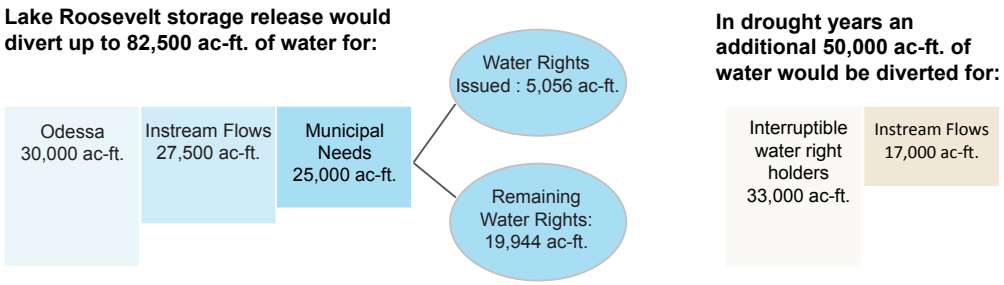


Whooshh Fish Transport Tube

Lake Roosevelt Incremental Storage Releases Program

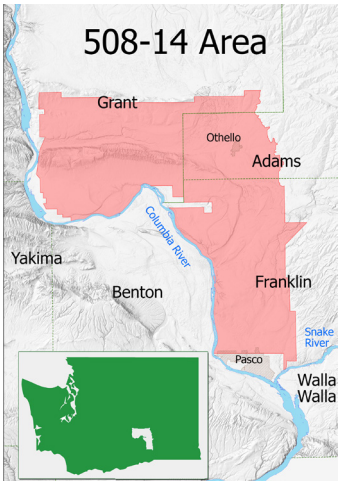
OCR continues to process applications for municipal, domestic, and industrial water using the 25,000 ac-ft. made available through this program. As of December 2016, we have permitted 37 water rights totaling 5,746 ac-ft. per year, and have contacted the remaining 10 pending applicants eligible for water under this program, totaling up to approximately 12,000 ac-ft. per year. OCR is now able to begin processing new applications that qualify for this program, in real time as they are submitted. Recipients of water under this program are required to pay cost- recovery fees associated with the development of the source at a rate of $35 per ac-ft. per year.

Additionally, this program designates 30,000 ac-ft. to replace the declining groundwater in the Odessa Subarea and 27,500 ac-ft. for instream flows. In drought years, an additional 50,000 ac-ft. is available, with one-third (17,000 ac-ft.) for instream flow and two-thirds (33,000 ac- ft.) for interruptible water users.



508-14 Rule Revision Project

An area northwest of Pasco, known as the Pasco Basin, contains groundwater that is under both state and federal regulation. The goal of a proposed amendment to Chapter 508-14 WAC is to clearly define how much groundwater may be allocated by the state and how much is reserved for the federal Columbia Basin. This will allow for new groundwater rights to be issued in portions of Franklin, Adams and Grant Counties from the Pasco Basin. Ecology partnered with Reclamation and USGS to develop the necessary groundwater and surface water hydrologic model for the 508-14 area. This modeling effort is complete and the USGS finalized the results in a report: "Simulation of Groundwater Storage Changes in the Eastern Pasco Basin" (March 2016). Based on the USGS groundwater study, we predict that up to 9,000 ac-ft. per year might be available for new agriculture water rights.



In January 2016, Ecology withdrew the long standing proposed amended 508-14 rule statement of inquiry. The 508-14 rule amendment process filed in November 2010 had been open for too long and potentially outdated with the 2016 USGS scientific data becoming available. OCR is currently in communication with the Bureau of Reclamation along with other interested parties on the next steps and evaluating framework options to amend the rule for administering artificially stored groundwater in the 508-14 area.

Port of Walla Walla Lease Program

OCR has issued five short-term permits totaling 4,496 ac-ft. of water leased from the Port of Walla Walla. Currently, there is 265 ac-ft. of water still available for short-term permits. These short-term permits provide water on a temporary basis, allowing time for water users to find a permanent water supply and are issued to seasonal water users. In some cases, these short-term permits are issued to unauthorized users as a means to attain temporary compliance. All water users under 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. All of these short-term permits are set to expire on December 31, 2020 or sooner.

Sullivan Lake Water Supply Project

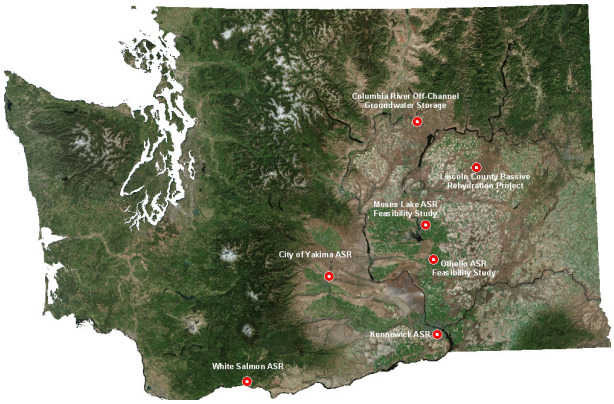
This water supply project makes 14,000 ac-ft. of water available for both instream use in Sullivan Creek and the Columbia River, and out-of-stream uses in six northeastern Washington counties. As directed by the legislature, 4,666 ac-ft. of water is available for municipal, domestic, and industrial needs; 4,667 ac-ft. for irrigation needs; and 4,667 ac-ft. for instream use. Construction activities are complete that now allow the PUD to release the entire 14,000 ac-ft. through a cold water discharge facility. Pend Oreille County Public Utility District, OCR's partner in this project, has released all of the increments of water, which are being placed into the State Trust Water Program to offset new out-of-stream uses.

As of December 2016, we have permitted 2 pending applications from this water supply, with one for irrigation use and one for municipal use. Processing pending applications, which qualify for this water supply, will continue into 2017. The quantity of irrigation water requested by pending applications far exceeds the water supply available for new irrigation permits. Recipients are required to pay a one-time cost-recovery fee of $1,500 per ac-ft. Payment plans are available.

Sullivan Lake

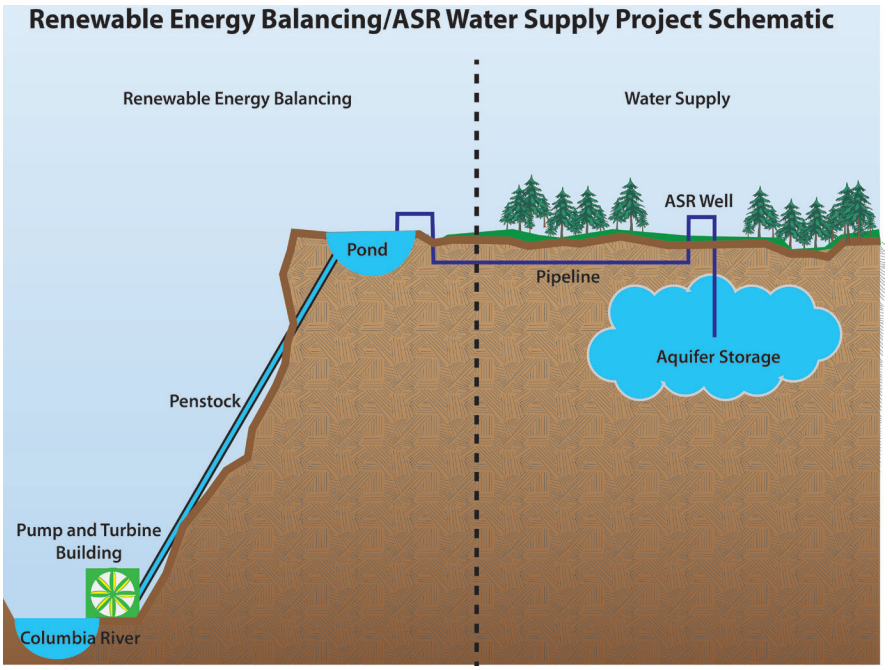
Sullivan Creek

Aquifer Storage and Recovery Exploration Projects



The study of aquifer storage and recovery (ASR) sites throughout the Columbia Basin continues with funding from OCR. Drilling, testing and analysis is ongoing to find suitable areas to locate new underground water storage. Preferred sites will have minimal environmental impacts, low capital costs and will not impair existing water rights. Additionally, these projects offer a cost-effective method to mitigate the impacts of climate change by capturing and storing water when it is available, for use during drier times of the year. Similar to above ground storage, if ASR water supply is developed, two-thirds of the water will be for out-of-stream uses and one-third for instream benefits. OCR continues to lead the way in ASR project development, currently partnering and investing in ASR projects with the cities of Yakima, Kennewick, White Salmon and Othello. Note, the City of Yakima hit a milestone this year, with the water right permit being finalized for their ASR facility in January 2017.

Additionally, OCR is investing in subsurface exploration efforts to evaluate the potential for large-scale ASR in eastern Washington. The Columbia River Off-Channel Aquifer Storage project located in northern Douglas County is one example. Preliminary study results indicate tens of thousands of ac-ft. of underground storage capacity is possible in this area. Ongoing studies and a feasibility assessment for this project will be complete by the end of the 2015-2017 biennium.



The diagram left depicts the potential to integrate ASR with renewable energy balancing facilities, which will maximize benefits of not only the ASR facility, but also the water users, the environment, and the energy grid. Realizing this kind of multi-sector vision will require significant effort including a business plan(s) for interagency and public-private partnership, multiple state agency coordination, and long-term funding strategies.

Switzler Reservoir Storage Project

The Switzler Reservoir Storage project aims to create approximately 44,000 ac-ft. of surface water storage within the Horse Heaven Hills area of WRIA 31 (above McNary Dam). Elements of this project include environmental review, engineering design and construction of an embankment dam to impound water within Switzler Canyon, piped conveyance between the reservoir and the Columbia River for both pumping water into and releasing water from storage, a Columbia River pumping station, and environmental improvements in Switzler Canyon downstream of the dam. Upon completion of the above noted infrastructure, water would be pumped to the reservoir from the Columbia River annually during high flow periods and conveyed back to the Columbia River during low flow periods. The release of the 44,000 ac-ft. from storage could offset any combination of new irrigation uses, new municipal and domestic uses, instream flows, and interruptible users during a drought.

Icicle Creek Water Resource Management Strategy

OCR and Chelan County co-convened a workgroup in December 2012 of interested stakeholders with the intent of finding collaborative solutions to resolve chronic water supply issues facing the Icicle Creek Watershed. The comprehensive package of projects must meet the workgroup's guiding principles to achieve multiple instream and out-of-stream benefits with investment in conservation, storage restoration and reoperation, pump exchange water marketing, and habitat and fish passage screening projects. Projects are currently being evaluated for feasibility.

Ecology and Chelan County are SEPA co-leads on environmental review of the Icicle Strategy. The co-leads issued a SEPA Determination of Significance (DNS) in February 2016. A SEPA scoping open house was held in April of 2016. The programmatic environmental impact statement (PEIS) launched in June 2016 with a goal of having a draft completed in the summer of 2017. A variety of project alternatives are being considered in the PEIS, however regardless of how the Icicle Strategy is implemented (via storage, conservation, groundwater augmentation, automation, etc) to achieve 100 cfs flow in normal water years and 60 cubic feet per second (cfs) during low flow years, nearly 90% of water stays instream for fish habitat and fish restoration.

Following on the heels of the 2015 drought, when flows in Icicle Creek reached a low of 16.4 cfs, the Icicle-Peshastin Irrigation District (IPID) conducted a flow augmentation pilot study in 2016 in coordination with district reservoir maintenance activities. Additionally, the workgroup convened an instream flow subcommittee of biologist from state, federal, local and tribes to advise on the timing an quantity of IPID reservoir releases for instream flow benefits in Icicle Creek and its tributaries.

Supply Inventory

OCR's grant program focuses on projects that will deliver permittable water to the Columbia River or one of its tributaries. Permittable water is water that is stored, retimed or conserved through farm management practices such as crop changes or fallowing. OCR screens the projects in its inventory and meets with project proponents to determine grant eligibility. The inventory includes projects whose feasibility is untested, lack project proponents and where adequate funding has not been secured. Projects are prioritized to balance where supply is available with the demands for the five legislative directives: Odessa Subarea; Pending Water Right Applications; Drought Relief; New Municipal, Domestic, Industrial and Irrigation; and Instream Flows. Since the $200 million dollar funding appropriated is relatively small compared to the total costs to develop projects, projects that leverage other federal, state and local funding sources are favored. This approach maximizes the public return on investment.

As stated in the 2014 and 2015 reports, OCR is eliminating projects from our inventory lists that do not seem to provide attainable benefits in reaching our statutory goals at this time. We will continue to refine the list as further information on project feasibility is acquired. To view our current inventory of projects, please refer to the expanded supply inventory spreadsheet located online at: *https://fortress.wa.gov/ecy/publications/SummaryPages/1512006.html*

Bond vs. Pay-as-you-go

The Washington State Legislature convened an interim task force on Washington Waters in 2015 to quantify the level of funding needed for water supply, flood control and storm water run-off through fiscal year 2026 and develop funding options that address all three water priorities. The task force prepared a report for consideration during the 2016 legislative session. 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 run-off, 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. Please refer to the OFM water infrastructure investment analysis located online at: *http://www.ofm.wa.gov/reports/WaterInfrastructureReport.pdf*.

Capital projects such as building construction, water infrastructure, land acquisition and transportation projects are typically funded with a combination of cash balances, revenues received over time or with proceeds of long-term financing. For these projects, most long-term financing by the State is provided through general obligation bonds which pledge its 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. With each borrowing, the state commits to make regular and approximately equal payments over the term to repay the debt, which includes the principal amount borrowed plus some amount of interest. The alternative to debt financing is to cash fund capital expenditures by relying on appropriations of revenues received over time, or "pay- as-you-go". Projects that require more than one biennium to be completed rely on a system of reappropriations to carry forward the remaining expenditure authority initially established.

The table below shows Columbia River Basin Water Supply Development funding sources.

	Funding Source		
	Columbia River Basin Water Supply Development Account	Columbia River Basin Water Supply Development Recovery Account	Other State Funding Source
Prior Biennia Expenditures	170,900,000		
2015 - 2017 Appropriation	16,800,000	2,200,000	
Proposed 2017 - 2019 budget	12,300,000	2,000,000	19,500,000
TOTAL	**$200,000,000**	**$4,200,000**	**$19,500,000**

These funds are available for project construction sooner and with greater predictability. Although the state pays interest, debt-financed capital projects can be cost-effective if borrowing costs are less than the costs associated with waiting to build. In addition, debt financing can promote tax equity as each asset is paid for over its useful life, and not all-at-once by taxpayers in a given year. However, leveraging future tax revenues with debt financing commits resources from future biennia for today's capital projects. For that reason, the amount of debt service (principal and interest payments) that can be paid in a given year is limited by the state constitution to a percentage of general state revenues. Nearly all general obligation bonds issued for capital projects are subject to this limit.

At the end of the 2015-2017 biennium, the Office of Columbia River (OCR) has $12.3 million remaining in its $200 million bond authority established in RCW 90.90 and RCW 43.99G (see table above). For the 2017-2019 biennium, Governor Inslee's December 2016 budget included a $33.8 million appropriation for OCR, which extends beyond OCR's current remaining bond authority. At the time of this report the 2017-2019 biennial budget has not been adopted by the legislature. Without this long term bonding authority, OCR will begin to operate under a "pay-as-you-go" model. Note, large scale water supply infrastructure projects, i.e. East-Low canal expansion in the Columbia Basin Project, span several biennial funding cycles. However, it is difficult and often more expensive to fit large scale infrastructure projects into 2-year biennial "pay-as-you-go" budget cycles, without splitting a project into multiple phases, each with their own bid and contracting requirements, which increase the both the state oversight and overall project implementation costs.

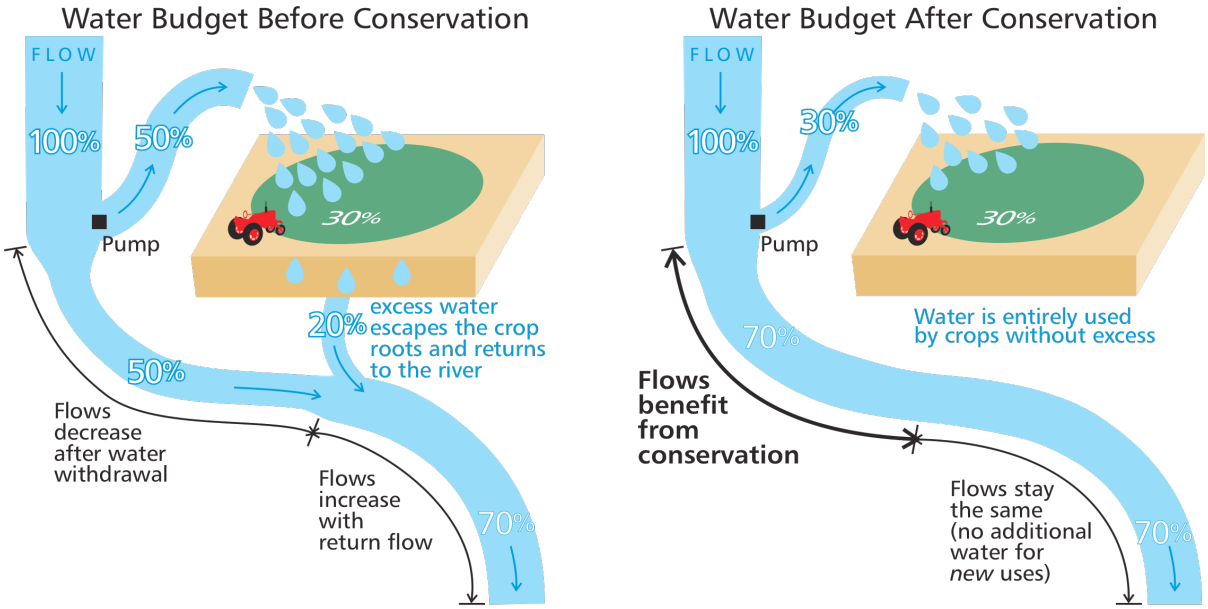
Secured bonding authority across multiple biennia for developing water supplies, has allowed OCR to aggressively pursue water supply development, achieving 410,000 ac-ft. of water supplies for families, farms and fish in eastern Washington. But, there's more to be done. Together with our partners we're continuing 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.

Lessons Learned

Over the past 10 years, we've learned that certain project types, such as water acquisition and storage/ operation modifications, are more effective at meeting multiple objectives than conservation and efficiency improvements. While conservation projects can provide valuable benefits to stream flows supporting aquatic species and their habitat, implementation of these projects generally do not yield enough benefits to achieve out-of-stream goals as directed by the legislature. Even with a wide range of application efficiencies, the amount of water used consumptively by crops remains essentially constant.

As depicted in the following illustration, water conserved through increased efficiency generally would return to the water body as "return flow" or runoff. While there is a small stream reach that benefits from conservation efforts, the water budget remains neutral in areas downstream from historic return flows. Therefore if OCR were to allocate new uses from the conserved water, it would reduce stream flows in this downstream stretch, which is not an acceptable option. Conservation projects have successfully been used in instances where there is a localized need for increasing flows in an affected stream reach and to ensure that developed supplies are used in the most efficient manner with a minimum amount of runoff. The below graphic demonstrates water budgets before and after conservation efforts are put forward.

Utilizing the lessons we have learned over this past decade, OCR evaluates projects based on their ability to balance water supply within the five legislative directives. This can be achieved through a variety of projects including increased storage capacity of existing reservoirs, new reservoirs, aquifer storage and recovery, pump exchanges, and water right donations and purchases. We will continue to aggressively pursue water supply development benefiting both instream and out-of-stream uses, while preserving and enhancing 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.



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