Yakima River Basin Water Enhancement Project Phase III

Enhanced Water Conservation Element Framework Technical Memorandum

U.S. Bureau of Reclamation
Contract No. 140R1019D0009

Prepared by

Anchor QEA

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia-Cascades Area Office

State of Washington
Department of Ecology
Office of Columbia River

April 2021

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1.0 Introduction

The Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) focuses on developing sustainable water supplies for farms, families, and fish at a watershed-scale. The Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. The plan elements will provide additional water supply, operational flexibility, habitat protections and enhancements to improve water supply reliability, improve instream flows to meet ecological objectives, and protect, mitigate, and enhance fish and wildlife habitat. The Integrated Plan is documented through the Yakima River Basin Study (U.S. Bureau of Reclamation [Reclamation], Washington Department of Ecology [Ecology] 2011) and the Yakima River Basin Integrated Water Resource Management Plan Final Programmatic Environmental Impact Statement (Reclamation, Ecology 2012). In 2013, a Record of Decision was signed by Reclamation selecting the Integrated Plan Alternative for implementation.

The Enhanced Water Conservation element of the Integrated Plan consists of agricultural conservation actions not included in the Yakima River Basin Water Enhancement Project (YRBWEP) Phase II (Title XII) implementation plans, along with municipal and domestic water conservation programs. The goal of the agricultural water conservation program is to conserve up to 170,000 acre-feet of water in good water years, which are non-drought years with sufficient water supply to meet proratable water needs, for the purposes of drought resiliency and improving instream flows. The goal is based upon a compiled list of potential projects that could be implemented that are listed in the technical memorandum, Agricultural Water Conservation (Anchor QEA, 2011). The program would include measures beyond those likely to be implemented in the YRBWEP Phase II conservation program.

In 2013, the Washington State Legislature recognized the need to find sustainable water solutions that meet both instream and out-of-stream benefits in the basin by authorizing funding for the initial development phase of the Yakima Basin Integrated Plan through RCW 90.38.

In March 2019, federal legislation (The John Dingell Jr. Conservation, Management and Recreation Act, Public Law 116-9 Section 8202 (a) (7)) was passed providing water conservation goals of 85,000 acre-feet for the initial development phase of Phase III of the YRBWEP and authorizing $75 million for conservation on the Wapato Irrigation Project.

In the six-year span between State authorization and Federal authorization, Reclamation continued to implement water conservation projects, by using its existing authorities under YRBWEP Phase II apart from Section 1203 – Basin Conservation Program. Since water conservation projects were implemented starting in 2013 under the Integrated Plan, the initial development phase is considered to extend from the date of the State legislation in 2013 to 2029, the end of that phase as defined in the federal legislation.

The purpose of this technical memorandum is to provide a framework document outlining the Enhanced Water Conservation Element, including previous conservation efforts between passage of State legislation and passage of federal legislation for YRBWEP Phase III. Also described are the purposes and goal of the Enhanced Water Conservation, participants in the Enhanced Water Conservation element, a summary of projects to be included in the initial development phase of the Enhanced Water Conservation element, and potential funding and accounting mechanisms to track progress towards the conservation goal of 85,000 acre-feet in the initial development phase and 170,000 acre-feet total in the Integrated Plan.

Figure 1 presents a map of the Yakima River basin and the six irrigation divisions of Reclamation's Yakima Project. The six irrigation divisions provide water to about 450,000 irrigated acres and represent about 70 percent of the total diversions of major entities in the Yakima River basin. The major irrigation

districts that have been implementing water conservation projects in YRBWEP Phase II and Phase III are located within those divisions.

1.1 Previous Conservation Efforts

The Yakima River Basin has a long history of water conservation efforts to address drought resiliency, improve water management, increase instream flows and improve water quality. For example, in 1986 the Yakima-Tieton Irrigation District replaced over 300 miles of open canal and ditches with pressure pipelines, significantly reducing their diversion requirement. Since 1994, YRBWEP Phase II in addition to irrigation district self-funded conservation has provided a significant quantity of water conservation.

1.2 YRBWEP Phase II – Section 1203 Basin Conservation Program

In 1994, YRBWEP Phase II authorized Reclamation, in partnership with Ecology and the Conservation Advisory Committee (Yakama Nation, irrigation districts, Washington State Fish and Wildlife, Washington State University Extension, and Trout Unlimited) to evaluate and implement various measures to improve water management in the Yakima River Basin to protect, mitigate, and enhance fish and wildlife and improve the reliability of the water supply for irrigation (PL 103-434, 1994). As part of the Basin Conservation Program (Section 1203 of the legislation), two-thirds of the water conserved returned to the river by reduced diversions and one-third of the water conserved provided for improved reliability of irrigation supply. Projects funded under the Basin Conservation Program throughout the Yakima River Basin provided an estimated 83,194 acre-feet of conserved water to date. The estimate is based on internal Reclamation accounting of conserved water volumes. Projects are summarized in Table 1. Projects continue to be funded under this authorization and conserved water will continue to be realized in the coming years. Additionally, Wapatox Power Plant water rights were purchased to keep 260,000 acre-feet of water in the Naches River (Reclamation, 2015). Water conserved from the YRBWEP Phase II – Basin Conservation Program exceeded the goal of 165,000 acre-feet conserved, as summarized in Table 1.

Table 1. YRBWEP Phase II – Basin Conservation Program Completed Projects

Entity	Description	Conserved Water (acre-feet)
Sunnyside Division Board of Control	Phase I – Check structures and reregulation reservoirs	29,162
Benton Irrigation District	Point of diversion change*	21,044
Benton Irrigation District	Conveyance water reduction	2,524
Benton Irrigation District	Pressurized pipe system	4,346
Sunnyside Division Board of Control	Phase IIA – Piping	6.522
Sunnyside Division Board of Control	Phase IIB,IIC, & IID – Piping**	6,311
Roza Irrigation District	Reregulation reservoir	8,284
Miscellaneous	Land and water purchases	5,000
	Total – Diversion Reduction	83,194
Wapatox Canal	Water right purchase	260,000
	Total	343,194

Source: Empel, 2020 (internal Reclamation documentation)
.*BID diversion entitlement stays instream for 71 river miles from old point of diversion at Sunnyside Dam to new point of diversion at Benton City
**Additional phases of SDBOC are in process.\

The water conserved that is shown in Table 1 is less in years proratable irrigation districts have a reduced water supply. The conserved water volumes are detailed in diversion reduction agreements each entity signs with Reclamation.

1.3 YRBWEP Phase II – Section 1204 Yakama Nation

Section 1204 of YRBWEP Phase II addressed Wapato Irrigation Project (WIP) improvements and appropriations. Section 1204 authorized system improvements to WIP, as well as the design, construction, operation, and maintenance of an Irrigation Demonstration Project and the Toppenish Creek corridor enhancement project. The legislation provided that conserved water resulting from irrigation system improvements are available for use by the Yakama Nation for irrigation and other purposes on the reservation and for protection and enhancement of fish and wildlife within the Yakima River basin. Projects funded were extensive planning and engineering studies for all three authorized uses, construction of measurement structures and flumes on the WIP system, and the plan, as well as, initial projects for the Toppenish Creek corridor enhancement projects. These initial projects include recharge of the Toppenish Creek alluvial fan, restoration of drained wetlands and diversion dam improvements. No estimates of water conservation from the projects are available.

1.4 YRBWEP Phase II – Section 1207 Enhancement of Water Supplies for Yakima Basin Tributaries

Section 1207 of YRBWEP Phase II authorized the investigation and implementation of measures to enhance water supplies for fish and wildlife and irrigation purposes on tributaries of the Yakima River basin. Since 2014, Kittitas Reclamation District (KRD) has been utilizing Section 1207 authority to implement water conservation measures and use conserved water to supplement flows in tributaries. An agreement between KRD, Ecology and Reclamation is updated as new conservation is implemented and conserved water is made available for tributary supplementation.

1.5 Other Water Conservation Projects

Water conservation projects were implemented in the Yakima River basin outside of YRBWEP Phase II by irrigators who were not eligible for funding, pursued other funding and/or self-funded projects to retain a greater share of the conserved water. Water conservation projects have been implemented using funding from several other sources, including state grants for water conservation, conservation district funding, tributary improvement grants, salmon restoration funds, Ecology Centennial Clean Water Grants, Department of Interior's WaterSMART program, Natural Resource Conservation Service, and many other sources. Reclamation and Ecology also funded projects prior to YRBWEP Phase II, the largest being replacement of the Yakima-Tieton Irrigation District distribution system in 1986, which was accomplished under authority of the Federal Rehabilitation and Betterment Act. These funding efforts have supported water conservation throughout the Yakima River Basin and have improved instream flows and water supply reliability during drought years.

2.0 Purpose and Goal

The purpose of YRBWEP Phase III (Public Law 116-9, 2019) is to:

- Protect, mitigate, and enhance fish and wildlife and the recovery and maintenance of self-sustaining harvestable populations of fish and other aquatic life, both anadromous and resident species, throughout their historic distribution range in the Yakima Basin through:
    - improved water management and the construction of fish passage at storage and diversion dams,
    - improved instream flows and water supplies,
    - improved water quality, watershed and ecosystem function,
    - protection, creation, enhancement of wetlands, and

- other appropriate means of habitat improvement.

- Improve the reliability of water supply for irrigation, municipal, industrial, and domestic water supply and use purposes, especially during drought years, including reducing the frequency and severity of water supply shortages for pro-ratable irrigation entities.

The goal of the Enhanced Water Conservation Element is to provide 170,000 acre-feet of water conservation savings over the next 30 years and 85,000 acre-feet of water conservation savings for the initial development phase (from 2013 through 2029) of YRBWEP Phase III (Public Law 116-9, 2019). The following criteria must be met for a project to count towards the water conservation goal:

- Water conservation project began in 2013 or later
- Agricultural or municipal/domestic improvement project resulting in conserved water
- Not part of the Title XII, Section 1203 Basin Conservation Program

3.0 Conservation Accounting

To account for water conserved to-date for YRBWEP Phase III (between 2013 and 2020), Reclamation and Ecology prepared a summary of projects which documents the quantity of water conserved and the cost for completed projects and projects in progress. A more detailed description and listing of the projects is described in Appendix 1. The methods for accounting for water conservation should remain consistent throughout YRBWEP Phase III to ensure conserved water quantities are accurately and reliably documented.

4.0 YRBWEP Phase III Participants and Projects

Agricultural, municipal and individual entities with water rights in the Yakima River Basin are potential participants in the Enhanced Water Conservation element of YRBWEP Phase III.

4.1 Projects Completed to-date or On-going for YRBWEP Phase III

A total of 104 projects have been completed since 2013 or are in progress (see Appendix 1). The water conservation projects were completed by 13 different entities including irrigation districts, conservation districts, and other entities. The estimated water conservation savings from the projects are 50,375 acre-feet at a cost of about $89,241,000. A listing of the projects is provided in the Accounting for Enhanced Water Conservation memorandum contained in Appendix 1. Figure 2 shows the location of the projects.

4.2 Benefits of Conserved Water

The water conservation projects completed to-date have improved instream flow and drought resiliency as well as improved the operations and maintenance of canals and laterals. The projects have been completed by Yakima Project entities and smaller entities, including individual irrigators. The projects have been categorized into those types of benefits in Table 2. Table 2 also provides an estimate of the water conservation savings and cost for each category or type of project.

Table 2. Completed or On-going Water Conservation Projects by Savings Type and Cost			
Water Conservation Savings Type	Water Conserved (acre-feet)	Cost	Cost per Acre-foot
Instream Flow	18,122	$33,437,228	$2,010
Drought Resiliency and Improved O&M	20,938	$42,090,172	$2,010
WIP Conservation	11,315	$10,822,338	$957
Total	50,375	$89,240,612	$1,772

Source: Appendix 1.

Water conservation projects on Yakima Project districts result in increased storage in reservoirs unless diversion reduction agreements or other agreements dedicate the conserved water to instream flow. Examples are supply of water to Kittitas Valley streams made possible through water conservation on KRD. If not allocated to instream flow, the increased storage results in increased carry-over storage from one season to the next, which improves water supply reliability for proratable irrigation districts in drought years that follow non-prorated water supply years. The increased storage could also be used for instream flow improvements such as spring pulse flows. The use of the additional water in storage should be evaluated when funding projects under Phase III.

Instream flow benefits accrue from water conservation projects that reduce diversions such as canal lining and piping and relocating points of diversion. Instream flow benefits occur from the point of diversion to the point where flows typically return to the river which can occur throughout the length of an irrigation system at various point such as drains and wasteways. The benefit varies depending on the location of the entity in the basin. Drought resiliency benefits from water conservation projects occur in proratable irrigation districts in water short years as the irrigation district can deliver water more efficiently through improved canals and laterals by reducing seepage. The same benefits occur from projects that improve operations and maintenance as less spill from canals and laterals occur allowing a more efficient delivery of water through an irrigation system. Improvements to irrigation delivery systems also allow improvements to on-farm irrigation systems reducing on-farm water needs. Water conservation projects that reduce or capture spill can take advantage of improvements to on-farm irrigation systems. Those improvements further reduce water needs and improves water supply reliability.

A separate category is water conservation projects in WIP as the conserved water is available for use by the Yakama Nation for multiple purposes on the reservation including irrigation and protection and enhancement of fish and wildlife within the Yakima River basin.

Funding for the construction of completed conservation projects has been provided by Reclamation, Ecology, irrigation districts, and other entities. Additional funding not reflected in the total sum has been provided for feasibility studies and designs of projects. Irrigation districts have provided the most funding, about 40 percent, Reclamation has provided about 28 percent of project funding, Ecology has provided about 18 percent, and other entities have provided the remainder.

4.3 Potential Projects to Meet Water Conservation Goals

To complete the initial water conservation goal of 85,000 acre-feet from YRBWEP Phase III, additional projects need to be implemented with at least 34,625 acre-feet of conservation (85,000 – 50,375). To meet the long-term goal from the Integrated Plan of about 170,000 acre-feet, 119,625 acre-feet of conservation would need to be implemented. Entities throughout the Yakima River Basin were contacted to obtain lists of potential projects for YRBWEP Phase III and the long-term conservation goal. The projects identified including lining, piping, diversion and measurement improvements, pump station upgrades, regulating reservoirs, pump backs of seepage and return flow, and supervisory control

and data acquisition (SCADA) projects. The largest number of potential projects and greatest water conservation savings from individual entities were identified by the Confederated Tribes and Bands of the Yakama Nation on behalf of WIP, and KRD. Listings of individual projects from WIP, KRD, and others are provided below.

4.3.1 Potential Wapato Irrigation Project Projects

The passage of the 2019 Dingell Act authorized $75 million for Indian irrigation projects that are consistent with the water conservation objectives of YBWEP Phase III and are in the Pacific Northwest Region. Wapato Irrigation Project water conservation projects will meet these criteria. While this funding has not been fully appropriated yet, this designated funding will help ensure the future implementation of projects. Reclamation will continue to work with the Yakama Nation to request funding to support implementation of system improvements on WIP.

Potential projects for WIP include improving their water measurement program, lateral and diversion improvements, reregulating reservoirs, SCADA, and pump and pipe systems. A total of 41 projects are proposed for WIP (ITRC, 2018). Table 3 lists the proposed projects for WIP that could be counted towards the initial water conservation goal and Table 4 lists the additional projects that could be counted towards the long-term goal of the Integrated Plan.

Table 3. Potential Initial Development Phase Water Conservation Projects – WIP

Project	Estimated Water Conserved (acre-feet)	Estimated Cost	Cost per Acre-foot
Satus Feeder Canal Reservoir System		$9,160,000	
SCADA Infrastructure Backbone - Office base station, repeater sites, etc.		$500,000	
Unit 2 Regulating Reservoir		$3,990,000	
West Branch Unit 2 Pump Canal Limited-Rate Demand Closed Pipeline		$3,541,000	
Unit 2 Limited-Rate Demand Closed Lateral Pipelines		$5,272,000	
Satus 2 Canal Reservoir System		$6,690,000	
Satus 3 Canal Reservoir		$4,150,000	
Satus 3 Canal Limited-Rate Demand Closed Pipeline		$2,589,000	
Lateral 1 Diversion improvements		$288,000	
Lateral 2 Diversion & Drain 2 Diversion		$356,000	
Lateral 3 Diversion & Drain 3 Diversion		$593,000	
Drain 4 Diversion from Lateral 4		$257,000	
Total	20,770[1]	$37,386,000	$1,800

Source: ITRC, 2018.

[1] Estimate of water conserved based on experience with recent projects on WIP

The estimated cost for the potential initial development phase WIP projects is $37,386,000. Estimated water conservation savings for individual projects were not available. Based on previous similar projects completed by WIP, it was estimated that the average cost per acre-foot of water conserved is $1,800. That value was assigned to the sum of the estimated costs resulting in an estimated water conservation savings of 20,770 acre-feet.

Table 4. Potential Additional Water Conservation Projects – WIP			
Project	**Estimated Water Conserved (acre-feet)**	**Estimated Cost**	**Cost per Acre-foot**
Main Canal Diversion Control Structure & Flow Measurement		$1,583,000	
Upper Ahtanum Diversion		$634,000	
Lower Ahtanum Diversion		$94,000	
Change of control at head of Piute Lateral		$183,000	
Olney Flat Drain Pump Improvements		$188,000	
New Mud Lake Drain Pump		$429,000	
Connections along the Piute Lateral to the Marion Drain		$3,131,000	
Lateral 4 Diversion to Harrah Drain		$398,000	
New Marion Drain Pumps & Connection Pipeline		$3,333,000	
East Branch Unit 2 Pump Canal Limited-Rate Demand Closed Pipeline		$1,847,000	
Lateral 3 Regulating Reservoir		$3,630,000	
Improved control at the Spencer Lateral Diversion		$310,000	
Lateral 4 Extension Diversion Improvements		$310,000	
Wanity Slough Reservoir System		$5,150,000	
Lateral 4 Extension Pump Restart		$727,000	
Track Lateral Reservoir System		$3,300,000	
New drain connections of Track Lateral to Parton Drain		$163,000	
Improvements to the Parton Drain Pumping Plant		$1,086,000	
Lateral 4 Extension Improvements		$911,000	
Harris Pumping Plant rehabilitation		$950,000	
Satus Feeder Canal siphon under Toppenish Creek		$693,000	
Inflow Pump System from Yakima River and Marion Drain to the Satus Feeder Canal			
Satus East Canal Reservoir		$2,560,000	
Satus East Limited-Rate Demand Closed Pipeline		$2,144,000	
Satus East Canal Limited-Rate Demand Closed Sub-Lateral Pipelines		$6,106,000	
Satus 2 Pump Canal Limited-Rate Demand Closed Lateral Pipelines		$10,203,000	
Lateral 680 Regulating Pond		$1,890,000	
Sub 45 Lateral Regulating Pond		$1,550,000	
Turnout & Lateral flow measurement improvements		$5,000,000	
Total	32,500[1]	$58,503,000	$1,800

[1]Estimate of water conserved based on experience with recent projects on WIP

The estimated cost for the potential additional projects that would help meet the long-term goal of the Integrated Plan is $58,503,000 with an estimated water conservation savings of 32,500 acre-feet.

4.3.2 Potential Kittitas Reclamation District Projects

Potential projects for KRD include converting conveyance laterals from open canals into pipes to reduce seepage and evaporation and lining earthen canals to reduce seepage. A total of 22 projects were identified (Satnik, 2020). Table 5 lists the proposed projects that could be counted towards the initial water conservation goal and Table 6 lists the additional projects that could be counted towards the long-term goal of the Integrated Plan.

Table 5. Potential Initial Development Phase Water Conservation Projects - KRD

Project	Estimated Water Conserved (acre-feet)	Estimated Cost	Cost per Acre-foot
Main Canal Crack Sealing	5,355	$4,372,500	$816
Pipe Lateral SB 9.9	357	$1,716,300	$4,807
Lining North Branch from NB30.6-NB31.1	357	$2,048,000	$5,736
Capture Weep Drain loss - Main Canal above Tucker	750	$1,303,000	$1,738
Pump Ditch Piping phase 1	1,030	$11,531,500	$11,191
Pump Ditch Piping phase 2	1,428	$14,623,200	$10,239
South Branch 3.9-7.0 Lining	1,071	$5,800,000	$5,415
Pipe Lateral SB 14.3	600	$3,700,000	$6,167
Pipe SB Extension	600	$3,800,000	$6,333
Pipe Lateral NB 33.5	2,200	$7,400,000	$3,364
Lining South Branch from SB0.9-SB1.7	357	$3,156,800	$8,842
Pipe Lateral NB 35.1	250	$900,000	$3,601
Turbine Ditch Lining (Wipple to Ross spill)	1,428	$6,900,000	$4,832
Total	15,784	$67,251,300	$4,261

Table 6. Potential Additional Water Conservation Projects - KRD			
Project	Estimated Water Conserved (acre-feet)	Estimated Cost	Cost per Acre-foot
M13.6 Piping	714	$3,100,000	$4,341
Pipe Lateral NB 4.1	900	$6,300,000	$7,000
Pipe Lateral NB 5.8	400	$800,000	$2,000
Pipe Lateral NB 6.4	900	$1,300,000	$1,444
Pipe Lateral NB 7.7	1,300	$5,100,000	$3,923
Pipe Lateral NB 8.3	2,100	$5,300,000	$2,524
Pipe Lateral NB 22.8	300	$300,000	$1,000
Pipe Lateral NB 26.7	3,200	$10,300,000	$3,219
Pipe Lateral NB 27.5	700	$1,000,000	$1,429
Pipe Lateral NB 28.6	200	$500,000	$2,500
Pipe Turbine Ditch Billiter to end	2,400	$6,000,000	$2,500
Pipe Lateral SB 1.7	200	$1,400,000	$7,000
Pipe Lateral SB 4.8	300	$700,000	$2,333
Pipe Lateral SB 11.7	300	$1,300,000	$4,333
Pipe Lateral NB 20.2	1,400	$2,200,000	$1,571
Pipe Sub Lateral NB 20.8-0.8	1,400	$2,200,000	$1,571
Pipe Lateral NB 22.0	3,800	$4,300,000	$1,132
South Branch Reregulating Reservoir	2,000	$8,100,000	$4,050
North Branch Reregulating Reservoir	4,100	$10,600,000	$2,585
Total	26,614	$70,800,000	$2,660

Source: Satnik, 2020.

Estimated conservation savings for the potential initial development phase KRD projects are 15,784 acre-feet at an estimated cost of $67,251,300. The estimated cost for the potential additional projects that would help meet the long-term goal of the Integrated Plan is $70,800,000 with an estimated water conservation savings of 26,614 acre-feet.

4.3.3 Other Potential Projects

Other potential projects identified include canal sealing, pumping, and piping projects in Roza, Union Gap, Selah-Moxee, Terrace Heights, Naches-Selah, and Columbia irrigation districts. Table 7 lists those projects, the estimated volume of water conserved, and the estimated cost. There are likely other smaller projects that could be implemented, such as water right acquisitions, on-farm conservation, diversion consolidations and piping that have not been identified and a placeholder is provided in Table 7.

Table 7. Other Potential Water Conservation Projects				
Entity	**Description**	**Estimated Water Conserved (acre-feet)**	**Estimated Cost**	**Cost per Acre-foot**
Roza Irrigation District[1]	Pump 3 High Lateral	675	$1,000,000	$1,481
	Canal Sealing	635	$500,000	$787
	Canal Sealing	635	$500,000	$787
	Canal Floor Replacement	635	$500,000	$787
	Lateral Piping	5,800	$25,400,000	$4,379
Union Gap Irrigation District[2]	Piping	9,317	$26,700,000	$2,866
Selah-Moxee Irrigation District[3]	Lining and Piping – Initial Phase	5,276	$18,100,000	$3,431
	Lining and Piping – Second Phase	4,651	$44,600,000	$9,589
Terrace Heights Irrigation District[4]	Pump Station and Piping	493	$1,160,000	$2,353
Naches-Selah Irrigation District[5]	Line Main Canal	500	$2,800,800	$5,602
	Re-regulation Reservoir	2,500	$1,230,000	$492
	No. 1 Lateral Piping	1,000	$6,777,900	$6,778
	No. 3 Lateral Piping	3,000	$12,118,000	$4,039
Columbia Irrigation District[6]	Main Canal Control Structures and Flow Measurement		$137,000	
	Lateral 2 Lining		$146,900	
Others to be determined	Acquisitions, on-farm conservation, diversion consolidations/reach improvements, other piping, lining projects	n/a	n/a	n/a
	Total	35,117	$141,670,600	$4,034

Sources:
1 – Revell, 2020, 2021.
2 – Andreas, 2017
3 – Draper, 2020.
4 – Leitch, 2018.
5 – Harter, 2020.
6 – Empel, 2020.

Estimated water conservation savings from the projects listed in Table 7 are 35,117 acre-feet at an estimated cost of $141,671,000. It is assumed that the Roza Irrigation District canal and Pump 3 High Lateral projects would be implemented in the Initial Development Phase (up to 2029) as they are relatively inexpensive, and the district has been successfully implementing similar projects since 2013.

4.4 Summary of Initial Development Phase and Long-term Projects

Table 8 provides a summation of projects that would meet the goal of the initial development phase of the Enhanced Water Conservation element. To-date, 104 projects have been or are in progress of being implemented with an estimated water conservation savings of 50,375 acre-feet. A total of 29 projects were identified for future implementation that have an estimated water conservation benefit of 39,134 acre-feet. The total potential water conservation for the initial development phase is 89,509 acre-feet, exceeding the goal of 85,000 acre-feet. The potential water conservation savings for long-term projects is 181,160 acre-feet, which would exceed the Integrated Plan goal of 170,000 acre-feet.

Table 8. Completed and Potential Water Conservation Projects				
Project Status	Number of Projects	Water Conserved (acre-feet)	Cost	Cost per Acre-foot
Completed or In progress	104	50,375	$88,737,500	$1,762
Potential Initial Development	29	39,134	$107,137,300	$2,738
Subtotal	133	89,509	$195,874,800	$2,188
Potential Additional	59	91,651	$268,473,600	$2,929
Total	192	181,160	$464,348,400	$2,563

4.5 Prioritization of Projects to Meet YRBWEP Phase III Water Conservation Goal

The lists of potential initial development phase projects were discussed at a Water Use Subcommittee meeting on August 4, 2020 and Subcommittee members recommended the projects not be prioritized at this time as there was not enough information to evaluate the priority. The Water Use Subcommittee members recommend obtaining additional information on the potential benefits of the projects and following a prioritization process to allow an informed decision on which projects to implement to achieve the 85,000 acre-feet water conservation goal of the initial development phase. A prioritization process was recommended to ensure the selected projects also fit other Integrated Plan goals. The prioritization process could include evaluating potential water conservation projects against criteria such as:

- Consistency with Integrated Plan goals, including reach-based benefits as described in the Final Programmatic Environmental Impact Statement (FPEIS) adopted in 2012
- Improving stream flow in reaches or tributaries where flow improvements benefit priority fish species (see Figure 3 for example of reaches that could be used in this criteria)
- Providing other benefits to priority fish species (e.g. passage improvements)
- Improving reliability of supply for proratable water users
- Meeting Endangered Species Act requirements
- Improving water quality
- Facilitating or leveraging other projects that offer benefits listed above
- Cost

The prioritization process would require input from project sponsors and evaluation of criteria by basin water managers and biologists. At this time, not enough information is known about the projects to fill out the criteria and prioritize projects.

The lists of projects in Tables 3 through 7 are preliminary; the projects may be adjusted in size and other projects can be added to the lists if they are found to be more viable for the initial development phase.

5.0 Implementation of Water Conservation Projects

Multiple entities have potential to fund projects, including Reclamation, Ecology, Bureau of Indian Affairs, NRCS, Bonneville Power Administration, environmental entities, conservation districts, irrigation districts, municipalities and individual water users (irrigators).

Each funding program or entity may use different criteria to select which projects get implemented. Projects that use public funding related to YRBWEP Phase III may have a broader range of criteria that

considers public benefits such as described in the previous section. Irrigation districts may undertake self-funded projects with solely water supply reliability and improved water management as criteria. Environmental entities and conservation districts may have focused criteria such as environmental preservation and restoration, instream flow and water quality improvement. Those projects could attract grants from different sources than YRBWEP Phase III such as salmon recovery funding, streamflow restoration grants, irrigation efficiencies program and clean water grants.

For projects receiving public funding related to YRBWEP Phase III we recommend an evaluation and ranking process be completed that uses criteria such as described in the previous section. The evaluation and ranking process should be on-going through the implementation phase to account for new information and better understanding of project benefits, potential project cost increases and other factors that are unknown at this time. We also recommend guidelines for use of conserved water be established to ensure Yakima River basin water managers understand the expectations for achieving project benefits.

Tracking of water conservation benefits is important to ensure they are realized. In YRBWEP Phase II, Reclamation has diversion reduction agreements with districts to account for the conserved water.

A process for tracking grant agreements, costs and accounting of water conservation savings should also be in place for at least the implementation phase. Reclamation and Ecology already have those processes in place, but they should be reviewed to ensure they are integrated and accessible to basin stakeholders.

Reclamation in coordination with Ecology and others should also periodically review the performance of the projects against the criteria used in their selection (such as listed in Section 4.5). This can be accomplished through review and analysis of diversion and streamflow records, and with use of tools like the RiverWare hydrologic model which should represent the changes in water supply and instream flow throughout the basin.

6.0 Summary and Next Steps

The Enhanced Water Conservation Element of YRBWEP Phase III has a water conservation goal of 85,000 acre-feet during the initial development stage (2013-2029). On-going and completed projects since 2013 have water conservation savings of approximately 50,375 acre-feet at a cost of $88,740,000. Those projects have been both self-funded by irrigation districts and funded through grants from Reclamation, Ecology, and other entities. To meet the Enhanced Water Conservation Element goal of the initial development phase, an additional 34,625 acre-feet of water conservation is needed to be implemented before 2029. Irrigation districts and other entities provided lists of potential water conservation projects. Projects from WIP, KRD and Roza Irrigation District could provide 39,134 acre-feet of water conservation savings at a cost of $107,137,300. If those projects are implemented, the total water conservation savings for the initial development phase would be 89,509 acre-feet, which exceeds the goal of 85,000 acre-feet by 2029. Projects that allow the long-term goal of about 170,000 acre-feet to be met were identified through WIP, KRD and other entities. The additional water conservation savings are estimated to be 85,851 acre-feet at a cost of $243,073,000. If those projects are implemented along with the initial development stage projects the total estimated water conservation savings would be 175,360 acre-feet. That volume of water conservation would exceed the long-term goal of the Enhanced Conservation Element of the Integrated Plan.

A priority list of potential projects was not prepared. The Water Use Subcommittee of the YRBWEP Work Group recommends following a prioritization process to allow an informed decision on which projects to implement with public funding to achieve the initial development goal of 85,000 acre-feet of water conservation. We recommend that process be on-going during the YRBWEP Phase III implementation phase to adapt to new information and potentially new projects.

A process for tracking grant agreements, costs and accounting of water conservation benefits should also be in place for at least the implementation phase. Reclamation and Ecology (through their grant process) already has those processes in place, but they should be reviewed to ensure they are integrated and accessible to basin stakeholders. A periodic comparison of the performance of the projects against the criteria used in their selection (such as listed in Section 4.5) should also be performed. This can be accomplished through review and analysis of diversion and streamflow records, and with use of tools like the RiverWare hydrologic model which should represent the changes in water supply and instream flow throughout the basin.

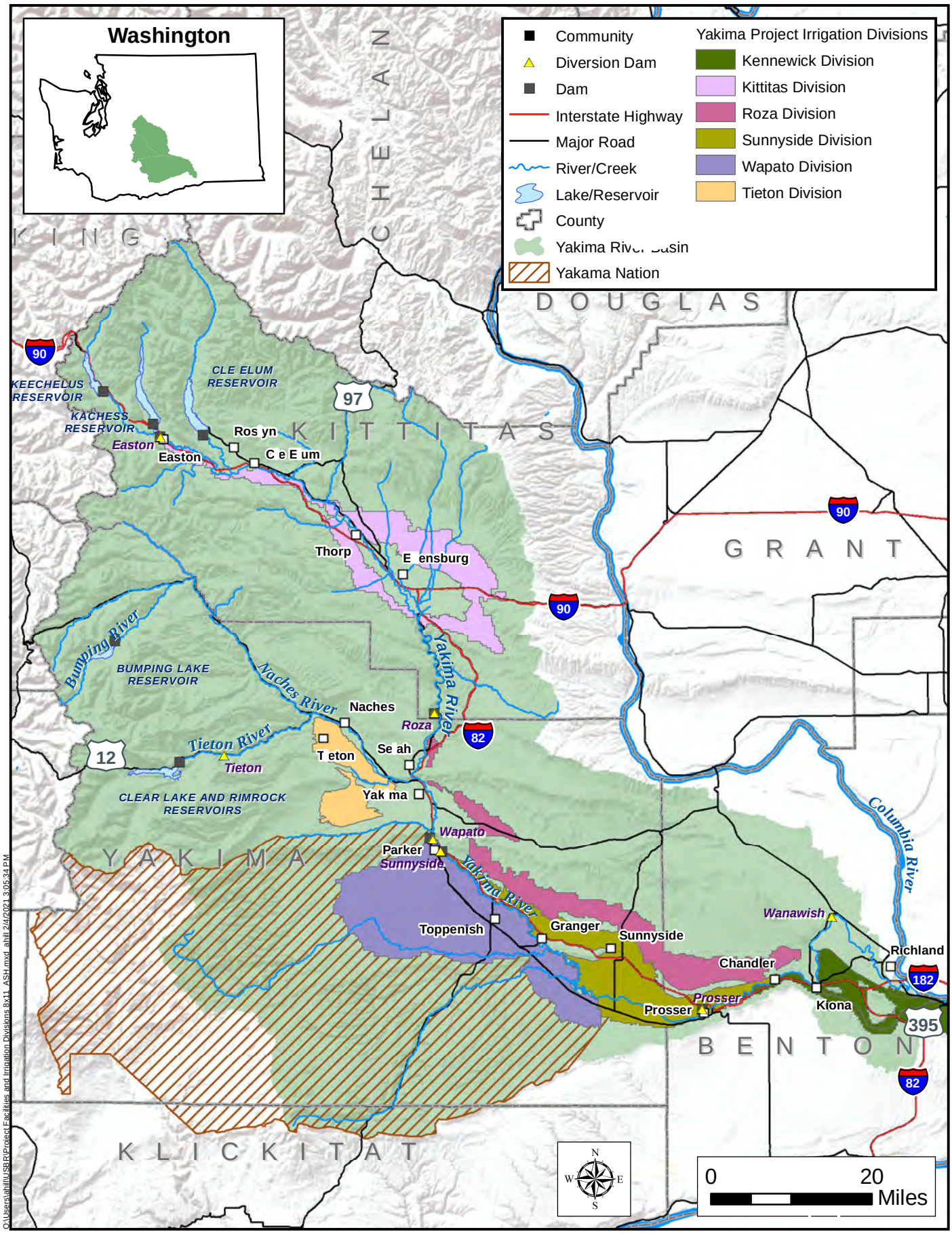
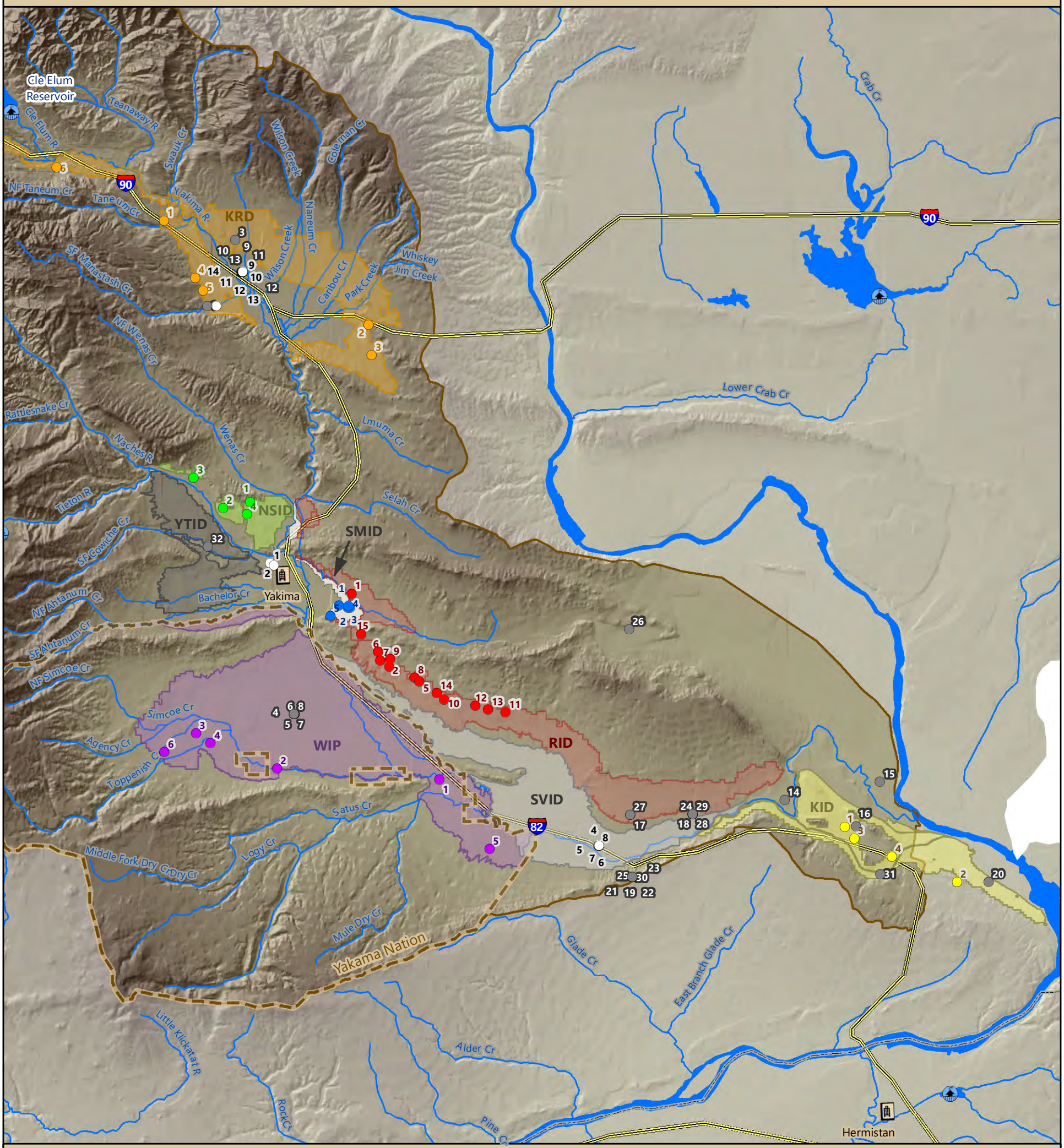


Figure 1. Yakima Project Irrigation Divisions

Figure 2. Enhanced Water Conservation Projects in the Yakima Basin



Conservation Districts -
- 2: Acquisition (Anderson Diversion irrigation water)
- 14: Education (Water Conservation)
- 1: Pipeline (Manastash – Consolidated & MWDA)
- 3: Pipeline (Reed)
- 4: Irrigation Conversion (82 acres flood/rill to sprinkler)
- 5: Irrigation Conversion (404 acres flood/rill to sprinkler)
- 6: Irrigation Conversion (1247 acres flood/rill to sprinkler)
- 7: Irrigation Conversion (75 acres flood/rill to sprinkler)
- 8: Irrigation Conversion (240 acres flood/rill to sprinkler)
- 9: Irrigation Conversion (273 acres flood/rill to sprinkler)
- 10: Irrigation Conversion (771 acres flood/rill to sprinkler)
- 11: Irrigation Conversion (755 acres flood/rill to sprinkler)
- 12: Irrigation Conversion (176 acres flood/rill to sprinkler)
- 13: Irrigation Conversion (175 acres flood/rill to sprinkler)
- 17: Irrigation Conversion (30 acres wheeline to pivot)
- 18: Irrigation Conversion (14 acres flood to pod irrigation)
- 19: Irrigation Conversion (14 acres flood to solid set/handline)
- 20: Irrigation Conversion (40 acres wheeline to pivot)
- 21: Irrigation Conversion (23 acres flood to pod)
- 22: Irrigation Conversion (3 acres flood to solid set)
- 23: Irrigation Conversion (10 acres flood to solid set)
- 24: Irrigation Conversion (15 acres wheeline to solid set)
- 25: Irrigation Conversion (16.4 acres wheeline to linear line)
- 26: Irrigation Conversion (126 acres wheeline to pivot)
- 27: Irrigation Conversion (18 acres flood to wheeline)
- 28: Irrigation Conversion (50 acres overhead sprinkler to drip)
- 29: Irrigation Conversion (40 acres flood to pod)
- 30: Irrigation Conversion (3.5 acres flood to solid set)
- 31: Irrigation Conversion (21 acres wheeline to center pivot)
- 15: Landscaping (Heritage Garden Program)
- 16: Landscaping (Heritage Garden Program implementation)
- 32: Structures (eliminated 2 Cowiche Cr div; created a new div at YTID's)

Kennewick Irrigation District (KID) -
- 1: Canal Lining
- 2: Canal Lining (14.6 miles of earthen canal with geomembrane liner)
- 3: Canal Lining (7.2 miles of earthen canal with geomembrane liner)
- 4: Canal Lining (5.6 miles of canal)

Kittitas Reclamation District (KRD) -
- 2: Canal Lining (North Branch Canal Phases 1, 2, 3A and 3B)
- 4: Canal Lining (South Branch Canal Phase 1)
- 5: Canal Lining (SB Phase 2, Robinson Canyon to Manastash)
- 6: Canal Sealing (cracks\joints in 3000' of concrete lined canal)
- 1: Pipeline (13.6, 13.8 Lateral Piping Project)
- 3: Pipeline (Turbine 1.1 Pipeline, 1700' of pipeline on a small lateral)

Naches Selah Irrigation District (NSID) -
- 2: Canal Lining (Install 5400' of liner on D Section of Main Canal)
- 3: Canal Lining (3530' concrete over geomembrane, 3326' pipe, replace flumes)
- 4: Canal Lining (Install 2600' exposed lining over circa 1918 concrete canal)
- 1: Pipeline (Install pipe, replace waterboxes with enclosed deliveries on Guinard Lateral)

Other -
- 3: Acquisition (Manastash Creek water)
- 4: Irrigation Conversion (560.4 acres converted to sprinkler or microirrigation)
- 5: Irrigation Conversion (231.2 acres converted to sprinkler or microirrigation)
- 6: Irrigation Conversion (292.1 acres flood/rill)
- 7: Irrigation Conversion (166 acres flood/rill to sprinkler)
- 8: Irrigation Conversion (253.7 acres flood/rill)
- 9: Irrigation Conversion (132.2 acres to sprinkler)
- 10: Irrigation Conversion (95 acres to sprinkler)
- 11: Irrigation Conversion (514.8 acres to sprinkler)
- 12: Irrigation Conversion (255.6 acres to sprinkler)
- 13: Irrigation Conversion (202 acres to sprinkler)
- 14: Irrigation Conversion (106.8 acres to sprinkler)
- 1: Landscaping (City of Yakima Xeriscape Demonstration Project)
- 2: Landscaping (Low water use garden conversion project)

Roza Irrigation District (RID) -
- 6: Canal Lining (Concrete seal MP 30.3-30.8)
- 1: Canal Sealing (MP 17.7 to 18.9)
- 2: Canal Sealing
- 7: Canal Sealing (900 feet)
- 8: Canal Sealing
- 9: Pipeline (Pump 7, 21.3 Lateral enclosed)
- 10: Pipeline (Pump 8 Lateral enclosed)
- 11: Pipeline (P16H,7.8 Lateral enclosed)
- 12: Pipeline (P16L, 18.3, 19.1, 22.1 Laterals enclosed)
- 13: Pipeline (P9 Lateral enclosed)
- 14: Pipeline (P15H, 23.9, 24.3 Laterals enclosed)
- 15: Pipeline (P15L, 23.2, 24.8 Laterals enclosed)
- 5: Structures (Enclosed conduit Project Pump 7)

Selah Moxee Irrigation District (SMID) -
- 1: Pipeline (Postma Pipe Line Phase III, railroad to canal end, 21" - 12")
- 5: Pipeline (S-M End Pipe Line Phase 1, 18" & 24")
- 2: Structures (Turnout and water measure replacement)
- 3: Structures (Turnout and water measure replacement)
- 4: Structures (Turnout and water measure replacement)

Wapato Irrigation Project (WIP) -
- 2: Canal Lining & Pipeline (WIP Project upgrades in Unit 2)
- 3: Canal Lining & Pipeline (Aquifer Recharge and Canal Piping Projects)
- 1: Pipeline (Yakama Nation aquifer recharge and canal piping projects)
- 4: Satus Unit 2 (L274, L739, L766, L434: PS&E)
- 5: Wapato Irrigation Project (WIP) Improvements AFA #1-4
- 6: Toppenish Creek Alluvial fan Aquifer Recharge Project

Enhanced Water Conservation

	Project Locations	District Boundaries
Conservation Districts		
Kennewick Irrigation District (KID)		
Kittitas Reclamation District (KRD)		
Naches Selah Irrigation District (NSID)		
Other		
Roza Irrigation District (RID)		
Selah Moxee Irrigation District (SMID)		
Sunnyside Valley Irrigation District (SVID)		
Wapato Irrigation Project (WIP)		
Yakima-Tieton Irrigation District (YTID)		

Dams/Reservoirs · Hydrology · Cities · Interstates · Yakama Nation

Cartography: Bureau of Reclamation; CCA Office
Date: November 17, 2020 (Updated: February 5, 2021)
Projection: WA State Plane; South Zone; NAD 83

Locations of water conservation projects are at a variety of accuracy levels. Some projects were conducted at multiple locations. For this map, centroids were used to show the project location instead of each individual site.

0 5 10 15 20 Miles

BUREAU OF RECLAMATION

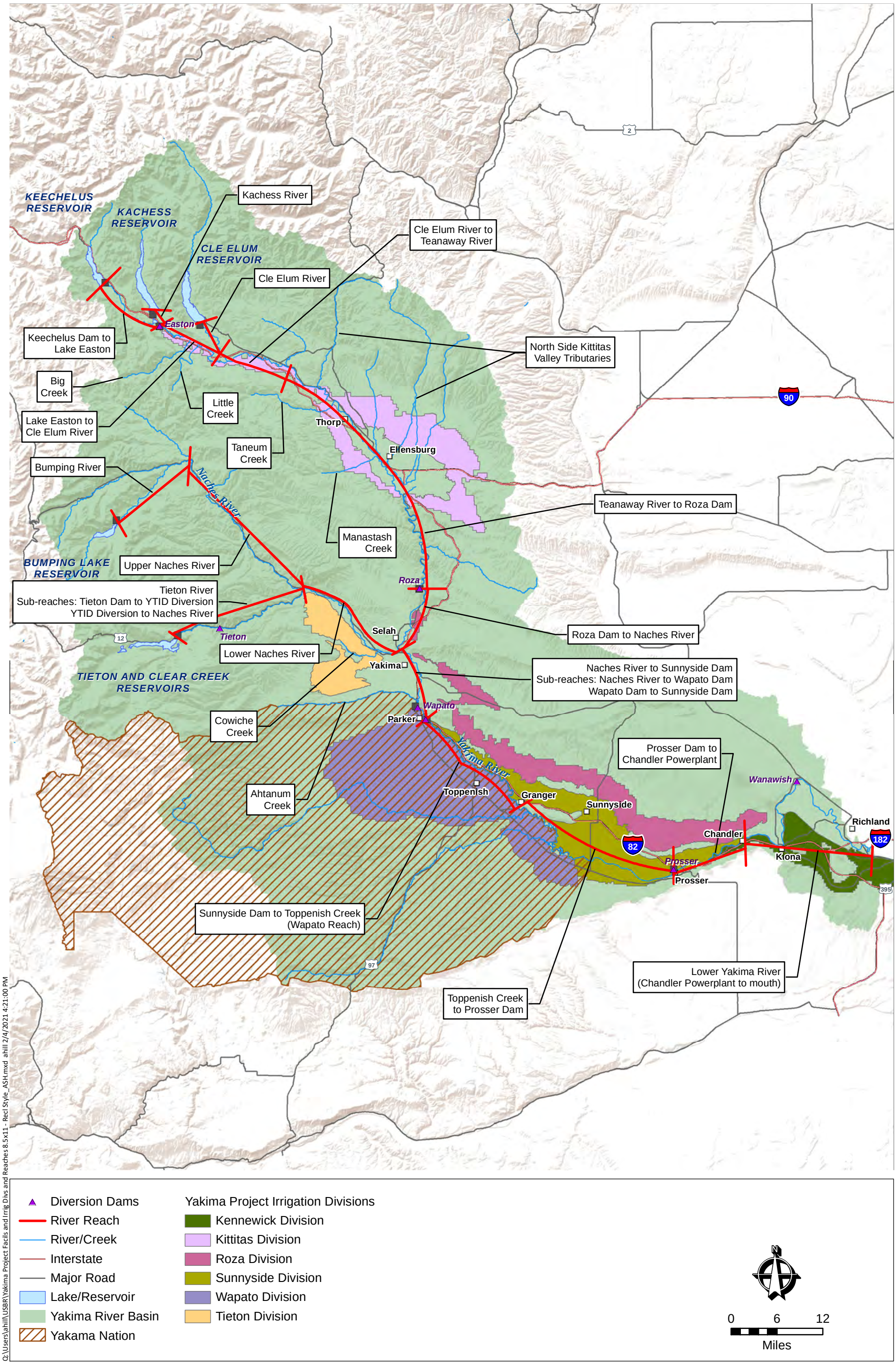


Figure 3. Yakima River Basin Stream Reaches

7.0 References

Andreas, Pat (Union Gap Irrigation District), 2017. Yakima Basin Integrated Plan Project Proposal – Union Gap Irrigation District. October 20, 2017.

Draper, Nathan (Selah-Moxee Irrigation District), 2020. Regarding: Enhanced Water Conservation Element Future Conservation Projects. Email to: Bob Montgomery, Anchor QEA. August 3, 2020.

Empel, Janine (Ecology/Reclamation), 2020. Regarding: Phase II conservation. Email to: Bob Montgomery, Anchor QEA. December 11, 2020.

Harter, Justin (Naches-Selah Irrigation District), 2020. Regarding: Water Conservation in Naches-Selah ID. Email to: Janine Empel, Ecology/Reclamation. August 7, 2020.

ITRC (Irrigation Training & Research Center), 2018. Wapato Irrigation Project Modernization Plan. Prepared for U.S. Bureau of Indian Affairs. March 2018.

Leitch, Lou Anne (Terrace Heights Irrigation District), 2018. Regarding: Grant Application. Email to: Bob Montgomery, Anchor QEA. April 5, 2018.

Public Law 103-434, 1994. Yakima River Basin Water Enhancement Project (YRBWEP). 103rd Congress of the United States of America, Second Session. Available online at https://www.usbr.gov/pn/programs/yrbwep/authorization/amended-legislation.pdf. October 31, 1994.

Public Law 116-9, 2019. The John Dingell Jr. Conservation, Management and Recreation Act. 116th Congress of the United States of America, First Session. Available online at https://www.usbr.gov/pn/programs/yrbwep/authorization/PL1169S47.pdf. January 3, 2019.

Revell, Scott, 2020 (Roza Irrigation District), 2020. Regarding: Conservation projects. Email to: Bob Montgomery, Anchor QEA. August 31, 2020.

Revell, Scott, 2021 (Roza Irrigation District), 2021. Regarding: Roza Drought Pump Back. Email to: Janine Empel, Washington State Department of Ecology, February 19, 2021.

Satnik, Roger (Kittitas Reclamation District), 2020. Regarding: Priority Projects. Email to: Bob Montgomery, Anchor QEA, July 6, 2020.

U.S. Bureau of Reclamation (Reclamation), 2015. Yakima River Basin Water Enhancement Project (YRBWEP). Phase 2 Fact Sheet. Available online at https://www.usbr.gov/pn/programs/yrbwep/phase2/factsheet.pdf. Updated September 11, 2015.

8.0 List of Preparers

Name	Background	Responsibility
Anchor QEA		
Robert Montgomery, P.E.	Water Resources Engineering	Author
Adam Hill, P.E.	Water Resources Engineering	Author

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Appendix 1

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Appendix 1 – Accounting for Enhanced Water Conservation

Yakima Basin Integrated Plan (Yakima River Basin Water Enhancement Phase III)

Enhanced Water Conservation Element

Technical Memorandum

Prepared by Janine Empel, Washington State Department of Ecology

April 2021

This memorandum explains the steps taken to account for enhanced water conservation projects across the Yakima River basin as part of the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). It also provides an overview of accounting practices currently in place for the Integrated Plan and provides a framework for adding new conservation projects in the future. It begins with a brief background discussing legislative milestones followed by the defining criteria used to select relevant projects. Finally, it concludes with the history of which projects have been accounted for to date.

Background

In 2012, the United States Bureau of Reclamation (Reclamation) and the Washington State Department of Ecology (Ecology) jointly submitted the Final Programmatic Environmental Impact Statement of the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). This is also commonly referred to as YRBWEP Phase III. The Integrated Plan takes a holistic approach to water resource challenges faced by stakeholders across the Yakima River basin. It also details 7 elements that support the overall goal of improving the basin's water resources, one of which is water conservation.

In 2013, Washington state passed legislation authorizing the Integrated Plan. This legislation is embedded in RCW 90.38.060 through 90.38.130 and provides flexibility for implementation. It also seeks guidance from the Integrated Plan EIS referenced above. Federal authorization followed in 2019 with the John Dingell Jr. Conservation, Management, and Recreation Act (Title VIII, Subtitle C, YRBWEP Phase III). In the six-year span between State authorization and Federal authorization, Reclamation continued to further the development of relevant projects by using its existing authorities under YRBWEP Phase II (Title XII, 1994).

Enhanced Water Conservation Element

Enhanced water conservation is one of the seven elements of the Integrated Plan. The goal of this element is to implement agricultural and municipal/domestic water conservation programs designed to conserve up to 170,000 acre-feet (AF) of water. This element includes conservation measures for irrigation district infrastructure improvements; on-farm conservation and irrigation efficiency improvements; municipal and domestic conservation; and commercial and industrial conservation. The most immediate goal outlined in the Dingell Act of 2019 is to conserve 85,000 AF of water by 2029.

The Integrated Plan is comprised of a diverse group of stakeholders, in addition to Reclamation, Ecology and the Yakama Nation. The current milestones achieved for the enhanced water conservation element were made possible in part by the participation and funding of this diverse group stakeholders (including irrigation districts, county conservation districts and others) implementing conservation.

Criteria

The following criteria are used to establish the relevance of projects and to determine if they fall under the enhanced water conservation umbrella:

1. The project is an agricultural or municipal improvement project that results in water savings through increased water use efficiency:
    a. Agricultural examples include piping laterals, lining canals, and constructing reregulation reservoirs.
    b. Municipal and domestic examples include improved landscape irrigation efficiency or improving the efficiency of consumptive uses.
    c. Grants for designs, feasibility studies, or education are not included. While they may ultimately lead to a project resulting in conserved water, they do not directly result in it, so discretion has been used to exclude them.
2. Funding was allocated to the project by an entity such as the State, Reclamation, the entity itself, or another organization. Values have not been adjusted for inflation.
3. The project funding occurred between 2013 (the year of state authorization) and 2020 (or more recently) and:
    a. The project is not part of the ‘Basin Conservation Program’ defined in the Title XII Section 1203 (YRBWEP Phase II) legislation. This includes Sunnyside

Valley Irrigation District's Diversion Reduction Agreement, Benton Irrigation District, and any other project that received Phase II Funding.[1]

Summary of the Enhanced Water Conservation Accounting Table

Overall

The "Enhanced Water Conservation Accounting Table" ('table') started by building on an agricultural conservation spreadsheet compiled by Danielle Squeochs, last revised in 2018. The agricultural conservation spreadsheet showcased the enhanced water conservation projects funded by Ecology. Each section in the spreadsheet contained the project name and description, the funding awarded to that project, the conservation benefit, and the amount of water conservation achieved. The table expands on the spreadsheet by including the most recent projects receiving funding not only from Ecology, but projects with other funding sources such as Reclamation, Natural Resources Conservation Service (NRCS), irrigation districts, conservation districts, or others as well.

The "Enhanced Water Conservation Accounting Table" has been included in its entirety at the end of this document.

The table includes the following information:

- Entity – the group or organization spearheading the project. Typically, this is also the group directly benefiting from the project.
- Project reference number – many projects contain subprojects. The project reference number is included for clarity and ease of reference to the overall project.
- Project description – the title of the project. This will often be the same as the title on a corresponding grant or contract (if there is one).
- Project notes – further description detailing work completed and its location. Any subprojects will be listed here.
- Proratable vs non-proratable – details each entity's water rights. During a prorationing year, a proratable irrigator's conservation water would also be reduced.

[1] Based on the funding and cost-share guidelines outlined in the legislation, the districts retained 1/3rd of the total conserved water and 2/3rd of the water needed to be placed instream. This was memorialized in diversion reduction agreements and was documented in contracts.

- Acre-feet conserved – the estimated annual quantity of water in acre-feet conserved because of the project. These estimated numbers are typically lifted from the contract or grant. Numbers are more accurate if they've been reported by the district after completion by examining the reduction of loss compared to data from years prior.
- Total cost – dollar amount granted or allocated to the project/subproject.
- Cost/AF – estimated cost of one acre-foot of conserved water. It is a beneficial metric used to compare cost-effectiveness of a project.
- Year – the time frame associated with the project.
- Funded by – the entity funding the project, subproject, or portion of either.
- Completed – the completion status of the project, which shows if the project is completed or ongoing.
- Conservation benefit – the benefit of the conservation water, dedicated to one of three categories: [2]
    - Instream flow
        - Adding conservation water back into rivers, creeks, and tributaries for the benefit of fish and aquatic habitat.
    - Drought resiliency and improved operations and maintenance
        - In a non-prorationing year, the conserved water generally gets left in storage and is not diverted. This enhances the carryover storage which, in turn, benefits all proratable entities. In a water-short year, irrigation districts may call on their full entitlement, which would also be prorated.
    - If the project is part of the Wapato Irrigation Project (WIP), then that water may be used either for instream flows, drought resiliency, or to irrigate additional acres at the discretion of the Yakama Nation. The last benefit is unique to WIP.
- Contract/Grant Number – the number located on the contract or grant that the 'entity' has with the 'funded by' source.
- Notes – any relevant notes.
- Creek/reach benefited – when the conservation benefit is 'instream flow,' then this is the creek or reach that is receiving benefits.

[2] There are limitations in the conservation benefit categories. Unlike YRBWEP Phase II Basin Conservation Program projects, the Integrated Plan enhanced water conservation projects are not required to enter diversion reduction agreements; therefore, water that is intended for instream flow may be left in carryover. Additionally, the funding source of projects may have an impact on how the conservation water is used. For instance, some projects have been entirely self-funded by irrigation districts, and thus they are able to determine the best use of the conservation water.

Projects

Projects accounted for are detailed below. Each section is separated by entity. Project data was gathered from either the funding source or the entity.

Yakama Nation

This section starts with developments on the Wapato Irrigation Project (WIP) that were funded by Ecology. It includes three projects and 15 subprojects. The primary focus of these projects/subprojects was canal lining, replacement of leaking concrete pipeline, and piping open ditch laterals. It also included the installation of surface-flow control structures in existing canals and making modifications to diversions to support the Toppenish Creek Alluvial Fan Aquifer Recharge project. The fourth project was partially funded by NRCS and involved work on Satus Unit 2. Finally, Reclamation's 638 contract is listed. It is a multi-year contract that has helped fund improvements to water measuring equipment, inventory of acres served by existing infrastructure, and pressurizing several Satus lines. In total, approximately $10 million was invested by Ecology, NRCS, Reclamation, WIP and Yakama Nation Engineering and 11,315 AF of water was conserved. The approximate cost was $956 per AF conserved, making these some of the most cost-effective projects documented to date.

Kittitas Reclamation District (KRD)

A total of six projects and ten subprojects were documented. KRD provided information on several of the subprojects including approximations of the cost and quantity of conserved water. Additional information was verified by reviewing grant or funding contracts provided by Ecology and Reclamation. KRD also received funding from the Salmon Recovery Funding Board. The board works through the Recreation and Conservation Office and they manage state and federal funds to protect and restore salmon habitat.

A unique feature of KRD's water conservation is that the conserved water they use helps provide 16 cubic feet per second (CFS), totaling approximately 5,700 AF/year, to Manastash Creek for instream flow benefits. Additionally, they have passed water through Tucker Creek, Big Creek, Little Creek and Taneum Creek and have plans to eventually run water through Whiskey Creek, Reecer Creek, Wilson Creek, and other creeks once they have more conserved water to use. The additional instream flow to these tributaries provides habitat for fish and other species. In total, approximately $23.3 million was invested, and 9,060 AF of water was conserved. The approximate average cost is $2,572 per AF conserved.

Roza Irrigation District (Roza)

Roza Irrigation District received funding from Ecology and Reclamation as well as significant self-funding resulting in an average of $2.4 million per year in infrastructure upgrades and water conservation. Fifteen projects were documented and consist primarily of canal sealing, canal lining, and enclosing laterals. Generally, canal sealing was funded by Ecology and Reclamation, and all the piping projects were self-funded. Water conserved by Roza has been assigned to drought resiliency and improved operations and maintenance. In total, approximately $18.4 million was invested and 10,113 AF of water was conserved. The approximate cost is $1,821 per AF conserved.

Kennewick Irrigation District (KID)

Four projects have been documented for KID. These projects received WaterSmart grants from Reclamation for their canal lining. The District is currently in discussion with Reclamation, Ecology, and the Yakama Nation to find ways to improve their water supply reliability.

The water conserved as part of the canal lining projects is dedicated to both instream use and to shore up supplies during periods of water shortage (aka drought resiliency). Another unique point to note is that by diverting less irrigation water, less power is needed to pump their water and a portion of water that would be diverted as drive water can remain instream. In total, an estimated 5,079 AF of water does not need to be diverted at Prosser for KID's Chandler pump system. They estimated that there was an energy savings of 228,459 kilowatt hours throughout reduction of pumping requirements in their 2013 project alone. The drive water savings was not included in the conserved water calculation. In total, approximately $13.3 million dollars was invested, and 4,198 AF of water was conserved. The approximate cost is $3,165 per AF conserved.

Selah-Moxee Irrigation District (SMID)

SMID projects were entirely self-funded so far. Their district projects previously did not fall under the criteria for what could be funded under YRBWEP Phase II. Information has been provided by the district and a total of five projects have been documented. These include piping open ditches and replacing water measurement devices along the irrigation delivery canals. The conserved water has been reserved for drought resiliency and improved operations and maintenance. In total, approximately $582,000 was invested, and 344 AF of water was conserved. The approximate cost is $1,690 per AF conserved.

Naches-Selah Irrigation District (NSID)

NSID projects were primarily self-funded, and they have received one WaterSMART grant from Reclamation. A total of four conservation projects have been documented and include canal lining, piping open laterals, and replacing old (circa 1910-1950s) wooden flumes with concrete and pipe. The conserved water is being reserved for drought resiliency and improved operations and maintenance. In total, approximately $8.2 million was invested, and 1,904 AF of water was conserved. The approximate cost is $4,325 per AF conserved.

Conservation Districts

Information has been gathered from the following conservation districts: Kittitas County Conservation District, North Yakima Conservation District, South Yakima Conservation District, and Benton Conservation District.

A total of eight projects and (10 subprojects) have been accounted for through Kittitas County Conservation District. These projects include replacing earthen ditches with pipeline, acquiring water rights and stock water rights for instream flow, and working with farmers to improve irrigation efficiency. Funding for these projects includes grants from Ecology and NRCS. The conserved water is dedicated to instream flow. For the irrigation efficiency projects, the conserved water has been estimated using a ratio of one acre-foot conserved per one acre converted. The costs for these projects are not available, so the price has been estimated by using an average conversion cost based on data from other NRCS irrigation efficiency projects within the table.

North Yakima Conservation District had one conservation project. The project eliminated the need for two Cowiche Creek diversions. The area already had Yakima-Tieton Irrigation District (YTID) infrastructure in place, and a new water right was created at the same point of diversion as YTID. These water users use YTID's pressurized pipe infrastructure to transport the Cowiche Creek Water User's water right to their existing place of use. The conserved water was then placed in Ecology's Trust Water Rights Program, which allows the water to contribute to instream flow. Funding for this project came from the Salmon Recovery Funding Board and North Yakima Conservation District in collaboration with Trout Unlimited. Trout Unlimited is a non-profit organization that helps protect and restore cold water fisheries and their watersheds through conservation and habitat restoration.

South Yakima Conservation District had five projects that improved farmers' irrigation efficiency with funding from the NRCS. A similar estimation of the quantity of conserved water and cost of implementation was calculated with the same metrics used for Kittitas County Conservation District.

Lastly, 17 projects have been accounted for from Benton Conservation District. These projects include the implementation of the Heritage Garden program and working with farmers to

improve irrigation efficiency. The Heritage Garden program helps homeowners switch from using high-water-use plantings (such as lawn) to low water-use-plants. This decreases the volume of water needed for irrigation. Funding has come from Ecology, Washington State Conservation Commission, and Benton Conservation District. The conserved water has not been put in Trust and is designated as drought resiliency water.

Between the four conservation districts $7.5 million has been invested and 7,706 AF has been conserved. The average cost per acre-foot conserved is $1,017.

Others

City of Yakima has implemented two enhanced water conservation projects. Both projects involved converting areas with high-water-use plants to low-water-use plantings. Funding was provided by Ecology, Reclamation, and City of Yakima. The conserved water was reserved for drought resiliency.

Trout Unlimited had one conservation project, which consisted of acquiring surface water rights from landowners that diverted from Manastash Creek yet was also part of KRD's assessed acres. The redundant Manastash Creek water rights were then dedicated to instream flow. Funding for this project came from Ecology.

A total of five projects were accounted for from the Benton County, Yakima County, and Tribal Lands NRCS Offices. These were all irrigation efficiency improvement projects. Additionally, the NRCS Kittitas Office took part in six conservation projects that were also irrigation efficiency improvement projects.

In total, all the entities in the 'others' category had a total of 14 projects with $3.7 million invested, and 3,134 AF of water conserved. This results in an average cost of $1,189 per acre-foot.

Not Listed

Prior to the Integrated Plan, YTID had piped extensive portions of their irrigation water delivery system. Since 2013, YTID has actively been involved in feasibility studies and designs for projects that will/may result in water savings, as well as other projects benefiting habitat. At this time, however, no projects fit the criteria outlined above to warrant inclusion under enhanced water conservation.

The following irrigation districts have also been contacted: Ahtanum Irrigation District, Benton Irrigation District, Broadway Irrigation Company, Cascade Irrigation District, Sunnyside Valley Irrigation District, Yakima Valley Canal Company and Union Gap Irrigation District. Benton and Sunnyside Valley provided information about projects they have completed since 2013, but

the projects they shared fell under YRBWEP Phase II. No further information was gathered from the other districts.

Conclusion

The data summarized on the table represents coordination with many different individuals, often multiple people, for each agency or entity shown. Previously, no single place existed where records for all these projects could be accessed. This led to difficulty in understanding how many conservation projects had been implemented across the basin since the start of the Integrated Plan. With the immediate enhanced water conservation goal of achieving 85,000 AF by 2029, the table provides clarity in determining how much water has been conserved and the cost incurred with each project.

This data has also highlighted the challenges of tracking conservation benefit water as part of the Integrated Plan. Because there have been no diversion reduction agreements required for projects receiving funding from Ecology or Reclamation unlike in YRBWEP Phase II, it has been hard to verify how, where, and when the conservation water is used. This is particularly evident in the case of instream flows.[3] Finally, there is a certain quantity of on-farm irrigation efficiency projects that could not be captured within the table. As irrigation districts continue to update their infrastructure and technology continues to improve, individual farmers also continue to update their irrigation systems, resulting in more savings. At this point, their data has not been available.

Looking to the future, it is planned that this table would be updated annually as construction projects are completed and new projects are started.

[3] One exception is that Reclamation has an agreement with KRD that states the quantity of flow that must go into the tributaries.

DRAFT Enhanced Water Conservation Accounting - 04/02/2021

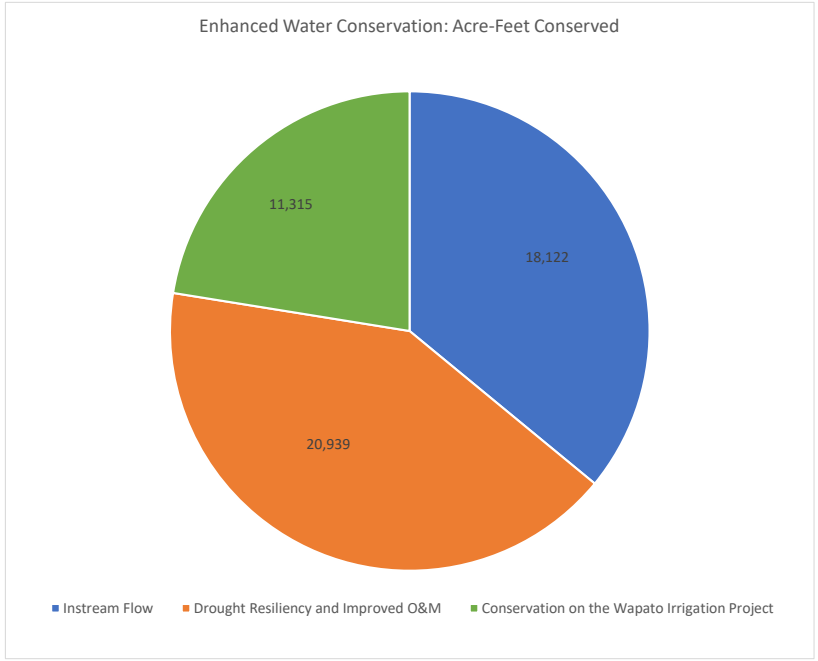
CONSERVATION PROJECTS TOTAL				
	Acre-Feet Conserved*	Total Cost*	Cost per Acre-Foot*	# of Projects
Total:	50,375	$89,349,737	$1,774	104

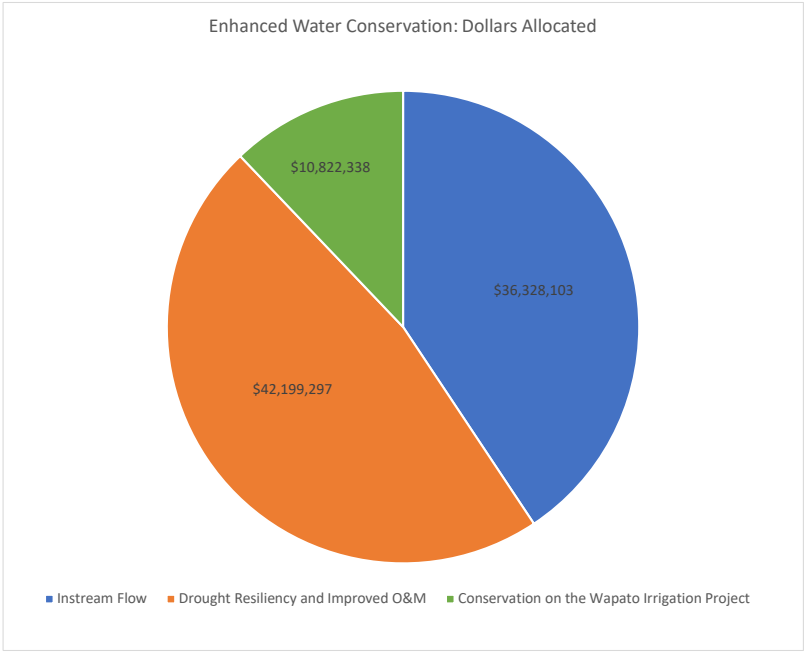
COMPLETE PROJECTS				
	Acre-Feet Conserved*	Total Cost*	Cost per Acre-Foot*	# of Projects
Total:	39,865	$65,714,975	$1,648	94

IN-PROGRESS PROJECTS				
	Acre-Feet Conserved*	Total Cost*	Cost per Acre-Foot*	# of Projects
Total:	10,510	$23,634,763	$2,249	10

	Acre-Feet Conserved*	Total Cost*	Cost per Acre-Foot*
Instream Flow	18,122	$36,328,103	$2,004.70
Drought Resiliency and Improved O&M	20,939	$42,199,297	$2,015.38
Conservation on the Wapato Irrigation Project	11,315	$10,822,338	$956.46
Total:	50,375	$89,349,737	$1,773.69

*All totals are approximate and subject to change





Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Yakama Nation	1	Yakama Nation Aquifer Recharge and Canal Piping Projects	Pipe Satus East Lateral E73. 1.5 miles of open ditch, except near end, piped.	X	X	890	$300,000	$337	2013 - 2019	Ecology	Yes	Conservation on WIP	C1500029 (Amendment No. 3)		
			Pipe WIP Lateral 4-414C. 1.25 miles of open ditch piped.	X	X	840	$650,000	$774			Yes				
			Toppenish Creek Alluvial Fan Aquifer Recharge - install surface-flow control structures in existing canals and make modifications to diversions	X	X		$612,284				Yes			~2,500 to 5,000 ac-ft/year delivered to aquifer	Toppenish, Simcoe and Agency Creek
Yakama Nation	2	WIP 2019-2020 Project Upgrades (Canal Lining and Pipeline Projects in Unit 2)	Pipeline Lateral 251. Replaced 4,100' of leaking concrete pipeline and eliminated tail-end spill.	X	X	220	$62,000	$282	2018 - 2020	Ecology	Yes	Conservation on WIP	WRYBIP-2019-BIndAf-00002	Whole project jointly funded by Ecology & WIP - ERL	
			Pipeline Lateral 398. Replaced 14,720' of leaking concrete pipeline and eliminated tail-end spill.			698	$307,000	$440			Yes				
			Pipeline Lateral 362. Replaced 16,920' of leaking concrete pipeline and eliminated tail-end spill.			684	$390,000	$570			Yes				
			Pipeline Lateral 160. Replaced 6,480' of leaking concrete pipeline and eliminated tail-end spill.			482	$143,000	$297			Yes				
			Pipeline Lateral 209. Replaced 1,280' of leaking concrete pipeline and eliminated tail-end spill.			164	$42,000	$256			Yes				
			Pipeline Lateral 229. Replaced 5,740' of leaking concrete pipeline and eliminated tail-end spill.			375	$110,000	$293			Yes				
			Pipeline Lateral 118. Replaced 1,280' of leaking concrete pipeline and eliminated tail-end spill.			220	$42,000	$191			Yes				
			Pipeline Lateral 149. Replaced 2,080' of leaking concrete pipeline and eliminated tail-end spill.			190	$46,000	$242			Yes				
			Liner: STA 204+20 to 221+20 (1,700ft). Lined 1,810' of canal.			628	$323,000	$514			Yes				
			Liner: STA 117+00 to 129+00 (1,200ft). Lined 1,760' of canal.			587	$228,000	$388			Yes				
Yakama Nation	3	Aquifer Recharge and Canal Piping Projects	Unit 2 L672 Pipeline Replacement. Replaced five miles of leaking concrete pipeline and eliminated tail-end spill.	X	X	1,060	$1,490,000	$1,406	2016 - 2020	Ecology	Yes	Conservation on WIP	C1700079 (Amendment No. 1)		
			Lining of Unit 2 West Branch from Station 167+20 to 173+80. Lined 660' of canal.			230	$125,000			Ecology	Yes				
							$30,950			Yakama Nation Engineering/WIP	Yes				
Yakama Nation	4	Satus Unit 2	L274, L739, L766, L434: PS&E	X		1,270	$800,000		2020	NRCS	Yes	Conservation on WIP		Information provided by YNE	
							$1,217,640			WIP	Yes				
Yakama Nation	5	Wapato Irrigation Project (WIP) Improvements AFA #1	Water measurement equipment procurement and installation, irrigation water flow and delivery measurement, update inventory of acres served by Satus 1, 2 & 3, replace & pressurize Satus 3 F Line			972	$1,115,335		2017 - 2018	Reclamation (638)	Yes	Conservation on WIP	R16AV00020	"Satus 3 Line F was jointly funded by WIP and Reclamation under AFA #1. Reclamation purchased materials only. 8,540' of the existing 14,645' leaking and failing pipeline was replaced by this project. 4,415' had been previously replaced by WIP. Initial water savings were estimated at 972 acre-feet per year." -ERL	
		Wapato Irrigation Project (WIP) Improvements AFA #2	Continue irrigation water flow and delivery measurement, continue to update inventory of acres served by Satus 1, 2 & 3, begin to procure materials for Satus 3 D Line and Satus 3 E Line	X	X		$1,300,000		2018 - 2019		Yes				

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
		Wapato Irrigation Project (WIP) Improvements AFA #3	Continue irrigation water flow and delivery measurement, continue to update inventory of acres served by Satus 1, 2 & 3, develop construction contract documents and begin construction of modernized Satus 3 D Line and Satus 3 E Line			1,805	$500,000		2019 - 2020		Yes			"Satus 3 Lines D and E were jointly funded by Reclamation under AFA #2 and #3. Line D: 11,560 feet of failing concrete pipe was replaced by PVC pipeline. Estimated water savings will be 987 ac-ft/year for a 189 day season. Line E: 13,640 feet of failing concrete pipe was replaced by PVC pipeline. Estimated water savings will be 818 ac-ft/year for a 189 day season." -ERL	
		Wapato Irrigation Project (WIP) Improvements AFA #4	Develop specification and contract documents for the construction of 10 long crested weir check/grade control structure on Satus 3 Pump Canal				$988,129		2020 - 2021		No				

COMPLETE PROJECTS TOTAL:	11,315	$9,834,209	$869.13
IN-PROGRESS PROJECTS TOTAL:	0	$988,129	
OVERALL PROJECTS TOTAL:	11,315	$10,822,338	$956

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Kittitas Reclamation District	1	13.6, 13.8 Lateral Piping Project	Construct and provide design and devices during construction for laterals 13.6 and 13.8. Upgrade existing piped laterals. Construct a permanent turnout to Manastash Creek	X		1,300	$240,242		2013 - 2015	Ecology	Yes	Instream	C1600087		Manastash Creek
			13.6, 13.8 Lateral Piping Project, Man. Turnouts				$4,000,000		2014 - 2015	Reclamation	Yes	Instream	R13MR13712	*Approximate cost. PriorityProjects.pdf (Source: KRD)	
Kittitas Reclamation District	2	North Branch Canal Lining (Phases 1, 2, 3A and 3B)	Line 850 linear feet of earthen canal with a geomembrane and concrete lining	X		195	$147,104		2016	Reclamation/WaterSmart	Yes	Instream	R16AP00105		Manastash Creek. Some water to tributary supplement program including Tucker, Big, Little, and Taneum Creeks using passthrough water.
							$150,950		2016	KRD	Yes				
			Phase 1 of construction of lining 3.4 mi of North Branch Canal	X		3,153	$250,000		2016 - 2017	Ecology	Yes		C1600156		
			Canal lining Johnson Siphon to Wipple	X			$200,000		2016 - 2019	Ecology/Drought Well Mitigation	Yes		PriorityProjects.pdf (Source: KRD)	*Approximate cost	
							$100,000		2016 - 2019	Ecology/Water Acquisitions	Yes		PriorityProjects.pdf (Source: KRD)	*Approximate cost	
							$245,593		2016 - 2019	Salmon Recovery Funding Board (SRFB)	Yes		16-1760R		
							$500,000		2016 - 2019	BPA/NFWF	Yes		PriorityProjects.pdf (Source: KRD)	*Approximate cost	
			Phase 2 of Canal Lining. Install geomembrane liner with an overlay of concrete on ~2.68 mi of earthen canal	X			$5,649,504		2017 - 2022	Reclamation	Yes		R17AP00064		
Kittitas Reclamation District	3	Turbine 1.1 Pipeline	1700' of pipeline on a small lateral	X		82	$25,000		2016 - 2016	Reclamation/WaterSmart	Yes	Instream	R16AP00062		Contract does not specifically state it will be used for the Tributary Enhancement Program. May benefit the Yakima River from Easton through Mouth of Canyon
							$28,727			KRD	Yes				
Kittitas Reclamation District	4	South Branch Canal Lining - (Phase 1)	Swede Tunnel to Robinson Canyon. Line KRD South Branch Canal to eliminate seepage and deliver saved water to tributaries on the upper Yakima River	X		1,585	$3,567,076		2017 - 2019 & 2018 - 2020	Ecology	No	Instream	No. WROCR-VER1-KittRD-00016 (Amendment No 1.)	As of 7/28/20, work is about 59% complete. Total conserved water will be 1585 ac/yr.	Water is used for tributary supplementation program. Manastash Creek and some water to tributary supplement program including Tucker, Big, Little, and Taneum Creeks using passthrough water.
							$5,751,700		2018 - 2023	Reclamation/YRBWEP	No		R18AP00036. (Addl: PriorityProjects.pdf (Source: KRD))	*Approximate cost	
							$300,000		2018 - 2022	Reclamation/WaterSmart	No		R18AP00180	As of 7/28/20, work is about 59% complete. Total conserved water will be 1585 ac/yr.	
Kittitas Reclamation District	5	South Branch Canal Lining - (Phase 2)	Robinson Canyon to Manastash	X		2,475	$2,000,000		2019 - 2022	Ecology/Streamflow Restoration	No	Instream	PriorityProjects.pdf (Source: KRD)	Design and permitting done, construction to begin in October 2020	Water is used for tributary supplementation program. Manastash Creek and some water to tributary supplement program including Tucker, Big, Little, and Taneum Creeks using passthrough water.
Kittitas Reclamation District	6	KRD Main Canal Seepage Loss Correction	Seal cracks and expansion joints in 3000' of concrete lined canal (starting at Tillman siphon/milepost MB12.5)	X		270	$75,000		2018-2020	Reclamation/WaterSmart	No	Instream	R18AP00254	As of 7/6/20, work is about 54% done. Estimated water savings from communications with Mr. Roger Satnik. Total conserved water will be ~270 ac/yr when complete. (or other non-Federal funding)	Contract does not specifically state it will be used for the Tributary Enhancement Program. May benefit the Yakima River from Easton through Mouth of Canyon
							$75,000			KRD	No				

COMPLETE PROJECTS TOTAL:	4,730	$11,537,120	$2,439
IN-PROGRESS PROJECTS TOTAL:	4,330	$11,768,776	$2,718
TOTAL PROJECTS TOTAL:	9,060	$23,305,896	$2,572

KRD must deliver **16 CFS (~5,700 AF/YR) to Manastash** for instream flow. They have also delivered water to Tucker, Big, Little, and Taneum Creeks using passthrough water. Whiskey, Reecer, Wilson, and other potential creeks will have to wait until we have conserved more water, and can make the changes necessary to guarantee that delivered water would stay in the creek on those tributaries.

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Roza Irrigation District	1	Canal Sealing - MP 17.7 to 18.9	Conserve water by sealing cracks and joints w/ AquaLastic in existing concrete lining in an ~6,336 linear foot section of main canal in the Moxee Valley	X		273	$350,000	$1,282	2015 - 2017	Ecology	Yes	Drought resiliency	IAA C1600174		The reach benefits for drought resiliency projects are most applicable in good water years and may not be applicable in water short years. From Roza dam to Chandler Power Plant would be the reach benefited.
Roza Irrigation District	2	Canal Sealing	Sealing at MPs: 11.8, 19.3-19.9, 21.3-21.5, 28.0-28.2, 28.9-29.1, 29.3-29.8, 30.7, 32.8-32.9, 33.2-34, 34.0-34.7, 35.5-35.9, 50.5-50.8, 58.0-58.2, 33.0-33.4 in Main Canal	X		2,115	$1,528,908	$723	2015 - 2021	Ecology	No	Drought resiliency	IAA C1700086 Amendment 5	As of 7/29/20, the project is 72% complete	
Roza Irrigation District	3	Enclosed Conduit Project Pump 7	Complete next phase of its ongoing water efficiency effort by converting 7.6 miles of lateral canal to pipeline and installing advanced flow meters to all for better monitoring of deliveries.	X		687	$300,000		2013	Reclamation/ WaterSmart	Yes	Drought resiliency	WEEG 2013		
Roza Irrigation District							$1,128,014			Roza	Yes				
Roza Irrigation District	4	Concrete Lining Seal Mile Post 30.3-30.8	Seal half a mile of concrete liner in the districts main canal to help reduce seepage	X		800	$75,000		2017	Reclamation/ WaterSmart	Yes	Drought resiliency	R17AP00197		
							$79,249			Roza	Yes				
Roza Irrigation District	5	Canal Sealing (900 feet)	Seal canal (MP 18.5-18.7 to MP 43.9-44.1) by applying AquaLastic over all cracks and joints	X		39	$25,000		2016	Reclamation/ WaterSmart	Yes	Drought resiliency	R16AP00066	Water savings estimate from YBConsProg.pdf	
							$25,858			Roza	Yes				
Roza Irrigation District	6	Canal Sealing (4,222 linear feet)	Main Canal Concrete Sealing Project - From MP36.2 to MP36.9. Seal 4,222 LF with AquaLastic	X		183	$74,972		2018	Reclamation/ WaterSmart	Yes	Drought resiliency	R18AP00252		
							$74,972			Roza	Yes				
Roza Irrigation District	7	Pump 7, 21.3 Lateral Enclosed		X		735	$1,189,395	$1,618	2013-2014	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	8	Pump 8 Lateral Enclosed		X		848	$2,269,406	$2,676	2014-2015	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	9	P16H,7.8 Lateral Enclosed		X		721	$1,525,107	$2,115	2015-2016	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	10	P16L, 18.3, 19.1, 22.1 Lateral Enclosed		X		1,054	$1,653,200	$1,569	2016-2017	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	11	P9 Lateral Enclosed		X		783	$2,264,290	$2,892	2017-2018	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	12	P15H, 23.9, 24.3 Lateral Enclosed		X		873	$2,800,000	$3,207	2018-2019	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		
Roza Irrigation District	13	P15L, 23.2, 24.8 Lateral Enclosed		X		1,002	$3,050,000	$3,044	2019-2020	Roza	Yes	Drought resiliency	Summary of ECS Construction 2019.pdf (Source: Roza)		

COMPLETE PROJECTS TOTAL:	7,998	$16,884,464	$2,111
IN-PROGRESS PROJECTS TOTAL:	2,115	$1,528,908	$723
TOTAL PROJECTS TOTAL:	10,113	$18,413,372	$1,821

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Kennewick Irrigation District	1	Canal Lining		X		131	$580,913	$4,434	2013 - 2015	KID	Yes	Drought Resiliency	GrantSummary.pdf (source: KID)		
Kennewick Irrigation District	2	EPDM Canal Lining and Conservation Project (KID WaterSmart 13 Canal Lining Project)	Line 14.6 miles of existing earthen canal with geomembrane liner.	X			$1,500,000		2013 - 2015	Reclamation/ WaterSmart	Yes	Drought Resiliency & Instream	R13AP13016 (WEEG 2013)	Does not include drive water (2,199 AF) at Chandler Pumps Not Diverted at Prosser for conserved water. A portion of water conserved will remain instream for add'tl fishery habitat. Remaining water savings used to shore up supplies during periods of shortage. District also estimates energy savings of 228,459 kw hours throughout reduction of pumping req.	Chandler Powerplant to Columbia River
			Line 14.6 miles of existing earthen canal with geomembrane liner.	X		1,763	$4,305,344	$3,293	2013 - 2015	KID	Yes			AF conserved and cost/ac-ft includes line above	Chandler Powerplant to Columbia River
Kennewick Irrigation District	3	HDPE Canal Lining and Water Conservation Project (KID WaterSmart16 Canal Lining Project)	Line 7.2 miles of an existing earthen canal with high-density polyethylene geomembrane liner	X			$1,000,000		2016 - 2019	Reclamation/ WaterSmart	No	Drought Resiliency & Instream	R16AP00108 (WEEG-050 2016)	Does not include drive water (1,334 AF) at Chandler Pumps Not Diverted at Prosser for conserved water.	Chandler Powerplant to Columbia River
				X		1,067	$2,471,215	$3,253	2016 - 2019	KID	No				Chandler Powerplant to Columbia River
Kennewick Irrigation District	4	KID WaterSmart18 Canal Lining Project	5.6 mi	X			$1,000,000		2019 - 2022	Reclamation/ WaterSmart	No	Drought Resiliency & Instream	R18AP00184	Contract is awarded, but pending final approval. Does not include drive water (1,546 AF) at Chandler Pumps Not Diverted at Prosser for conserved water	Chandler Powerplant to Columbia River
				X		1,237	$2,427,874	$2,771	2019 - 2022	KID	No				

COMPLETE PROJECTS TOTAL:	1,894	$6,386,257	$3,372
IN-PROGRESS PROJECTS TOTAL:	2,304	$6,899,089	$2,994
TOTAL PROJECTS TOTAL:	4,198	$13,285,346	$3,165

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Selah-Moxee Irrigation District	1	Moxee Canal	Postma Pipe Line Phase III (Railroad to Canal End) 21"-12"	X[1]	X[2]	233	$351,000	$1,506.44	2014	SMID	Yes	Drought Resiliency	SMID Conservation Projects.pdf (Source: SMID)		The reach benefits for drought resiliency projects are most applicable in good water years. Benefits Yakima river from SMID diversion points along return.
Selah-Moxee Irrigation District	2	S-M Canal	Replace T.O. and water measure	X[1]	X[2]	9	$20,000	$2,285.71	2016	SMID	Yes	Drought Resiliency	SMID Conservation Projects.pdf (Source: SMID)		
Selah-Moxee Irrigation District	3	S-M Canal	Replace T.O. and water measure	X[1]	X[2]	15	$20,000	$1,333.33	2018	SMID	Yes	Drought Resiliency	SMID Conservation Projects.pdf (Source: SMID)		
Selah-Moxee Irrigation District	4	S-M Canal	Replace T.O. and water measure	X[1]	X[2]	10	$20,000	$2,000.00	2019	SMID	Yes	Drought Resiliency	SMID Conservation Projects.pdf (Source: SMID)		
Selah-Moxee Irrigation District	5	S-M Canal	S-M End Pipe Line Phase 1 (18" & 24")	X[1]	X[2]	78	$171,000	$2,206.45	2020	SMID	Yes	Drought Resiliency	SMID Conservation Projects.pdf (Source: SMID)		

[1] 14.4% Junior rights (proratable)

[2] 85.6% Senior rights (non-proratable)

COMPLETE PROJECTS TOTAL:	344	$582,000	$1,690.63
IN-PROGRESS PROJECTS TOTAL:			
TOTAL PROJECTS TOTAL:	344	$582,000	$1,690.63

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Naches-Selah Irrigation District	1	Pipe Guinan Lateral - Phase 2 (North End)	Pipe Guinan Lateral - Phase 2 2013: Install 3,440 12" HDPE Pipe and replace waterboxes with enclosed deliveries.	X[1]	X	64	167,750.32	$2,641.74	2013	NSID	Yes	Drought Resiliency		All project data provided by Justin Harter	The reach benefits for drought resiliency projects are most applicable in good water years and may not be applicable in water short years. Reach benefited would be from the Naches-Selah Canal diversion on the Naches River to the confluence with the Yakima River
Naches-Selah Irrigation District	2	D-Section Lining - 5,400 Ft	D-Section Lining - Installation of 5,400 Ft of Geomembrane Liner from Mile 9.8 to 10.8 & Mile 11.4 to 11.7 on D Section of Main Canal	X[1]	X	273	$213,747		2013	Reclamation/ Watersmart	Yes	Drought Resiliency			
							$213,747	$1,565.91		NSID	Yes	Drought Resiliency			
Naches-Selah Irrigation District	3	Main Canal Flume Replacement	Replace Wood and Concrete Flumes circa 1910-1950. Install 3,530ft reinforced concrete canal over HDPE geomembrane, 3,326ft 96" CCFRP Pipe	X[1]	X	1,150	$7,430,860	$6,462.74	2015	NSID	Yes	Drought Resiliency			
Naches-Selah Irrigation District	4	Mile 14.48 Lining	Install 2,600ft exposed bituminous geomembrane lining over circa 1918 concrete canal	X[1]	X	417.9	$209,422	$501.13	2020	NSID	Yes	Drought Resiliency			

[1] Water user has both non-proratable and proratable entitlements (mostly non-proratable)

COMPLETE PROJECTS TOTAL:	1,904	$8,235,526.43	$4,324.93
IN-PROGRESS PROJECTS TOTAL:	0	$0.00	
TOTAL PROJECTS TOTAL:	1,904	$8,235,526.43	$4,324.93

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach
Kittitas County Conservation District	1	Manastash – Consolidated Pipeline & MWDA Pipeline Construction	Replace MWDA earthen ditch with 4 miles of pipeline and remove three unscreened diversions on Manastash Creek	N/A	N/A	574	$507,713	$884.52	2013 - 2015	Ecology	Yes	Instream Flow	G1000527		Manastash Creek
Kittitas County Conservation District	2	Anderson Diversion Irrigation Water Acquisition	Trout Unlimited negotiate acquisition of water rights for instream flow or alternately KCCD assist with connection between existing irrigation systems and the new KRD Lateral 13.8 pressurized pipeline in exchange for an equitable portion of water rights	N/A	N/A	895	$275,000		2016 - 2021	Ecology	Yes	Instream Flow	WROCR-VER1-KittCD-00003 (Amendment No. 5)		Manastash Creek
		Reed Pipeline Construction	Continue the pipeline previously constructed by USBR by designing pipeline to replace one mile of earthen ditch.	N/A	N/A		$200,000			Ecology	No	Instream Flow			
		Stockwater Acquisition	KCCD and Trout Unlimited to work with stockwater rights holders to acquire water for instream flow and convert to winter stockwatering wells.	N/A	N/A	1,071	$548,747			Ecology	No	Instream Flow			
Kittitas County Conservation District	3	Irrigation Efficiency Improvements	273 acres flood/rill irrigation to sprinkler	N/A	N/A	273	$354,900		2013	NRCS	Yes	Instream Flow		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	Reach benefits could not be determined[2]
Kittitas County Conservation District	4	Irrigation Efficiency Improvements	771 acres flood/rill irrigation to sprinkler	N/A	N/A	771	$1,002,300		2014	NRCS	Yes	Instream Flow		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	Reach benefits could not be determined[2]
Kittitas County Conservation District	5	Irrigation Efficiency Improvements	755 acres flood/rill irrigation to sprinkler	N/A	N/A	755	$981,500		2015	NRCS	Yes	Instream Flow		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	Reach benefits could not be determined[2]
Kittitas County Conservation District	6	Irrigation Efficiency Improvements	176 acres flood/rill irrigation to sprinkler	N/A	N/A	176	$228,800		2016	NRCS	Yes	Instream Flow		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	Reach benefits could not be determined[2]
Kittitas County Conservation District	7	Irrigation Efficiency Improvements	175 acres flood/rill irrigation to sprinkler	N/A	N/A	175	$227,500		2017	NRCS	Yes	Instream Flow		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	Reach benefits could not be determined[2]
Kittitas County Conservation District	8	Upper Yakima RCPP Irrigation Efficiency Improvements	Conversion of surface to sprinkler irrigation on 283 acres	N/A	N/A	353	$1,000,000	$2,832.86	2018 - 2021	Ecology	No	Instream Flow	WRYBIP-VER1KitCCD*-00002 & Amendment No. 1	Upgrade on-farm conveyance and irrigation systems	Reach benefits could not be determined[2]

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach
North Yakima Conservation District	9	CCWUA Barrier Removal and Trust Water	NYCD eliminated the need to use two Cowiche Creek diversions by creating a new 7.9 cfs water right on the Tieton River at the same point of diversion as the Yakima Tieton Irrigation District. An agreement between the Cowiche Creek Water Users (CCWUA), YTID, and Reclamation was entered into, in which YTID uses its current pipeline infrastructure to transport the CCWUA water right to their existing place of use where a new pressurized pipeline taps into YTID's mainline and delivers water.	N/A	N/A	1,583	$574,599		2015 - 2018	Salmon Recovery Funding Board (RCO)	Yes	Instream Flow	12-1328R		Cowiche Creek to Naches River
			The existing CCWUA 7.9 cfs Cowiche Creek water right was acquired by the Washington Water Project of Trout Unlimited and placed into trust down to the Naches River.				$350,007			North Yakima Conservation District	Yes	Instream Flow			
South Yakima Conservation District	10	Irrigation Efficiency Improvements	82 acres flood/rill irrigation to sprinkler	N/A	N/A	82	$106,600		2013	NRCS	Yes	Drought Resiliency [1]		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects. It is a placeholder.	
South Yakima Conservation District	11	Irrigation Efficiency Improvements	404 acres flood/rill irrigation to sprinkler	N/A	N/A	404	$525,200		2014	NRCS	Yes	Drought Resiliency [1]		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	
South Yakima Conservation District	12	Irrigation Efficiency Improvements	1247 acres flood/rill irrigation to sprinkler	N/A	N/A	1,247	$1,621,100		2015	NRCS	Yes	Drought Resiliency [1]		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	
South Yakima Conservation District	13	Irrigation Efficiency Improvements	75 acres flood/rill irrigation to sprinkler	N/A	N/A	75	$97,500		2016	NRCS	Yes	Drought Resiliency [1]		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	
South Yakima Conservation District	14	Irrigation Efficiency Improvements	240 acres flood/rill irrigation to sprinkler	N/A	N/A	240	$312,000		2017	NRCS	Yes	Drought Resiliency [1]		Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings. Cost is estimated based on average conversion cost of other NRCS projects.	
Benton Conservation District	15	Heritage Garden Program		N/A	N/A		$75,000		2019-2021	Ecology	Yes	Drought Resiliency	Agreement No. WRYBIP-1921-BentCD-00012		
Benton Conservation District	16	Heritage Garden Program Implementation		N/A	N/A	0.2	$34,125	$213,281.25	2018-2019	Ecology	Yes	Drought Resiliency	Agreement No. WRYBIP-2019-BentCD-00001		
Benton Conservation District	17	Irrigation Efficiency Improvements	30 acres wheeline to pivot on row crops	N/A	N/A	14	$25,000	$1,773.05	2013	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	18	Irrigation Efficiency Improvements	14 acres flood to pod irrigation on pasture	N/A	N/A	28	$15,000	$535.71	2013	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	19	Irrigation Efficiency Improvements	14 acres flood to solid set/handline irrigation on pasture	N/A	N/A	28	$9,000	$321.43	2013	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	20	Irrigation Efficiency Improvements	40 acres wheeline to pivot irrigation on row crops	N/A	N/A	25	$15,000	$595.24	2014	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Total Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach
Benton Conservation District	21	Irrigation Efficiency Improvements	23 acres flood to pod irrigation irrigation on pasture	N/A	N/A	46	$16,497	$358.63	2014	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	22	Irrigation Efficiency Improvements	3 acres flood to solid set irrigation on row crops	N/A	N/A	5	$1,813	$362.61	2014	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	23	Irrigation Efficiency Improvements	10 acres flood to solid set irrigation on pasture	N/A	N/A	20	$8,349	$417.47	2014	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	24	Irrigation Efficiency Improvements	15 acres wheeline to solid set irrigation on row crops	N/A	N/A	4	$3,900	$1,083.31	2014	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	25	Irrigation Efficiency Improvements	16.4 acres wheeline to linear line irrigation on row crops	N/A	N/A	10	$45,411	$4,408.82	2015	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	26	Irrigation Efficiency Improvements	126 acres wheeline to pivot irrigation on alfalfa	N/A	N/A	111	$15,000	$134.89	2015	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	27	Irrigation Efficiency Improvements	18 acres flood to wheeline irrigation on pasture	N/A	N/A	36	$16,461	$457.24	2015	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	28	Irrigation Efficiency Improvements	50 acres overhead sprinkler to drip irrigation on pasture	N/A	N/A	29	$15,000	$513.70	2015	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	29	Irrigation Efficiency Improvements	40 acres flood to pod irrigation on pasture	N/A	N/A	80	$15,000	$187.50	2016	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	30	Irrigation Efficiency Improvements	3.5 acres flood to solid set irrigation on pasture	N/A	N/A	7	$7,927	$1,132.39	2018	Benton Conservation District	Yes	Drought Resiliency		Info provided by Benton Conservation District	
Benton Conservation District	31	Irrigation Efficiency Improvements	21 acres wheeline to center pivot irrigation on row crops	N/A	N/A	13	$50,000	$3,787.88	2018	Washington State Conservation Commission	Yes	Drought Resiliency		Info provided by Benton Conservation District	

[1] NRCS does not require recipients of grants to give up water rights or place water in trust. However, conserved water from these projects is typically left in stream or in the irrigation delivery canal.

[2] Reach benefits cannot be determined for Irrigation Efficiency Projects. These project locations were not disclosed to protect the farmers' privacy.

COMPLETE PROJECTS TOTAL:	7,706	$7,533,202	$977.52
IN-PROGRESS PROJECTS TOTAL:	1,424	$1,748,747	$1,228.05
TOTAL PROJECTS TOTAL:	9,130	$9,281,948	$1,016.59

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
City of Yakima	1	City of Yakima Xeriscape Demonstration Project	Project will install a low water use garden at the City of Yakima Public Works Facility and Downtown Yakima			8	$50,200	$6,435.90	2015-2017	Ecology	Yes	Drought Resiliency	C1600173		
City of Yakima	2	Low Water Use Garden Conversion Project	City of Yakima will implement a low water-use garden conversion project converting 38,000 sq ft of grass lawn and high water use plants to low water-use landscaping			10	$63,500		2017 - 2019	Reclamation/ WaterSmart	Yes	Drought Resiliency	R17AP2003 (2019 Amendment)		
							$85,863			City of Yakima	Yes	Drought Resiliency			
Trout Unlimited	3	Manastash Creek Water Acquisitions	Surface water rights & assessed acres from KRD, and KRD water satisfied their need. Essentially removal of redundent water needs.			337	$128,468	$381.21	2018	Ecology Water Acquisitions	Yes	Instream			Manastash Creek
Benton County, Yakima County, & Tribal Lands NRCS Offices	4	Irrigation Efficiency Improvements	560.4 acres converted to sprinkler or microirrigation	N/A	N/A	560	$580,574	$1,036.00	2013	NRCS	Yes	Drought Resiliency [1]	Conservation by Acres by County	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Benton County, Yakima County, & Tribal Lands NRCS Offices	5	Irrigation Efficiency Improvements	231.2 acres converted to sprinkler or microirrigation	N/A	N/A	231	$306,429	$1,325.39	2014	NRCS	Yes	Drought Resiliency [1]	Conservation by Acres by County	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Benton County, Yakima County, & Tribal Lands NRCS Offices	6	Irrigation Efficiency Improvements	292.1 acres flood/rill irrigation to sprinkler	N/A	N/A	292	$516,763	$1,769.13	2015	NRCS	Yes	Drought Resiliency [1]	Conservation by Acres by County	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Benton County, Yakima County, & Tribal Lands NRCS Offices	7	Irrigation Efficiency Improvements	166 acres flood/rill irrigation to sprinkler	N/A	N/A	166	$198,003	$1,192.79	2016	NRCS	Yes	Drought Resiliency [1]	Conservation by Acres by County	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Benton County, Yakima County, & Tribal Lands NRCS Offices	8	Irrigation Efficiency Improvements	253.7 acres flood/rill irrigation to sprinkler	N/A	N/A	254	$486,109	$1,916.08	2017	NRCS	Yes	Drought Resiliency [1]	Conservation by Acres by County	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Benton County, Yakima County, & Tribal Lands NRCS Offices	9	Irrigation Efficiency Improvements	297.6 acres to sprinkler or microirrigation in Yakima County	N/A	N/A	297	$384,302	$1,293.94	2018	NRCS	Yes [2]	Drought Resiliency [1]			
Benton County, Yakima County, & Tribal Lands NRCS Offices	10	Irrigation Efficiency Improvements	542.2 acres to sprinkler or microirrigation in Yakima County	N/A	N/A	542	$610,472	$1,126.33	2019	NRCS	Yes [2]	Drought Resiliency [1]			

Entity	Project Reference Number	Project Description	Project Notes	Proratable Water User	Non-proratable Water User	Acre-feet Conserved	Cost	Cost/Ac-ft	Year	Funded By	Completed	Conservation Benefit	Contract/Grant/Agreement # or Reference	Notes	Creek/Reach Benefited
Benton County, Yakima County, & Tribal Lands NRCS Offices	11	Irrigation Efficiency Improvements	337 acres to sprinkler or microirrigation in Yakima County	N/A	N/A	337	$701,114	$2,080.46	2020	NRCS	No [2]	Drought Resiliency [1]			
Kittitas NRCS Office	12	Irrigation Efficiency Improvements	132.2 acres to sprinkler	N/A	N/A	132	$104,293	$788.90	2013	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Kittitas NRCS Office	13	Irrigation Efficiency Improvements	95 acres to sprinkler	N/A	N/A	95	$50,000	$526.32	2014	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Kittitas NRCS Office	14	Irrigation Efficiency Improvements	514.8 acres to sprinkler	N/A	N/A	515	$419,177	$814.25	2015	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Kittitas NRCS Office	15	Irrigation Efficiency Improvements	255.6 acres to sprinkler	N/A	N/A	226	$197,366	$874.85	2016	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Kittitas NRCS Office	16	Irrigation Efficiency Improvements	202 acres to sprinkler	N/A	N/A	202	$274,128	$1,357.07	2017	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	
Kittitas NRCS Office	17	Irrigation Efficiency Improvements	106.8 acres to sprinkler	N/A	N/A	107	$266,549	$2,495.78	2018	NRCS	Yes	Drought Resiliency [1]	NRCS Kittitas	Source: 'Conservation by Acres by County.xlx'. 1 AF conserved per 1 AC converted used as an estimate of water savings	

[1] NRCS does not require recipients of grants to give up water rights or place water in trust. However, conserved water from these projects is typically left in stream or in the irrigation delivery canal.

[2] Completion status is an estimation.

[3] Reach benefits cannot be determined for Irrigation Efficiency Projects. These project locations were not disclosed to protect the farmers' privacy.

COMPLETE PROJECTS TOTAL:	3,973	$4,722,196	$1,189
IN-PROGRESS PROJECTS TOTAL:	337	$701,114	
TOTAL PROJECTS TOTAL:	4,310	$5,423,310	$1,258