



Water Security for the Yakima River Basin's Economy, Communities, and Watersheds Executive Summary

Prepared for the Yakima River Basin Water Enhancement
Project Workgroup Economic Subcommittee

June 14, 2017

Ecology Publication Number 17-12-010

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EXECUTIVE SUMMARY*

Water influences almost all aspects of the economy, communities, and watersheds of the Yakima River Basin (YRB). The Basin's water-dependent economic sectors account for approximately 40 percent of total Basin employment.¹ Meeting current demands and supporting future growth and development of the YRB's communities cannot happen without reliable water supplies. Stream flows and riparian habitats support fish species that have spiritual and cultural significance for members of the Yakama Nation. Salmon, steelhead, and other species support recreational and commercial harvests in the YRB, the Columbia River, and ocean catch. Additionally, many of the recreational activities in the YRB involve water resources. Water is key to habitats that provide a variety of recreational wildlife viewing and hunting opportunities for waterfowl, upland birds, and big game elk and deer. Water is also



The Yakima River Basin

a major factor for the Basin's critical habitats, which have high priority locally and statewide. The quantity and quality of ecosystem services from the Basin's fresh water, wetland, grassland, and forest habitats depend on water.

The Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) is a forward-thinking plan that addresses current and anticipated future threats to the Basin's water security, especially during drought years.

The combination of projects in the Integrated Plan help address multiple objectives including: reduced water insecurity and enhanced water supply, especially during drought years; improved in-stream flows; improved fish habitats; and improved access to upstream fish habitats currently blocked by dams.

To highlight these various objectives and the potential outcomes of the Plan's projects, the Yakima River Basin Water Enhancement Project Workgroup's Economic Subcommittee commissioned this report to describe the economic importance of the Integrated Plan.

WATER AND THE YRB

Water provides the YRB's agricultural producers with a unique competitiveness that yields regional, state, and national benefits. The Basin's deep and fertile soils, optimal growing seasons, low humidity during growing seasons, freezing temperatures in winter (that help minimize pest and disease infestation), and an ample supply of affordable land relative to other growing regions accounts for the fact that the YRB has the largest agricultural

The Yakima River Basin's economy runs on water.



Total water-dependent employment in the YRB is approximately 96,000 workers, representing 40% of the Basin's employment. This is well above the statewide average of water-dependent employment (20%) and the national average (16%).



Crop production and food manufacturing account for approximately 75% of the \$1.8 billion+ in annual export value from the YRB. The Basin has the largest agricultural economy in the state.



Members of the Yakama Nation have spiritual, cultural, and economic connections with the YRB's water and fisheries resources. In years past, the YRB had the second largest salmon and steelhead runs in the Columbia River Basin.



The Basin's water-dependent ecosystem services are valued as high as \$15.2 billion.



Many of the recreational activities in the YRB involve water resources. The region's reservoirs, streams, and lakes are a major draw. In 2015, total outdoor recreation expenditures in the YRB exceeded \$1.2 billion. Spending specific to recreation on public waters exceeded \$280 million in 2015.

*This Executive Summary document is derived from a report by the same title, produced on June 14, 2017 for the Yakima River Basin Water Enhancement Project Workgroup. See the website for the Yakima Basin Integrated Water Resource Management Plan for the full report, www.ecy.wa.gov/programs/wr/cwp/YBIP.html.

economy in the state and is one of the most agriculturally diverse and productive regions in the United States.² Crop production and food manufacturing account for approximately 75 percent of the over \$1.8 billion** in annual export value from the YRB.³

The total water-dependent employment in the YRB (including agricultural production and processing) is over 96,000 workers, or approximately 40 percent of the Basin's workforce. The annual economic output from water-dependent firms in the YRB is over \$13 billion.⁴

Ample in-stream flows, access to upstream habitats, and the protection and restoration of riparian areas are key to the Yakama Nation's historic, ongoing, and future stewardship of culturally significant anadromous fish species. Started in 1983, the Yakama Nation Fisheries program employs 200 people and focuses on restoring fish species and their habitats.⁵

Many of the recreational activities in the YRB involve water resources. The Basin's reservoirs, streams, and lakes are a major draw for anglers, kayakers, canoers, jetskiers, and campers. The demand for water-based recreational activities in the Basin is expected to increase at a rate faster than population growth through the year 2050. Total outdoor recreational expenditures in the Yakima Basin in 2015 exceeded \$1.2 billion. Spending specific to recreation on public waters exceeded \$280 million in 2015.⁶

The Yakima River, its tributaries, and the Basin's diverse landscapes provide a range of ecosystem services.⁷ An estimated annual

value of ecosystem services provided by the Basin's fresh water, wetlands, grasslands, and forests is up to \$15.2 billion.⁸

Existing supplies of municipal water cannot support current demands and lack of water availability constrains the growth and development of communities in the YRB. Populations in the YRB are projected to grow faster than the state or national averages.⁹ Without addressing the Basin's water uncertainties, these population pressures combined with the anticipated increasing frequency of droughts will further constrain municipal growth.

DROUGHT AND THE YRB

The YRB's economy, communities, and watersheds are vulnerable to drought, and competing demands among users reduces water security for all. The region's susceptibility to drought comes from the fact that the population centers and areas of agricultural production receive very little rainfall each year—approximately 10 inches. Also, the five main reservoirs in the Basin capture relatively little of the runoff volume.

Snowpack (known as the "6th reservoir") provides up to half of total water supplies.¹⁰ A "snowpack drought" happens during water years when warmer than normal temperatures cause more moisture to fall as rain rather than snow, and the snow that does fall melts earlier in the year. The result is more water flowing down rivers and streams earlier in the year. This combined with relatively small reservoir capacity means less water for food production, municipalities, and fish later in the year. The 2015 drought was such an event.

The Yakima River Basin is particularly vulnerable to drought.

The arid lowlands, which include the major population and business centers and agricultural production and processing areas, receive approximately 10 inches of rain per year. The YRB's major reservoirs have a relatively low capacity to capture runoff volumes. Snowpack is a critical water source for the YRB, because it can account for more than half of the YRB's water supply. A "snowpack drought" happens when warmer than normal temperatures cause more moisture to fall as rain than snow, and the snow that does fall melts earlier in the year. The 2015 drought was such an event.



The 2001 drought caused the loss of over 4,800 job-years of employment in the Yakima Basin. Agricultural losses were over \$176 million and lost economic output for the YRB economy was \$265 million.



The 2015 drought caused losses of over \$122 million for YRB agriculture.



By the 2020's, the frequency of drought is estimated to be double that compared with recent history.

**All dollars in this Executive Summary are reported in 2016 dollars.

Reduced water availability during the past droughts lead to staggering economic losses in the YRB. The 2001 drought caused over \$176 million in lost agricultural production in the Basin, over \$265 million in losses in the larger Basin economy, and the loss of over 4,800 job-years¹¹ of employment.¹² The 2015 snowpack drought harmed statewide agricultural production by \$633 million to \$773 million. A partial estimate of the 2015 drought losses in the YRB agricultural sectors is over \$122 million.¹³

The YRB needs a plan to improve water security that anticipates increasing drought frequency. The YRB's current water deficit is projected to worsen in the future. Researchers at the University of Washington estimate that by the 2020's the frequency of drought will be double that compared with recent history.¹⁴

THE INTEGRATED PLAN'S ECONOMIC BENEFITS AND RETURNS ON INVESTMENT

The Integrated Plan is a forward-thinking approach that addresses current and anticipated future threats to the YRB's water security, especially during drought years. From an economic perspective, the Integrated Plan makes sense. According to U.S. Bureau of Reclamation calculations, the benefits of the Integrated Plan exceed costs, with benefit-cost ratios ranging from 1.4 to 3.2.¹⁵ Comparing the Plan's cost with measures of economic output that the Plan would support provides another context within which to view the Plan's costs and benefits. For example, the cost of the integrated Plan over 30 years is approximately equivalent to the value of one year of crop and animal production and food processing in the YRB.¹⁶

The over \$13 billion in annual economic output from YRB's water-dependent economic sectors is over two-and-a-half times the estimated cost of the Integrated Plan over 30 years.

Constructing the projects in the Integrated Plan will generate over \$2.5 billion dollars of economic output and \$1.4 billion dollars of personal income in the YRB.¹⁷ Total economic output benefits for the state of Washington (including benefits in the YRB) are over \$4.9 billion and total personal income benefits in the state are over \$2.2 billion. These projects will also support 27,000 job-years of work in the YRB and an additional 15,000 job-years of work elsewhere in Washington.¹⁸

Projects in the Integrated Plan will help increase populations of anadromous fish and increases Tribal, commercial, and recreational harvests. The value of increased recreational and commercial fish harvests supported by the Integrated Plan ranges between \$104 million to \$313 million.¹⁹ These values do not include the cultural and spiritual values that members of the Yakama Nation associate with salmon and steelhead populations. These values are unquantifiable.²⁰

In addition to providing direct economic benefits, the Integrated Plan will also help avoid economic losses. The water projects in the Integrated Plan would avoid drought-related agricultural losses of \$128 million in grain production; \$169 million in vegetables and melon production; and \$151 million in fruit production, per severe drought year.²¹ Losses in the YRB's agricultural sector will ripple through the Basin and the state's economies causing losses in other sectors. Total economic losses

The Integrated Plan makes good economic sense.



The Integrated Plan will support 27,000 job-years of work in the Yakima Basin and an additional 15,000 job-years elsewhere in Washington.



The value of increased fish harvests supported by the Plan ranges between \$104–\$313 million.



During a severe drought year, the Plan's implementation will prevent a \$823 million loss in economic output in the Yakima Basin.

For every severe drought year, the Plan would prevent drought-related losses of \$128 million in grain production; \$169 million in vegetable and melon production; and \$151 million in fruit production.



Without the Integrated Plan, municipalities would need to spend approximately \$412 million on senior water rights to support current and future populations.

Irrigation districts will pay their share of the costs for the projects that provide additional storage based on their water use.

avoided in the state's economy during a severe drought year because of the Integrated Plan include \$823 million in economic output; \$217 million in personal income; and 10,800 job-years of employment.²²

The Yakama Nation and federal and state agencies have invested millions of dollars in restoring and protecting aquatic and riparian habitats in efforts to increase anadromous fish populations. These efforts have had an effect and populations are on the rise. The in-stream flow, habitat, and fish-passage projects in the Integrated Plan will help protect the millions of dollars in current and past investments and population gains throughout the YRB.

Without the Integrated Plan, the U.S. Bureau of Reclamation estimates that municipalities would need to spend approximately \$412 million purchasing senior water rights in order to support current and future populations.²³ This assumes senior rights are available at prices that municipalities can afford.

The habitat restoration, in-stream flow, and water quality projects in the Integrated Plan will help protect and restore the riparian and related habitat ecosystem services and their associated economic values.²⁴ The estimated annual value of ecosystem services provided by the Basin's freshwater, wetlands, grasslands, and forests ranges from \$350 million to \$15 billion (2016 dollars).²⁵

The projects in the Integrated Plan that help promote and protect water supply and quality, and water-related natural habitats, will also help protect the YRB's natural resource-based recreational assets. Much of the recreational activities in the

YRB involve water resources, and the Basin's reservoirs, streams, and lakes are a major draw. Demand for water-based recreational activities is expected to increase at a rate faster than the rate of population increase through the year 2050. Total outdoor recreational expenditures in the YRB in 2015 exceeded \$1.2 billion. Total tourism spending is over \$870 million.²⁶

BENEFITS OF THE INTEGRATED RIVER PLAN EXTEND BEYOND THE YRB

The YRB is regionally and nationally significant in a number of areas that will benefit from the Integrated Plan. Agricultural producers in the YRB lead the state and the nation in apple production.²⁷ Milk is second only to apples in value of agricultural production from Washington State, and Yakima County leads the state in milk production and ranks seventh nationally.²⁸ The YRB leads the state, the nation, and the world in hops production. In 2015 and 2016, growers in the YRB produced more hops than anywhere else in the world, including Germany.²⁹ Across the country, sales of organic foods are growing at twice the rate of all food sales.³⁰ The YRB's rich soils, long growing season, and dry summer climate are ideal for growing crops without chemicals fertilizers or pesticides and help support a thriving center for organic production.³¹ Projects in the Integrated Plan that benefit agricultural production will also benefit firms in the transportation sector that move foods from the YRB to overseas markets. Crop production and food manufacturing accounts for approximately 75 percent of the over \$1.8 billion in export value from the YRB in 2015.³² Moving these goods to export markets supports jobs

and economic activities in Columbia River rail and barge transport and at Puget Sound Ports.³³

Salmon and steelhead that originate in the YRB travel downstream through the Columbia Basin and out into the Pacific Ocean. The increased fish populations supported by the Integrated Plan will help increase Tribal, commercial, and recreational harvests throughout this area.

The Integrated Plan addresses concerns shared by many in regions throughout the arid West—reducing water insecurity in times of declining water supply and increasing demand. Many outside the YRB see the Integrated Plan as a case study for finding common ground on water management and other, often-contentious natural resource issues.³⁴

The National American Water Resources Association recognized the Integrated Plan's Workgroup for outstanding teamwork and contributions to water resources management, which they describe as an "unprecedented achievement" in a region that struggled for years with efforts to reach agreement on water-policy issues.

In 2016, the U.S. Department of the Interior and the U.S. Department of Agriculture proclaimed the success of the Integrated Plan and the improvements the Plan's projects will make to the health and resiliency of the Yakima River Basin.

ENDNOTES

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