

Yakima River Basin Water Enhancement Project (YRBWEP) Workgroup Integrated Water Resource Management Plan Summary Support Document

1.0 Action

The Workgroup supports an Integrated Water Resource Management Plan for the Yakima basin to improve water supply reliability during drought years to 70% proratable supply for participating irrigation districts, enhance instream flows and habitat conditions and provide for fish passage at existing reservoirs. The Integrated Plan includes seven elements: fish passage, structural/operational changes, surface storage, groundwater storage, fish habitat enhancements, enhanced water conservation, and market based reallocation of water resources; and the actions contained within these elements, as described below.

By approving this summary document the Workgroup members support working together to develop a strategy and agreement regarding implementing the Integrated Plan. The entire Workgroup will support administrative review of the Integrated Plan including preparing a final planning report and programmatic National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and State Environmental Policy Act (SEPA) reviews, including incorporating results from land conservation discussions and advance mitigation currently underway. Depending upon the outcomes of these reviews (i.e., no fatal flaws), the non-federal organizations represented on the Workgroup will support legislative authorization and appropriations for the Integrated Plan. All Workgroup members will support permitting and mitigation for actions in the Integrated Plan.

The Workgroup will organize an Implementing Subcommittee comprised of tribal, state, and local government representatives, and one representative representing environmental interests to oversee efforts to seek authorization and funding. Implementing Subcommittee members will be drawn from the existing Workgroup participants. The Implementing Subcommittee will report progress back to the Workgroup. The Workgroup will meet periodically to review plan implementation progress.

2.0 Background

The Yakima River Basin Water Enhancement Project (YRBWEP) Workgroup has been working for nearly 18 months on a Yakima Basin Integrated Water Resource Management Plan (Integrated Plan) to restore fisheries and improve water supply in the Yakima basin.

The Workgroup, convened in June 2009 by the Bureau of Reclamation (Reclamation) and Washington State Department of Ecology (Ecology), developed a preliminary Integrated Plan (December 2009) comprised of seven elements and agreed to move these forward for further evaluation in 2010. These seven elements were identified in the 2009 Ecology Final Environmental Impact Statement for the Yakima River Basin Integrated Water Resource Management Plan.

Actions within these seven elements have been evaluated and characterized in greater detail in 2010 through the Yakima River Basin Study. Summary results from the basin study are provided in this document, including the elements and actions the Workgroup is approving for inclusion in the Final Integrated Plan. More detailed information will be provided in the Integrated Plan. Workgroup members will have the opportunity to review and comment on the draft Integrated Plan in early 2011. A group of natural resource conservation community stakeholders are developing a proposal for land conservation and broadly structured advance mitigation program to further the plan's instream flow and ecosystem protection and restoration goals. This program would be incorporated into the administrative review process described in Section 1.

The Workgroup identified the following key concepts for promoting the Integrated Plan:

- Include benefits for all involved interests.
- Be composed of a package of complementary projects drawn from all seven elements, that in combination, provide water supply, flow and habitat benefits.
- Be adaptable and flexible to accommodate anticipated trends, such as increasing drought, climate change and population growth, as well as unanticipated events.
- Maximize benefits from in-basin supply opportunities first, and evaluate other surface water storage or pump exchange supply projects if triggered by rolling needs review.

3.0 Integrated Plan Elements and Actions

The YRBWEP Workgroup finds that the elements and actions listed below should be included in the Final Integrated Water Resource Management Plan. Procedures for adjusting the plan if necessary during the implementation stage are described in Section 4.

3.1 Fish Passage

Restore anadromous salmonid access to habitat above the five existing large storage reservoirs and provide upstream and downstream passage for bull trout and other resident fish. For Clear Lake dam spillway and Box Canyon Creek, provide improved upstream passage for bull trout based upon an evaluation study. For Cle Elum and Bumping dams, install upstream and downstream fish passage. Install upstream and downstream fish passage at Tieton, Keechelus, and Kachess dams where passage is determined to be feasible based upon future evaluation studies as consistent with the 2006 Settlement Agreement between the Yakama Nation and Reclamation (or if not found feasible then pursue alternative fish restoration measures per 2002 HPA issued by WDFW).

Passage would be constrained by the following:

- Fish passage facilities would be designed and operated within existing operational Considerations and Constraints (CCs) outlined in the *Interim Comprehensive Basin Operating Plan* (Reclamation, 2002);
- Operations would continue to serve existing Reclamation contracts; and
- Potential operational changes that might enhance passage without causing adverse impacts to existing contracts or irrigation water supply would be considered.

Providing for unimpeded fish migration past the existing storage dams in the Yakima basin will increase species distribution, allow for the reintroduction of extirpated sockeye runs, allow expanded migrations and genetic interchange for listed bull trout and other native fish, and provide a strategy to cope with potential future climate change impacts by allowing fish to access higher elevation, high quality habitat.

3.2 Structural and Operational Changes

3.2.1 Cle Elum Dam (Pool Raise)

The proposed Cle Elum Pool Raise project (Pool Raise) consists of raising the maximum water level of Cle Elum Lake three feet from a current maximum elevation of 2,240 feet to 2,243 feet. The Pool Raise would increase the volume of available storage in Cle Elum Lake by approximately 14,600 acre-feet. Modifications would include shoreline protection, radial gate improvements, and mitigation of upstream inundation and recreation.

3.2.2 Kittitas Reclamation District (KRD) Canal Modifications

The proposed KRD Main Canal and South Branch Canal Modifications project (KRD Modifications) would improve KRD laterals along those canals designed to reduce seepage losses, and allow greater flexibility in KRD supply management. The water saved or transferred would be used to enhance instream flows in tributaries to the Yakima River, including Taneum Creek, Manastash Creek, Big Creek, and Little Creek. Specific actions would include:

- Piping of irrigation laterals along the KRD Main Canal and South Branch Canal.
- Construction of a re-regulation reservoir to capture KRD operational spills at Manastash Creek.
- Construction of a pump station on the Yakima River to deliver flows to Manastash Creek water users.

Tributary flow improvements will be coordinated with habitat enhancement actions (Section 3.5) targeting improving fish passage at KRD canal crossings¹.

¹ The updated Habitat Enhancement program description presented to the Workgroup at the October 2010 meeting identifies improving four canal/creek crossings within the entire KRD system.

3.2.3 Keechelus to Kachess (K to K) pipeline

Convey water from Lake Keechelus to Lake Kachess to reduce flows and improve habitat conditions during high flow releases below Keechelus, and provide more water storage in Lake Kachess for downstream needs.

This project would include modifying the existing Lake Keechelus outlet tunnel, installing nearly five miles of large-diameter pipe, and installing a new control structure and outfall into Lake Kachess. Also included, is an evaluation of a new power generation facility at the outfall.

Every effort will be made to coordinate construction of the K to K pipeline with ongoing construction of I-90, particularly on the Lake Keechelus end of the pipeline.

3.2.4 Power Subordination

Further subordinate water diversions for power generation at Roza Dam and Chandler power plant to support outmigration of steelhead, Chinook, sockeye and coho juveniles, recognizing power is already greatly subordinated above what originally occurred when the dams were built. Subordination will be pursued subject to the condition that acceptable mitigation is agreed upon and approved by Reclamation, Bonneville Power Administration and either Roza or Kennewick Irrigation District as applicable.

3.2.5 Wapatox Improvements

This project includes piping and/or replacing the lining along portions of the existing Wapatox Canal. It would include installation of new canal lining from the fish screen midway down the canal and replacement of the existing canal downstream from that point with a pipeline, or replacement of the entire length of existing canal downstream of the fish screen with a pipeline. The purpose of the project is to reduce or eliminate the carriage water diverted into the canal for Wapatox Ditch Company water users. This project could consolidate other diversions into the Wapatox Canal such as the Naches Selah Irrigation District, the City of Yakima Water Treatment Plant and the Glead Ditch. However the benefits of consolidating those diversions may not be sufficient compared to the cost and those water users may choose to not participate in the project.

3.3 Surface Water Storage

Pursue additional water supply development through the following storage projects. Storage enhancements should provide supply for instream flow needs and out-of-stream needs, including municipal and domestic uses. With each of these projects, evaluate and implement feasible additional power generation opportunities.

The first three surface water storage projects listed below (Wymer Dam, Kachess Inactive Storage, and Bumping Lake Enlargement) reflect the Workgroup's intent to focus on in-basin solutions to address water supply and aquatic resource problems in the Yakima River Basin. Collectively, these projects represent just over 450,000 acre-feet of additional water supply for

instream and out-of-stream uses in the basin. Should, after concerted effort by the Workgroup to advance these projects, one or more of the three projects fail to receive necessary permits and approvals for implementation, the Workgroup will select a replacement project (or projects) that will supply at least an equivalent quantity of water.

3.3.1 Wymer Dam

Wymer Dam would be located as an off-channel storage facility on Lmuma Creek, approximately 8 miles upstream of Roza Diversion Dam. The storage capacity of the reservoir would be approximately 162,500 acre-feet. Water would be pumped into the reservoir from the Yakima River during winter, spring and potentially summer, during high flow periods from upstream reservoir releases, which has the potential to mitigate for artificially high summer flows.

Two pump station options are being considered. Option 1 includes a new pump station at Thorp, including a new water transmission main from the pump station to an upgraded Kittitas Reclamation District (KRD) North Branch Canal system, and a new tunnel to deliver water to Wymer. Option 2 would be a 400 cfs pump station on the Yakima River just upstream of Lmuma Creek with water conveyance through a new water transmission main that would deliver water to Wymer.

Wymer Reservoir releases would pass through tunnels, a siphon, and a hydroelectric powerhouse to the Roza Canal at the existing Roza Canal intake structure. Evaluate Roza dam removal feasibility as part of implementing the Wymer project. The downstream conveyance alignment provides for connection with future potential storage sites within the Burbank and Selah drainages.

3.3.2 Kachess Reservoir (Inactive Storage up to 200 KAF)

The Lake Kachess Inactive Storage project is located just east of Interstate 90 (I-90) near Easton, Washington. The project involves a lake tap in Lake Kachess that would allow the lake to be drawn down approximately 80 feet lower than the current outlet. This lake tap would provide the ability to withdraw another 200,000 acre-feet (AF) of water from the lake when needed for downstream uses during drought conditions.

Water would be conveyed either through a pump station and outlet just downstream of the Lake Kachess Dam or a tunnel outlet to the Yakima River approximately 4.8 miles southeast of the Lake Kachess Dam.

3.3.3 Enlarged Bumping Reservoir (190 KAF)

The proposed dam site is about 40 miles northwest of Yakima, Washington, on the Bumping River about 4,500 feet downstream of the existing Bumping Lake Dam.

The dam would impound approximately 198,300 acre-feet at elevation 3,490 (top of active conservation capacity) with a surface area of 4,120 acres. The existing dam would be breached following construction to allow full use of the existing pool. The dam and reservoir would

provide carryover storage against possible shortages of irrigation water for federally-served irrigable lands, and would also provide instream flow and incidental flood control benefits.

3.3.4 Columbia River Pump Exchange with Yakima Storage

As implementation of the three surface storage projects described above proceeds, appraisal and feasibility level work would commence on other water supply enhancements, including the potential for an inter-basin transfer from the Columbia River. As in-basin actions are developed and implemented, supply improvements will be measured at least every five years as part of a rolling needs assessment against the identified 70% proratable supply need for irrigation and other out of stream needs, and instream flow objectives. Need for additional water supply enhancements will depend on the effectiveness of projects that are implemented as part of the Integrated Plan, how the Basin economy develops over time, as well as the timing of and manner in which climate change affects water supply availability.

The feasibility study for a Columbia River to Yakima Basin transfer would be conducted in two steps.

Step 1 - The first step would involve the following: 1) a detailed analysis of the physical and legal availability of water for diversion from the Columbia River, 2) a description of alternatives for configuration of pumping, routing and storing Columbia River water in the Yakima Basin as well as options for instream and out-of-stream uses of that water, 3) estimates of capital and O&M costs for each alternative, and 4) an evaluation of allocation of costs for each alternative. The Columbia River water availability analysis should consider constraints for the Federal Columbia River Power System Biological Opinion target flows, effects on salmonids (migration, spawning and rearing), and cumulative impacts of other water withdrawal proposals (e.g., Odessa).

Step 2 - The Workgroup would consider the results of the initial stage of the study in deciding whether to pursue the second step involving more detailed, site-specific analyses of alternatives. In the feasibility study, depending upon the outcome of the Wymer project described above, serving the Roza diversion through Columbia River supply could also be evaluated.

3.4 Groundwater Storage

3.4.1 Shallow Aquifer Recharge

The objective of groundwater infiltration is to divert water prior to storage control into designed infiltration systems (ponds, canals, or spreading areas), and allow withdrawal of the infiltrated water during storage control in lieu of reservoir releases. The timing and scale of surface water diversions will be designed to allow continuation of natural high flow events that provide biologic and geomorphic benefits.

There are two phases to the groundwater infiltration program: pilot scale infiltration testing in two study areas, followed by full scale implementation. Initially, a limited pilot study would be conducted to verify the feasibility and general design features of groundwater infiltration systems. Pilot testing would take place in two study areas: the Kittitas Reclamation District

(KRD) and the Wapato Irrigation Project (WIP). In each study area, two pilot scale infiltration systems would be constructed. Each system would be between one and two acres in size. The pilot tests would result in recommendations for implementation.

At full scale implementation, it is anticipated that between 160 and 500 acres of infiltration area would be necessary to achieve a total infiltration capacity of at least 100,000 acre feet. Total infiltration volumes may vary from year to year depending on snowpack conditions and reservoir re-fill requirements. Full scale infiltration on the KRD system would be dependent on construction of the Thorp Pump Station (See Wymer Dam – Section 3.3.1). During the pilot phase, policy and legal protocols will be developed to ensure water stored through infiltration is not captured by unauthorized users.

3.4.2 Aquifer Storage and Recovery

Aquifer Storage and Recovery (ASR) involves diverting surface waters during high-flow periods and storing the water in underground aquifers for use during low-flow periods. The timing and scale of surface water diversions will be designed to allow continuation of natural high flow events that provide biologic and geomorphic benefits.

The City of Yakima would divert water from the Naches River and treat it at the City's existing water treatment plant. It would then be injected through wells and later pumped out for use by the City's residents and businesses. ASR may also be viable for other cities in the Yakima basin.

3.5 Fish Habitat Enhancement

Implement an approximate \$470 million habitat enhancement program addressing reach-level floodplain restoration priorities and restoring access to key tributaries through flow restoration, removing fish barriers, and screening diversions. These actions would significantly improve prospects for recovering fish populations to levels that are resilient to catastrophic events and the potential impacts of climate change by accelerating ongoing efforts to protect existing high-value habitats, improve fish passage, enhance flows, improve habitat complexity, and reconnect side channels and off-channel habitat to stream channels.

Fish habitat enhancement actions would help create improved spawning/incubation, rearing, and migration conditions for all salmonid species in the Yakima basin, implement key strategies described in the Yakima Subbasin Plan, and complete most of the actions described in the Yakima Steelhead Recovery Plan. Early mainstem floodplain improvements could include channel and habitat restoration in the Yakima River near Ellensburg and between Selah and Union Gap, and on the Naches River. Tributary program early actions could include completing screening and passage at diversions in the middle and upper Yakima basin, bull trout habitat improvements and management actions, and implementing the Toppenish Creek Corridor program.

The implementation approach will be tailored to utilize existing organizations, review processes and plans, as applicable. Reclamation and Ecology may establish an advisory group similar to

the YRBWEP Conservation Advisory Group (CAG) (see Section 3.6.1) to help in developing a more detailed approach for how and when projects would be funded.

3.6 Enhanced Water Conservation

3.6.1 Agricultural Conservation

Implement an approximate \$423 million agricultural water conservation program designed to conserve up to 170,000 acre-feet of water in good water years. The agricultural water conservation program includes measures beyond those likely to be implemented in the existing YRBWEP Phase II conservation program.

Agricultural water conservation measures that could be implemented under this program include:

- Lining or piping existing canals or laterals.
- Constructing reregulation reservoirs on irrigation canals.
- Installing gates and automation on irrigation canals.
- Improving water measurement and accounting systems.
- Installing higher efficiency sprinkler systems.
- Implementing irrigation water management practices and other measures to reduce seepage, evaporation and operational spills.

Although a list of specific projects was reviewed in developing this element, this recommendation does not identify specific projects for implementation. Projects to be implemented would be selected through detailed feasibility studies and evaluation by the existing YRBWEP Conservation Advisory Group (CAG). Irrigation districts eligible for project funding include both federally and non-federally served irrigation districts, private irrigation entities and individual land-owners.

3.6.2 Municipal and Domestic² Conservation program

Create a \$30 million fund to promote water use efficiency basin-wide using voluntary, incentive-based programs. Focus on outdoor uses as top priority.

Convene a multi-stakeholder advisory committee, including local and environmental stakeholders on municipal and domestic water conservation to organize outreach to local elected

² **Municipal and domestic water usage includes** water delivered by public water systems regulated by the State Department of Health, water used by individual homeowners served by “exempt” wells; water used by commercial or industrial facilities, and water delivered by irrigation entities for purposes of outdoor landscape irrigation in developed areas of the Yakima Basin. It includes residential, commercial, industrial and urban recreational uses of water such as parks, ballfields, and golf courses

officials and provide liaison with Reclamation, WDOE and WDOH. The advisory committee would focus particular attention on:

- Education, incentives and other measures to encourage residential and commercial users to improve efficiency of landscape irrigation, where the source of supply is agricultural irrigation canals or ditches.
- Improving the efficiency of consumptive uses.
- Establish best practice standards for accessing the new supply developed through the Integrated Plan and dedicated to municipal use and municipal/domestic mitigation. The standards will be based on review of evolving practices in similar communities and similar climate zones of the western United States.
- Determining appropriate conditions for accessing the new supply that would apply to homeowners or developers seeking mitigation water for homes supplied by individual household wells.

3.7 Market Reallocation

The Market Reallocation Element proposes to reallocate water resources through a water market and/or water bank to improve water supply in the Yakima River basin. This element consists of recommendations for legislative changes and funding requests to improve the efficiency and flexibility of water transfers. The proposal includes two phases—a near-term effort to build on the existing water market programs, and a longer-term effort that requires more substantial changes to existing laws and policies.

The near-term program would continue existing water marketing and banking programs in the basin, but take additional steps to reduce barriers to water transfers.

The long-term program would focus on facilitating water transfers between irrigation districts. This would allow an irrigation district to fallow land within the district and lease water rights for that land outside the district.

To facilitate this process, Agricultural Conservation program funding (See Section 3.6.1) would also be made available to non-federal irrigation entities to upgrade conveyance infrastructure in a manner that improves these entities' operational flexibility and ability to lease water to other irrigation districts, including federally-served Districts.

4.0 Rolling Review and Future Plan Adjustments

The Integrated Plan has seven Elements and some of these include multiple projects. Implementation is expected to extend at least over a 20 year period. While the Yakima Basin Study has addressed many questions regarding the Plan, there are still uncertainties around whether the State Legislature, U.S. Congress and local participants will authorize and/or fully fund the program; whether all of the recommended projects will receive the necessary permits and regulatory approvals; and whether project outcomes achieve the goals predicted using

available models. In addition, while the Workgroup supports all seven elements and actions identified in the Integrated Plan, the stakeholders involved in the YRBWEP Workgroup have differing levels of support, authorizations and priorities attached to implementation and outcomes of the various elements and projects.

These factors point to a need for periodic review of the Integrated Plan's success, both in terms of implementation and outcomes. In the event projects cannot be implemented as recommended; or if project benefits are different than expected, adjustments may need to be made over time. Guidelines for review and adjustments to the IP are presented below.

4.1 Rolling Review

It is recommended that Reclamation and Ecology, in cooperation with the YRBWEP Workgroup Implementing subcommittee, jointly review and summarize progress on implementing the Integrated Plan annually for the next five years (2011-2015); and at least every 5 years thereafter until the plan is deemed fully implemented. Develop an adaptive management plan prior to the 2015 rolling review to further refine metrics, triggers and adaptive management measures for potential plan adjustments through time. The Integrated Plan review will include:

- Status of securing funding for implementation;
- Progress in setting up programmatic elements (e.g. water marketing, water conservation, habitat restoration; floodplain restoration);
- Progress in constructing identified infrastructure improvements;
- Assessment of outcomes for water supply and fish production, compared with the goals and metrics;
- Effectiveness of revised Yakima Project operating rules³ based upon identified goals for meeting instream and out of stream needs
- Significant changes, if any, in the underlying drivers for the IP, such as listing status of aquatic species; changes in the Basin's population and economy; changes in climate, snowpack and hydrology; major shifts in cropping patterns or irrigation practices; and changes in water needs.
- If necessary, any recommendations for adjustments to the IP or implementation schedule, with a clear explanation of the basis for each recommendation.

The Rolling Review will be submitted to the YRBWEP Workgroup or its successor organizations. If the YRBWEP Workgroup no longer exists, then the review will be submitted to each of the local, state, federal and tribal agencies that were represented on the Workgroup in 2010.

4.2 Adjustments to the Integrated Plan Over Time

If the review described above indicates a need for significant changes to the Integrated Plan, then the following principles should be applied:

³ Yakima Project operating rules should be revised as projects are implemented to meet in and out of stream needs identified in the plan.

- In making changes, every effort should be made to advance both water supply improvements and fisheries enhancements, consistent with the balanced nature of the Integrated Plan;
- In the event that particular projects or programs encounter insurmountable obstacles to implementation or are found unable to deliver the expected benefits, then substitutes for those projects should be developed to achieve comparable outcomes;
- The agencies and organizations represented on the YRBWEP Workgroup will continue to work in good faith throughout the implementation period to secure resources as soon as possible to implement all of the Integrated Plan projects and programs, or to identify reasonable substitutes if one or more of the recommended projects or programs cannot be implemented. This collaborative effort will continue until the entire plan has been implemented, or further implementation is deemed infeasible based on the Rolling Review described above.