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| WALLA WALLA BASIN INTEGRATED FLOW ENHANCEMENT STUDY  Draft Summary Report  Prepared for: Office of Columbia River  Prepared by: Walla Walla Watershed Flow Study Steering Committee  Submitted by: Walla Walla Watershed Management Partnership |
| Project No. 160135 • October 04, 2017 Draft |

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| Project No. 160135 • September 21, 2017 Draft | | |
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# Executive Summary

### Overview

The Walla Walla River and its tributaries provide for agricultural production, support thriving communities, and sustain resident and anadromous fish populations. As in many western river basins, instream and out-of-stream water demands often exceed available supplies. In 2014, building on previous efforts, the Walla Walla Watershed Management Partnership (WWWMP) and the Walla Walla Basin Watershed Council (WWBWC; collectively, the WWWMP and the WWBWC are referred to as the Study Partners) convened a steering committee (Steering Committee) to develop strategies to meet instream flow objectives while preserving existing diversionary requirements. The Washington Department of Ecology (Ecology) Office of Columbia River (OCR) invested in this effort through two grants: Grant No. G1400656 (completed in 2015) and Grant WROCR-WaWWWMP-00004 (completed in /2017), supporting this Walla Walla Basin Integrated Flow Enhancement Study (the Flow Study).

The objective of this Flow Study is to determine the best package of options for achieving Walla Walla River stream flow targets for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. The Flow Study intends to identify strategies to meet instream flow demands while providing opportunities to protect and enhance municipal and agricultural needs. The Steering Committee consisted of tribal, state, and local governments, as well as irrigation, municipal, and environmental interests to guide strategy development. The Steering Committee developed and screened a broad range of projects (e.g., conservation, storage, source exchanges, aquifer recharge, water markets), then grouped them into alternatives (Alternatives) to evaluate their ability to meet Flow Study objectives. The Steering Committee will now lead the next steps consisting of feasibility studies on the Alternatives, environmental review, expanded outreach, addressing Oregon-Washington joint decision-making strategies, and other efforts designed to move toward selection of a Preferred Alternative in the 2017-2019 biennium. This executive summary outlines the Study’s status and findings as of September 2017. Funding for the next phases of the Flow Study is being provided through additional grants from the United States Bureau of Reclamation (USBR) and a legislative proviso through the Washington Department of Ecology by the Washington State Legislature.

### Flow Study Development by the Steering Committee

The Steering Committee meets at least quarterly to provide guidance and decision-making on the Flow Study. The Steering Committee strives for consensus-based decision-making, which helps inform the Study Partners as they adopt final decisions. Member organizations participate as Voting, Ex-Officio, or Advisory Members and are shown in Table ES-1 below. In late 2017, the Steering Committee will extend invitations to additional stakeholders to participate in the next steps of the Flow Study development.

**Table ES-1: Flow Study Steering Committee Membership**

|  |  |  |  |
| --- | --- | --- | --- |
| Voting Members: Attend meetings, review materials, provide feedback, and vote. | | | |
| Gardena Farms Irrigation District (GFID) | | Washington Department of Fish & Wildlife | |
| Walla Walla River Irrigation District (WWRID) | | Oregon Department of Fish & Wildlife | |
| Hudson Bay District Improvement Company (HBDIC) | | City of Walla Walla | |
| Bergevin – Williams and Old Lowden Irrigation | | City of Milton-Freewater | |
| Fruitvale Water Users Association | | Kooskooskie Commons | |
| Confederated Tribes of the Umatilla Indian Reservation | |  | |
| Ex-Officio Members: Same as voting members but without voting authority | | | |
| Walla Walla Watershed Management Partnership | Trout Unlimited | | |
| Walla Walla County Conservation District | Columbia County Conservation District | | |
| Walla Walla Basin Watershed Council | Umatilla County Soil and Water Conservation District | | |
| Oregon Water Resources Department | U.S. Fish and Wildlife Service | | |
| Washington Department of Ecology | National Oceanic and Atmospheric Administration | | |
|  | Oregon Department of Environmental Quality | | |
| Advisory Members: Kept updated and can provide input to the level desired but meeting attendance optional. | | | |
| Umatilla County Commissioners | | | Washington Department of Agriculture |
| Walla Walla County Commissioners | | | Oregon Department of Agriculture |
| Columbia County Commissioners | | | U.S. Corps of Engineers |
| U.S. Congressional Staff | | | Bureau of Reclamation |
| State elected officials/ Staff | | | U.S. Forest Service |
| National Resources Conservation Service | | | Snake River Salmon Recovery Board |
| The Freshwater Trust | | | Tri-State Steelheaders |
| Washington Water Trust | | |  |

### Flow Study Objectives

The Steering Committee’s primary is restoring and protecting stream flows in the Walla Walla River. Towards that end, the Committee agreed by consensus to instream flow targets (Table ES-2). These represent significant improvement to flow relative to recent conditions in the Walla Walla River that range from no flow to on the order of 20 cubic feet per second (cfs) but closer to historic instream flow conditions depending on river reach and water year. Table ES-2 also summarizes Washington State minimum instream flows adopted by rule in 2007 (Washington Administrative Code (WAC) 173-532)); these flows govern new water rights and changes to existing rights only, whereas the Flow Study target flows are designed to be met while also meeting existing water right demands.

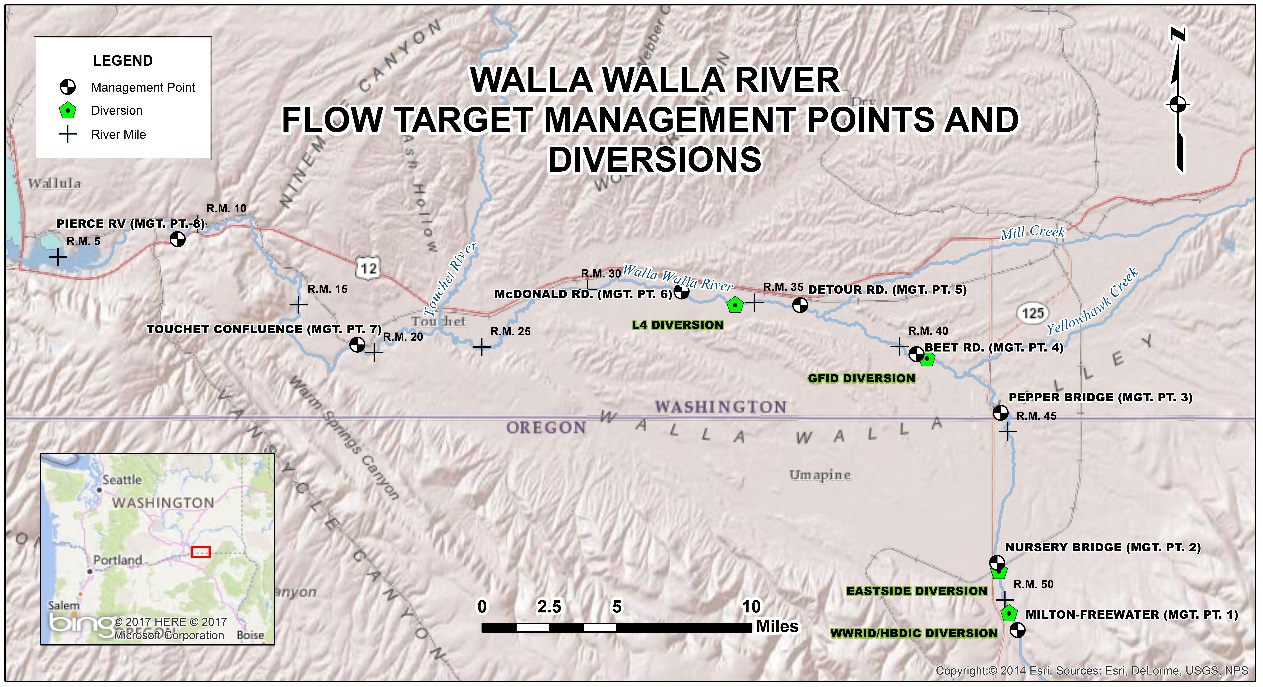
**Table ES‐2. Walla Walla River Stream Flow Targets**

|  |  |  |
| --- | --- | --- |
| **Time Period** | **Flow Study Flow Targets** | **WAC 173-152-030 Flow Ranges by Gage** |
| **April 1—June 15** | **150 cfs** | **95 cfs to 350 cfs** |
| **June 16—June 30** | **100 cfs** | **95 cfs to 125 cfs** |
| **July 1—November 30** | **65 cfs** | **41 cfs to 150 cfs** |

Additional considerations of the Flow Study include providing opportunities for efficiency and protection of existing water uses. For example, starting in 2000 irrigators in the basin negotiated temporary irrigation bypass flows to benefit fish. The Flow Study Alternatives are designed to replace temporary bypass flows with water from new projects, which in turn return that bypass water to irrigators. However, water that was conserved from conservation projects would remain instream as required by individual conservation funding agreements. Additionally, depending on which Alternative is selected as the Preferred Alternative, there may be opportunities to augment or expand irrigation, municipal, and aquifer recharge uses in the future.

### Measurement of Flow Study Objectives

The Steering Committee designated eight management points on the Walla Walla River that divide the river into management reaches. The management points were selected in Oregon (2) and Washington (6) based on changes in major river characteristics, such as location of major irrigation diversions, location of tributary confluences, and where stream gages have been established to track river flows. Figure ES-1 shows these management points by river mile, along with the location of major irrigation diversions.

**Figure ES‐1. Walla Walla River Flow Target Management Points and Diversions**

### Selection of Projects

The Steering Committee identified and evaluated a wide range of strategies intended to meet these stream flow targets, including water conservation, increasing aquifer recharge, developing large-scale reservoirs, water markets, and pumping water from the Columbia River. In order to evaluate these strategies, the Steering Committee assembled the following Technical Workgroups (TWGs), whose function was to evaluate the timing, location, magnitude, costs and benefits of proposed flow improvement strategies:

* Conservation & Infrastructure in WA
* Conservation & Infrastructure in OR
* Managed Aquifer Recharge (MAR) and Aquifer Storage and Recovery (ASR)
* Surface Water Storage
* Legal
* Planning
* Columbia River Pump Exchange
* Water Right Transactions / Management

Each of the TWG’s were chartered by the Steering Committee to:

* Develop potential project lists or strategies to meet or contribute to Flow Study objectives;
* Develop and document a screening process to reduce the list to priority efforts with the highest likelihood of success towards meeting or contributing to Flow Study objectives;
* Provide a prioritized list of projects for completion of “Project Proposal Templates”, which summarized the project attributes, benefits, and costs; and
* Participate in a “Project Pairing” evaluation with the Steering Committee to assemble various project packages into Recommended Alternatives designed to meet Flow Study objectives.

Through this process, the Steering Committee and the TWG’s evaluated over 100 project alternatives to determine how best to meet Flow Study objectives. Based on this planning framework, the Steering Committee reached the following two initial conclusions:

1. One of two “anchor” projects would be necessary to meet the Flow Study objectives. Combinations of smaller complementary projects could not, by themselves, meet them. The two anchor projects that are currently being vetted include a new off-channel reservoir in the Pine Creek drainage and a source pump exchange on the Columbia River.
2. The small 33.1K storage reservoir and exchange projects do not, by themselves, meet the flow targets in Table ES-2 at all the locations in Figure ES-1. Some additional complementary projects added to each anchor project (e.g., water markets, conservation, MAR/ASR) are needed to fully meet the objectives. A hybrid of the small 33.1K storage reservoir and Washington-only pump exchange would fully meet flow objectives.
3. The medium 45.8K storage reservoir, with enhanced water supply from Mill Creek to increase fill reliability, could meet the Flow Study objectives.

From these conclusions the Steering Committee advanced several Alternatives for further consideration, which are comprised of the following projects in Table ES-3. A summary of the location of the projects is shown on Figure ES-2.

These projects were then “paired” into 5 Alternatives[[1]](#footnote-1) described in Table ES-4. A spreadsheet model was used to evaluate their ability to meet the Flow Study objectives in the reaches shown in Figure ES-1. Cost estimates were developed using a variety of previous reports, inflationary adjustments, and best professional judgment. Primary and secondary benefits were estimated using a combined qualitative/quantitative scoring matrix[[2]](#footnote-2) developed by the Steering Committee.

**Figure ES‐2. Walla Walla River Flow Study Alternative Components**



**Table ES‐3. Summary of Projects**

|  |  |  |
| --- | --- | --- |
| **Project**  **Name** | **Description** | **Target Flow Benefit** |
| **Anchor Projects** | | |
| Pine Creek Reservoir | Construct a new reservoir on Pine Creek in Oregon. Several storage sizes are evaluated (33.1K, 45.8K, and 65K acre-feet). Several filling sources are considered, including: Walla Walla River, Columbia River, and Mill Creek. | Active storage from 26.6K – 58.5K acre-feet annual flow |
| Columbia River Exchange | Construct a new pump station on the Columbia River near the mouth of the Walla Walla River. Pipe water to irrigators in exchange for leaving water in the Walla Walla River. Exchanges evaluated include a large option to both OR & WA and a smaller WA-only option. | 13.6K – 30.9K acre-feet annual flow |
| **Smaller Complementary Projects** | | |
| Managed Aquifer Recharge | Infiltrate river water into shallow alluvial aquifers at a range of locations to increase Walla Walla River flows by increasing surface water inputs, retiming base flow, augmenting groundwater levels, and decreasing river seepage. | 3.1 – 7.8 cfs |
| Aquifer Storage and Recovery | Directly inject treated river water (or shallow groundwater of adequate quality) into deep basalt aquifers or infiltrate river water into shallow alluvial aquifers for active recovery creating a source exchange so summer water rights can be left instream. | 5 – 12 cfs |
| Telemetry | Improve water management through automation to reduce demand and add savings to instream flow. | 2 cfs |
| Water Market | Incentivize water right transfers to meet Flow Study objectives. | 1 cfs |
| GFID Conservation | Pipe portions of the Upper GFID Ditch to conserve water and reduce storage/exchange demands. | 10+ cfs |
| Lowden Ditch Conservation | Pipe portions of the Lowden #2 Ditch to conserve water and reduce storage/exchange demands. | 2 – 5 cfs |
| Bennington Lake Reoperation | Modify Bennington Lake operations for approximately 1 month by releasing available storage into Mill Creek and/or Russel / Yellowhawk Creek to help meet Flow Study objectives in the Walla Walla River. | 1,900 – 3,900 acre-feet annual flow |
| White Ditch Conservation | Pipe portions of the White Ditch to conserve water and reduce storage/exchange demands. | 5.6 cfs |
| Other Projects | Other conceptual-level projects include upgrades to the City of Walla Walla municipal system, restoring habitat in the Nursery Channel reach, additional pump exchange projects for HBDIC, GFID, and Lower Touchet irrigators, and enlarging Bennington Lake (see Chapter 3 of the main text for additional detail). | TBD |

**Table ES‐4: Flow Study Alternatives Summary**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Alt**  **#** | **Alternative Description** | **Cost[[3]](#footnote-3)** | | |  |
| **Construction** | **Unit** | **O&M** | **Meets Target?[[4]](#footnote-4)** |
| 1 | Pump 31K AF of Columbia River water from Lake Wallula near the mouth of the Walla Walla River to exchange WWRID, HBDIC, GFID and Lowden 4 irrigation systems, leaving instream the exchanged quantities plus efficiencies gained. | $163M | $176/AF | $2.25M/yr | Fully met in 4 of 8 reaches. Remaining 4 reaches achieve at least 2/3rds benefit. |
| 2 | Alternative 1 + Complementary Projects (White Ditch Conservation, ASR, MAR, and Bennington Re-operation). | $169M+ | $330/AF+ | $3.1M/yr+ | Yes for 7 reaches;  1 reach achieves at least 2/3rds benefit. |
| 3 | 45.8K acre-foot (39.3K active) Pine Creek Reservoir from Walla Walla River | $315M | $209/AF | $986K/yr | Yes for 6 reaches (70% reliability). Remaining 2 reaches achieve at least 2/3rds benefit. |
| 4 | 33.1K acre-foot (26K active) Pine Creek Reservoir from Walla Walla River + Lowden Ditch Conservation, GFID Pump Loop, and Water Market | $280M | $273/AF | $969K/yr | Yes (80% reliability). |
| 5 | Anchor Project Hybrid 5.1b: 33.1K acre-foot (26K active) Pine Creek Reservoir from Walla Walla River + 13.7K Columbia River Pump Exchange | $343M | $333/AF | $1,364K/yr | Yes (80% reliability). |
| Anchor Project Hybrid 5.2b: 35.1K acre-foot (28.6K active) Pine Creek Reservoir from Walla Walla River and Mill Creek + 13.7K Columbia River Pump Exchange | $361M | $331/AF | $1,364K/yr | Yes (80% reliability) |

### Next Steps

With a consensus-based package of Alternatives adopted for further consideration, the Steering Committee has recommended the following key next steps to advance them and select a Preferred Alternative:

1. **Feasibility Studies and Data Gaps:** Several of the Alternatives contain projects that need additional targeted work to help understand their feasibility. The Steering Committee is developing a targeted list of actions for each Alternative. A major item will be to continue necessary engineering and design of selected alternatives. Another key item underway in 2017-2018 is to use the Walla Walla basin hydrologic model to improve the accuracy of the spreadsheet model originally used to vet Alternatives.
2. **Expanded Outreach:** The Flow Study already benefits from a robust stakeholder process. However, the selection of Alternatives and the magnitude of the funding necessary to meet the Flow Study Objectives necessitates a broader audience. In late 2017, the Study Partners will extend formal invitations to new Washington and Oregon stakeholders who can help local constituencies shape the selection of a Preferred Alternative.
3. **Environmental Review:** Washington State Environmental Policy Act (SEPA) scoping and development of a National Environmental Policy Act (NEPA)/SEPA integration strategy is being planned by the Steering Committee in 2018. This will help vet Alternatives selected, identify data gaps in the analyses completed to-date, provide a formal way for all stakeholders to engage in the process, and allow the Steering Committee to help scope the budget and timeline for an Environmental Impact Statement (EIS).
4. **Legislation / Legal Coordination:** A critical path item that is common to all of the Alternatives is to ensure that water supplies that are developed can be protected instream on both the Oregon and Washington sides of the border. The Washington Department of Ecology and Oregon Water Resources Department are actively exploring how to meet this need, either through existing statutory authorities or via Legislative change. At the same time, the Steering Committee is evaluating its current decision-making structure relative to other similar efforts throughout the West and determining how best to form a Bi-State Caucus focused on the Walla Walla Basin. A pilot strategy to protect Bi-State flows is expected.
5. **On-Going Pilots and Early Action Projects:** Several projects have already proceeded to pilot stage or could be developed as an Early Action Project for the selected Preferred Alternative. Following selection of a Preferred Alternative 2019+), the Steering Committee is looking for a blend of early action improvements (2021+) on their way to a final solution (2023+).
6. **Funding Coordination:** Implementing a Preferred Alternative of the magnitude shown in Table ES-4 will require a combination of federal, state, and local partners. The Study Partners have already been successful in coordinating funding for initial phases of this work with Ecology and USBR. Understanding how local irrigators and municipalities will benefit from a Preferred Alternative may help shape the degree to which local funding is available (e.g. potential cost-share of O&M costs). Capital funding tends to be easier to obtain than long-term O&M funding, which is a significant factor for some of the Alternatives. All of these issues are being actively evaluated by the Steering Committee.

### Timeline Moving Forward

The Steering Committee’s primarily focus is on the 2017-2019 biennium, for which it has secured funding from both the Washington Legislature and USBR to continue implementation of the Flow Study. The Steering Committee has proposed implementing a Preferred Alternative over a 10-year planning horizon. Table ES-5 summarizes a timeline over the next 10 years.

**Table ES‐5: Projected Flow Study Timeline**

|  |  |
| --- | --- |
| **Biennium** | **Description** |
| **2017 - 2019** | Targeted Feasibility Studies and Data Gaps, Environmental Scoping, Expanded Outreach, NEPA/SEPA Integration Strategy, Bi-State Caucus Formation, , and Pilot Strategy to Protect Bi-State Flows |
| **2019 - 2021** | EIS, Interim Resolution of Legal Issue to Protect Bi-State Flows, Targeted Feasibility Studies, Selection of Preferred Alternative |
| **2021 - 2023** | Design of Preferred Alternative, Final Resolution of Legal Issue to Protect Bi-State Flows , Implementation of Early Action Items |
| **2023 - 2025** | Construction of Preferred Alternative, Monitoring of Successes of Early Action Items |
| **2025 - 2027** | Construction of Preferred Alternative, Monitoring of Successes of Early Action Items |

A more specific description of anticipated near-term 2017-2019 studies that will inform continuing Steering Committee decisions towards a Preferred Alternative are:

July 2017 – June 2018

* Ongoing efforts to address data gaps (hydrologic modeling and monitoring of surface and groundwater) and NEPA/SEPA integration will inform continued general engineering and feasibility studies of 5 current alternatives.

July 2018 - 2019

* Study of some less likely alternatives may be dropped and continued efforts on data gaps and NEPA/SEPA as well as results of feasibility studies will inform selection of one or more preferred alternatives.

1. Although five Alternatives are summarized in Table ES-4, each of these has several potential permutations discussed in Chapter 4 of the main text. A number of Alternatives were dropped from further consideration because they could not come close to meeting the interim Flow Targets, and additional permutations are still being evaluated to maximize benefits and minimize costs. [↑](#footnote-ref-1)
2. The scoring matrix is described in detail in Chapter 3 for each Alternative. Generally, each category is on a scale of 0 to 3, with higher numbers reflecting better scores relative to each category (e.g. reliability, protectability, detectability, etc.). [↑](#footnote-ref-2)
3. Unit per acre-foot cost is construction cost and O&M costs over 50-year lifespan, assuming 3% inflation and a 3% discount rate for future costs. O&M costs are appraisal-level estimates at this stage. [↑](#footnote-ref-3)
4. The Steering Committee used a spreadsheet model to evaluate the efficacy of each Alternative to meet the Flow Targets. Follow up work with the hydrologic model for the Walla Walla basin is planned under the USBR grant. If an Alternative met the Flow Study objectives within a reasonable margin of error, it received a “Yes” when determining whether it met flow targets. [↑](#footnote-ref-4)