Walla Walla Bi-state Stream Flow Enhancement Study
Interim Progress Report

Department of Ecology Grant No. G1400656

Submitted by:

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Executive Summary

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. The Walla Walla Watershed Management Partnership (WWWMP) and the Walla Walla Basin Watershed Council (WWBWC) convened a working group to develop strategies to meet instream needs. Washington Department of Ecology invested in this effort through Grant No. G1400656, supporting the **Walla Walla Bi-state Stream Flow Enhancement Study** (the Study). This executive summary outlines the Study's status and findings as of July 2015.

The Study intends to identify strategies to meet instream flow demands while addressing municipal and agricultural needs. Objectives include restoring Walla Walla River stream flows to the magnitude necessary to support harvestable populations of native fish species and providing certainty to water right holders that their needs will be met. Study partners convened a steering committee consisting of tribal, state, and irrigation district representatives to guide the development of these strategies. The steering committee operates on a consensus basis.

The steering committee focused on restoring stream flows in the Walla Walla River from the Cemetery Bridge POD to the mouth, and the committee agreed by consensus to interim stream flow targets in this reach (Table ES-1).

Table ES-1. Interim stream flow targets agreed on by the steering committee.

Time Period	Short –Term Target	Long Term Target
Jul 1 – Nov 30	65 cfs	100 cfs
Apr 1 – Jun 30	100 cfs	150 cfs

Study partners identified and evaluated a wide range of strategies intended to meet these stream flow targets. These strategies range from increasing aquifer recharge to developing large-scale reservoirs associated with pumping water from the Columbia River. They incorporated these strategies into a draft stream flow enhancement scenario, included as Appendix A to the full Interim Progress Report, and they recommended several of these strategies for further evaluation.

In Phase 1 of the Study, partners built on these recommendations by:

- Evaluating fish conditions in the Walla Walla River;
- Evaluating legal mechanisms to protect bi-state flows;
- Updating the integrated surface and groundwater flow model;
- Initiating discussions about rotational leasing in Gardena Farms Irrigation District #13;
- Initiating discussions about the use of shallow aquifer wells in Gardena Farms Irrigation District #13;
- Evaluating mainstem Walla Walla River stream flow metering and telemetry needs; and
- Completing two of three phases of an evaluation of the Columbia River pump exchange.

Study partners have proposed additional tasks to complete under Phase 2 of Study, including:

- Utilize the updated surface and groundwater model to run scenarios;
- Complete a legal analysis of Walla Walla River Irrigation District's delivering managed aquifer recharge water;
- Complete an Eastside aquifer recharge and recovery pumping test analysis;
- Characterize a lower Walla Walla Valley basalt storage site;
- Install irrigation diversion telemetry infrastructure;
- Analyze large-scale surface water storage sites;
- Survey and complete the design for piping Hudson Bay District Improvement Company's White Ditch;
- Design a small-scale upper basin reservoir;
- Complete Gardena Farms Irrigation District #13's Upper Canal piping design;
- Protect existing Walla Walla River Irrigation District trust water instream (no Office of Columbia River funding needed); and
- Develop a Gardena Farms Irrigation District #13, Hudson Bay District Improvement Company, and Walla Walla River Irrigation District on-farm efficiency program (no Office of Columbia River funding needed).

The Study has advanced stream flow enhancement in a basin with a long-history of both strong partnerships and challenging water resources conditions. The formation of the Steering Committee, the development of a water management scenario, and the evaluation of water supply strategies has strengthened collaborative efforts to meet both instream and out-of-stream water needs in the Walla Walla River.

1 Introduction

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. The Walla Walla Watershed Management Partnership (WWWMP) and the Walla Walla Basin Watershed Council (WWBWC) convened a working group to develop strategies to meet instream needs. Washington Department of Ecology invested in this effort through Grant No. G1400656, supporting the **Walla Walla Bi-state Stream Flow Enhancement Study** (the Study). This report outlines the study's status and findings as of July 2015.

1.1 Purpose

Stakeholders in the Walla Walla Basin have worked together to identify and meet instream flow demands for the last 15 years. Their past efforts have focused on individual actions that may or may not have considered the needs of out-of-stream water users. The Study intended to identify strategies to meet instream flow demands while addressing municipal and agricultural needs. It identified the following objectives (WWWMP 2014):

- Restore Walla Walla River streamflows to the magnitude necessary to support harvestable populations of native fish species;
- Provide certainty to water right holders that their needs will be met;

It intended to meet those objectives by:

- Prioritizing actions to achieve targets;
- Complete feasibility analyses of actions;
- Complete engineered designs of actions;
- Solve bi-state flow protection problem; and
- If funds allow, implement one or more actions.

1.2 Process Overview

WWMWP and WWBWC applied for and received a grant from the Washington Department of Ecology to complete the Study in 2014. As project co-managers, WWMWP and WWBWC convened a steering committee that met over an 18 month period to work towards the study's objectives. Project managers and the steering committee completed a portion of the work necessary to meet the study's objectives, and they contracted out the remainder of the work necessary to meet these objectives.

1.3 Existing Conditions

A plethora of reports outline surface water and groundwater hydrology, water supply and demands, and ecological conditions in the Walla Walla Basin. At the request of the National Fish and Wildlife Foundation, Watershed Strategies worked with local stakeholders in 2013 to concisely summarize Bi-

State conditions in the basin. This section draws directly from parts of their report (Watershed Strategies 2013).

1.3.1 Geology & Hydrology

The Walla Walla River flows from its headwaters in Oregon to its confluence with the Columbia River in Washington (Figure 1). Oregon encompasses the headwaters of the river and some of its tributaries, and Washington encompasses the remainder of the basin. The river and its tributaries support a thriving agricultural economy across the region.

The basin's geology leads to strong surface and groundwater connections, which both limit stream flows and provide opportunities to restore them. The Walla Walla River flows over both a shallow gravel aquifer and a deeper basalt aquifer. The gravel aquifer is hydrologically connected to the Walla Walla River and its tributaries, and they gain and lose stream flow as they flow across this alluvial aquiver. Evapo-transpiration and pumping draw down aquifer levels while stream losses, precipitation, and canal losses recharge the aquifer (HDR/EES 2005) Losses in some reaches, such as the Walla Walla River downstream from Milton-Freewater, can be very high.

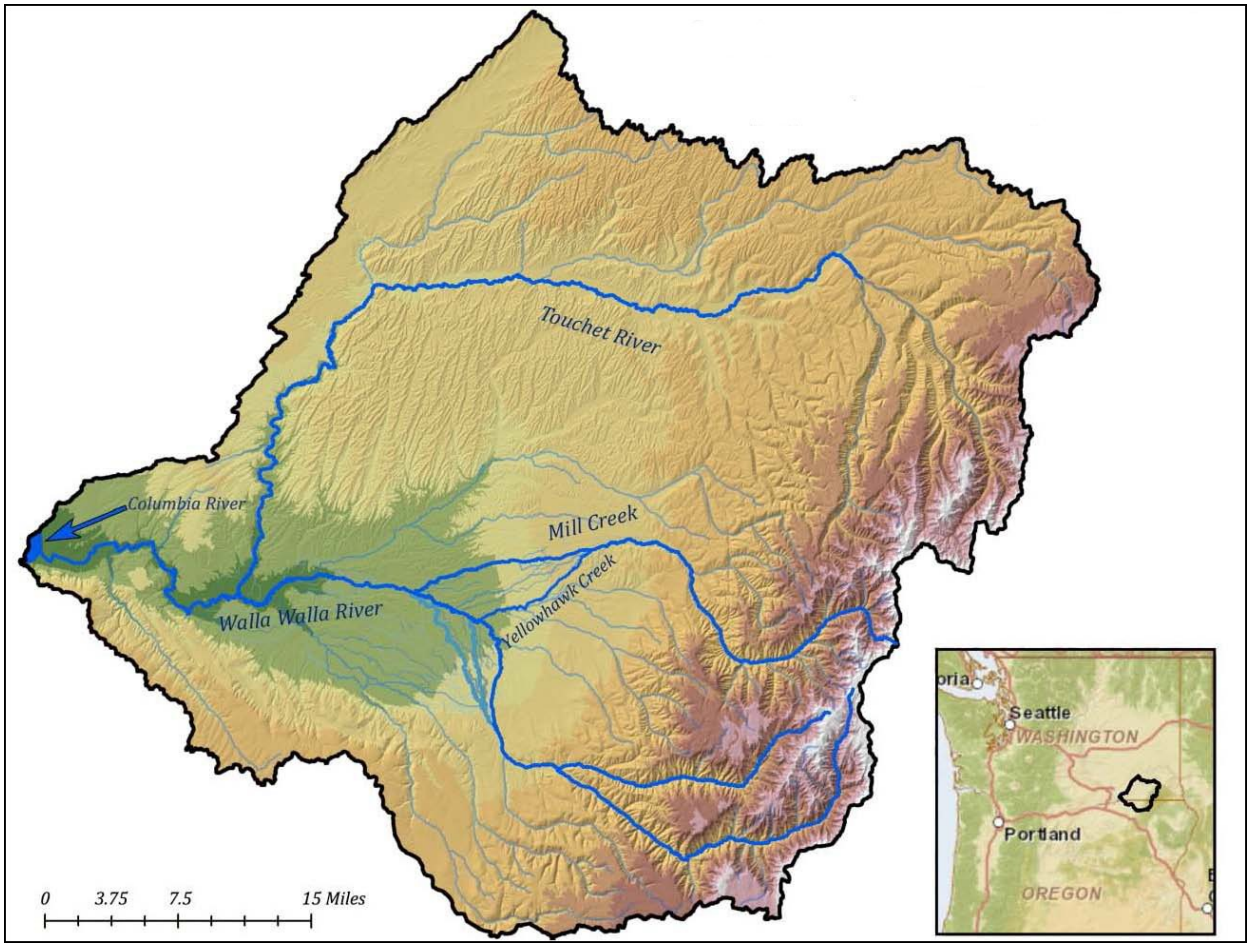

Figure 1. The Walla Walla River flows from its headwaters in Oregon to its confluence with Columbia River in Washington. Source: provided by the Walla Walla Basin Watershed Council.

The deeper basalt aquifer underlies the entire Walla Walla Basin. The depth and yield of this aquifer varies throughout the basin. According to HDR/EES (2005), this aquifer discharges into surface waters along the eastern highlands. It maintains summer flows in Mill Creek and the Walla Walla River (HDR/EES 2005).

Groundwater provides both a primary and supplemental water source to water users in the Walla Walla Basin. Approximately half of groundwater pumped, primarily for irrigation, comes from the gravel aquifer and half comes from the basalt aquifer.

The Walla Walla Basin is relatively low elevation and does not have an extensive snowpack reservoir to provide late season stream flow. Groundwater provides an alternative reservoir, and many surface water users rely on groundwater as a secondary water source.

1.3.2 Fish Presence

Schwartz (2015) outlines fish population conditions in the Walla Walla River. The river and its tributaries support multiple fish populations, including:

Steelhead Trout

Middle Columbia Steelhead appear or have the potential to appear across the Walla Walla Basin. Adult steelhead stage in the Columbia River and enter the Walla Walla River from September through February. They migrate upstream to spawning areas from March through June, and their spawning peaks in April and May. Juveniles rear year-round in the Walla Walla River and its tributaries.

Spring Chinook Salmon

The Confederated Tribes of the Umatilla Indian Reservoir have reintroduced spring Chinook salmon to the upper Walla Walla River, South Fork Walla River, and Mill Creek. Adult spring Chinook stage in the Columbia River from March through May. They move upstream in the Walla Walla River and its tributaries through June and spawn during September in the upper reaches of these streams.

Bull Trout

Generally, bull trout spawn in the upper reaches of the basin between August and November. Sub-adults rear in portions of the Walla Walla River and its forks, the Touchet River, and Mill Creek. Adults overwinter in and migrate through portions of those same waterways.

1.3.3 Stream Flow Restoration Needs

Watershed Strategies (2013) recommended that restoration efforts focus on restoring stream flow in the Walla Walla River downstream from the Little Walla Walla Diversion, located in Oregon (Figure 2; RM 49.5). Walla Walla River Irrigation District and Hudson Bay District Improvement Company divert water at this diversion, and the river historically ran dry downstream.

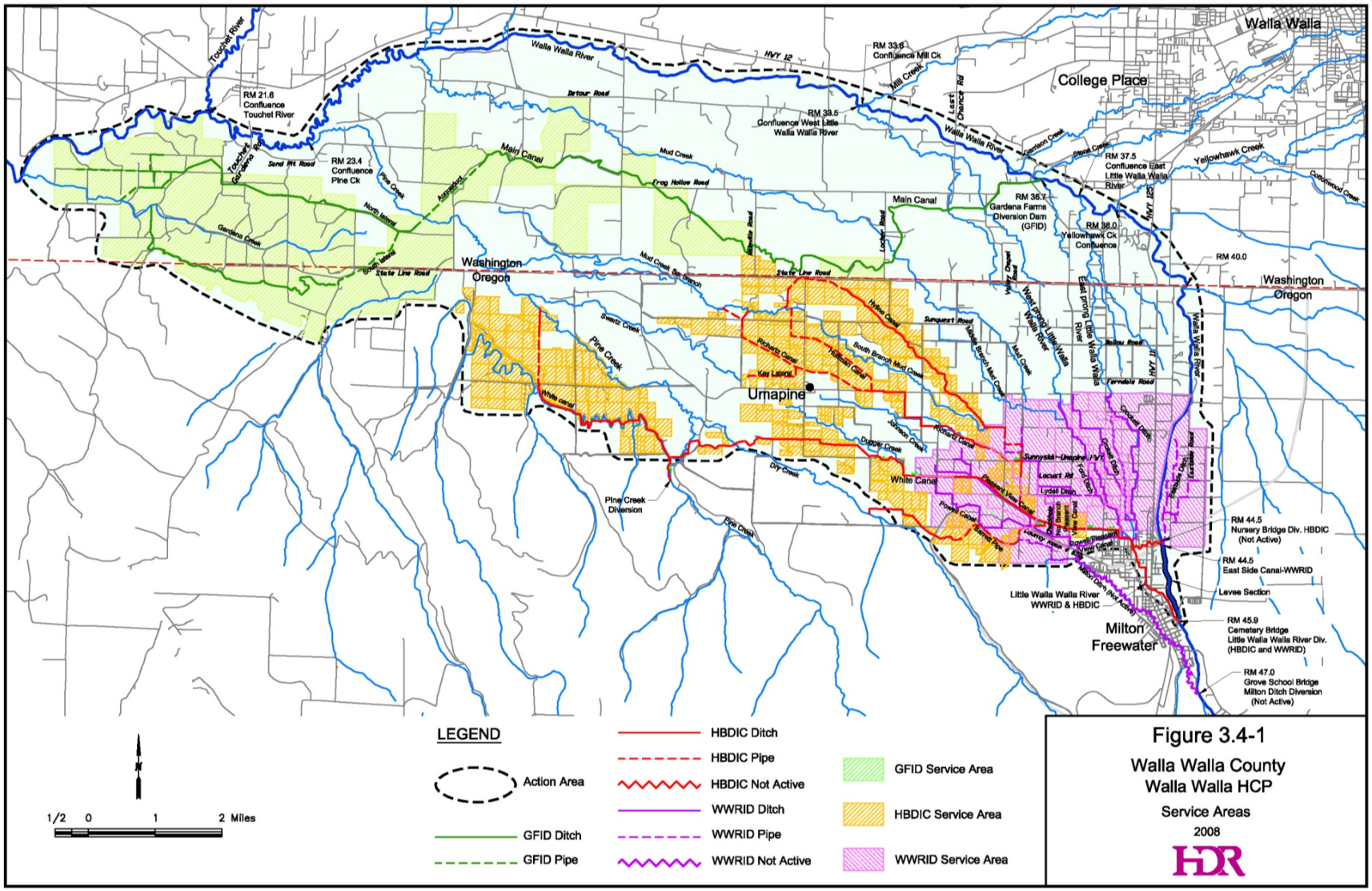

Figure 2. Walla Walla River Irrigation District, Hudson Bay Ditch Irrigation Company, and Gardena Farms Irrigation District #13 serve patrons downstream from Milton-Freewater. Source: Figure from draft Habitat Conservation Plan (HDR 2008) provided by Walla Walla Watershed Management Partnership.

Following a civil penalty settlement agreement related to bull trout take with the United States Fish and Wildlife Service in 2000, these two irrigation water users agreed to leave up to 27 cfs downstream from their diversions from January 1 through June 30th, then 25 cfs from July to December 31st. Walla Walla River Irrigation District and Hudson Bay District Improvement Company have continued to provide a bypass flow of 27/25 cfs at their diversion following the expiration of the settlement.

A third irrigation district, Gardena Farms Irrigation District #13, located in Washington, also agreed to participate in the settlement agreement in 2000. The district has provided an agreed upon bypass flow of 19 cfs from January 1 to June 30th, then 18 cfs from July to December 31st, in the river downstream of their diversion since 2000.

The river loses extensive amounts of water into the underlying gravel aquifer near Milton-Freewater, Oregon, downstream from the Little Walla Walla diversion. Restoring stream flows through this reach will allow juvenile fish to move out of low flow areas as flows decline seasonally. Areas with extensive riverbed losses also appear in Washington.

Gardena Farms Irrigation District #13 diverts water from the Walla Walla River at RM 36.7. As a junior user, the district largely shuts off in June and does not divert during the summer. Following the civil penalty settlement agreement, Gardena Farms Irrigation District #13 agreed to maintain a minimum flow of up to 19 cfs downstream from their diversion.

Additional water users divert water at the Four District Consolidated Diversion (RM 30.9) near Lowden, Washington. Four District water users have some of the most senior water rights in Washington. Adult salmon have stranded downstream of these diversions in recent years despite the settlement agreement bypass flows.

1.4 Process

Following the initial planning effort documented by Watershed Strategies (2013), WWWMP and WWBWC applied and received funding from Washington Department of Ecology to further stream flow restoration in the Walla Walla River through the Walla Walla Basin Integrated Flow Enhancement Study. WWWMP and WWBWC contracted with Watershed Strategies to support this effort and, as requested, to facilitate stakeholder meetings.

1.4.1 Timing of Expenditures

Project co-managers initially expected to complete the study by the end of the 2013-2015 biennium. Washington Department of Ecology invested in the study in July 1, 2014, partway through the biennium. Project co-managers acknowledge that, due to project funding arriving in the middle of the biennium, they will have obligated but not spent all of the study funds by June 30, 2015. Project co-managers have proposed to continue the study as contractors complete the tasks associated with these obligated funds.

1.4.2 Bi-state Steering Committee

The project co-managers convened a steering committee to guide study implementation. The steering committee includes tribal, state, and irrigation district representatives. Groups represented on the committee include:

- Confederated Tribes of the Umatilla Indian Reservation
- Gardena Farms Irrigation District #13
- Hudson Bay District Improvement Company
- Oregon Department of Fish and Wildlife
- Oregon Water Resources Department
- Walla Walla Basin Watershed Council (project co-manager)
- Walla Walla County Conservation District
- Walla Walla River Irrigation District
- Walla Walla Watershed Management Partnership (project co-manager)
- Washington Department of Ecology
- Washington Department of Fish and Wildlife

The steering committee operates on a consensus basis and guides project co-managers decisions. A committee member can choose to agree with a proposed action item, agree with a proposed action item if their identified concerns or questions can be addressed, or disagree with a proposed action item. An action item only moves forward when no committee members disagree with it. The committee also agreed that individual communications with the public represent only individual opinions unless they're communicating a consensus decisions by the group.

The steering committee met six times from February 2014 through May 2015. Meeting dates included:

- February 3, 2014
- May 21, 2014
- October 9, 2014
- December 10, 2014
- February 12, 2015
- May 21, 2015

The steering committee agreed on study objectives, identified interim stream flow targets, proposed and evaluated strategies for meeting those targets, and developed a set of strategies to reach those targets through the mainstem Walla Walla River.

1.5 Framework

Past efforts to restore stream flow primarily considered individual actions independently. The interconnected nature of the various surface water and groundwater supplies and demands in the Walla Walla Basin suggested that a coordinated approach may better meet instream flow needs while addressing the needs of existing out-of-stream water users. The steering committee reviewed coarse-scale strategies and identified specific potential actions within those strategies. They reviewed information needs associated with those strategies and actions and agreed to invest study funds to advance strategies and actions that had a high potential for success.

Steering committee participants developed two screening tools to evaluate potential actions. The first tool, a scenario table that includes a suite of potential actions (Appendix A), allows the committee to evaluate these actions as part of a greater context. The second tool, a project proposal review template (Appendix B), allows committee member to better understand and evaluate individual actions within that greater context.

2 Study Status

2.1 Interim Stream Flow Targets

The steering committee agreed by consensus to interim stream flow targets in the Walla Walla River. These interim targets do not represent the interests of any individual group member; they represent interim targets that the entire committee could accept. The group agreed to interim target average stream flows from the Cemetery Bridge POD to the mouth (Table 1)

Table 1. Interim stream flow targets agreed on by the steering committee.

Time Period	Short –Term Target	Long Term Target
Jul 1 – Nov 30	65 cfs	100 cfs
Apr 1 – Jun 30	100 cfs	150 cfs

These targets explicitly do not include peak or ecological flow components.

2.2 Strategies

Watershed Strategies (2013) outlined coarse-scale strategies to meet instream flow needs. The steering committee reviewed these and other coarse-scale strategies to identify specific actions that could potentially restore stream flows in the mainstem Walla Walla River. Ultimately, the steering committee identified a set of coarse-scale strategies to meet stream flow needs throughout the river. These strategies address both short- and long-term interim stream flow targets.

2.2.1 Strategies to Meet Short-term Interim Stream Flow Targets

The steering committee identified coarse-scale strategies that could be implemented relatively quickly to meet short-term interim stream flow targets. These strategies include:

- Mainstem Puchases/Leases/Forebearance/Diversion Reduction Agreements
- Tributary Purchases/Leases/Forebearance/Diversion Reduction Agreements
- Conveyance Efficiency
- Trust/Conserved Water In-Process
- Point-of-Diversion Change
- On-farm Efficiency
- Shallow Aquifer Recharge
- Aquifer Storage and Recovery
- Surface-to-Groundwater Source Switch
- Surface Water Storage - Small Scale
- Infrastructure & Measurement

2.2.2 Strategies to Meet Long-Term Interim Stream Flow Targets

The steering committee identified coarse-scale strategies that could be implemented over a longer time-scale to meet long-term interim stream flow targets. While these strategies are critical to restoring stream flows in the Walla Walla River, their relatively high costs and legal or administrative challenges make them less feasible in the short-term. These strategies include:

- Surface Water Storage - Large Scale
- Columbia River Pump Exchange

2.3 Strategy Evaluation

Study participants developed two tools to evaluate strategies to meet interim stream flow targets. Participants developed a scenario framework and preliminary draft scenario to project the impacts of implementing a suite of stream flow restoration strategies. Participants also developed a proposal template to focus on individual actions within any scenario.

2.3.1 Preliminary Draft Scenario

Walla Walla River water users divert water at different locations and different times of year, depending on their location of use and priority date. Correspondingly, actions to restore stream flow apply to different locations and different times of year. Study participants estimated stream flow needs at six locations along the river through five times of year to adequately account for this variability.

Study participants identified specific stream flow restoration actions that fell within the coarse-scale strategies identified above. They estimated the stream flow contribution from each of those actions at each of the six locations along the river and through each of the five times of year. These actions can be implemented independently, but their outcomes need to be evaluated

concurrently. Recognizing the interconnections between these actions, study participants developed a preliminary draft scenario that encompasses a suite of actions and estimates their cumulative effect on stream flow in the Walla Walla River (Appendix A).

The preliminary scenario attempted to meet both short- and long-term interim stream flow targets identified by participants. It accounted for project losses in the river, and it assumed that some stream flows would be protected across state lines.

The preliminary scenario met short-term targets in some locations and at some times of year, and it met long-term stream flow targets in all locations and all times of year. The scenario suggested that stream flows at Stateline, downstream from the Touchet River, and at Pierce RV Park would increase but fall short of short-term targets during most or all times of year.

2.3.2 Project Proposal Template

Study participants developed a project proposal template to aid in understanding and evaluating individual stream flow restoration actions. This template (Appendix B) will help participants to understand the status, costs, and potential outcomes from each individual action.

3 Existing Tasks, Subcontracts & Deliverables – Phase 1

At the direction of the steering committee, project co-managers committed or contracted with several parties to complete tasks associated with study. Tasks, contractors and the status of their associated deliverables appear below. A condensed list appears in Appendix C.

3.1 Facilitation

Project co-managers contracted with Watershed Strategies to facilitate steering committee meetings as requested, develop coarse-scale strategies and scenarios, and produce this report. As requested by project co-managers, Watershed Strategies facilitated three of the six steering committee meetings. They developed the scenario framework used in this study and worked with meeting participants to develop the preliminary draft scenario (Appendix A).

3.2 Fish conditions

Project co-manages contracted with Portland Fish Company to summarize the current status of fisheries in the Walla Walla River. Portland Fish Company is using the Ecosystem Diagnosis and Treatment tool to analyze fisheries production potential based on updated data on habitat conditions.

3.3 Legal mechanisms to protect bi-state flows

Project co-managers contracted with Cascadia Law Group to evaluate legal mechanisms to protect bi-state flows. They asked contractors to build on and reference, rather than repeat, existing reports on this subject. Cascadia Law Group identified six potential enhancement actions and their associated state laws in an interim report to the steering committee in February

2015 (Appendix D). Following the direction of the steering committee, Cascadia Law Group will produce a final report to the committee in September 2015.

Project co-managers have indicated the possibility of an additional contract with Cascadia Law Group to complete additional work following the completion of these tasks.

3.4 Update integrated surface and groundwater flow model

Project co-managers contracted with GeoSystems Analysis, Inc. to update and expand the geographic scope of an existing integrated surface water and groundwater flow model. The model intends to quantify the distribution of water resources and water requirements and to evaluate surface water and groundwater scenarios developed through the study.

The expanded model developed under this study updates the prior version of the model. It expands the geographic area to the north and east of the Walla Walla River, revises geology grids, includes additional data for model calibration, better accounts for alluvial aquifer pumping, better accounts for pumping from the Columbia River Basalt aquifer, and includes new and proposed aquifer recharge sites.

3.5 GFID #13 rotational leasing

Under this program, Gardena Farms Irrigation District #13 farmers would lease their water rights instream from April through mid-July approximately once every five years as an alternative to growing wheat. Discussions are ongoing with the district about this potential program.

3.6 Shallow aquifer wells

Under this action, irrigators in Gardena Farms Irrigation District #13 who currently have shallow aquifer wells would switch to pumping groundwater from the shallow aquifer as needed. Discussions are ongoing with the district about this potential program.

3.7 Mainstem Walla Walla River stream flow metering and telemetry

Stream flow measurement will be critical to managing flow enhancement projects and maintaining instream flows. WWBWC staff documented existing flow telemetry hardware and software currently in use in the valley to track streamflows and irrigation diversions. Staff also documented the opportunities that exist for expanding that telemetry network to other streamflow and diversion sites (Appendix E).

3.8 Columbia River pump exchange

Stakeholders in the Walla Walla Basin have continued to discuss the potential for a Columbia River pump exchange to restore stream flows in the Walla Walla River. IRZ Consulting has analyzed routing, infrastructure required (including a 6,000 acre foot re-regulation reservoir) and O&M costs for an exchange system that could serve the three largest irrigation districts in the valley and potentially also provide summertime exchange water to the Lowden area irrigators. Two phases of this study have been completed (see reports in Appendices F and G) and a third phase has been initiated.

4 Proposed Tasks, Subcontracts, and Deliverables – Phase 2

During the study, participants identified additional tasks that would bring them all closer to implementation. These additional tasks were proposed for funding in early April of 2015. An amended Flow Study funding contract has not been completed as of the writing of this progress report. Many of these tasks relate to questions, concepts, and options developed through the study. The following sections outline tasks proposed for the second phase of the study. A condensed list appears in Appendix H.

4.1 Utilize surface water groundwater model to run scenarios

Participants will develop a report to summarize the flow improvement scenarios and their results of the modeling by October 31, 2015. They propose a $27,000 budget for this task.

4.2 Legal analysis of Walla Walla River Irrigation District's delivering managed aquifer recharge water

The Steering Committee proposed to pass water through the Walla Walla River Irrigation District's delivery system with the express purpose of delivering water to managed aquifer recharge sites within Walla Walla River Irrigation District. The district has expressed concerns over associated liabilities. This task encompasses a legal analysis of the potential liability associated with delivering managed aquifer recharge water through the district's ditches, canals, and pipes.

Participants will produce an assessment of the district's liability and identify options for reducing or eliminating any legal risk by September 30, 2015. They propose a budget of $10,000 for this task.

4.3 Eastside aquifer recharge and recovery pumping test analysis

A groundwater pumping test will be conducted in the Eastside subbasin to better quantify aquifer characteristics for the proposed Eastside Aquifer Recharge and Recovery project. The pumping test will provide aquifer characteristics such as transmissivity, hydraulic conductivity and others. These parameters will then be utilized to determine an estimate for groundwater storage and recovery in the Eastside subbasin.

Participants will produce a report detailing pump test results and estimating the potential for aquifer recharge and recovery in the Eastside Subbasin by March 15, 2016. They propose a budget of $75,000 for this task.

4.4 Lower Walla Walla Valley basalt storage site characterization

This task will assess the potential for aquifer storage and recovery (ASR) and aquifer recharge and recovery (ARR) in the basalt aquifers of the lower Walla Walla Valley. The assessment will include review and compilation of existing data for the basalt aquifers, a review of existing basalt wells, an evaluation of state requirements for ASR and ARR in both Oregon and Washington, and the development of a potential pilot project.

WWBWC has submitted an RFP to certified hydrogeologists to oversee pump testing, to assist in analyzing the feasibility of this site, and to quantify the amount of summer water rights could be transferred to a groundwater source that has been augmented with an injection of winter high flows.

Participants will produce an ASR and ARR suitability site characterization report by September 30, 2015. They propose a budget of $35,000 for this task.

4.5 Irrigation diversion telemetry infrastructure

Participants propose to design and install a stream flow measurement telemetry station at Gardena Farms Irrigation District #13's diversion on the Walla Walla River. The station will include a telemetry tower, flow measurement sensor, data logger, enclosure, and spread spectrum radio equipment.

Two similar sites were installed in March of 2015 (using Bonneville Power Administration funding) at the Hudson Bay District Improvement Company and Walla Walla River Irrigation District division point (the frog), 1.5 miles downstream on the Little Walla Walla system. A stream flow measurement telemetry station will be installed at the Little Walla Walla Diversion on the Walla Walla River next winter using Bonneville Power Administration funds.

With the addition of the Gardena Farms Irrigation District diversion telemetry station, three of the main diversion points on the Walla Walla River will have near real-time gauging capabilities.

Participants will install this station by October 31, 2015. They propose to invest $15,000 in equipment and $3,000 in staff time necessary to design, construct, and initially operate the station.

4.6 Large-scale surface water storage site analysis

Study participants identified several opportunities for medium and large scale reservoirs in the Walla Walla Basin. Participants specifically highlighted Pine Creek, Dry Creek, and Flume Canyon as potential reservoir locations. WWBWC is developing a scope of work to evaluate opportunities and costs associated with potential reservoir sites in the valley that could store from 10,000 acre-feet up to 60,000 acre feet of water. These reservoirs would provide irrigation water to Walla Walla River water users at times when stream flows are needed for fish passage and fish rearing.

Participants propose to complete a feasibility analysis of these potential reservoir sites. The analysis will assess hydrology, the suitability of geological conditions for holding water, appropriate fill for reservoir dams, seismic data, and other associated site characteristics. The site analysis may also include borings and test diggings to better understand geological conditions and hydrology.

Participants will produce a feasibility report on reservoir site suitability by October 31, 2015. They propose an $85,000 budget for this task.

4.7 HBDIC White Ditch piping survey and design

This task will survey and provide final designs for piping 3.6 miles of Hudson Bay District Improvement Company's White Ditch. The White Ditch is one of the main canals in Hudson Bay District Improvement Company's delivery system. It serves up to 65.8 cfs to a total of 38 water right holders who farm a total of 3181.1 acres. Piping this portion of the ditch will conserve 3-5 cfs of water.

Participants will produce a survey and final design for piping 3.6 miles of the White Ditch by August 31, 2015. They propose an $80,000 budget for this task.

4.8 Design a small-scale upper basin reservoir

Participants propose to survey and design a small-scale reservoir in the Walla Walla River headwaters to provide later season stream flow enhancements. The design will include geology, hydrology, and soil compaction analyses and an evaluation of overflow requirements for dam safety.

Participants will produce a final design for a small-scale reservoir by August 31, 2015. They propose a $10,000 budget for this task.

4.9 GFID #13 Upper Canal piping design

This task will provide final designs and costing for piping the Gardena Farms Irrigation District #13's Upper Burlingame canal. The district serves up to 90 cfs to 65 water users who farm 7,000 acres, and this unlined 11 mile canal delivers this water. Piping the canal would conserve up to 14 cfs.

Participants will produce final designs and costing for piping the Upper Burlingame canal by May 31, 2015. They propose to invest $40,000 for Walla Walla County Conservation District to complete this task.

4.10 WWRID trust water

This project includes conserved water already in-process with Oregon Water Resources Department and associated with past water conservation projects. The Confederated Tribes of the Umatilla Indian Reservation will utilize Columbia Basin Water Transactions Program funding to assist WWRID in completing the steps necessary to protect this conserved water instream as instream water rights through Oregon's Allocation of Conserved Water Program. There will not be a need for any Office of the Columbia River funding for this task.

4.11 GFID #13, HBDIC, and WWRID on-farm efficiency

This program would work to improve on-farm efficiency. It would not necessarily reduce diversions on its own, but it could be combined with other tools to yield instream benefits. Study

partners are still developing this project. They intend to set up and implement this program prior to the 2016 irrigation season. There will not be a need for any Office of the Columbia River funding for this task.

5 References

HDR/EES. 2005. Walla Walla Watershed Plan: Planning Unit Final. May 2005. Pasco, WA: HDR/EES.

Walla Walla Watershed Management Partnership. 2014. Walla Walla Basinwide Instream Flow Enhancement Study Project Plan. January 7, 2014. Walla Walla, WA: Walla Watershed Management Partnership.

Watershed Strategies. 2013. Walla Walla Basin Strategy Session, March 20-21, 2013. Summary Report. Bend, OR: Watershed Strategies.

6 Appendices

A. Scenarios table;
B. Project proposal and evaluation template;
C. List of tasks completed under Phase 1 of the study;
D. Interim report on legal mechanisms to protect bi-state flows;
E. Walla Walla River metering and telemetry assessment;
F. Columbia River pump exchange evaluation, phase 1 report;
G. Columbia River pump exchange evaluation, phase 2 report; and
H. List of tasks proposed for Phase 2 of the study.