UPPER GRANDE RONDE RIVER WATERSHED PARTNERSHIP

UNION COUNTY, OREGON

PLACE-BASED INTEGRATED WATER RESOURCES PLAN

January 2022

This project is funded through the Oregon Water Resources Department
Place-Based Integrated Water Resources Planning Grant

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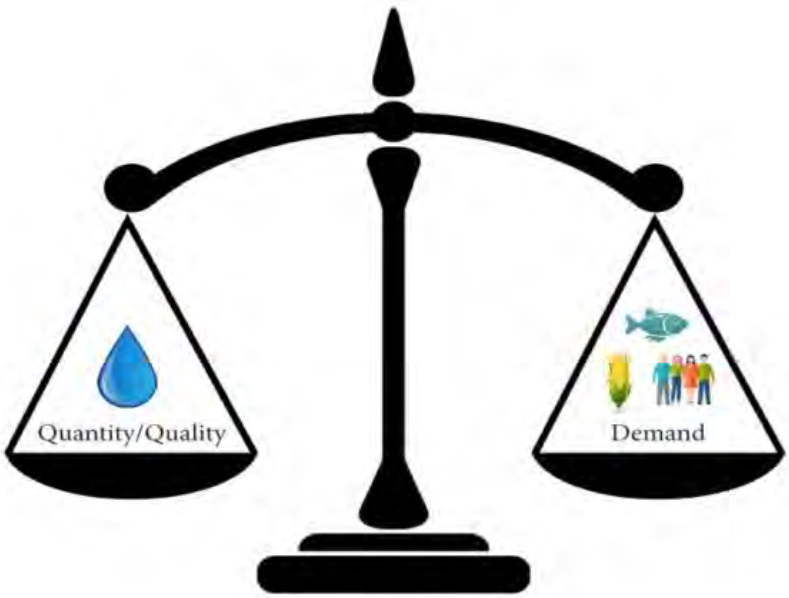
Suggested Citation: Upper Grande Ronde River Watershed Partnership. 2022. Place-Based Integrated Water Resources Plan. Union County, Oregon, USA.

Partnership Approval Date: The Upper Grande Ronde River Watershed (UGRRW) Partnership supports the conclusions and recommended strategies contained in this Place-Based Integrated Water Resources Plan as determined by a vote of the UGRRW Partnership on April 20, 2021, to support the Draft Plan and January 5, 2022, to support the Final Plan.

Final Approval Process: The UGRRW Partnership approved the Draft Plan on April 20, 2021. It was submitted for agency (Oregon Water Resources Department, Oregon Department of Fish and Wildlife, Oregon Department of Environmental Quality, Oregon Department of Agriculture) review. Agency comments were addressed and approved by the UGRRW Partnership and agency review team on January 5, 2022. The Final Plan will be submitted to the Oregon Water Resources Commission for formal recognition.

Acknowledgements: The UGRRW Partnership would like to acknowledge the contributions of all members of the Steering Committee, Stakeholder Committee, and Interested Public (names and organizations listed in Section 1 - The Planning Process [Planning Step 1], below) for their contributions to Steps 1 through 5 of this planning process.



Executive Summary

Introduction

The Upper Grande Ronde River Watershed (UGRRW) is located in Union County, Oregon. Within the UGRRW, agriculture thrives because of fertile valley soils, irrigation, and innovation. Endangered Species Act-listed fish species including bull trout, Chinook salmon, and steelhead find refuge to spawn and rear in the headwaters of tributaries to the Grande Ronde River and Catherine Creek. Eight cities provide homes to nearly 25,000 people within the County. Surface water and groundwater are essential to the continued success of the UGRRW. Water within the UGRRW is limited in the late summer and fall, with estimated deficits increasing into the future. To address these concerns, Union County convened a diverse partnership composed of farmers, ranchers, fish and wildlife advocates, tribes, municipal representatives, and federal and state agencies to develop a place-based integrated water resources plan consistent with the State of Oregon's guidelines. This plan helps implement the State of Oregon's Integrated Water Resources Strategy and related policies. See Figures ES-1, ES-2, and ES-3 for County location, UGRRW location, and the project timeline. Under Oregon law, all water belongs to the public and is managed in accordance with many state and federal laws and policies. This planning effort will help understand and meet the water needs of our communities, economy, and environment consistent with existing law and policy and will not jeopardize any existing rights to use water.

Figure ES-1
Location of Union County and Upper Grande Ronde River Watershed

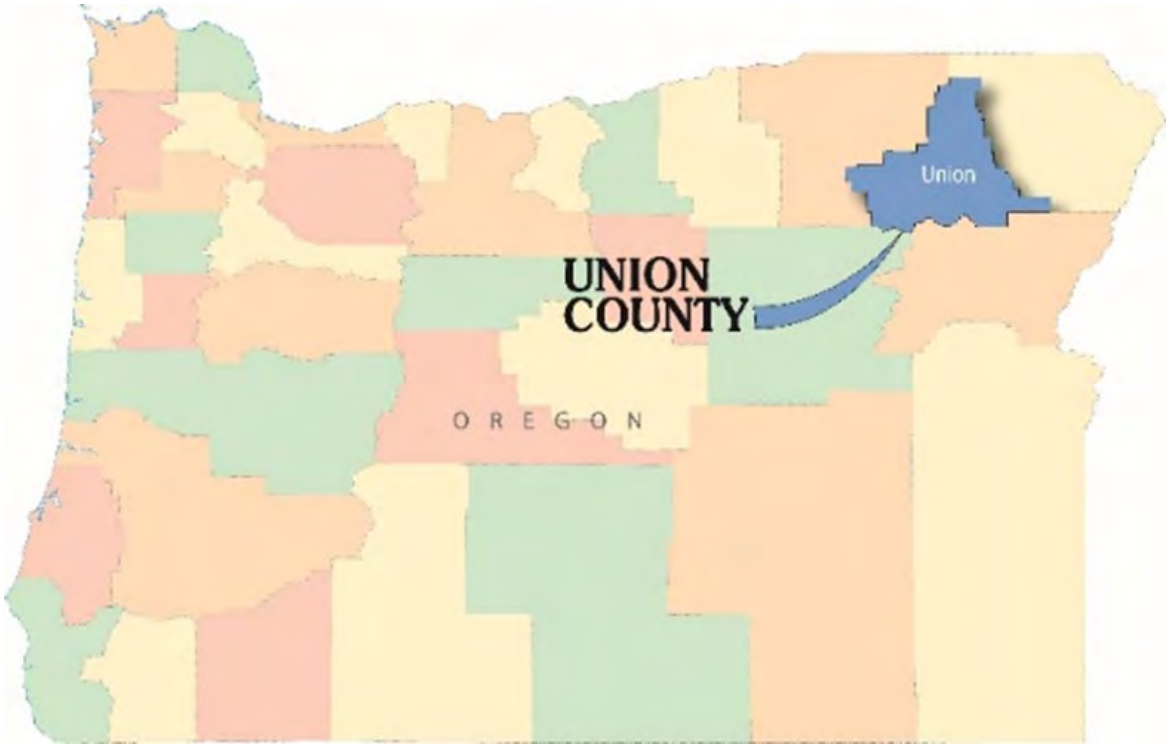


Figure ES-2
Location of Upper Grande Ronde River Watershed

Section 1.0: The Planning Process

Twenty-eight groups and individuals signed a Memorandum of Understanding (MOU) included in the Governance Agreement. The UGRRW Partnership has met approximately monthly (2,500 volunteer hours) over the last six years (2016 to 2021) to make collaborative, consensus-based reports and decisions to characterize the water supply in the UGRRW (Figure ES-3). Important outcomes of this work include estimates of water demand for instream and out-of-stream needs, improved understanding of

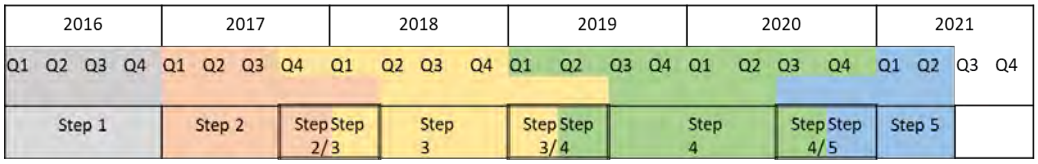
water resources issues and challenges, development of strategies, and completion of this Place-Based Integrated Water Resources Plan in accordance with the Oregon Water Resources Department's (OWRD) Planning Guidelines (OWRD, 2015; UGRRW, 2017). The UGRRW Partnership worked to have a balanced representation of interests while working through this process. Municipal representation included three of the eight cities in the UGRRW, which represented more than 50 percent of the population of Union County. Agricultural representation included the Union County Farm Bureau, Union County Cattleman's Association, and multiple individual farmers and ranchers. Instream representation included the Grande Ronde Model Watershed (GRMW), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and Oregon Department of Fish and Wildlife (ODFW). Each interest group had a representative on the Steering Committee to ensure all interests were represented. Strategies developed were targeted to meet the needs of all user groups (see Appendix A, Implementation Schedule, for details). All votes were unanimous. Table ES-1 below summarizes UGRRW Partnership participation by MOU signatory type. Appendix B, UGRRW Partnership Participation (2016-2021), lists participants by organization, name, sector, signatory status, number of meetings attended, additional responsibilities, primary interests, reasons for reduced participation, if any, and eligibility to vote on the Step 5 Plan. It is ordered by number of meetings attended.

Table ES-1
Upper Grande Ronde River Watershed Partnership Participation (2016-2021)

Category from Planning Guidelines	MOU Signatories	Instream	Out-of-Stream	Government/ Other	Voted for Plan Adoption
Local governments and elected officials	Union County			X	X
Tribal governments	CTUIR	X		X	
Municipal water and wastewater utilities	City of La Grande, City of Imbler		X		X
Major industries or employers	Agriculture and government (major employers in the County)				
Agriculture (see also private landowners below)	Union County Farm Bureau		X		X
Forestry	U.S. Forest Service (USFS)				Non-voting
Conservation/environmental groups	GRMW	X			X
Power companies	Oregon Trail Electric Cooperative				
Private landowners (many of whom are also self-supplied water users and small business owners)	Eight individual landowners		X		X
Special districts	Union County Soil and Water Conservation District	X	X	X	X
State agencies	ODFW	X		X	X
	OWRD	X	X	X	X

Category from Planning Guidelines	MOU Signatories	Instream	Out-of-Stream	Government/ Other	Voted for Plan Adoption
	Oregon Department of Agriculture		X	X	X
Federal agencies	USFS, Natural Resources Conservation Service			X	Non-voting

Figure ES-3
Upper Grande Ronde River Watershed Partnership Place-Based Planning Timeline



Notes:

Q = Quarter

Step 1 (approved October 2016); Step 2 (approved February 2018); Step 3 (approved April 2019); Step 4 (approved December 2020); Step 5 (approved April 2021) - Begin Implementation

The following reports were generated as a result of this process. Reports were generated by working together as a partnership to draft and revise documents until they could be approved by a consensus vote. All reports voted on and received 100 percent consensus.

- Step 1 - Governance Agreement and Memorandum of Understanding
- Step 2 - State of Water Resources Report
- Step 3 - Needs and Demands Report
- Step 4 - Integrated Strategies Report
- Step 5 - Integrated Water Resources Plan

All reports can be accessed at https://union-county.org/planning/place-based-integrated-water-resources-planning/.

Section 2.0: Water Resources

The UGRRW is a unique ecosystem home to numerous species that serve different roles in maintaining ecological health.

Focal terrestrial species include Rocky Mountain elk (*Cervus elaphus nelsoni*), Rocky Mountain bighorn sheep (*Ovis canadensis*), American beaver (*Castor canadensis*), American marten (*Martes americana*), great blue heron (*Ardea herodias*), bald eagle (*Haliaeetus leucocephalus*), white-headed woodpecker (*Picoides albolarvatus*), olive-sided flycatcher (*Contopus cooperi*), yellow warbler (*Dendroica petechia*),

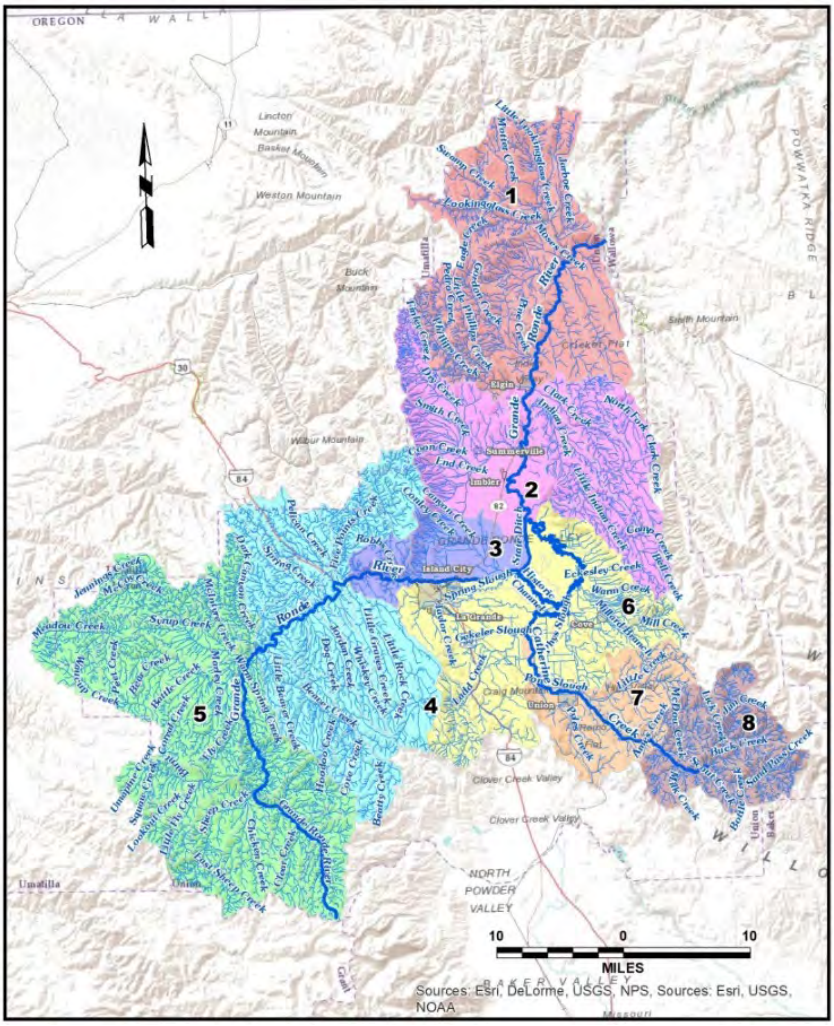
sage sparrow (*Amphispiza belli*), western meadowlark (*Sturnella neglecta*), and Columbia spotted frog (*Rana luteiventris*) (Northwest Power and Conservation Council [NPCC], 2004).

Focal aquatic species include summer steelhead/redband trout (*Oncorhynchus mykiss*), spring Chinook salmon (*Oncorhynchus tshawytscha*), and bull trout (*Salvelinus confluentus*). Prior to the installation of dams in the area, coho salmon (*Oncorhynchus kisutch*) were also common (NPCC, 2004).

Federally endangered species in the UGRRW are monitored through recovery plans, and many restoration projects are ongoing to provide additional resources to these vulnerable species, many of which are aquatic, including steelhead, Chinook, and bull trout. State-listed species are also monitored and have protections in place to support population recovery.

For planning, the UGRRW is divided into eight subwatersheds (through combining Water Availability Basins [WABs] based on geographic characteristics and local knowledge; see the Step 2 report for details), as shown on Figure ES-4.

Figure ES-4
Subwatersheds of the Upper Grande Ronde River Watershed



Surface water quantity was calculated for each subwatershed using estimated natural streamflow from the OWRD Water Availability Reporting System (WARS) model; surface water quality was estimated using the DEQ 303(d) listings and total maximum daily limit data. Groundwater quantity was estimated using groundwater rights from OWRD's Water Rights Information Services database; groundwater quality was estimated using the DEQ Environmental Cleanup Site Information database information and sensitive aquifer information.

Section 3.0: Current and Future Demands

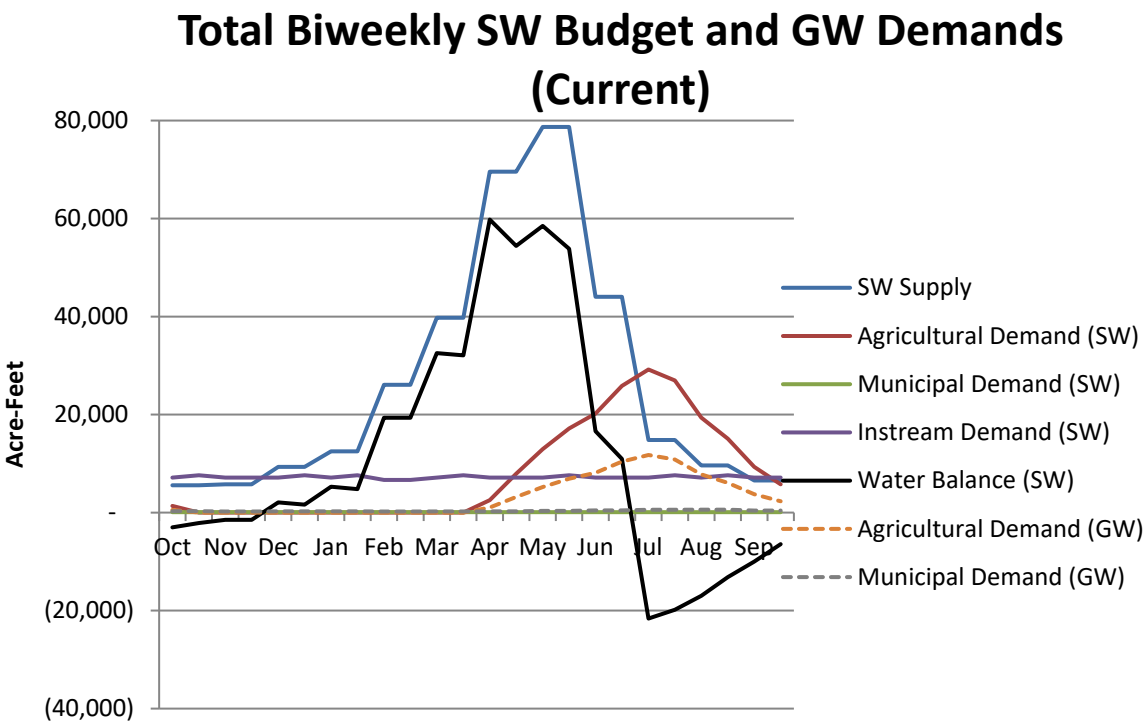
Current and future demands for surface water were calculated for agricultural use, instream use, and municipal use on a bi-weekly basis. Current and future estimates of demand for groundwater were also computed for agricultural and municipal use on a bi-weekly basis; however, without a quantifiable supply and understanding of the groundwater system, the groundwater budget could not be computed. Current agricultural use was calculated using water rights, irrigation data, and evapotranspiration data. Current municipal use was calculated using OWRD water use reports. Current instream use was calculated only using water rights. Instream demands are likely underestimated since instream water rights, the only quantified instream demands in the UGRRW, are an incomplete approximation of demand, cover only a portion of all the streams in the UGRRW, and do not account for the full range of flows across seasons. Future supply was estimated to the year 2068 using the Representative Concentration Pathway 8.5 climate model to estimate the most severe conditions associated with increasing temperatures. These data also informed future irrigation demand. Future municipal demands were estimated using an increase in population. No estimates of future instream demands were computed because these demands were solely based on instream water rights. This does not mean that there is no anticipated change to future instream demand, only that the UGRRW Partnership is currently unable to calculate it.

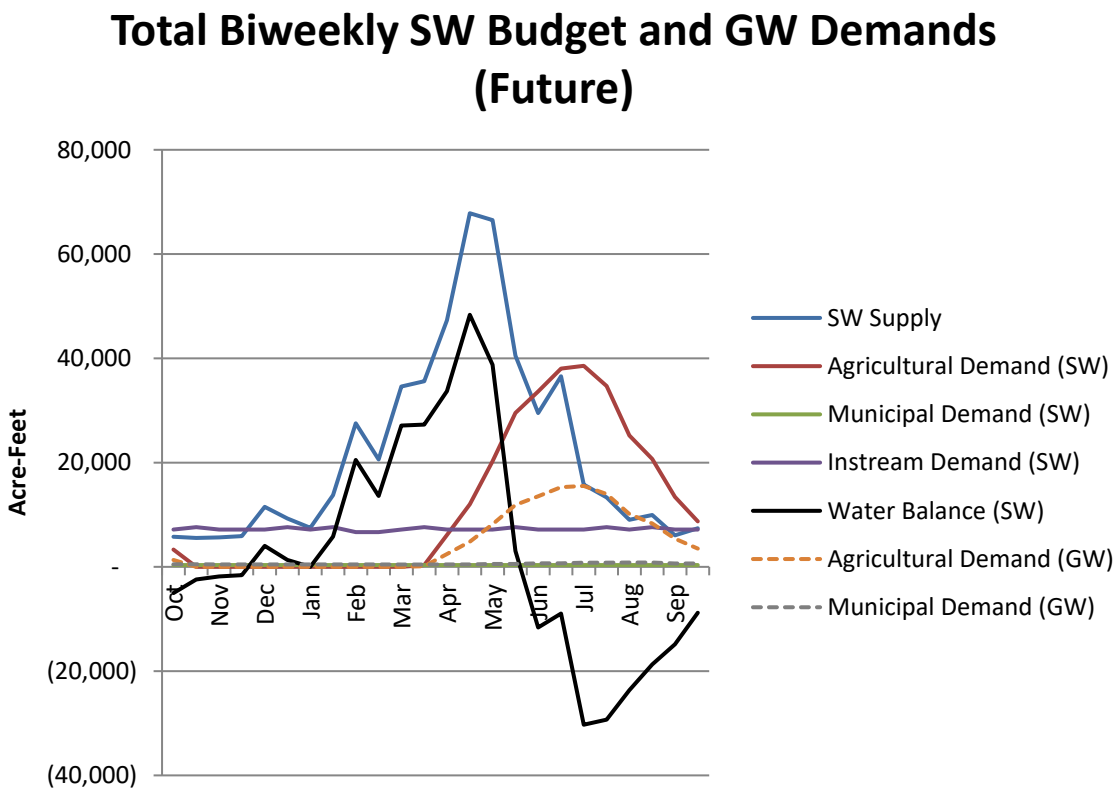
Generally, high agricultural use areas have the greatest potential for surface water demand conflicts with other uses of water because agricultural use is the highest percentage of consumptive water use in the UGRRW. Based on analysis in Step 3, groundwater demand may not have high conflict potential if pumping rates are held constant; however, there is significant uncertainty in groundwater supply data and interactions between groundwater and surface water, which are likely connected. Stream segments with instream water rights have known flow target needs, but since instream water rights are often junior in priority to most other water rights, regulation to satisfy instream rights in dry periods is ineffective at protecting instream needs for fish and wildlife. Additionally, Scenic Waterway (SWW) flows downstream of the planning area prevent the allocation of hydraulically connected groundwater during several months of the year unless mitigation is provided, increasing potential conflict as demands from all sectors increase. Municipal systems appear to have the lowest vulnerabilities of the three demand groups based on water use reporting data showing that needs are met and demands are relatively small.

On an annual basis, there is sufficient surface water quantity to meet current surface water demands as currently characterized. On a bi-weekly basis there are deficits from July through November (the maximum is an approximately 20,000 AF deficit in late July). Groundwater demands are included here, though note that since groundwater supply is not yet well-understood, no water budget calculation was completed for groundwater. See Figure ES-5 below for the total biweekly surface water budget and groundwater demands (current and future).

Water needs for recreational water uses, hydroelectric power, and groundwater-dependent ecosystems (such as springs) were not formally assessed in the current version of this Step 5 Plan. Natural hazards like flooding, fire, and drought impact the UGRRW frequently; these impacts were not quantitatively assessed in this version of the Step 5 Plan.

Figure ES-5
Total Biweekly Surface Water (SW) Budget Summary and Groundwater (GW) Demands





UGRRW water quality concerns include temperature, bacteria, sedimentation, dissolved oxygen (DO), and pH. Temperature impairments are the most widespread. Surface water quality falls below statewide regulatory standards throughout different times of the year in the UGRRW; total maximum daily loads have been established for temperature and bacteria, with the main 303(d) listed concerns being high temperatures and low DO, which are associated with seasonal low flows, as well as sedimentation and pH (UGRRW, 2019).

Table ES-1, Subwatershed Summary, shows that generally, subwatersheds in the northern and central portions of the UGRRW (subwatersheds 1 through 6) have more surface water quality limits than ones in the southern portion of the UGRRW (the Catherine Creek area and subwatersheds 7 and 8). Groundwater use is highest in subwatersheds 2, 3, and 6 reflecting primarily agricultural demand and some municipal demand. Additional details about estimated subwatershed acreage, land use, stream flow, precipitation and evapotranspiration are included for reference. See Figure ES-4 above for subwatershed locations.

Table ES-2
Subwatershed Water Supply Summary

Subwatershed	Total Acres	Land Use	Municipal Water Use	Estimated Surface Water Quantity (Natural Streamflow) (acre-feet per year)	Estimated Mean Annual Precipitation (inches)	Estimated Mean Annual Evapotranspiration (inches)	Surface Water Quality	Groundwater Quantity	Groundwater Quality
1	169,000	Predominantly Forested, Rural Municipal (40 percent public land)	Elgin	644,600	33	19	Impaired for seven beneficial uses	Low to no use	Low risk
2	149,800	Half Forested/Half Agriculture (23 percent public land)	Imbler, Summerville	523,380	29	18	Impaired for seven beneficial uses	Second highest use	Medium risk
3	41,000	Predominantly Agriculture (12 percent public land)	Island City	234,120	19	17	Impaired for six beneficial uses	Third highest use	High risk
4	178,050	Predominantly Forested (56 percent public land)	No cities; limited out-of-stream water use, significant instream use	219,830	27	16	Impaired for five beneficial uses	Low use	Low risk
5	249,740	Predominantly Forested (74 percent public land)	No cities; limited out-of-stream water use, significant instream use	127,840	28	16	Impaired for five beneficial uses	Low to no use	Low risk
6	142,260	Predominantly Agriculture (10 percent public land)	La Grande, Cove	153,740	22	18	Impaired for six beneficial uses	Highest use	High risk
7	55,500	Half Forested/ Half Agriculture (9 percent public land)	Union; limited out-of-stream water use, significant instream use	116,240	27	14	Impaired for six beneficial uses	Fourth highest use	Medium risk
8	61,820	Predominantly Forested (82 percent public land)	No cities; limited out-of-stream water use, significant instream use	71,600	41	16	Impaired for one beneficial use	Low to no use	Low risk

Groundwater quality risk ranked as a comparative risk between the subwatersheds.
Groundwater quantity use based on number of water rights per subwatershed.
Surface water quantity is the sum of the biweekly 50 percent exceedance calculation in acre-feet (AF) per year from the OWRD Water Availability Reporting System (UGRRW Partnership, 2018).
Flows are cumulative (additive).

Section 4.0: Water Issues and Recommended Actions

Overall, there are four primary water issues:

1. Surface water supply is limited in summer through late fall (circa July through November) when the combined demands for water instream and for irrigated agriculture and municipal uses is the highest (Step 3 report).
2. There is significant uncertainty with groundwater supply. The UGRRW Partnership needs to evaluate groundwater supply sustainability to inform strategic groundwater resource planning. At this time, the UGRRW lacks sufficient groundwater monitoring wells, long-term trend data, pumping/use data, and data regarding surface water interactions -- all are needed to inform strategic groundwater resource planning and management (Step 3 report).
3. Surface water quality is below statewide standards in all eight subwatersheds at various times of the year. The water quality issues are predominantly related to high temperatures, low DO, sedimentation, pH, and insufficient flows (DEQ, 2000; Step 2 report).
4. Natural hazards like flooding, fire, and drought impact the UGRRW frequently, and the UGRRW Partnership needs a plan to mitigate and respond to these events. The climate change scenario considered by the UGRRW Partnership suggests the frequency, magnitude, and duration of these events could change within the UGRRW (Step 2 report and Step 3 report).

To improve these four issues the following goals and objectives are proposed:

**Goals 1 and 2 objectives to be pursued simultaneously.*

1. **Issue/Goal 1 - Eliminate surface water deficit for instream and out-of-stream uses**
    - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)
    - Objective 1.2 - Fill data gaps (instream flow now; complete by 2040)
2. **Issue/Goal 2 - Improve water quality**
    - Objective 2.1 - Reduce each water quality issue (by 2040)
    - Objective 2.2 - Fill data gaps (by 2040)
3. **Issue/Goal 3 - Reduce groundwater supply uncertainty**
    - Objective 3.1 - Complete a groundwater study (by 2035)
    - Objective 3.2 - Develop and implement plan based on study results
4. **Issue/Goal 4 – Prepare for natural hazards/climate change**
    - Objective 4.1 - Develop natural hazards mitigation plan (by 2030)
    - Objective 4.2 - Implement mitigation measures identified in plan (by 2040)
    - Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030)

The UGRRW Partnership brainstormed more than 100 specific strategies to address these issues, goals, and objectives and combined the strategies into nine categories. The UGRRW Partnership created

strategy summaries and decided to prioritize UGRRW Partnership resources and focus on the top five strategies (see Table ES-2 below) while retaining other strategies for opportunistic implementation (UGRRW, 2020).

Section 5.0: Plan Implementation Strategy

Strategy working groups created action plans for the nine strategy categories. Table ES-2 summarizes the nine strategy categories including the strategy name, primary beneficiaries (agriculture, instream, or municipal) and implementation lead, a brief description, purpose, and selected milestones.

Table ES-3
Strategy Summary

No.	Strategy (Implementation Lead) [Primary Beneficiaries]	Description/Purpose	Selected Milestones
1	Built Storage - Aboveground Storage and Underground Storage (Union County) [Agriculture, Instream]	Address specific instream and out-of-stream water supply deficits in each subwatershed through advancing possible built storage projects.	• Conduct aboveground storage and instream flow study (applied for state funds). • Develop next steps for Catherine Creek underground storage (to benefit instream flows).
2	Land Management - Agricultural Land (Natural Resources Conservation Service) [Agriculture, Instream]	Conduct research and provide subsequent educational outreach to support water management actions that maintain water quality and increase water use efficiency.	• Convene a pilot group of landowners for on-farm conservation activities. • Create a shared resources list. • Strategize funding for irrigation water management projects.
3	Data Collection, Monitoring, and Research (GRMW) [Agriculture, Instream]	Coordinate data collection to fill data gaps, support working groups, and inform water management in the UGRRW.	• Prioritize data gaps. • Study Groundwater. • Study water quality. • Update assessment of instream flow needs.
4	Non-structural Water Storage and Habitat Management (Union Soil and Water Conservation District) [Instream]	Raise awareness of work being done and how this work addresses goals of the Partnership; prioritize and pursue nonstructural storage projects in strategic locations.	• Plan field tour. • Prioritize areas and projects (using the Ecological Atlas geomorphic potential information [GRMW, 2021]).
5	Land Management - Public Land (USFS) [Instream]	Information sharing and communication between public land management agencies and stakeholders to identify potential areas of mutual support.	• Update Partnership on USFS projects. • Plan field tours.
6	Infrastructure - Land Modification (Union County) [Municipal, Agriculture, Instream]	Reduce the frequency and severity of damage due to flooding now and in the future.	• Review U.S. Bureau of Reclamation hydraulics study. • Study sedimentation. • Hold ditch-opening meeting. • Draft hazards mitigation plan.
7	Administrative Actions (CTUIR) [Instream]	Increase awareness of how administrative actions can improve water quality and quantity.	• Create outreach material for landowners and legislators. • Survey interest in administrative actions.
8	Land Management - Municipal Land (City of La Grande) [Municipal]	Improve city-to-city coordination to respond to natural hazards, increase water conservation, and support water infrastructure efficiency improvements.	• Develop shared resources agreement. • Update/develop hazard mitigation plans.
9	Outreach and Education (Union County) [Municipal]	Inform the public about water quality issues and UGRRW Partnership activities.	• Distribute water quality and lawn care outreach materials. • Complete digital storytelling project. • Update outreach plan.

This Step 5 Plan represents the conclusion of the OWRD five-step planning process. It also provides the roadmap for the implementation phase. The implementation phase will consist of work group meetings as needed and quarterly UGRRW Partnership meetings to coordinate and assist groups with implementation. Appendix A, Implementation Schedule, will be revised annually to update progress and will be located on the Union County website. The entire UGRRW Partnership will review the plan at least every five years and adaptively manage the strategies based on data collection, monitoring, and research.

Introduction

Planning Purpose

The Upper Grande Ronde River Watershed (UGRRW) located in Union County, Oregon, is a vital ecosystem that supports ranchers, farmers, tribes, and urban residents as well as an array of fish and wildlife species.

Stakeholders in Union County, and other non-local interested parties, are concerned about the sufficiency of water quantity and quality to meet future demands for municipal, agricultural, and ecological purposes. Under Oregon law, all water belongs to the public and is managed in accordance with many state and federal laws and policies. This planning effort will help understand and meet the water needs of our communities, economy, and environment consistent with existing law and policy and will not jeopardize any existing rights to use water.

While there is a significant amount of data on water quantity and quality in the UGRRW, historically there has been a lack of seasonal-level data to evaluate whether the demands are aligned with available water quantity and quality. Groups working in the UGRRW lack coordination to improve water quantity and quality for agricultural, municipal, and instream purposes.

Exhibit I-1 UGRRW Partnership Field Trip to Southern Cross, Oregon

To address these issues, in 2016 Union County applied for and received an Oregon Water Resources Department (OWRD) grant. This Integrated Water Resources Place-Based Planning Grant allowed Union County to convene a collaborative effort to assess demands on water resources within the watershed compared to available water resources and develop integrated strategies in an effort to provide a better water future. Throughout the process, the goals of the UGRRW Partnership have evolved and broadened to include natural hazards after the spring flooding that occurred in 2019. This Place-based Integrated Water Resources Plan was developed consistent with the State of Oregon's guidelines and helps implement the State of Oregon's Integrated Water Resources Strategy and related policies.

The UGRRW Partnership is composed of a diverse representation of 28 individuals and stakeholder groups, including local organizations and individuals, with interest in the area's water resources. Over the past six years (2016 to 2021), the UGRRW Partnership has been working through the five steps of the OWRD integrated water resources place-based planning process, captured in their draft planning guidelines (OWRD, 2015). These steps included 1) convening a diverse partnership, 2) characterizing

water resources, 3) quantifying demand for water quality and quantity,
4) developing strategies to align supply and demand, and 5) creating a plan for implementation.

To develop this Plan, the UGRRW Partnership completed each of the five place-based planning steps, with each step building on information learned in previous planning steps. Each planning step ended with a consensus-supported report involving all eligible voting members of the UGRRW Partnership.

The UGRRW Partnership will use this plan to implement projects to benefit the multitude of water users (including agricultural, municipal, tribal, ecological, recreational, and others) that reside in the UGRRW.

Geographic Scope

UGRRW is located in northeast Oregon and is closely aligned with the boundary of Union County, Oregon; see Figures ES-1 and ES-2.

The UGRRW is part of the Grande Ronde River Subbasin in northeast Oregon. This system includes the numerous tributaries to the Grande Ronde River and Catherine Creek, which join in the valley, and eventually drain to the Snake River. In addition, a limited number of wetlands, ponds, lakes, dams, and reservoirs are located throughout the UGRRW. The UGRRW contains both alluvial aquifers, located near the ground surface, and deep basalt aquifers, located hundreds to several thousand feet below ground surface.

Geologically, the Grande Ronde Valley is surrounded by the Blue Mountains and drained by the Grande Ronde River. Elevations range widely, from the mountainous areas bounding the UGRRW that reach more than 6,000 feet in elevation, to the central portion of the UGRRW, which comprises the valley floor at only 2,700 feet in elevation. Miocene volcanic rocks are exposed at the surface on the edges and outside of the low-lying river valleys where subsided volcanic rocks have not been covered by sedimentary deposits. Within the valley, alluvium, or sedimentary deposits from rivers and lakes, may be greater than 2,500 feet thick. The climate is semi-arid with hot, dry summers and cold, moist winters. The hydrology of the UGRRW is dominated by snowmelt runoff peaking in April/May generally.

Water is used in many ways in the UGRRW. Sixty percent of the UGRRW is forestland, 20 percent is rangeland, and the majority of the remaining acreage is used for field crops and pastureland, with a small percentage in municipal and residential areas. Agricultural water uses dominate much of the valley area, domestic and industrial uses are concentrated in city areas, and recreation/fish/wildlife uses are located throughout the UGRRW. Water supply shortages for instream and out-of-stream uses currently exist and will intensify with a changing climate and projected increases in future demand.

- Agricultural users include 800 farms and ranches that require irrigation from a combination of surface water and groundwater allocations. Agriculture is a primary economic driver in Union County.
- Municipal users include the cities of Union County (Elgin, Imbler, Summerville, Island City, La Grande, Cove, and Union), each of which have distinct water systems to serve their populations ranging from more than 13,000 in La Grande to 136 in Summerville. Summerville does not have a municipal water system. The communities rely primarily on groundwater, robust storage reservoir systems, and distribution systems to meet municipal water needs. There are five primary industrial users in the UGRRW; these users obtain water through municipal systems or self-supplied systems.

- Instream users include native redband trout, and Endangered Species Act-listed fish species summer steelhead, spring Chinook salmon, and bull trout; recreational users; the ecosystem as a whole. Instream uses also fulfill tribal treaty rights to sustain the fishery, support flows to a state-designated Scenic Waterway downstream of the study area, and support recreational opportunities.

Historically, many tribes included the Grande Ronde Valley within their territories and utilized the natural resources. More recently, people have significantly modified waterbodies within the UGRRW, including the Hilgard sawmills, placer mines on the Upper Grande Ronde River in the late 1800s, and the creation of the State Ditch in the 1880s (with additional work in the 1980s) to reroute the Upper Grande Ronde River to a straighter and more-channelized path. Many residents of the Grande Ronde Valley have family histories here that trace back multiple generations, and residents are vested in working toward sustainable water use practices.

The geographic scale selected aligns with watershed boundaries inclusive of water demands and supply throughout the planning area.

Plan Organization

This document is divided into an introduction and six sections. For additional information on Steps 1 through 4, please see the final reports located at https://union-county.org/planning/place-based-integrated-water-resources-planning/.

Introduction - Overview of the purpose and location of planning, and a brief introduction to the document (this section).
1.0 - The Planning Process - Documentation of the governance, structure, participation, guiding principles, and outreach central to the planning process.
2.0 - Water Resources - Summary of work completed under Step 2 to characterize surface water and groundwater, including legal and physical characteristics.
3.0 - Current and Future Water Demands - Summary of work completed under Step 3 to characterize and quantify current and future water demands by user group and subwatershed, and compare to supply.
4.0 - Water Issues and Recommended Actions - Prioritized list and description of the main water issues agreed to by the collaborative, and actions to address each of those issues.
5.0 - Plan Implementation Strategy - Approach for convening, communicating, and pursuing recommended actions.
6.0 - References

1.0 - The Planning Process

Planning Participants

Throughout the planning process, Union County, as the convener, has worked to bring together a balanced representation of interests to participate in this open, transparent, and public process. Three water demand groups (municipal, agricultural, and instream) were identified, and participants were sought from each group for both the Steering Committee and Stakeholder Committee. The following partners participated in this process. All, except for Interested Public, have signed the Memorandum of Understanding (MOU), which is described further in the next section. The Steering Committee members are also members of the Stakeholder Committee, signed the MOU, and can vote.

The Upper Grande Ronde River Watershed (UGRRW) Partnership sought to have a balanced representation of interests while working through this process. Municipal representation included three of the eight cities in the UGRRW, which represented more than 50 percent of Union County's population. Agricultural representation included the Union County Farm Bureau, Union County Cattleman's Association, and multiple individual farmers and ranchers. Instream representation included the Grande Ronde Model Watershed (GRMW), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and Oregon Department of Fish and Wildlife. Each interest group had a representative on the Steering Committee to ensure all interests were represented. Strategies developed were geared to meet the needs of all user groups.

Steering Committee

- ODFW (Nick Myatt [2016-2017]; Tim Bailey [2017-2020]; Adrienne Averett [2021]; Joseph Lemanski [2021-Present])
- Union County (Mark Davidson [2016-2017]; Donna Beverage [2017-Present])
- City of La Grande (Kyle Carpenter)
- Union County Farm Bureau (Jed Hassinger)
- Oregon Water Resources Department (OWRD) (Steve Parrett)

Stakeholder Committee

*An * indicates a Stakeholder Committee organization or individual who has signed the MOU. The names listed in parentheses are people who contributed to the planning effort. Each organization is allowed only one MOU signature (vote). Organizations and individuals were allowed to sign the MOU as either voting or non-voting members.*

Ann Hulden*; CTUIR* (Anton Chiono, Allen Childs, Chris Marks, David Haire, Ian Wilson); Austin Bingaman*; U.S. Forest Service* (Bill Gamble, Dave Plummer, Sarah Brandy); Brett Rudd*; Cheryl Murchison*; Curt Howell*; Curt Ricker*; Oregon State University Extension (OSU)* (Darrin Walenta, Robin Maille); City of Cove* (Dave Johnson and Del Little); GRMW* (Jeff Oveson, Jesse Steele, Alex Towne, Connar Stone, Jessica Humphreys); Jim McDonald*; Union Soil Water Conservation District* (Jim Webster, Aaron Bliesner, Deric Carsen, Chris Motes, Kate Frenyea); Larry Larson*; City of Union* (Leonard Flint, Rod McKee); Oregon Department of Agriculture* (Margaret Matter, Tom Demianew);

U.S. Fish and Wildlife Service* (Gary Miller, Marisa Meyer, Gretchen Sausen); Oregon Fescue Commission* (Matt Insko); Ford Family Foundation (Maurizio Valerio); City of Island City* (Rob Rea, Delmer Hanson); Union County Cattleman* (Rodger Huffman, Darren Hansen); Union County* (Scott Hartell, Lorcinda Johnson, Darcy Carreiro, JB Brock); Oregon Department of Environmental Quality* (Smita Mehta, Tonya Dombrowski, Randy Jones, Roxy Nayar, Don Butcher, John Dadoly); National Marine Fisheries Service (Sara Fesenmyer, Rebecca Viray); OWRD* (Shad Hatten, Jen Woody, Jason Spriet, Kim Ogren, Nick Teague, Phil Marcy, Rachel LovellFord; Bob Harmon, Jordan Beamer); ODFW* (Winston Morton, Anna Pakenham Stevenson; Colleen Fagan; Danette Faucera); The Freshwater Trust* (Caylin Barter, Aaron Maxwell, Tony Malmberg, Jessica Phelps, Spencer Sawaske); U.S. Bureau of Reclamation (Darrell Dike); Trout Unlimited* (Levi Old); Natural Resources Conservation Service* (Mike Burton; Nick Vora); Tim Wallender*.

Interested Public

Kurt Bowman; Powder Valley Water Control District (Lyle Umpleby); Representative Waldon (Tucker Billman); Senator Wyden (Kathleen Cathey); Senator Merkley (Karen Wagner; Jessica Keys); Boise Cascade (Bart Barlow); Bobby White; Nez Perce Tribe (Bobby Hills); Business Oregon (Brian McDowell; Jeremey McVeety; Melisa Drugge); The La Grande Observer (Cherise Kaechele); Governor's Office (Courtney Crowell); Oregon Cattleman's Association (Curtis Martin); Union County Economic Development Corporation (Dan Stark); Delon Lee; City of Cove (Doug Kruse); GSI (Jason Melady); Oregon Department of Forestry (Joe Hessel); John Frisch; Climate Impacts Research Consortium (Kathie Dello); Kurt Bowman; Water Watch (Kimberley Priestley); Levon Baremore; Eastern Oregon University (Maren Peterson); Mauri DeLint; City of Imbler (Mike McLean); Oregon Trail Electric Co-op (Nina Valerio; Susan Snider); Peter Nilsson; Tom Bowman; Michael Bettis.

Governance and Organizational Structure

Governance and Structure

The Upper Grande Ronde River Watershed (UGRRW) Partnership is led by the Co-Conveners (Union County Commissioner Donna Beverage and Union County Planning Director Scott Hartell). The Co-Conveners lead the group, encourage participation, work through partner disagreements, and perform grant administration. The Co-Conveners rely on a Steering Committee of four partners representing primary water interests in the UGRRW. These include instream interests represented by the ODFW, municipal interests represented by the City of La Grande, agricultural interests represented by the Union County Farm Bureau, and agency interests represented by the OWRD. The Stakeholder Committee includes all organizations involved in the planning process through signature of the MOU. A signatory of the MOU agrees to work collaboratively, that all decisions will be made through consensus (minus 2), and that the signatory may participate in decision-making if they attended two of the last four meetings. Decision-making in the UGRRW Partnership is described in the Governance Agreement.

Through discussions at early meetings, the Stakeholder Committee determined that signatories must live or work in the UGRRW. The interested public is notified of UGRRW Partnership activities and encouraged to participate in the process through notices on the Union County website, notices/articles in the newspaper, radio advertisements/interviews, presentations at community events, and direct outreach by UGRRW Partnership members. *Ad hoc* working groups form and disband as needed throughout the process to work through specific issues - these have included

MOU wording disagreements, caveats and data issues, instream demand, agricultural demand, municipal demand, natural hazards/climate change, and strategy working groups.

Vision

The goal is to use place-based planning as a starting point for a lasting UGRRW-wide partnership where improvements are made to better align various water demands with available water resources. This process will recognize water rights and has no authority to modify current legal uses of water.

Guiding Principles

The guiding principles of the UGRRW Partnership are:

1. Participation. Partners have a duty to contribute information and resources to the cause.
2. Collaboration. Partners will work together to determine priorities in a fair and open manner. Information will be shared freely throughout the UGRRW Partnership.
3. Respect. Partners will respect the research and focus of different members of the UGRRW Partnership.
4. Balanced Analysis. Data, decisions, and resources will be analyzed using the best science and technical expertise.
5. Funding. Partners will work to support each other in applications through matching funds or in-kind support, as they are able.
6. Action. The ultimate goal is to implement incremental projects to create beneficial and lasting change in the UGRRW.
7. Flexibility. The partners realize that modifications to the original scope and views may be required.

The planning group also adhered to the guiding principles for implementation in the Integrated Water Resources Strategy.

Public Outreach

Public outreach has been an ongoing part of the planning process. Methods frequently used include:

- Public meetings (notice in Briefly section of the La Grande Observer, and on the Union County website) (each meeting - more than 47 publications)
- Presentations to various groups in the region (including GRMW annual meeting, Farm Bureau Banquet, Union County Farm Tour, meeting with cities of Union County, etc.)
- Radio advertisements/interviews (approximately one per year)
- Newspaper articles (three articles)
- Personal phone calls and one-on-one outreach

When a member of the public attends a meeting, the person receives background information on the UGRRW Partnership and process. While the UGRRW Partnership strives to be inclusive, it is acknowledged that stakeholders from certain sectors elected not to participate. This included recreational users (no organized groups or interested individuals were willing to participated when one-on-one outreach occurred); industrial users (Boise Cascade initially participated but then did not due to staffing changes). The UGRRW Partnership worked to represent these interests in both demand and strategy decisions.

Collaborative, Open, and Transparent Public Process

All decisions were made through consensus and collaboration with supporting information available on the Union County website. More than 47 UGRRW Partnership meetings, and many additional steering committees and working group meetings have been held. The public has been involved and made aware of the UGRRW Partnership progress. Members of the UGRRW Partnership have presented at numerous public meetings in the region (including GRMW annual meeting, Farm Bureau Banquet, Union County Farm Tour, meeting with cities of Union County, etc.). The UGRRW Partnership was sensitive to different communication preferences and abilities for involvement. Meetings were available via in-person or call-in options (with the exception of when COVID-19 restrictions limited meetings to call-in only). Printing copies of reports for review was always offered, and comments were accepted via email/redline comments, handwritten comments, over the phone, or in person. Meeting times were scheduled to accommodate those who had occupations or responsibilities that could preclude attendance. Meeting times shifted from earlier to later depending on the times of year and as requested by Stakeholders to increase participation. Meetings were canceled or rescheduled during busy times of the year when it was felt a diverse representation of Stakeholders could not be present. Those unable to attend meetings or who felt uncomfortable speaking publicly could comment via email, mail, or individual conversations with the facilitator or convener. The UGRRW Partnership addressed all comments to the greatest extent practicable, and all documents were approved via consensus vote. Funding and in-kind support for this project included:

- OWRD Place-Based Planning Grant
- Ford Family Foundation Learning Partnership Grant
- OSU Extension Office and Union County meeting spaces
- Time and effort from Stakeholders to complete reports and attend meetings

2.0 - Water Resources

During Planning Step 2, "Characterize Water Resources, Water Quality, and Basin Conditions" the Upper Grande Ronde River Watershed (UGRRW) Partnership learned about and characterized the state of water resources in the UGRRW.

Water Resources Supply

Water resources supply includes both the quantity and quality of surface and groundwater. Important factors that influence supply in the UGRRW include:

- Surface water supply is affected by the UGRRW's precipitation patterns of winter precipitation and snowmelt driven hydrology followed by low precipitation and high temperatures in the summer (when water use is highest). This seasonal pattern of precipitation and snowmelt, combined with a lack of storage in the UGRRW contribute to a supply shortage during late summer/fall. Water quality is reduced during this time of year due to the impact of summer heat environment and low stream flows, resulting in high water temperatures. Dissolved oxygen (DO) and pH are also above regulatory standards (see Figure 2-2).
- Groundwater supply is uncertain. Alluvial aquifers are strongly influenced by surface water; however, accurate estimates of groundwater supply are not available. Groundwater quality is not known to be a concern at this time.

A brief description of physical conditions impacting supply is discussed below. The UGRRW is the portion of the Grande Ronde River Watershed above the Grande Ronde River's confluence with the Wallowa River. Elevations range widely, from the mountainous areas bounding the UGRRW that reach more than 6,000 feet in elevation, to the central portion of the UGRRW, comprising the valley floor at only 2,700 feet in elevation (see Figure 2-1).

The climate is semi-arid with hot, dry summers and cold, moist winters (see Figure 2-2). Low precipitation during the hot growing season creates a strong reliance on irrigation. The hottest months are July and August and the driest months are July, August, and September.

Figure 2-1
Relief Map

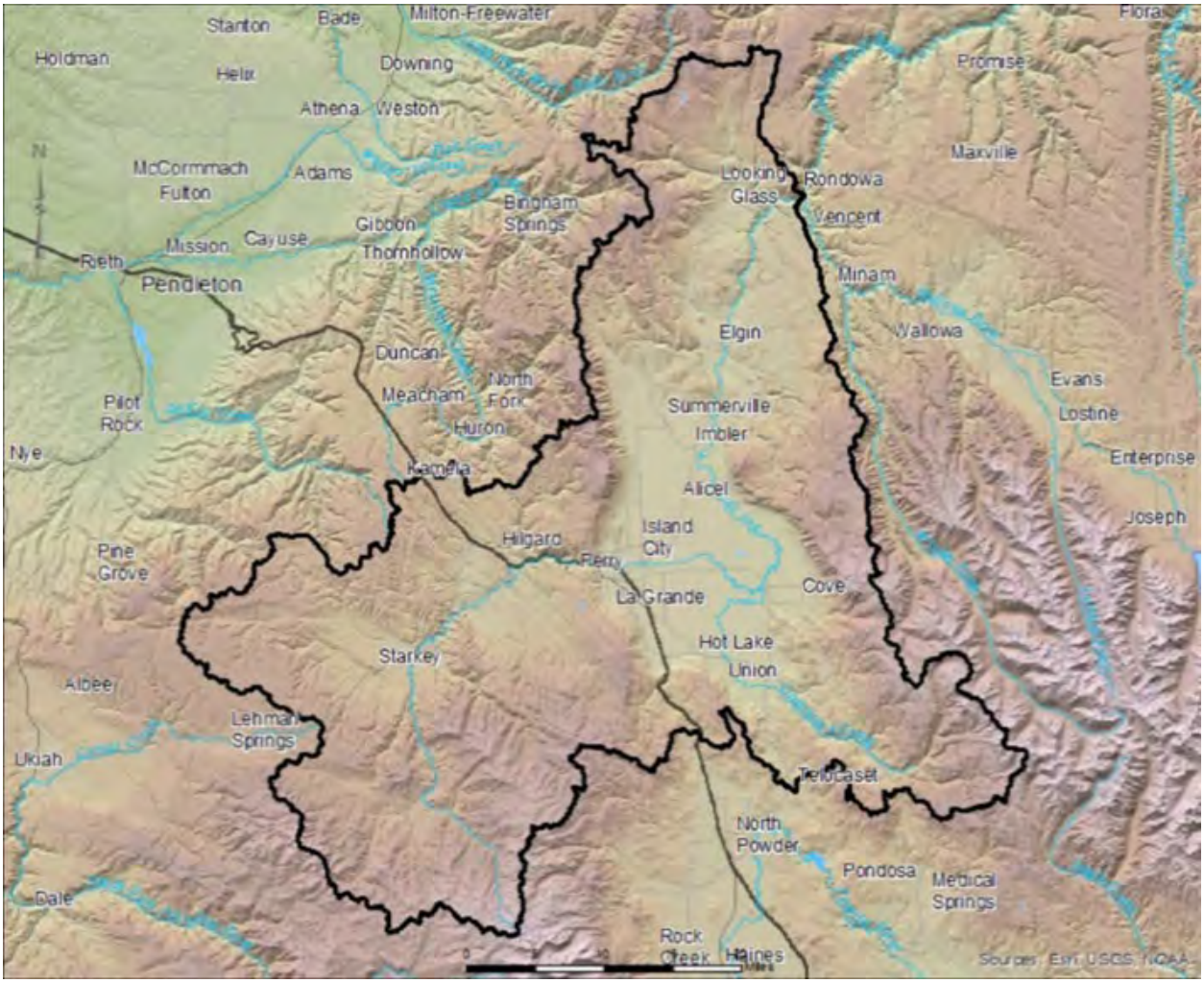
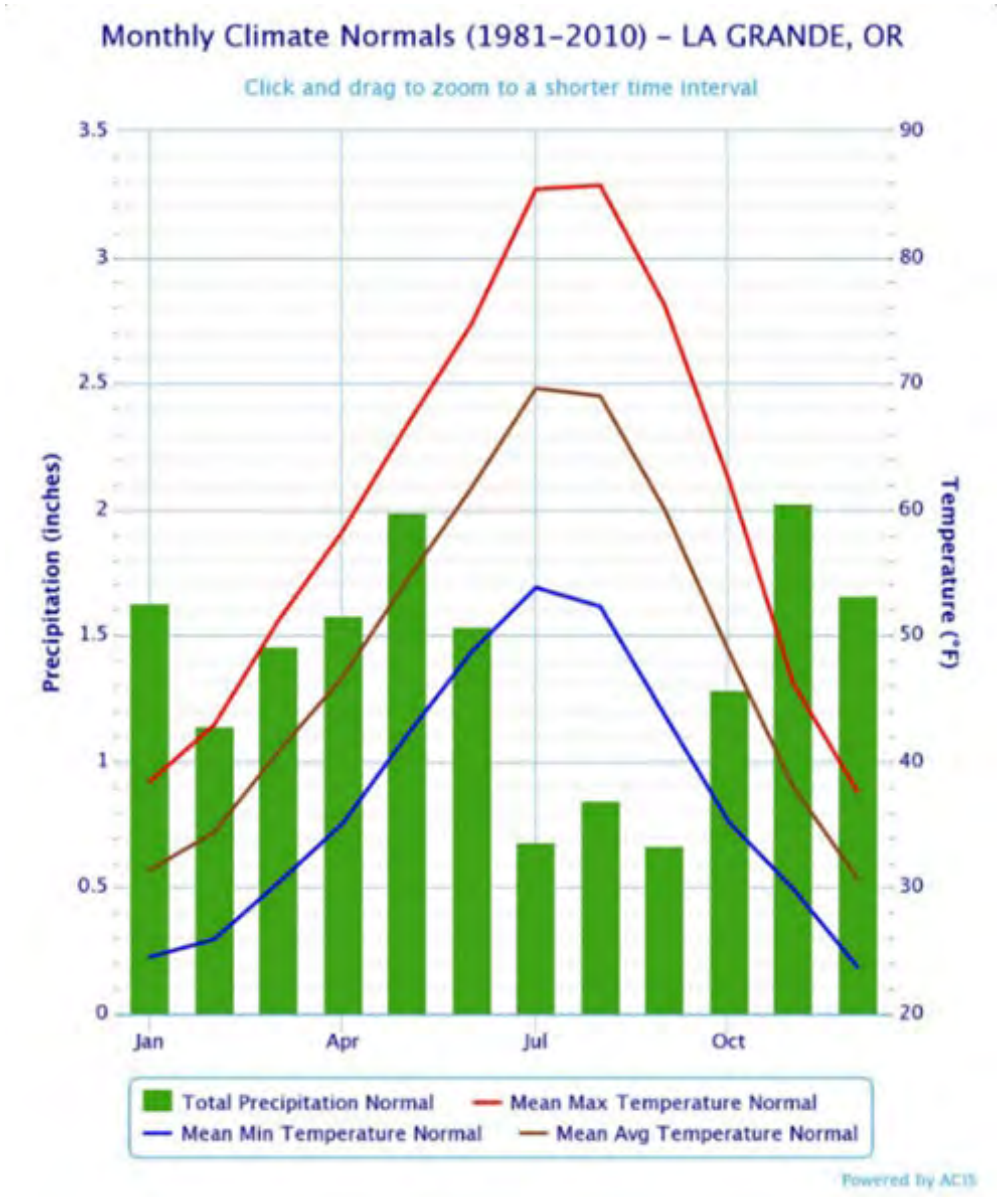


Figure 2-2
Average Precipitation and Temperature



The surface hydrology of the UGRRW is dominated by snowmelt runoff. Groundwater is predominately sourced from snowmelt runoff and direct infiltration in high elevations and descends to both confined aquifers and shallow aquifers (composed of thick-fine grained unconsolidated sediment) in the ancestral lakebed/valley sediments. Sixty percent of the UGRRW is forestland, 20 percent is rangeland, and the majority of the remaining acreage is used for field crops and pastureland, with a small percentage in residential areas. Geologically, the Grande Ronde Valley is surrounded by the Blue Mountains and drained by the Grande Ronde River, meaning there are portions of the UGRRW dominated by Columbia River Basalt and areas in the Grande Ronde Valley with a thick accumulation of the valley-fill sediments. See Figures 2-3 and 2-4.

Figure 2-3
Geologic Overview

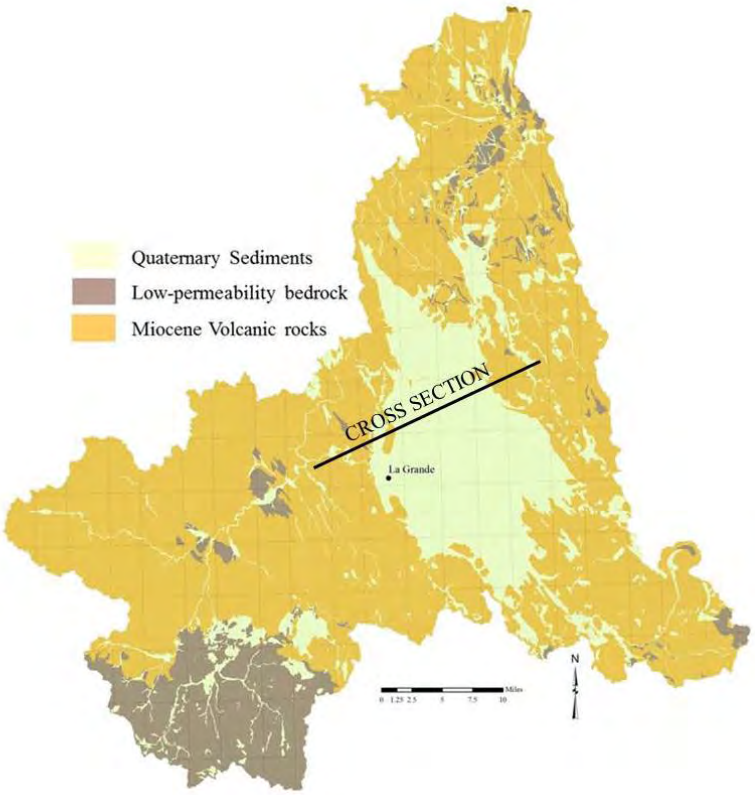
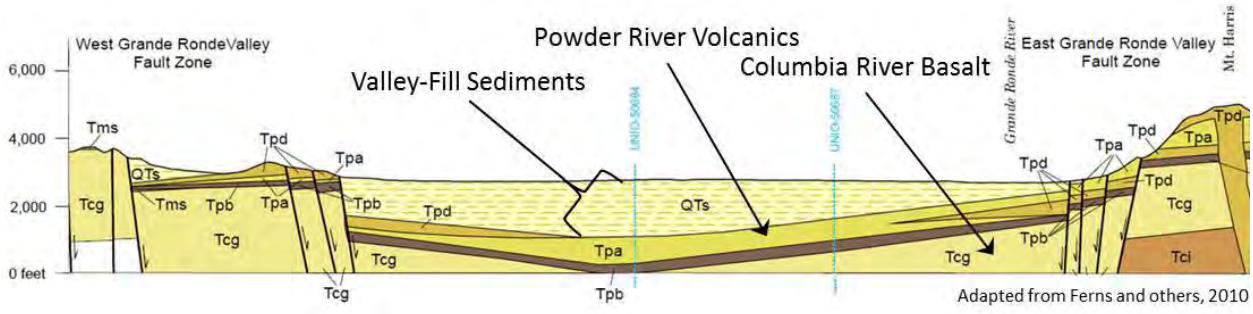


Figure 2-4
Geologic Cross Section



The UGRRW contains both alluvial aquifers, located near the ground surface, and deep basalt aquifers, located from several hundred up to several thousand feet below the ground surface.

Surface Water

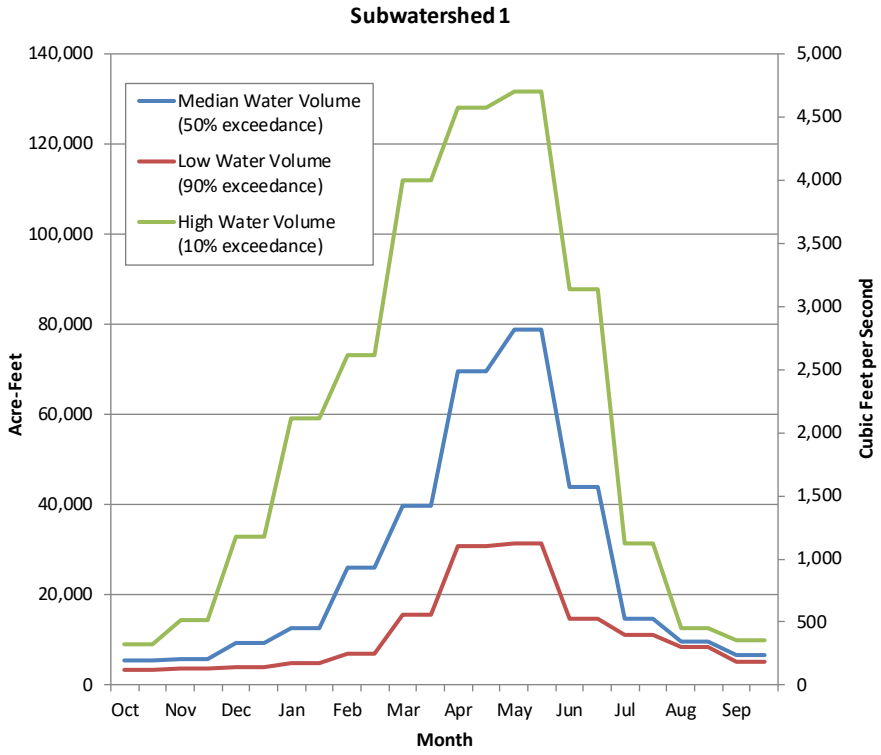
For planning, the UGRRW is divided into eight subwatersheds to analyze surface water quantity and quality. These subwatersheds were based on a combination of the U.S. Geological Survey hydrologic

unit codes and Grande Ronde Model Watershed's (GRMW) Biologically Significant Reaches. Detailed descriptions of the subwatersheds are included in the Step 2 Report (UGRRW, 2018). See Figure ES-3 for a map of the eight subwatersheds.

Surface Water Quantity

Surface water flow is measured at selected locations in the UGRRW by multiple agencies, including the Oregon Water Resources Department's (OWRD) eight active gauging stations in the UGRRW. Flow was analyzed in each subwatershed using a statistical analysis of streamflow data for the period 1958 to 1987 as presented in OWRD's Water Availability Reporting System. Water volume was shown as an exceedance probability (chance that volume will be greater than a certain value) for each two-week period. Exceedance probabilities were calculated for the base period to represent three different flow conditions: high water (10 percent exceedance), low water (90 percent exceedance), and median water (50 percent exceedance). Each subwatershed had the same general patterns of peak flows during springtime. Subwatershed 1 (which includes all flow in the UGRRW) showed a maximum median flow in a two-week period of approximately 2,700 cubic feet per second (80,000 acre-feet [AF] during the base period). See Figure 2-5.

Figure 2-5
Subwatershed 1 High, Low, and Median Flow Volume by Month



Much of the streamflow in the UGRRW occurs during a brief snowmelt period in the spring (April through May, generally). According to OWRD's Water Availability Reporting System, streamflow is generally not available for allocation to out-of-stream uses at 80 percent exceedance. Surface water is only available for new out-of-stream allocations for a few months of the year, primarily

during the winter months when out-of-stream needs and demands are lowest. Given that surface water is generally not available for new live flow allocations, current unmet needs and future needs will likely need to be met through administrative actions (e.g., transfers), water conservation, storage, or other novel water supply solutions. Water is available at 50 percent exceedance for potential storage in different portions of the watershed and is generally available during the winter months. However, it should be noted that the full range of instream needs (e.g., high winter flows) has not been accounted for throughout the planning area. Other laws and rules influence legal availability for new allocations. See Figure 2-6 for locations.

Figure 2-6
Months of Available Streamflow (Calculated at 80 Percent Exceedance)

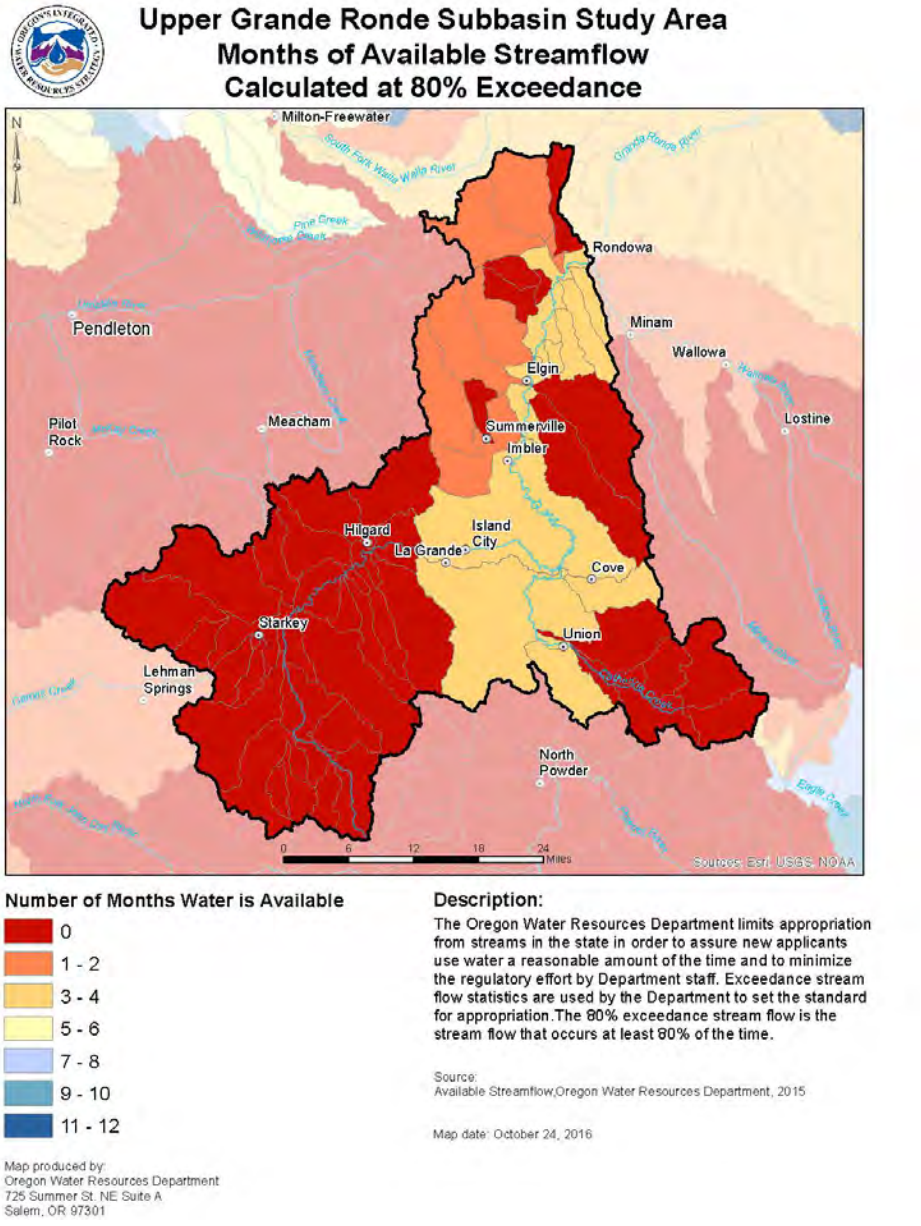
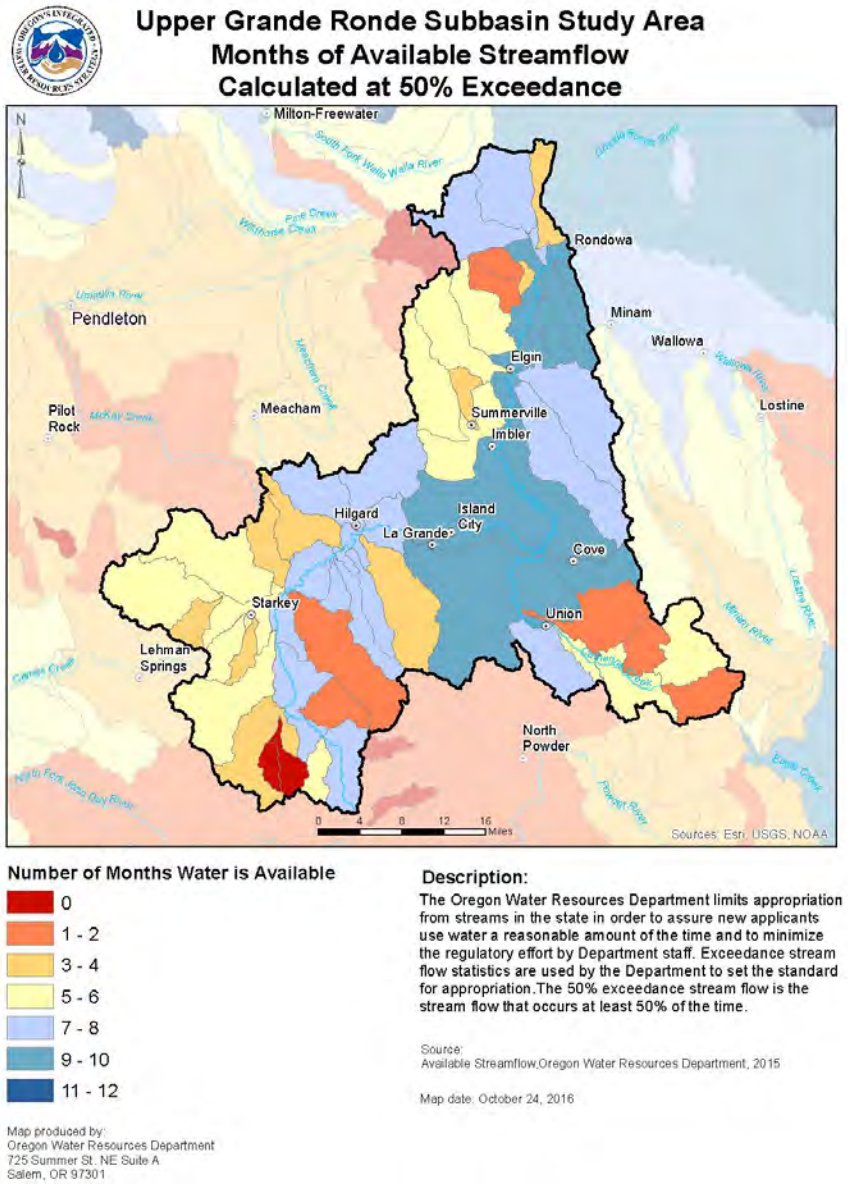
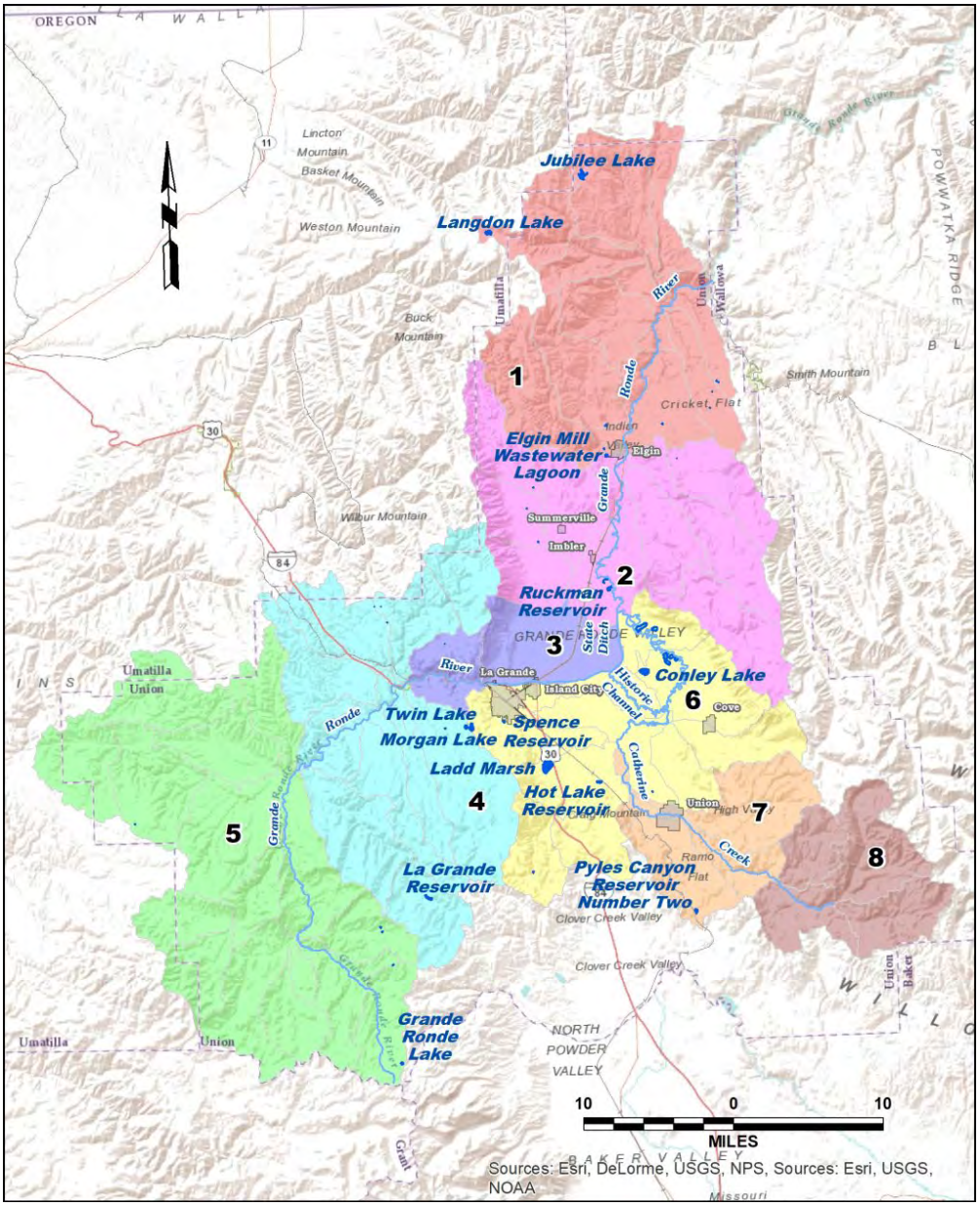


Figure 2-7
Months of Available Streamflow (Calculated at 50 Percent Exceedance)



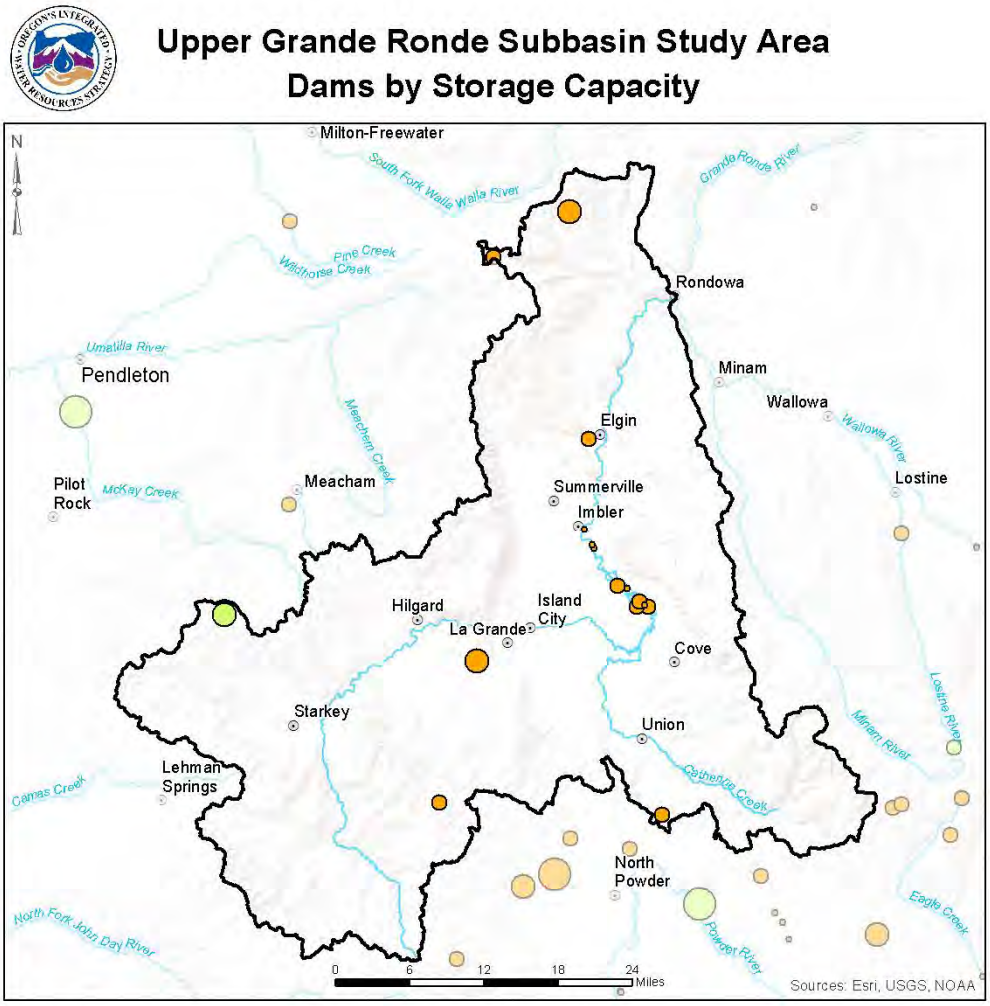
There is very limited built aboveground storage in the watershed. All permitted reservoirs store a total of 7,230 AF. The majority of water is used for recreational purposes. Several private reservoirs are used for irrigation, but there are no large-scale reservoirs to serve irrigated lands, meaning that irrigators must manage water based on live flow conditions. Below is a map of existing reservoirs that serve private and public interests.

Figure 2-8
Major Wetlands, Lakes, and Reservoirs



Of note, Ladd Marsh contains a large constructed wetland, and Morgan Lake, Jubilee Lake, and Langdon Lake are used for recreation. Other small ponds exist and are more prevalent in the central Grande Ronde Valley part of the UGRRW.

Figure 2-9
Dams by Storage Capacity



State Dams
Storage in acre feet
- < 100
- 100-1,000
- 1,000 - 10,000
- > 10,000

Non-State Dams
Storage in acre feet
- < 100
- 100-1,000
- 1,000 - 10,000
- > 10,000

Description:

The Oregon Water Resources Department maintains an inventory of Oregon dams. Information available includes dam height, storage capacity, dam name, location, permit number and hazard classification.
Large dams are defined by a dam height >= 10 feet and a storage capacity of >= 9.2 acre feet. These larger dams are within the juristiction of Oregon Water Resource Department.

Source:
Dams, Oregon Water Resources Department, 2016

Map produced by:
Oregon Water Resources Department
725 Summer St. NE Suite A
Salem, OR 97301

Map date: October 24, 2016

Table 2-1
Dam and Storage Uses

App/ Permit/ Cert	Dam Name	Water Source	Stored Water Use	Owner	Size in Acre-Feet
C 36683	Arnoldus Loop	Grande Ronde	Irrigation	Private	28.8
C 61437	Beaver Creek	Beaver Creek	Municipal	City of La Grande	510
C 58876	Elgin Mill Treatment Lagoon No. 1	Wastewater	Industrial	Boise Cascade	131
C 41585	Elmer Reservoir 1	Grande Ronde	Irrigation	Private	123
C 41586	Elmer Reservoir 2	Grande Ronde	Irrigation	Private	91
File E 32	Elmer Reservoir 3	Grande Ronde	Irrigation	Private	58
C 46521	Elmer Stoplog Dam	Grande Ronde	Irrigation	Private	298
C 64890	Fleet Reservoir 2	Grande Ronde	Irrigation	Private	78
C 40472	Fleets Loop	Grande Ronde	Irrigation	Private	246
C 58083	Howell	Grande Ronde	Irrigation	Private	56
	Indian Lake Dam	Jennings Creek	Exempt	CTUIR	1,214
C 40153	Jubilee Lake Dam	Mottet Creek	Recreation	ODFW	1,579
C 40151	Langdon Lake Dam	Lookingglass	Recreation	Langdon Lake Association	253
C 64461	Morgan Lake Dam	Sheep Creek	Recreation	City of La Grande	2,076
C 64478	Pyles Canyon 2	Pyles Creek	Irrigation	Private	221
C 40820	RuckmanReservoir	Grande Ronde	Irrigation	Private	76
Permit R-14464	Conley Farms	Catherine Creek	Multiple Purpose	Private	192
TOTAL					**7,230.8**

CTUIR = Confederated Tribes of the Umatilla Indian Reservation
ODFW = Oregon Department of Fish and Wildlife

Surface Water Quality

Numerous waterbodies in the UGRRW do not meet statewide water quality standards identified by the Oregon Department of Environmental Quality (DEQ). Section 303(d) of the federal Clean Water Act requires each state to develop a list of waterbodies that do not meet water quality standards and submit this list (called the 303(d) list) to the U.S. Environmental Protection Agency (EPA). This designation is based on one or multiple water quality parameters over a short or long portion of the year. The DEQ monitors the following parameters: alkalinity, ammonia, aquatic weeds and/or algae, biological criteria, DO, *E. coli*, iron, manganese, pH, phosphorus and phosphate, sedimentation, and temperature.

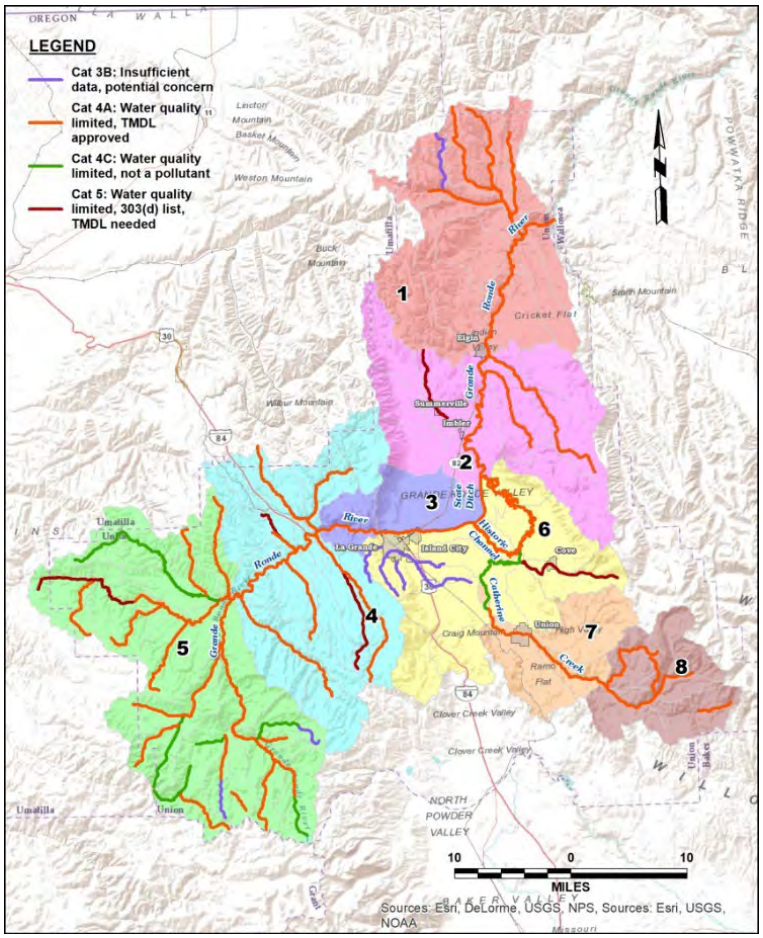
The primary water quality parameters of concern on the 303(d) list for the UGRRW are temperature, pH, DO, bacteria, sedimentation, habitat modification and flow modification, and ammonia toxicity.

The three parameters commonly listed throughout the UGRRW (habitat modification, sediment, and temperature) can all be improved through management decisions that would lead to improving vegetation condition. Riparian habitat degradation is a problem in the basin and improving these riparian areas will improve temperature, stability, sediment, other water quality factors, and habitat (DEQ Upper Grande Ronde River Subbasin Water Quality Management Plan, 2000).

Temperature, with heat as the pollutant, is a limiting factor for aquatic life for many of the summer months. Temperature is a concern in the lower and central parts of the UGRRW. Water temperature can be affected by a variety of activities and events, including reduction in riparian vegetation, reduction of summertime stream flows, and widening of stream channels.

In most subwatersheds, temperature and pH are concerns for the summer months. Generally, lower elevation and downstream watersheds (subwatersheds 1 through 6) have more designations, while higher elevation subwatersheds upstream (subwatersheds 7 and 8) have fewer. See Figure 2-10 below for the extent of surface water impairment.

Figure 2-10
Department of Environmental Quality 303(d) Listed Reaches Impaired for Water Quality



The DEQ established a set of total maximum daily limits (TMDLs) and associated goals for the Upper Grande Ronde River. There are five point sources in the UGRRW with National Pollutant Discharge Elimination System Permits. Human and natural non-point sources also impact water quality. Human activities include timber harvesting, livestock grazing, agriculture, road construction and maintenance, rural residential development, and urban runoff. In addition, farming, urban development, and transportation corridors have channelized streams and removed vegetation, exacerbating the temperature and sedimentation impairments in particular. Natural sources include abiotic and biotic landscape attributes, wildfire, drought, and severe flood events.

TMDL Overview

The UGRRW TMDL was developed by the DEQ to establish water quality targets to fulfill Oregon's obligation to comply with state and federal water quality laws. The EPA approved the temperature and bacteria TMDLs in 2000, which can be accessed online at http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-Grande-Ronde.aspx (Oregon Department of Agriculture, 2012).

A Water Quality Standard (WQS) is the desired condition. A TMDL is the method to accomplish the WQS. TMDLs are developed to show how much of each pollutant a stream can accept while still providing the water quality needed for all of the designated beneficial uses.

The Upper Grande Ronde River Subbasin Agricultural Water Quality Management Area Plan was then developed to work toward meeting these goals.

Beneficial Use Overview

Beneficial uses are defined in Oregon Administrative Rules (OAR) 340-041-0002(17) as "Designated Beneficial Use," which means "the purpose or benefit to be derived from a water body as designated by the Water Resources Department or the Water Resources Commission."

DEQ designated beneficial uses for all waterbodies, including irrigation, industrial water, municipal water, swimming, fishing, and aquatic life. Human health, salmon and trout (salmonids), and other cold water species that inhabit most streams in the Upper Grande Ronde Subbasins (part of the Grande Ronde Basin as identified in OAR 340-041) are considered the beneficial uses most sensitive to stream temperature. The OWRD and DEQ have similar uses of the term "beneficial uses." OWRD beneficial uses refer to the "reasonably efficient use of water without waste for a purpose consistent with the laws, rules, and the best interests of the people of the state" including, but not limited to, irrigation, municipal, or instream.

Upper Grande Ronde Basin Designated Beneficial Uses from OAR 340-041-0151, Table 151A (DEQ, 2017a):

- Public Domestic Water Supply*
- Private Domestic Water Supply*

- Industrial Water Supply
- Irrigation
- Livestock Watering
- Fish and Aquatic Life
- Bull Trout (12°C, 53.6°F)
- Core Cold Water (16°C, 60.8°F)
- Salmon and Trout (rearing and migration, 18°C, 64.4°F)
- Salmon and Steelhead (migration corridors, 20°C, 68°F)
- Wildlife and Hunting
- Fishing
- Boating
- Water Contact Recreation
- Aesthetic Quality
- Hydropower

** With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards.*

Tables for each subwatershed were developed to show the times of year and impairments for the most sensitive beneficial uses. A waterbody is considered impaired when a beneficial use standard is exceeded any time within the period of record, which includes any measurement ever recorded by the DEQ. Table 2-1 for subwatershed 1 is shown below because it is the most downstream subwatershed in the UGRRW and encompasses impacts from upstream impairments. Tables for each subwatershed are in the Step 2 Report (UGRRW, 2018).

Table 2-2
Water Quality Impairments by Date and Beneficial Use
Subwatershed 1

Surface Water Supply Limits to Beneficial Use										
Month	Days	Anadromous Fish Passage	Salmonid Fish Spawning	Salmonid Fish Rearing	Resident Fish and Aquatic Life	Aquatic Life	Human Health	Water Contact Recreation	Fishing	Aesthetic Quality
Oct	1st to 15th									
	16th to 31st									
Nov	1st to 15th									
	16th to 30th									
Dec	1st to 15th									
	16th to 31st									
Jan	1st to 15th		Flow, Sedimentation	Flow, Sedimentation						
	16th to 31st									
Feb	1st to 15th									
	16th to 28th									
Mar	1st to 15th									
	16th to 31st									
Apr	1st to 15th				Flow, Sedimentation					
	16th to 30th									
May	1st to 15th		DO							
	16th to 31st									
Jun	1st to 15th					Ammonia, Phosphate Phosphorus, Iron, Biological criteria				
	16th to 30th	Temperature, pH		Temperature, pH	pH		Manganese, Iron	Algae, pH	Algae	Phosphorus, Algae
Jul	1st to 15th									
	16th to 31st									
Aug	1st to 15th									
	16th to 31st									
Sep	1st to 15th									
	16th to 30th									

Beneficial use is not supported.
Insufficient data to determine if beneficial use is supported; some data indicate a potential concern.
Insufficient data to determine if beneficial use is supported.
Flow data from OWRD; Beneficial Use data from DEQ
Temperature and pH impairment measured
pH impairment measured
Temperature impairment measured
Dissolved oxygen (DO) impairment measured

Depending on the location in the UGRRW, some subwatersheds face more limiting factors than others. Limiting factors are defined as those conditions or circumstances that limit the successful growth, reproduction, and/or survival of select species of concern (for both tribes and Endangered Species Act listings). Generally, subwatersheds in the northern and central portions of the UGRRW (subwatersheds 1 through 6) have more limits than ones in the southern portion of the UGRRW (Catherine Creek area and subwatersheds 7 and 8).

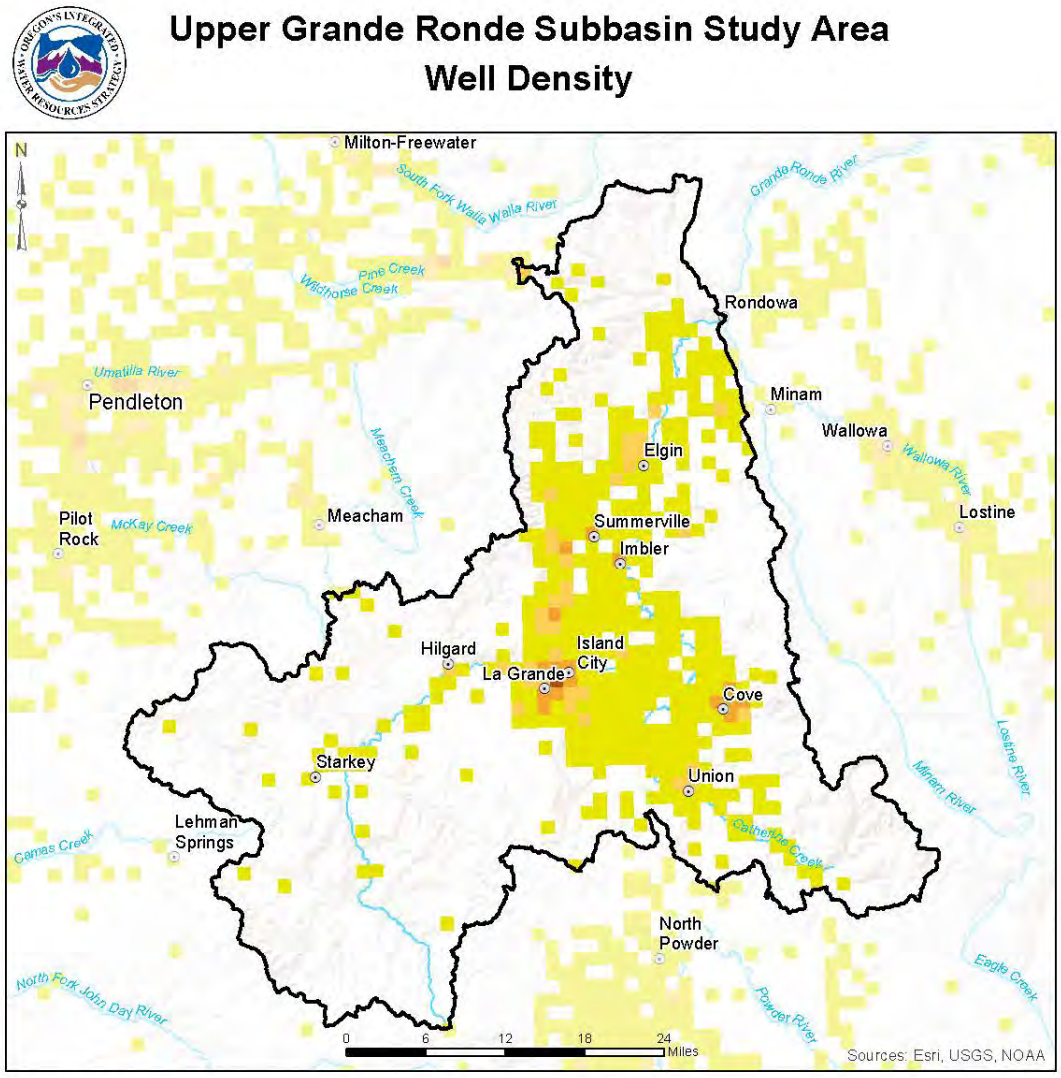
Groundwater

This section includes a discussion of groundwater quantity and quality relative to the eight surface subwatersheds. Multiple scales of analysis were used because there are few long-term observation wells in the area.

Groundwater Quantity

OWRD produced estimates of groundwater use based on maximum legal use of water rights and exempt domestic well permits. Subwatershed 6 has the highest possible permitted groundwater use, followed by subwatersheds 2 and 3. There is little to no permitted groundwater use in subwatersheds 1, 4, 5, 7, and 8. Overall, groundwater wells are more densely concentrated in the central and northern parts of the UGRRW (OWRD, 2019).

Figure 2-11
Well Density



Well Density

Number of Wells by PLS Section

- 1 - 10
- 11 - 40
- 41 - 100
- 101 - 200
- > 200

Map produced by:
Oregon Water Resources Department
725 Summer St. NE Suite A
Salem, OR 97301

Map date: October 24, 2016

Description:

A well log is a report provided by a well constuctor that describes the physical construction of the well, geologic materials and the water encountered.The Oregon Water Resources Department is the custodian of well logs filed by well drillers when they drill, deepen, or abandon a well. Location information provided by most well logs is defined by a Public Land Survey description. The number of wells per PLS section are combined to provide this well density map.

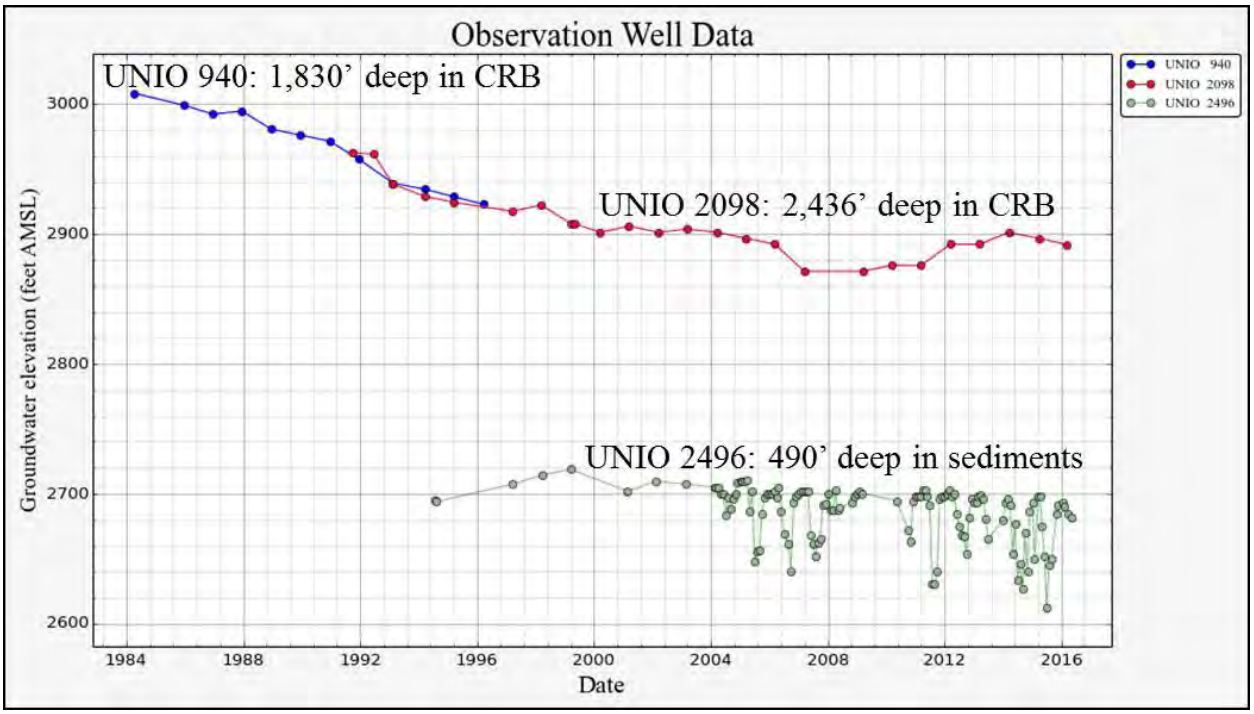
Source:
Well Logs,Oregon Water Resources Department, September 22, 2015

Throughout the UGRRW, primary irrigation accounts for approximately 81,365 AF per year of legally allowed groundwater withdrawals, supplemental irrigation accounts for 41,070 AF per year, and municipal uses account for 36,242 AF per year. Groundwater pumping, especially from the alluvial system, captures some natural groundwater discharge and has the potential to reduce flows in hydraulically connected streams/rivers. Currently, new groundwater allocations from alluvial aquifer wells in the UGRRW require mitigation for potential impacts to the Grande Ronde River state Scenic Waterway. According to the OWRD, this is because available data and analyses indicate that groundwater discharge supports baseflow in valley streams and the cumulative impact of groundwater rights issued since the state Scenic Waterway was designated have exceeded the thresholds established in law (see ORS 390.835(9) and (12)). To gain a better understanding of the connection between surface water and groundwater as well as the connection between the alluvial and volcanic groundwater systems, the UGRRW Partnership wants to explore existing data gaps in the future.

Groundwater levels vary across the basin and are influenced by local geology, recharge, available storage, and patterns of groundwater development and use, among other factors. The OWRD noted in a 2019 memo that groundwater declines have been observed in some alluvial wells (six out of 12 wells analyzed) and volcanic wells (six out of seven wells analyzed) where there was sufficient long-term groundwater level data monitored by the OWRD. Among the wells analyzed, there are also examples of groundwater levels that are stable and have risen. When declines are observed, they are generally steeper in the volcanic groundwater system likely due to the fact that recharge is more limited. Groundwater levels are comparatively stable in the alluvial system, especially in the shallow alluvial system and where, presumably, there is a more direct hydraulic connection to recharge areas. Observed declines in a subset of wells does not mean that groundwater levels are declining everywhere across the basin, but declines can be important indicators for areas where supply may be insufficient to meet current or future demand or where there is the potential for conflict between different water users or uses. It is important to note that only limited data are available and, without a more comprehensive network of monitoring wells and consistent measurements made over time, it is difficult to determine the spatial extent and long-term trends of any declines. More information is needed to determine overall groundwater trends across the UGRRW.

Figure 2-12 provides an example of groundwater level trends over time for select wells, two completed in the volcanic system and one completed in the alluvial system. The decline shown in the City of La Grande well (UNIO 940) has stabilized in a nearby well managed by the City (UNIO 2098) that produces groundwater from the same aquifer. The reason why groundwater levels in this area have stabilized is not known but may be associated with a reduction in pumping at UNIO 940. The City of Imbler well (UNIO 2496) shows seasonal fluctuations as well as a general declining trend. Groundwater level declines in the City of Imbler municipal alluvial well are an ongoing concern identified by the City (OWRD, 2019). More information is needed to determine overall groundwater trends.

Figure 2-12
Hydrograph of Columbia River Basalt Group and Alluvial Wells



Groundwater Quality Data

Groundwater quality data in the UGRRW are very limited; groundwater quality is not known to be a concern at this time. Potential threats to groundwater quality were investigated using the DEQ Environmental Cleanup Site Information database and the Oregon Health Authority's real estate transaction database nitrate measurement data. Based on the location of sensitive aquifers in the UGRRW, several cleanup sites associated with the City of La Grande have the potential to have impacted aquifers in the central portion of the UGRRW (subwatershed 6). Nitrate database records show localized (five wells) nitrate concentrations of more than 8 milligrams per liter near the City of La Grande/City of Island City (subwatersheds 3 and 6). These levels were considered likely to be localized concerns and not indicative of UGRRW-wide conditions. The DEQ implements toxic monitoring in groundwater and surface water, annually rotating from basin to basin as funding allows. The DEQ has not carried out toxic monitoring in groundwater in the Grande Ronde Basin. Overall, groundwater quality is not known to be a concern.

Ecology and Watershed Health

The reports generated for Steps 2 and 3 include descriptions of the basin ecology and watershed health. Ecosystems and watershed health are affected by both the quality and quantity of surface water and groundwater. Furthermore, restoring watershed health can improve water quantity and quality and help buffer the impacts of extreme events like drought and floods. Healthy watersheds are essential for fish and wildlife, our communities, our quality of life, and

the local economy. Additional information about watershed health can be found on the GRMW Website at https://www.grmw.org/data/assessments/. The key takeaways are as follows:

- The UGRRW is a unique ecosystem that is home to numerous species that serve different roles in maintaining ecological health.
- Focal species were identified in the Grande Ronde Subbasin Plan as representing species that will be most sensitive to threats and changes in the environment. Focal species are thought to encompass characteristics that represent the needs of other unlisted species. If a focal species is protected, these protections will benefit other species as well. Focal terrestrial species include Rocky Mountain elk (*Cervus elaphus nelsoni*), Rocky Mountain bighorn sheep (*Ovis canadensis*), American beaver (*Castor canadensis*), American marten (*Martes americana*), great blue heron (*Ardea herodias*), bald eagle (*Haliaeetus leucocephalus*), white-headed woodpecker (*Picoides albolarvatus*), olive-sided flycatcher (*Contopus cooperi*), yellow warbler (*Dendroica petechia*), sage sparrow (*Amphispiza belli*), western meadowlark (*Sturnella neglecta*), and Columbia spotted frog (*Rana luteiventris*) (Northwest Power and Conservation Council [NPCC], 2004).
- Focal aquatic species include summer steelhead/redband trout (*Oncorhynchus mykiss*), spring Chinook salmon (*Oncorhynchus tshawytscha*), and bull trout (*Salvelinus confluentus*). Prior to the installation of dams in the region, coho salmon (*Oncorhynchus kisutch*) were also common (NPCC, 2004).
- Federally endangered species in the UGRRW are monitored through recovery plans, and many restoration projects are ongoing to provide additional resources to these vulnerable species, many of which are aquatic, including steelhead, Chinook, and bull trout. State-listed species are also monitored and have protections in place to support population recovery.

Annual Water Balance

To understand the relative magnitude of the macro-components of the water cycle within the UGRRW, OWRD has estimated the annual precipitation entering the basin, annual volumes of stream flow leaving the basin, and losses from land surface evapotranspiration (UGRRW Partnership, 2018). This analysis (summarized on Table 2-2 below) estimates that the UGRRW receives approximately 2,468,000 AF of precipitation in an average year, 696,000 AF leaves the watershed as stream flow 28 percent of total precipitation), and 1,498,000 AF of water leaves the UGRRW annually as evapotranspiration (61 percent of total precipitation). This leaves 274,000 AF annually unaccounted for. It appears that the highest evapotranspiration occurs in mountainous areas, and lower on the Grande Ronde Valley floor. The highest precipitation occurs in Subwatershed 5 and other mountainous areas.

Table 2-3*
Estimates of the Annual Water Balance Fluxes in the Upper Grande Ronde River Watershed (Assuming Groundwater Inflow and Outflow are Negligible)

Water Cycle Component	Volume (AF)	Rate (feet per year)	Percent of Precipitation
Mean Annual Precipitation Volume, AF (1961 to 1990)	2,468,000	2.36	-
Mean Annual Natural Streamflow Volume, AF (1961 to 1990)	696,000	0.67	28
Mean Annual Evapotranspiration, AF (2000 to 2013)	1,498,000	1.43	61
Estimated Residual (unaccounted for precipitation)	274,000	0.26	11

**All information on this table is from the Step 2 report (UGRRW Partnership, 2018).*

Subwatershed Summaries: Water Resource Contributions and Vulnerabilities

Information described above was used to assess the water resources of each area by summarizing the vulnerabilities of the resource as well as the resources available for meeting water needs of the UGRRW. See Table ES-2, which summarizes the findings by subwatershed.

Data Gaps

Numerous data gaps were identified in this step. The primary ones are listed below:

- Consistent methodologies for hydrologic and water resources analyses are needed that incorporate new advances in understanding of hydrology and climate and can replace frequency analysis that assumes stationarity. Stationary assumptions do not take into account changing conditions over time.
- The modeled surface water datasets included in this report are based on a period of record from 1958 to 1987, which do not represent current conditions or changing conditions and assume stationarity.
- The use of OWRD's Water Availability Reporting System to quantify water supply and demand runs the risk of inaccurately quantifying surface water supply because it does not consider current conditions.
- The UGRRW Partnership did not independently validate data discussed in this report. Validation requires comparisons between modeled and measured data to estimate the deviation between predicted and actual values. There was not a field validation/data verification component to this report and, as such, the information is only as reliable as the sources and studies from which it was obtained. The UGRRW Partnership has identified significant data gaps and is committed to performing monitoring and conducting studies to increase confidence in data used for decision-making.
- Surface water supply information is limited to eight gauging station locations within the entire watershed with varied accuracy and duration of data collection. The continued operation of these gauges is threatened by lack of funding, particularly the Grande Ronde at Troy. Estimates of groundwater supply are based on legally allowed rate and volume of groundwater withdrawals and exempt domestic well permits and do not reflect the volume of water available, the depth at which it is being extracted, or the rate or source of recharge. These estimates also do not reflect the actual amount used. Groundwater supply was

estimated using permitted volumes, not actual pumping measurements. Return flow to surface water and groundwater after an initial use is unknown and requires a more detailed understanding of the amount of water pumped, applied, recharged to the aquifer, and consumed by crops as well as surface water-groundwater interactions.

3.0 - Current and Future Water Demands

During Step 3, the Upper Grande Ronde River Watershed (UGRRW) Partnership estimated demands on current and future water resources and identified vulnerabilities to water systems. Demand for water was quantified using best available data to assess vulnerabilities to ecological, agricultural, and municipal interests associated with these demands.

Municipal Needs/Demands

Seven of the eight cities in Union County are located within the UGRRW. Each city has unique water supply and infrastructure challenges, but all share a similar demand profile with increased water use in the summer months. The cities exclusively use groundwater for their municipal potable water supply needs. The City of La Grande owns and maintains the Beaver Creek reservoir that was historically used for municipal supply, which has potential as a future/backup water source if repairs to infrastructure (pipeline, treatment system) are completed. Two other groups of users are analyzed with municipal users: unincorporated users (those outside city limits) and self-supplied industrial users (SSIU) (industrial users located outside city limits that have their own water rights and supply).

Current water use for these cities was obtained by reviewing actual water use records for those entities that reported water use (with outlier data removed) as reported on the OWRD water use reporting site (OWRD, 2018). The result from the actual use calculation is that cities, unincorporated users, and SSIU use approximately 2,060 acre-feet (AF) per year of surface water and 8,190 AF per year of groundwater. Bi-weekly estimates were calculated using actual water use reporting records (which are reported monthly and were divided in half for bi-weekly use estimates).

Future water use was calculated by taking all current estimates for cities and unincorporated users and forecasting a six percent increase in population (as estimated by the Portland State University population Forecast). SSIU usage was increased based on assumptions of some industrial growth (increased work shifts from one to two per day). This results in a projected total of 8,240 AF per year of surface water needed and 13,550 AF per year of groundwater needed in 2068 for municipal, industrial, and unincorporated domestic use.

The UGRRW cities appear to have adequate water rights and supplies based on OWRD Water Use Reports as well as plans to upgrade infrastructure as needed and so are rated as having **low** vulnerability; Imbler is the exception, as decreasing groundwater levels have been documented and the City indicated their concern. Some vulnerabilities appear to exist relative to the lack of redundancy of supply for individual cities. Water quality issues were not identified as a limiting factor for municipal needs. Cities were surveyed during Step 3 to determine needs and vulnerabilities, of which few actionable items for the UGRRW Partnership to work on were identified. The primary issues included greater need for coordination between cities and also with the County on resource sharing and updating natural hazards mitigation plans to meet Federal Emergency Management Agency standards. City issues were explored by the UGRRW Parnertship with field trips to two City managed water facilities.

Agricultural Needs/Demands

Agricultural demand was calculated in two ways: 1) water rights assessment and 2) crop consumptive demand using calculations of evapotranspiration (ET) of crops raised in the UGRRW. Scenarios for increased irrigation efficiency and future climate were evaluated based on the ET method.

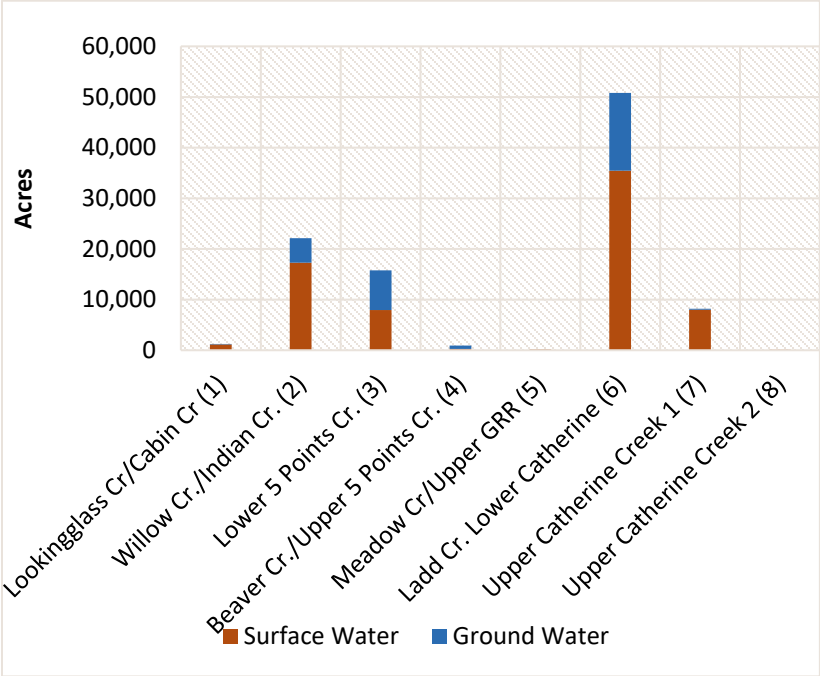
To estimate the current demand for irrigation water use based on water rights in the UGRRW (for surface and groundwater), first the number of irrigated acres was estimated and multiplied by the annual permitted volume per acre. This total volume was then distributed over time according to the modeled crop water use for the makeup of crops grown in the basin. The water rights method of estimating current agricultural demand can be thought of as the upper limit, since it represents the maximum legally allowable use. However, it can also be considered an incomplete estimate of demand, since it does not account for cropland that currently does not have a water right but would benefit from irrigation if water was available.

The second method was to calculate agricultural water demand based on ET. First, the distribution of crops in Union County was estimated using Farm Service Agency/Oregon Agriculture Information Network acreage data. Then, ET was calculated for this crop distribution using a Kimberly-Penman ET model. Weather parameters used in the modeling were taken from the Agrimet station at Imbler (IMBO).

Future demand was calculated using estimated future ET based on precipitation and temperatures projected by the Representative Concentration Pathways (RCP) 8.5 climate scenario. Future demand was calculated for two scenarios: the first only accounted for changes based on future weather parameters, while the second also assumed a specified suite of reasonably attainable irrigation efficiency improvements. The Natural Resources Conservation Service water savings estimator for irrigation system planning was used to estimate water savings.

Total annual agricultural water use per year was estimated to be 211,130 AF (surface water) and 86,830 AF (groundwater) using water rights, while the ET method resulted in somewhat lower estimates of 193,730 AF (surface water) and 77,970 AF (groundwater). Future demand with irrigation efficiency improvements implemented and with projected increases in future temperature was estimated to be 284,530 AF per year (surface water) and 114,520 AF per year (groundwater) based on the ET model. Estimates assume that no additional water rights are issued and that no expansion of irrigated acres occur, and in this regard might be considered an incomplete estimate. Figure 3-1 shows irrigated acres by subwatershed in the UGRRW.

Figure 3-1
Upper Grande Ronde River Watershed Irrigated Acres by Subwatershed



Given the limitations imposed by climate modeling, current and future water quantity vulnerability for agriculture systems appears to be **high** on a bi-weekly basis. During certain months, water quality impairments (temperature, bacteria) are not identified as having a negative impact on water used for agricultural activities.

Instream Needs/Demands

Instream demand is complex; numerous processes contribute to the amount of water needed for instream use. Instream demand for aquatic life is driven by several factors: species, water needs, stream variables, and future changes. Instream flow demand recognizes the value and importance of suitable flows and water elevations throughout a basin's drainage network to sustain and enhance fish and wildlife populations and their habitats, support ecological functions, maintain and improve water quality, meet recreational needs, and contribute to the socioeconomics of local communities. Sufficient instream flow to ensure functioning ecosystems and stable fisheries is critical to tribal culture and maintaining the treaty rights reserved for local tribes. Municipal, agricultural, and recreational users all benefit from instream functions.

For instream demand, the UGRRW Partnership quantified species and water needs and described instream demands using calculations based on existing instream water rights (ISWRs) and qualitative analysis. The accuracy of this approach is limited due to the incomplete coverage of instream water rights and the fact that some ISWRs are insufficient to protect the range of public uses served by ISWRs. ISWRs exist only in limited stream segments, and many reaches bearing Endangered Species Act (ESA)-listed species do not have instream water rights. See Figure 3-2 below for the distribution of ESA-listed species and Figure 3-3 for the location of instream water rights. These two images together show the limited spatial coverage of existing instream rights relative to the presence of ESA-listed species. Also, instream water rights currently do not account for elevated winter and spring flows, even though they

are an important component of maintaining a natural flow regime by creating and maintaining habitat, maintaining floodplain connectivity, and providing important environmental cues to multiple species.

The analysis of instream water rights was supplemented through exceedance flow analysis as described below. Scenic Waterway flows are used for recreation downstream of the project area. The Grande Ronde River from its confluence with the Wallowa River downstream to the Oregon-Washington border is designated as a state Scenic Waterway, which makes new allocations in the planning area contingent on the maintenance of Scenic Waterway flows.

Figure 3-2
Location of Endangered Species Act-Listed Fish Species

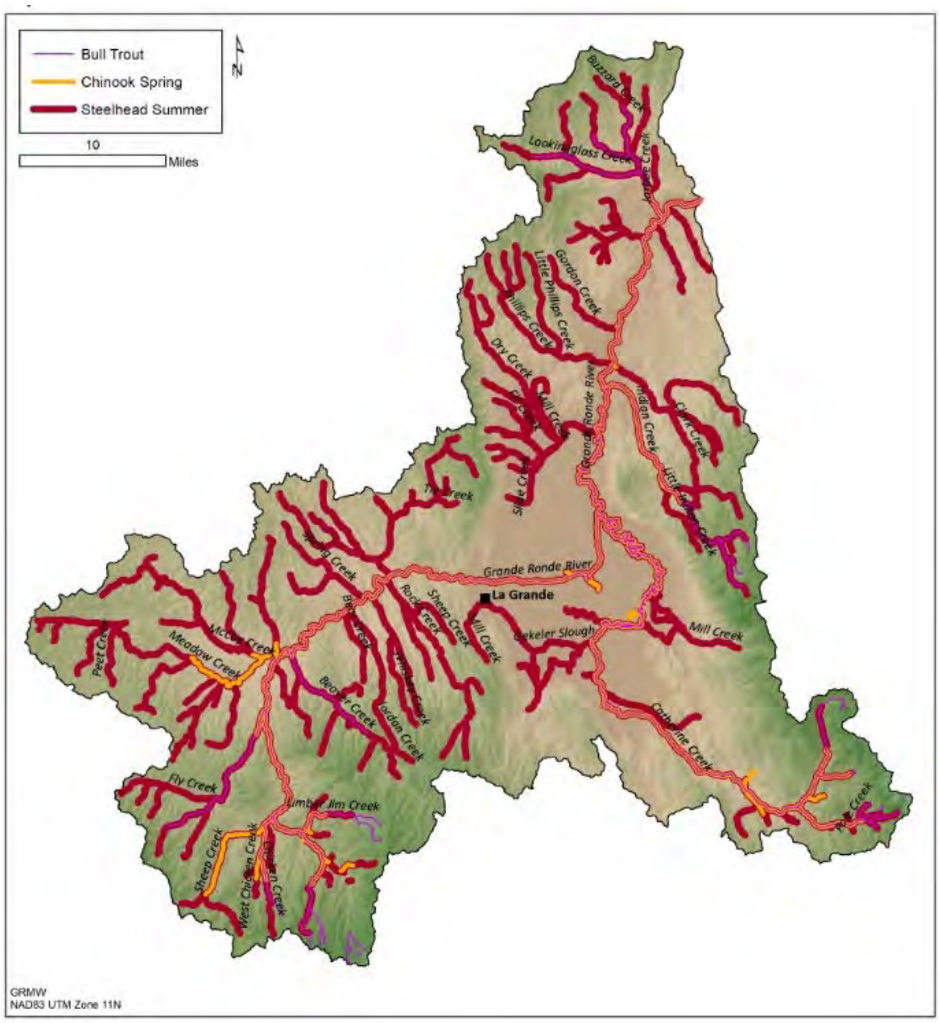
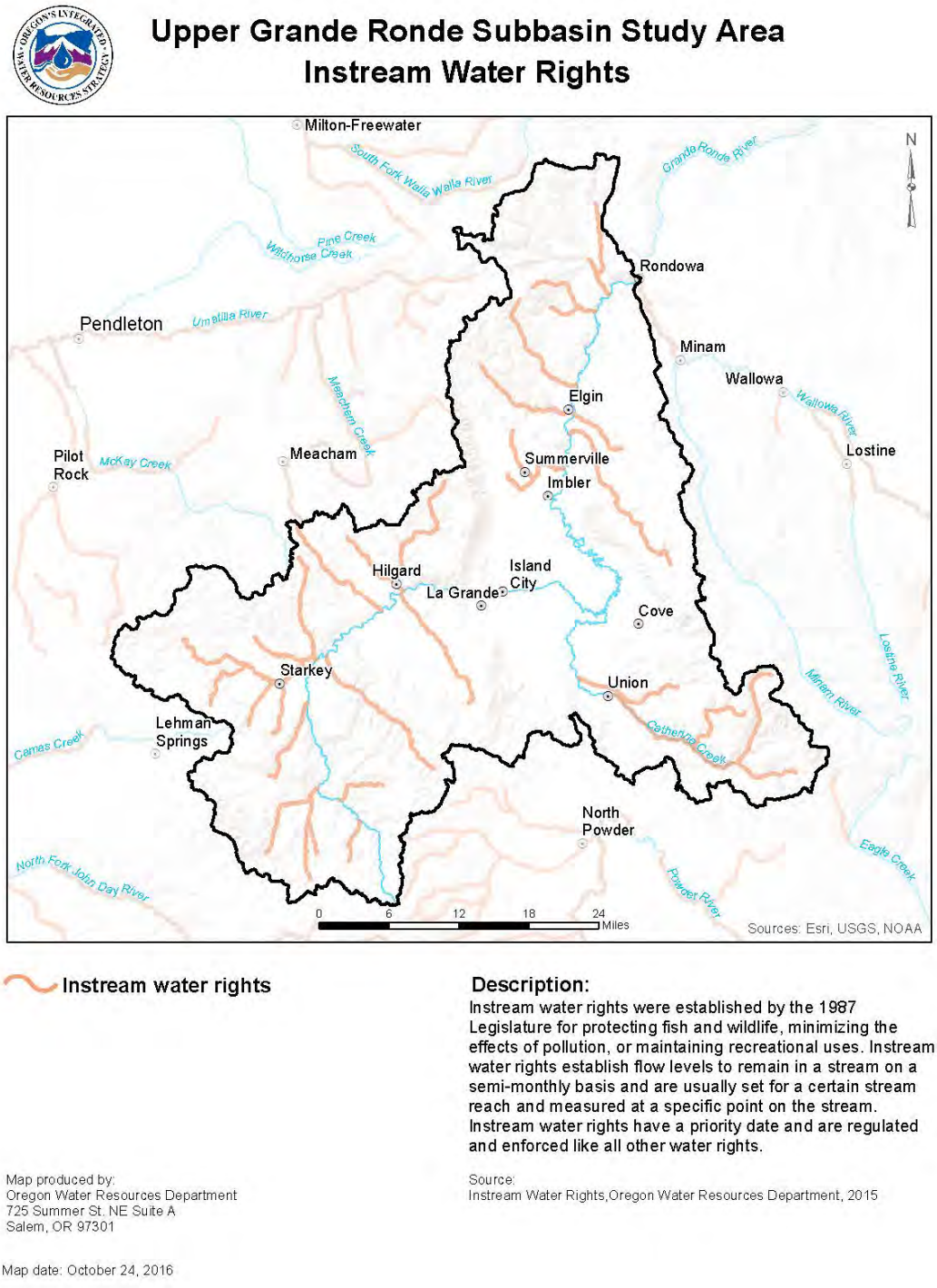


Figure 3-3
Location of Instream Water Rights

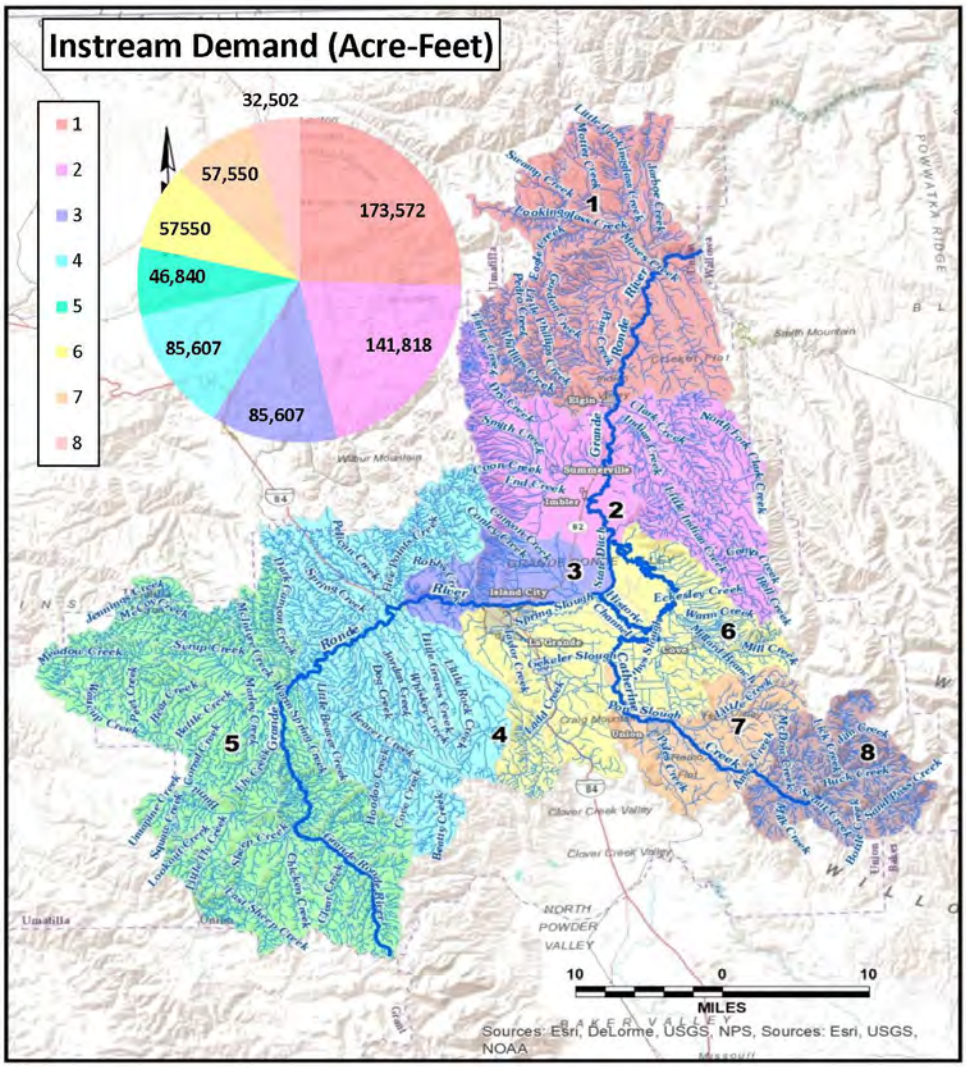


When considering water needs for aquatic species, multiple variables were considered. Aquatic species, such as the salmonid species of elevated concern in the UGRRW, are highly reliant on water flow, temperature, volume, velocity, depth, water quality, and timing/seasonality. Flow needs for salmonid spawning, incubation, passage, and rearing in the Grande Ronde Basin were studied in the late 1960s and

early 1970s, and the recommended flow values in the resulting Basin Investigation Report (BIR) (Smith, 1975) were used to inform amounts requested on subsequent instream water right applications. Figure 3-3 shows the total amount of instream water rights within each subwatershed; however, it is important to remember that certificated water rights may have been reduced below amounts requested in the application and, therefore, do not fully represent actual instream needs..

Based on the historical data, the greatest demand has come from northern Union County (subwatershed 1, north of Elgin), central Union County (subwatershed 3, near Island City), southeastern Union County (near Medical Springs), and southeastern Union County (subwatershed 7, near Union). There were no instream rights for the south-central area (subwatershed 6) that includes La Grande or Cove (Oregon Department of Fish and Wildlife [ODFW], 2018). This approach is limited, as it does not account for peak and channel forming flows. There are many places in the UGRRW where instream flow demands exist but are not represented through ISWRs because flow studies have not been completed and applications for instream rights have not been made.

Figure 3-3
Aquatic Species Instream Demand (as calculated by UGRRW Partnership)



To determine how often existing needs (as described by ISWRs only) are met, data from the OWRD Water Availability Reporting System were used to evaluate how much water was left for instream uses when consumptive uses (municipal and agricultural) were removed. For this planning process, the Technical Committee utilized ISWRs and past flow studies (ODFW, 1975) to calculate the instream flow demand to meet the specific biological needs of sensitive fish species. Consumptive uses were subtracted from both the 80 percent and 50 percent natural streamflow exceedance values at each subwatershed with an ISWR. It should be noted that the Water Availability Reporting System includes a summary of estimated monthly flows based on a 30-year period of record (1958 through 1987) and does not include variation in actual supply conditions or use from year to year or month to month. This means that this statistical summary provides, at best, an indicator of the likelihood of instream flows being available for instream needs and does not reflect actual measured streamflow conditions or the seniority of instream water rights relative to other users.

The lower flow value (80 percent exceedance, or water expected in the stream at least 80 percent of the time) is often fully allocated to consumptive uses. That means that when flows are at this level, it is unlikely that there will be water available to meet instream needs. At the higher flow level (50 percent exceedance, or water expected in the stream at least 50 percent of the time), consumptive uses likely leave enough water instream to meet some needs except in the late fall. This analysis indicates that the majority of the time (80 percent of the time), instream flows are not likely met across the UGRRW. In practice, this means that fish migration can be threatened in the fall in reaches where there are inadequate flows.

The analysis provides an understanding of how current instream flows, if met, would meet the biological needs of sensitive fish species. No analysis was performed to determine the actual frequency that instream water rights are met using measured flows at gauging stations in the UGRRW or how protective these flows might be given their relative priority date to more senior out-of-stream water uses. Also, no analysis was performed to quantify other flows such as flushing or channel-forming flows as well as the relationship between flows and temperature. As a result, the plan likely underestimates instream flow needs.

A quantitative assessment of future instream demand is not included. Qualitatively, RCP 8.5 modeling outputs were considered for future planning efforts. Modeling assumptions suggest that for every 1°F increase in temperature, it was estimated that there would be a 5 percent decrease in stream flow (National Research Council [NRC], 2011). This will reduce the ability to meet instream demand in future forecasted scenarios.

Given the limitations imposed by climate modeling assumptions and quantitative and qualitative analyses, current and future instream supply flow vulnerabilities appear to be **high.** Water quality issues were identified as a limiting factor for instream needs.

Climate Change and Natural Hazards

The planning group evaluated the estimated impacts of climate change and natural hazards on demand estimates. RCP 8.5 estimated temperature and precipitation data were used to model future climate change for the 2068 (50 years in the future) scenario and estimate values discussed in each demand section. Overall, modeled estimates of climate change suggest an increase in the frequency and magnitude of some natural hazards. Floods, droughts, and wildfires are occurring with increasing frequency and intensity in the UGRRW. These events impact instream and out-of-stream water users.

Declining snowpack and rising temperatures impact water quantity, quality, and both instream and out-of-stream needs.

Natural hazards are evaluated in a qualitative manner and with information derived from the County-wide hazards vulnerability analysis, Emergency Operations Plan, Natural Hazards Mitigation Plan, and Community Wildfire Protection Plan.

Subwatershed Demand Summaries

Based on the estimated demands above, a coarse classification of vulnerabilities for each subwatershed -- the level of risk for each demand group (how likely that demands are not met) -- were examined and resulted in the rankings shown on Table 3-1:

Table 3-1
Water Demand Vulnerabilities by Subwatershed

Name	Agricultural+	Municipal+	Instream*	Water Quality*
1 Lookingglass Creek/Cabin Creek	Low	Low	High	High
2 Willow Creek/Indian Creek	High	Low	High	High
3 Lower Five Points Creek	High	Low	High	High
4 Beaver Creek, Upper Five Points Creek	Low	Low	High	Moderate
5 Meadow Creek Upper Grande Ronde River	Low	Low	High	Low
6 Ladd Creek Lower Catherine	High	Moderate	High	High
7 Upper Catherine Creek 1	High	Low	High	Moderate
8 Upper Catherine Creek 2	Low	Low	High	Low

+ Quantitative attribute assessments have measured attributes at their foundation but may include estimates to fill data gaps and/or some reliance on professional opinion.
**Qualitative attribute assessments are based on limited measured data and rely heavily on condition estimates, professional opinion, published studies, and agency policy.*

Surface water and groundwater demand vary by subwatershed, demand category, and time of year. For example, municipal demand is primarily reliant on groundwater sources, while instream demand is exclusively reliant on surface water sources (although these sources are fed through groundwater contributions). Limited data are available to help the UGRRW Partnership understand surface water/groundwater interactions and interdependencies. Agricultural demand encompasses both surface water and groundwater. Tables 3-2 and 3-3 below summarize the annual water balance based on estimated supply and estimated demand (current, and in 2068). Table 3-4 shows bi-weekly surface water deficits in each subwatershed. Overall, surface water is available on an annual basis; however, bi-weekly surface water deficits are present generally July through November in most subwatersheds. This analysis was completed using information available to the UGRRW Partnership at the time of writing; it should be noted that the instream flow section states that the full range of flows throughout the year have not been taken into account in the formation of the annual basis, and instream water rights (which were used as a proxy for instream demands) are not present on all streams in the planning area.

Table 3-2
Annual Water Balance (Current Demand)

Subwatershed	Name	Surface Water Quantity (Natural Stream Flow) AF per Year (50th Percentile)[a]	Groundwater Used (AF per Year)[b]	Agricultural Demand Surface Water (AF per year) (Water Rights Only)[b]	Agricultural Demand Groundwater (AF per Year) (Water Rights Only)[b]	Agricultural Demand Surface Water (AF per Year) (ET Estimate)[b]	Agricultural Demand Groundwater (AF per Year) (ET Estimate)[b]	Municipal Demand Surface Water (AF per Year)[b]	Municipal Demand Groundwater (AF per Year) 2013 Totals[b]	Instream Demand (AF per Year) (Water Rights Only)[b, c]	Surface Water Balance (ag ET)[b]	Groundwater Balance (ag ET)[b]
1	Lookingglass Creek/Cabin Creek	644,600	-	3,470	230	3,410	220	383	810	173,750	467,440	(1,030)
2	Willow Creek/Indian Creek	523,380	29,400	51,890	14,440	46,630	12,980	-	810	141,820	334,930	15,620
3	Lower Five Points Creek	234,120	25,720	23,780	23,490	20,770	20,520	1,393	500	85,610	127,740	4,700
4	Beaver Creek, Upper Five Points Creek	219,830	1,960	750	2,040	710	1,932	170	160	85,610	133,510	(120)
5	Meadow Creek Upper Grande Ronde River	127,840	190	520	-	510	-	-	50	46,840	80,490	140
6	Ladd Creek Lower Catherine	153,740	71,720	106,330	46,100	96,350	41,774	110	5,500	57,550	(160)	24,450
7	Upper Catherine Creek 1	116,240	9,280	24,030	530	24,870	550	-	370	57,550	33,820	8,360
8	Upper Catherine Creek 2	71,600	-	360	-	470	-	-	10	32,500	38,620	(10)
	Total	644,600*	138,270	211,130	86,830	193,730	77,973	2,060	8,190	173,750*	277,130	52,110

[a] Data developed and documented in the Step 2 report.

[b] Data developed and documented in the Step 3 report.

[c] Total natural stream flow and instream demand are expressed as the total from Subwatershed 1 (the most downstream section of the watershed) to prevent "double counting."

Table 3-3
Annual Water Balance (Future Demand)

Subwatershed	Name	2068 Temperature Change from Current (°F from Annual Mean[a])	Surface Water Quantity (Natural Stream Flow) (AF per Year)[b]	Groundwater Used (AF per Year)[c]	Agricultural Demand Surface Water (AF per Year) (Water Rights Only)[c]	Agricultural Demand Groundwater (AF per Year) (Water Rights Only)[c]	Agricultural Demand Surface Water (AF per Year) (ET Estimate)[c]	Agricultural Demand Groundwater (AF per Year) (ET Estimate)[c]	Municipal Demand Surface Water (AF per Year)[c]	Municipal Demand Groundwater (AF per Year)[c]	Instream Demand AF per Year (Water Rights Only)[c]	Surface Water Balance (ag ET)[c]	Groundwater Balance (ag ET)[c]
1	Lookingglass Creek/Cabin Creek	1.6	593,040	-	3,470	230	5,010	330	60	30	173,750	414,210	(2,090)
2	Willow Creek/Indian Creek	1.6	481,510	29,400	51,890	14,440	68,490	19,060	-	860	141,820	271,210	9,490
3	Lower Five Points Creek	1.6	215,390	25,720	23,780	23,490	30,510	30,140	5,570	1,240	85,610	93,700	(5,660)
4	Beaver Creek, Upper Five Points Creek	1.6	202,250	1,960	750	2,040	1,050	2,840	690	360	85,610	114,910	(1,230)
5	Meadow Creek Upper Grande Ronde River	1.6	117,610	71,720	520	-	750	0	-	50	46,840	70,020	140
6	Ladd Creek Lower Catherine	1.6	141,440	9,280	106,330	46,100	141,510	61,360	460	8,870	57,550	(58,070)	1,490
7	Upper Catherine Creek 1	1.6	106,940	-	24,030	530	36,530	810	-	390	57,550	12,870	8,080
8	Upper Catherine Creek 2	1.6	65,870	190	360	-	690	0	-	10	32,500	32,680	(10)
	Total	1.6	593,040*	138,270	211,130	86,830	284,530	114,520	6,780	11,810	173,570*	126,510	10,200

[a] *All future estimates have a high degree of uncertainty associated with them because of the inherent difficulty in making estimates and predictions 50 years into the future.*

[b] *Data developed and documented in the Step 2 report.*

[c] *Data developed and documented in the Step 3 report.*

Table 3-4
Shaded Bi-weekly Water Balance

Biweekly surface water balance by subwatershed

	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
Subwater	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 28th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 30th
1	-1607	-2059	-1393	-1393	2160	1684	5350	4874	19409	19409	32618	32142	62371	62276	71312	70762	36536	36436	7133	6697	2116	1716	-775	-712
2	-1007	-1029	-528	-528	2357	2010	4948	4601	16323	16323	27087	26740	46949	45651	51850	50243	25695	24336	-215	-19	-2064	-1377	-2134	-1282
3	345	431	-33	-33	1062	923	2504	2365	6960	6960	14425	14226	21029	20451	21306	20260	816	3185	-3345	-3302	-1715	-1314	-772	-392
4	449	395	-111	-111	918	779	2271	2132	6464	6464	13411	13212	19496	19476	20766	20156	2229	5183	-443	-633	262	218	172	185
5	842	-1534	-1110	-1110	658	579	1260	1181	3496	3219	7866	7767	13431	13417	15529	15370	4914	4900	-660	-803	-1547	-2478	-2353	-2343
6	-241	372	478	478	1325	1265	2086	2026	5384	5384	6506	6308	9370	6689	6365	3876	-5499	-6075	-13376	-12413	-8240	-6162	-3969	-2208
7	352	466	662	662	855	796	997	938	1320	1320	616	417	1725	1033	8971	8034	5495	7002	-2206	-2076	-1584	-1091	-670	-216
8	-8	-63	-54	-54	184	125	271	212	493	493	1319	308	3138	3125	8103	7954	6516	6502	262	129	-66	-130	-72	-63

2068 biweekly surface water balance by subwatershed

	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
Subwater	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 28th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 30th
1	-1495	-2135	-1557	-1297	4301	1589	299	6076	20796	13882	27399	27911	39997	60417	58938	32329	21715	28686	7883	5032	1389	1906	-1386	39
2	-1322	-1051	-621	-411	4135	1972	886	5617	17489	11875	22889	23264	28016	43262	40190	16280	10655	15326	-1687	-3084	-3937	-2458	-3520	-1298
3	11	250	-249	-154	1641	733	472	2656	7279	4904	11981	12181	10782	19084	15439	3397	-4750	-328	-4340	-4588	-2594	-2046	-1474	-728
4	468	367	-172	-83	1604	743	505	2547	6905	4675	11258	11468	10361	18729	16107	5662	-1550	3207	-327	-948	145	219	53	297
5	867	-1538	-1133	-1082	1092	569	280	1426	3750	2251	6650	6784	8407	13014	12752	6707	2503	3644	-578	-988	-1607	-2467	-2412	-2267
6	-1187	351	436	498	1833	1240	878	2310	5712	4063	5259	5121	2276	4241	-187	-11382	-15670	-13929	-17816	-16628	-11293	-8895	-6141	-3481
7	149	459	631	701	1266	787	241	1127	1438	868	149	-5	-1293	312	5464	-1595	-865	3052	-3153	-3461	-2440	-1751	-1303	-409
8	18	-68	-73	-30	438	120	-194	328	566	214	1032	75	1552	2991	6501	2968	3630	5003	396	-132	-146	-105	-147	43

AF<-10000
-10000<AF<-5000
-5000<AF<-2000
-2000<AF<-1000
-1000<AF<-500
-500<AF<0
0<AF<500
500<AF<1000
1000<AF<2000
2000<AF<10000
10000<AF<20000
20000<AF<50000
AF>50000

Data Gaps and Uncertainty

In summary, the following major data gaps and uncertainty elements are present within this report:

- Surface water volume involved use of data from a 1958 to 1987 period of record. Updated analysis should be performed to better understand current surface water supplies.
- Groundwater volume. Lack of information on whether groundwater pumping rates are sustainable. Groundwater balance graphs are not included in analysis because of lack of certainty about supply.
- Uncertainty in the models used to estimate future temperatures, precipitation, and other climate variabilities. For precipitation, seasonal and average annual projections are more certain than daily or monthly.
- Uncertainty in estimated population growth.
- Uncertainty in quality of future water supply, which may limit the volume of water usable by municipal, agricultural, and instream uses.
- Uncertainty in the UGRRW's response to changes in precipitation and temperature and how those changes will impact available water supply (timing, amount, intensity, and frequency).
- Instream demand calculations were incomplete, and winter ecological (channel-forming) flows were not considered. Physical Habitat Simulation System (PHABSIM) studies are needed on the Grande Ronde River and Catherine Creek.

4.0 - Water Issues and Recommended Actions

The purpose of Planning Step 4 was to utilize information reviewed in the previous two steps to identify water issues facing the Upper Grande Ronde River Watershed (UGRRW), identify goals and objectives associated with each water issue, explore a wide range of strategies, and determine which strategies (and corresponding recommended actions) the UGRRW Partnership should implement.

Water Issues, Goals, Objectives, and Strategies

Water issues are identified as water-related problems or challenges that, if not resolved, will inhibit the ability to meet water demands. At the start of planning Step 4, information from planning steps 2 and 3 was used to determine the primary water issues to be addressed.

Overall, there are four primary water issues:

1. Surface water supply is limited in summer through late fall (circa July through November) when the combined demands for water instream and for irrigated agriculture and municipal uses are the highest (Table 3-4 above).
2. There is significant uncertainty with groundwater supply. The UGRRW needs to evaluate groundwater supply sustainability and inform strategic groundwater resource management as well as better understand the impact of the Scenic Waterway flows on new allocations. At this time, the UGRRW lacks sufficient groundwater monitoring wells, long-term trend data, pumping/use data, and data regarding surface water interactions.
3. Water quality is below statewide standards in all eight subwatersheds. The water quality issues are predominantly related to high temperatures, low dissolved oxygen (DO), and insufficient flows (Department of Environmental Quality (DEQ), 2000; UGRRW 2018, Step 2 report, Table 3-4).
4. Natural hazards like flooding, fire, and drought impact the UGRRW, and the UGRRW Partnership needs an integrated plan to mitigate and respond to these events to protect water supply sources and enhance water source resiliency. The climate change scenario considered by the UGRRW Partnership suggests that frequency, magnitude, and duration of these events could change within the UGRRW (UGRRW, 2018 Step 2 report, Section 3.0, page 3-45, and UGRRW, 2019, Step 3 report, Section 6.0).

The specific issues, goals, and objectives are described below. It is important to note that while certain objectives have a longer timeline attached to them, it is the intent of the UGRRW Partnership to try to move forward in an accelerated way and complete work as quickly and efficiently as possible. Goals 1 and 2 objectives are to be pursued simultaneously. The UGRRW Partnership is committed to advancing projects and activities to understand and meet instream and out-of-stream water needs in a balanced way and will seek to develop integrated, multi-benefit projects whenever possible.

Issue/Goal 1 Eliminate Surface Water Deficit

The largest issue facing the UGRRW is limited surface water availability in summer through late fall months when demand is highest for instream and agricultural needs. However, surface water is

available on an annual basis. The aspirational goal is to eliminate 100 percent of the seasonal surface water deficits in each subwatershed through the UGRRW Partnership's work or support of other organizations.

Objective 1.1

By 2040, reduce current (2018) surface water deficit (Table 3-2 above) as much as possible. Strategic and integrated actions will be implemented to verify and reduce this deficit according to data presented in the Step 2 and Step 3 reports, preferred alternatives identified in the feasibility studies, actions from strategies such as administrative actions and non-structural storage and habitat management, and the best available research and monitoring data. Feasibility studies and next steps for implementing each strategy may determine how much of the deficit is actually feasible to reduce. Initiate feasibility studies immediately to identify potential storage projects (including above- and below-ground, on-channel, off-channel, large, small, built, and natural storage) across the UGRRW. The total quantity achieved will be based on the outcome of the feasibility studies and will include consideration of laws determining water availability, including Scenic Waterways. Projected water deficit may increase in magnitude, frequency, and duration by 2068 (see Table 3-3 above). The list below was generated in the Step 3 report. It is noted that these deficits are partially derived from water rights, are additive and carry over from upstream to downstream watersheds.

- Subwatershed 1: September through November - 7,940 acre-feet (AF) deficit
- Subwatershed 2: July through November - 10,182 AF deficit
- Subwatershed 3: July through November - 10,129 AF deficit
- Subwatershed 4: July through November - 1,297 AF deficit
- Subwatershed 5: July through November - 13,098 AF deficit
- Subwatershed 6: June through October - 58,183 AF deficit
- Subwatershed 7: July through September - 7,843 AF deficit
- Subwatershed 8: July through November - 510 AF deficit

Agricultural shortages occur in the valley bottoms of subwatersheds 2, 3, 6, and 7 during the late summer and early fall. Instream deficits occur both above and in the dominant agriculture elevation zone in subwatersheds 1 through 8 during the months of July through November. Municipal deficits are insignificant, highest water use occurs in summer months in subwatershed 6 (Island City and La Grande). Given that none of the watersheds contain impoundments specifically intended to manage seasonal flow, this objective will require an active flow management strategy to retain water during periods of excess flows with controlled release to mitigate periods of deficit.

Objective 1.2

By 2040, fill data gaps identified in the Steps 2 and 3 reports. Data gaps have been identified for municipal demand, agricultural demand, instream demand, and supply (surface water and groundwater). Begin work immediately to fill data gaps, particularly with respect to instream flow demands (ODFW, 2018). These studies are anticipated to investigate instream flows

needed year-round and the effectiveness of mitigation strategies to deliver the amount and timing of required flows.

Issue/Goal 2 Improve Water Quality

Water quality values that do not meet statewide standards are present in all subwatersheds. The water quality parameters of concern are predominantly high temperatures, bacteria, low DO, pH, and insufficient flow. As mentioned previously herein, sedimentation, nutrients, *E. coli,* and iron were also found to be impairments in the UGRRW, though the iron may be relatively localized (not enough data spatially to evaluate). The goal is to improve water quality with the tools available to the UGRRW Partnership, through our own work, support of other organizations (such as efforts of the Grande Ronde Model Watershed [GRMW], Union Soil and Water Conservation District, and others), or a combination of the two.

Objective 2.1

By 2040, reduce each water quality issue as much as possible per the outcomes of feasibility studies and prioritization efforts addressing the parameters of concern as described below. Support the work of others in addressing additional water quality parameters beyond those identified by the DEQ. For instance, toxic chemicals, pharmaceuticals, heavy metals, etc., may also need to be addressed (UGRRW, 2018, Step 2 Report, Section 7.0, Table 7-8).

- Subwatershed 1: Temperature, pH, DO, algae
- Subwatershed 2: Temperature, pH, DO, algae, *E. coli*
- Subwatershed 3: Temperature, pH, algae
- Subwatershed 4: Temperature, pH
- Subwatershed 5: Temperature, pH
- Subwatershed 6: Temperature, pH, algae, *E. coli*
- Subwatershed 7: Temperature, pH, DO, algae
- Subwatershed 8: Temperature

The DEQ has identified numerous waterbodies that do not meet water quality standards in the UGRRW. The primary parameters of concern in the UGRRW are temperature, pH, DO, and *E. coli*. Temperature is a limiting factor for aquatic life; peak temperatures typically occur July through August, especially in the lower and central parts of the UGRRW. The approved temperature total maximum daily load (TMDL) has identified the following activities as nonpoints sources of warming in streams: excessive inputs of solar radiation because of streamside vegetation removal or reduction, channel disturbance, and flow modifications.

Generally, subwatersheds in the northern and central portion of the UGRRW (subwatersheds 1 through 6) have more limiting factors than ones in the southern UGRRW (subwatersheds 7 and 8). Review of water quality standards and the effectiveness of mitigating techniques may be evaluated on a project level, as needed.

The DEQ Water Quality Management Plan (page 21) advises that practices that reduce the amount of solar energy striking the water, reduce the width-to-depth ratio, and increase flow will result in cooler stream temperature.

Objective 2.2

Existing water quality standards are referenced in this Step 5 Plan. The UGRRW Partnership has questions about how achievable these standards may be and has discussed in meetings whether, for example, temperature standards have ever or could ever be met for every day of the year. As a result of these discussions and a general desire to better understand water quality conditions and whether standards are achievable, the UGRRW Partnership will work to fill data gaps identified in the Steps 2 and 3 reports by 2040 with respect to water quality, including temperature and other parameters important for beneficial uses. This information would be used to better characterize current conditions, prioritize restoration actions, and communicate progress toward, and likelihood of, meeting established water quality standards.

Issue/Goal 3 Reduce Groundwater Supply Uncertainty

The UGRRW lacks sufficient groundwater monitoring wells, long-term trend data, data related to understanding groundwater-surface water interaction, and pumping data to evaluate groundwater supply sustainability and support strategic groundwater resource planning. Several specific issues that need to be addressed include time required for recharge, connectivity and storage properties of discrete aquifer systems, and groundwater/surface water interaction, including information related to mitigation for Scenic Waterway flows. The goal is to improve understanding of groundwater supply and to develop and implement a plan to ensure groundwater aquifers are sustainable.

Objective 3.1

Complete a groundwater study by 2035. Through data collection and analysis, understand the characteristics of the UGRRW aquifers and determine the rate of change or trends in aquifer levels. The UGRRW Partnership will likely not request a groundwater study from the Oregon Water Resources Department (OWRD) due to time constraints but would take steps with OWRD to prepare for a future study and increase general understanding of the system.

Objective 3.2

Once the groundwater system is understood, convene a group of stakeholders to develop and implement a plan to ensure sustainable use of groundwater. This plan (in the form of an update to this document or a future Oregon Watershed Enhancement Board [OWEB] Strategic Action Plan) will consider rates of aquifer recharge, withdrawals of groundwater and surface water, and the connection between groundwater and surface water. Short-term goals will be compiled to achieve sustainable groundwater levels in the meantime (also in the form of an update to the Step 5 Plan).

Issue/Goal 4 Prepare for Natural Hazards/Climate Change

Natural hazards like flooding, fire, and drought impact water supply in the UGRRW frequently, and an integrated plan is needed to mitigate, respond, and adapt to the impact these hazardous events have on water supply. The goal is to develop an integrated plan to reduce or mitigate the impact of

these events. This plan will be prepared as a portion of a future OWEB Strategic Action Plan, or as an update to this document, depending on timing and content. Also, climate change models have projected temperature increases and stream flow changes by 2068. The goal is to create an adaptive management protocol that allows for all water uses (municipal, ecological, and agricultural water rights) without reducing water currently available to satisfy water rights.

Objective 4.1

By 2030, develop a Natural Hazards Mitigation Plan (set of projects and actions to be included in a future OWEB Strategic Action Plan or as an update to this document) to reduce or mitigate the impact of flooding, fire, and drought.

Objective 4.2

By 2040, implement mitigation measures identified in the Natural Hazards Mitigation Plan developed above.

Objective 4.3

By 2030, create an adaptive management protocol to apply new climate change data to goals. The protocol (in the form of an update to the Step 5 Plan) will document a method to modify goals based on new climate change data at regular intervals. This adaptive management protocol will evaluate the UGRRW Partnership's progress toward accomplishing the objectives and goals listed in this report. It will also provide a means for feedback to determine whether the approach needs to be revised.

Strategies Considered

After water issues were determined, the Stakeholders identified and described potential strategies to meet specific goals and objectives. This section provides an overview of the evaluation and outcomes of the strategy development and review.

The following methods were used to evaluate and develop potential strategies: group brainstorming sessions, presentations, grouping ideas into major strategy categories, spreadsheet strategy development, individual preliminary rankings, development of strategy summaries, and a group prioritization.

Each utilized method was applied in the following way:

1. **Group Brainstorming Sessions** - After identification of the four water issues (natural hazards/climate change, surface water deficit, groundwater uncertainty, and water quality), four meetings were held with the entire UGRRW Partnership stakeholder group to brainstorm strategies. Each meeting focused on one of the UGRRW Partnership-identified water issues. After being asked to individually review the Steps 1 through 3 reports, Stakeholders shared strategies to address these water issues. Strategies were written on a white board and then captured in a Word document. The Word document was sent to the group after each meeting to ensure that all ideas were included.

2. **Grouping Ideas into Major Strategy Categories** - After the four brainstorming meetings were complete, more than 100 potential strategies had been generated. These individual strategies were combined into draft major strategy categories. These categories included subsets of similar individual strategies. The group reviewed these draft major strategy categories and, after some revision, 12 major strategy categories were identified. See number 8 below in this section for a description of each strategy. The strategies included:

    - Built Storage - Aboveground Off-channel
    - Built Storage - Aboveground On-channel
    - Land Management - Agricultural Land
    - Data Collection and Monitoring
    - Non-structural Water Storage and Habitat Management
    - Land Management - Public Land
    - Infrastructure/Land Modification
    - Administrative Actions
    - Land Management - Municipal Land
    - Outreach and Education
    - Underground Storage
    - Research - Review of Existing Information

3. **Spreadsheet Strategy Development** - Each major strategy category was listed in a spreadsheet with all associated individual strategies. Elements of each strategy were drafted, and Stakeholders reviewed and contributed to the spreadsheet. A draft of this spreadsheet can be found on Union County's Place-Based Planning website with meeting minutes from the December 11, 2019, meeting (http://union-county.org/planning/place-based-integrated-water-resources-planning/). This draft was never completed, finalized, or approved by the Stakeholders and the method was terminated because it was determined the spreadsheet was better for ranking projects than strategies. Elements described included:

    - Strategy Type
    - Description
    - Issues Targeted (and Metrics)
    - Potential Benefits
    - Potential Barriers/Negatives
    - Potential Magnitude (Low, Moderate, High)
    - Potential Costs (Low, Moderate, High)
    - Potential Environmental Impacts (Low, Moderate, High)
    - Potential Human Impacts (Low, Moderate, High)

- Potential Feasibility (Recommended, Considered, Not Recommended)
  - Recommended (to be evaluated through feasibility study by the group)
  - Considered (missing information, or not enough impact to be recommended; if opportunities arise, the group would support working on this)
  - Not Recommended (strategy is not supported by the group and would not be evaluated further)
- Sites to Consider (for sub-strategies)
- Notes
- New Idea or Already Being Implemented
- Action Agency or Potential Action Agency
- What is Needed/Next Steps

4. **Individual Preliminary Rankings** - As identified in the spreadsheet, Stakeholders were asked (via email) to identify their preliminary rankings for each major strategy category whether it was:

   - Recommended (to be evaluated through feasibility study by the group)
   - Considered (missing information, or not enough impact to be recommended; if opportunities arise, the group would support working on this)
   - Not Recommended (strategy is not supported by the group and would not be evaluated further)

   The goal of this preliminary review was to identify the Stakeholders' preferences and concerns with various strategies. After discussion of the preliminary rankings, it was determined by the Stakeholders that all strategies should be retained and that strategy summaries should be developed to further explain what each major strategy category entailed.

5. **Development of Strategy Summaries** - These summaries were reviewed and refined by the group. Some components were similar to the original spreadsheet, but the goal was to simplify the plan to a one- to two-page summary of the anticipated action. The strategy summaries were originally called "draft action plans" but later changed to "strategy summaries" in recognition that the descriptions provided summarized work done to date rather than a plan of action for implementation. Items included in each strategy summary are:

   - Recommended Action - Description of the initial action or set of potential actions to be taken to accomplish an objective during the initial phase of implementation (i.e., feasibility study or data collection).
   - Water Issues to be Addressed - Narrative describing which of the four water issues the strategy will attempt to address (multiple issues are addressed by some strategies).
   - Benefits - Potential positive effects of the ultimate result of a recommended action (i.e., benefits of potentially implementing a project).
   - Concerns - Potential negative effects of the ultimate result of a recommended action (i.e., risks and problems associated with the implementation of a potential project).

- Methods to Address Concerns - A preliminary set of ideas on measures to take to reduce concerns and address potential problems associated with strategy implementation.
- Specific Subwatersheds - Which of the eight subwatersheds the recommended action would affect or focus on improving.
- Action Agency(ies) - Organizations to be involved with implementing the recommended action. This list includes potential funders, leaders, implementers, and technical resources in the Stakeholder group.
- Resources Needed - Description of assistance needed to begin work on the strategy (i.e., funding, information, staff).
- Research Needs/Data Needs - Description of known data and research gaps that need to be addressed before a strategy is implemented.
- Next Steps - Listing potential ordered tasks to be accomplished when beginning to implement the recommended action (i.e., obtain funding, conduct literature review, etc.).

6. **Group Prioritization** - The prioritization method used to review the strategies was an in-person vote where Stakeholders who were eligible to vote by Memorandum of Understanding requirements were asked to prioritize their top five major strategy categories. Each vote was assigned a point value of five points for a 1 rank, four points for a 2 rank, three points for a 3 rank, two points for a 4 rank, and one point for a 5 rank. The major strategy categories were prioritized from this ranking; however, some uncertainty remained about strategy types. It is noted that this voting did not embrace the consensus process; however, this method was used to achieve a draft order of strategies. Consensus was achieved on accepting the document with a strategy order presented in item 8 below.

7. **Presentations** - Four presentations were made, one on aboveground on-channel storage permitting and ESA consultation requirements, one on the logistics and types of underground storage, one on unappropriated water in the UGRRW, and one on water markets and water right transactions, which are administrative actions (National Marine Fisheries Service, 2020; Confederated Tribes of the Umatilla Indian Reservation [CTUIR], 2020; Oregon Department of Agriculture, 2020; and The Freshwater Trust, Oregon Water Resources Department, and CTUIR, 2019). These presentations provided a better understanding of these strategy types. As a result, the UGRRW Partnership determined that it would be beneficial to modify the original 12 major strategy categories (see item 2 above) so aboveground on-channel storage, aboveground off-channel storage, and underground storage could be combined into a single strategy. Given the challenges of siting on-channel storage facilities in a basin with ESA-listed species, sensitive cultural sites, and river recreation, the UGRRW Partnership further condensed the built storage category to “aboveground storage and underground storage.” The UGRRW Partnership felt that this acknowledged these unavoidable siting challenges but still enabled an evaluation of potential aboveground storage sites in the future on a case-by-case basis. The UGRRW Partnership also determined that data collection, monitoring, and research should be combined into one strategy.

8. **Development and Approval of Issues/Goals/Strategies Document** - As described in item 2 above, an issues/goals/strategies document was created to summarize the four major water issues identified, clarify goals associated with those issues, and pair measurable objectives to those goals. The major strategy categories were linked with each objective and also listed in the following final prioritization:

    1) Built Storage - Aboveground Storage and Underground Storage - This strategy seeks to study the feasibility of developing off-channel, on-channel, or underground multi-purpose storage projects with a favorable cost-to-benefit ratio to benefit all water uses, both instream and out-of-stream.
    2) Land Management - Agricultural Land - This strategy seeks to improve the management of agricultural land with the purpose of maintaining water quality and improving water supply availability.
    3) Data Collection, Monitoring, and Research - This strategy seeks to fill data gaps identified in the Step 2 and Step 3 reports through monitoring (i.e., groundwater and stream gauges), data collection (i.e., instream flow study), and research (i.e., historical flooding interviews).
    4) Non-structural Water Storage and Habitat Management - This strategy seeks to educate Stakeholders about the efficacy of non-structural water storage and habitat management and prioritize areas for implementation on non-structural water storage projects based on the GRMW's Ecological Atlas geomorphic potential rankings (GRMW, 2021).
    5) Land Management - Public Land - This strategy seeks to educate Stakeholders about work being conducted on public lands and find opportunities to work on projects/ policies together that support mutual interests (including non-structural water storage).
    6) Infrastructure/Land Modification - This strategy seeks to identify flow characteristics of the UGRRW (initially through a sediment study and a U.S. Bureau of Reclamation hydraulic modeling project) to identify potential actions to reduce negative flooding impacts in the Grande Ronde Valley.
    7) Administrative Actions - This strategy seeks to educate Stakeholders about how administrative actions can improve water quality and quantity. Administrative actions are defined as publicly available actions to utilize existing laws to use water for different purposes in different times of the year (water market/management framework). Administrative actions would be voluntary and non-regulatory.
    8) Land Management - Municipal Land - This strategy seeks to increase coordination among Union County and the seven cities in the planning area initially through improved resources sharing and emergency management (via Natural Hazard Response Plan coordination).
    9) Outreach and Education - This strategy seeks to keep the Partnership's outreach plan up to date, support actions to improve water quality, and conduct outreach for other strategies as needed.

These strategies are listed in priority order, with the first one listed as the highest priority strategy. It was determined that the top five strategies in the list would be the primary focus of the Step 5 Plan and

the remaining strategies would be retained. This was approved by a consensus vote of the UGRRW Partnership in April 2020. The UGRRW Partnership acknowledges the integrated nature of the critical issues and strategies. The UGRRW Partnership will simultaneously advance both instream and out-of-stream strategies.

This process took more than a year and a half for the group to complete. There were numerous meetings that included tense moments related to strong feelings for or against particular strategies. The vote on this was unanimous; all signatories of the Memorandum of Understanding who voted in this process had at least one of their top priorities in the top five strategies.

Recommended Actions

Nine major strategy categories were identified (listed in item 8 above). These are listed in the next section. The top five strategies are the focus of the Step 5 Plan. All strategies are retained, and lower priority strategies will be opportunistically addressed. Where possible, multi-benefit strategies that serve multiple users will be pursued and projects that address quantifiable deficits/water quality issues will be prioritized. Projects designed to improve flows must identify measurement methods to estimate what the project will accomplish. Table 4-1 below shows which issue/goal and objective each strategy seeks to address.

TABLE 4-1
CROSSWALK OF OBJECTIVES AND POTENTIAL STRATEGIES

Issue, Goal, and Objective	Built Storage - Aboveground Storage and Underground Storage	Land Management - Agricultural Land	Data Collection, Monitoring, and Research	Non-structural Water Storage and Habitat Management	Land Management - Public Land	Infrastructure/Land Modification	Administrative Actions	Land Management - Municipal Land	Outreach and Education
Issue/Goal 1 - Eliminate Surface Water Deficit									
Objective 1.1 - Reduce Current Deficit	X	X	X	X	X	X	X	X	X
Objective 1.2 - Fill Data Gaps			X						
Issue/Goal 2 - Improve Water Quality									
Objective 2.1 - Reduce Each Water Quality Issue	X	X	X	X	X				X
Objective 2.2 - Fill Data Gaps			X						
Issue/Goal 3 - Reduce Groundwater Supply Uncertainty									
Objective 3.1 - Complete a Groundwater Study			X						
Objective 3.2 - Implement Plan Based on Study Results	X	X		X	X	X	X	X	X

Issue, Goal, and Objective	Built Storage - Aboveground Storage and Underground Storage	Land Management - Agricultural Land	Data Collection, Monitoring, and Research	Non-structural Water Storage and Habitat Management	Land Management - Public Land	Infrastructure/Land Modification	Administrative Actions	Land Management - Municipal Land	Outreach and Education
Issue/Goal 4 - Prepare for Natural Hazards/Climate Change									
Objective 4.1 - Develop Natural Hazards Mitigation Plan					X		X		
Objective 4.2 - Implement Mitigation Measures Identified in Plan	X	X	X	X	X	X	X	X	
Objective 4.3 - Create an Adaptive Management Protocol to Apply New Climate Change Data to Goals			X	X	X	X	X		

5.0 - Plan Implementation Strategy

Priority Actions

Of the nine strategies, the top five are considered priority (shown in bold).

1) **Built Storage - Aboveground Storage and Underground Storage**
2) **Land Management - Agricultural Land**
3) **Data Collection, Monitoring, and Research**
4) **Non-structural Water Storage and Habitat Management**
5) **Land Management - Public Land**
6) Infrastructure/Land Modification
7) Administrative Actions
8) Land Management - Municipal Land
9) Outreach and Education

Strategy descriptions are found below, and summaries of these strategies can be found in the Upper Grande Ronde River Watershed (UGRRW) 2020, Step 4 report. The majority of the UGRRW Partnership's effort will be on the top five strategies; other strategies are currently being pursued opportunistically. Each strategy has a work group that has started meeting to advance the strategies.

Timeline

An action plan table is included in Appendix A, Implementation Schedule. Timelines are quarterly for the first five years, then yearly after that out to 2031 (10 years from this draft). They will be modified and extended, as this is a working document. Appendix A, Implementation Schedule, will be revised annually to update progress and will be located on the Union County website. This entire Plan may be updated every five years, if needed.

The final plan adoption will take place as follows:

- The Partnership will approve this plan through a normal consensus-based decision-making process (after revision is complete).
- Agencies will review and comment, and changes will be incorporated.
- The Partnership will review, modify, and approve the Agency-revised plan (two-week period).
- The Partnership will present the revised plan to the Water Resources Commission for approval.

Once the plan is approved by the Water Resources Commission, the Partnership will begin the implementation phase, which will consist of quarterly meetings and work designed to meet the

milestones below. The UGRRW Partnership intends to make progress on all strategies and is committed to advancing instream and out-of-stream needs.

The **overall implementation** milestones are as follows:

Years 1 through 2

- Receive state approval for this plan by December 31, 2021.
- Complete Oregon Watershed Enhancement Board (OWEB) Strategic Action Plan by December 2023.
- Begin studies, outreach, and funding applications as described in Appendix A.
- Begin quarterly implementation meetings, update schedule with notes and progress quarterly.
- Each implementation team will report to the group on progress.
- Individual organizations can report on lead action items.
- Each implementation team will update the Appendix A spreadsheet and provide group documentation to Anderson Perry & Associates, Inc., to retain on project server.
- The fourth quarter implementation meeting of each year will include updates on progress toward achieving objectives.

Years 2 through 5

- Initial project construction and design (as determined by study results)

By 2040

Complete approved objectives:

- Issue/Goal 1 - Eliminate surface water deficit
  - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)
  - Objective 1.2 - Fill data gaps (instream flow now; complete by 2040)
- Issue/Goal 2 - Improve water quality
  - Objective 2.1 - Reduce each water quality issue (by 2040)
  - Objective 2.2 - Fill data gaps (by 2040)
- Issue/Goal 3 - Reduce groundwater declines and supply uncertainty
  - Objective 3.1 - Complete a groundwater study (by 2035)
  - Objective 3.2 - Implement plan based on study results
- Issue/Goal 4 - Natural hazards/climate change
  - Objective 4.1 - Develop natural hazards mitigation plan (by 2030)
  - Objective 4.2 - Implement mitigation measures identified in plan (by 2040)
  - Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030)

The **individual strategy milestones** were developed by work groups to implement Step 4 Recommended Actions and approved by the UGRRW Partnership as follows. These will be updated annually in this Step 5 Plan, and quarterly as needed in Appendix A - Implementation Schedule.

1) **Built Storage - Aboveground Storage and Underground Storage** - This strategy seeks to study the feasibility of developing off-channel, on-channel, or underground multi-purpose storage projects with a favorable cost-to-benefit ratio.

   Purpose: Address specific water supply deficits in each subwatershed through advancing possible built storage projects

   Step 4 Recommended Action: Study the feasibility of developing off-channel, on-channel, or underground multi-purpose storage projects with a favorable cost-to-benefit ratio.

   Narrative: This strategy was the highest ranked strategy by the Partnership. Organizations in the UGRRW are not actively pursuing a high-level evaluation of storage options. This strategy has had more work started than other strategies and is anticipated to be generally led by the Partnership (as opposed to other entities). This strategy will include a literature review on previously conducted feasibility studies and will also examine natural storage opportunity areas.

   Progress Summary:

   - Meetings January 21, 2021, and February 17, 2021
   - Oregon Water Resources Department (OWRD) Feasibility Study Grant recommended for funding

   Milestone Summary:

   - Years 1 through 2
     - Apply for Oregon Watershed Enhancement Board (OWEB) Technical Assistance (TA) grant for Aboveground Feasibility Study (with instream flow study focus).
     - Apply for OWEB TA grant for Aquifer Capacity Study (Bonneville Power Administration).
     - Begin feasibility study to look into aboveground storage (both built and non-structural) and conduct Physical Habitat Simulation System instream flow studies to both support storage efforts and assist with filling data gaps for instream demands. The Study will evaluate new storage locations as well as evaluating increasing capacity of existing reservoirs (such as Beaver Creek).
     - Initiate Catherine Creek underground storage consultation with agencies (via Kaizen process) to determine the permitting pathway for storage of 10 cubic feet per second of water in Catherine Creek area to benefit instream flow.
   - Years 2 through 5
     - Depending on results of aboveground feasibility study: design and construction.
     - Depending on results of underground storage meetings: design and construction.

- By 2040
    - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).
    - Develop storage for each subwatershed to reduce each deficit.

2) Land Management - Agricultural Land - This strategy seeks to improve the management of agricultural land with the purpose of maintaining water quality and improving water supply availability.

Purpose: Conduct research when needed and provide subsequent educational outreach to support water management actions that maintain water quality and expand capacity.

Step 4 Recommended Action: Determine methods of improving management of agricultural land to improve water quality and quantity. Much of this work is already being done, so it is anticipated the role of the UGRRW Partnership would be to see where potential bottlenecks are occurring and if the UGRRW Partnership can assist in progress.

Narrative: This strategy was the second ranked strategy by the Partnership. Organizations in the UGRRW are actively working to improve agricultural land management, particularly the Natural Resources Conservation Service (NRCS) and the Oregon State University Extension office. The Oregon Department of Agriculture (ODA) is the designated management agency responsible for regulating agricultural activities that affect water quality through the Agricultural Water Quality Management Act (Senate Bill 1010) and Senate Bill 502. In the temperature TMDL, ODA is the agency responsible for implementation of this TMDL on agricultural lands.

NRCS has significant resources and access to grants to support growers transitioning to beneficial systems. The UGRRW Partnership identified a concern that many NRCS-promoted techniques have not been tested or proved in the UGRRW and information about them is not available. This strategy will be led by the NRCS that will apply for funding to convene a pilot group of growers to provide case studies for techniques to reduce water consumption and improve soil health, such as cover crops, to increase adaptation of these practices in the UGRRW. This strategy will also seek to support and fund new on-farm Integrated Water Management (IWM) projects as well as share resources of existing programs to increase their adoption in the UGRRW.

Progress Summary:

- Meetings January 20, 2021, January 26, 2021, and February 17, 2021

Milestone Summary:

- Years 1 through 2
    - Provide input as needed to built storage group from agricultural perspective (water management and project funding).
    - Identify grant (NRCS) to provide case studies for on-farm conservation/efficiency projects.
    - Develop list of programs and share.

- Funding strategy for IWM projects.
- ODA funding, technical assistance, and enforcement of state water quality laws

- Years 2 through 5
  - Implement pilot project grant.
- By 2040
  - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).
  - Attain Step 3 assumed efficiency improvements:
    - 90 percent of flood irrigation can be converted to a sprinkler of some kind.
    - 33 percent of wheel lines can be converted to pivots.
    - 75 percent of unconverted wheel lines will be upgraded to new nozzles, drains, etc.
    - 75 percent of pivots that are not new (90 percent of total) can be upgraded with new sprinkler packages.
    - Intensive IWM is used on all converted/upgraded systems.

3) **Data Collection, Monitoring, and Research** - This strategy seeks to fill data gaps identified in the Step 2 and Step 3 reports through monitoring (i.e., groundwater and stream gauges), data collection (i.e., updated instream flow analyses and studies), and research (i.e., historical flooding interviews).

   Purpose: Coordinate data collection to fill data gaps, support working groups, and inform water management in the UGRRW.

   Step 4 Recommended Action 1: Develop and fund a plan (or set of plans) for monitoring and collecting data to fill data gaps identified in the Steps 2 and 3 reports, as well as through Step 4 strategy development. Collect additional data to expand existing data sets, inform solution actions and designs, evaluate effectiveness of strategies, and improve long-term forecasting.

   Step 4 Recommended Action 2: Complete research (identified as non-data collection activities) on identified data gaps from Steps 2 and 3 reports, as well as outstanding questions identified during Step 4 strategy development. When possible, research topics will be linked to other strategies to improve results/support feasibility analysis.

   Narrative: This strategy encompasses many data gaps identified by the Partnership that need to be filled through data collection, monitoring, or research. This work will be prioritized based on the needs of other working groups. Initially, stream gauges (supporting retention of existing gauges), groundwater (initiate steps for a groundwater study), surface water quality (support ongoing Grande Ronde Model Watershed [GRMW] water quality study), and instream flow needs in the basin) will be the focus of this working group.

Progress Summary:

- Meetings January 20, 2021, and February 17, 2021
- OWRD Feasibility Study Grant (instream flow study) recommended for funding.

Milestone Summary:

- Years 1 through 2
    - Prioritize data gaps.
    - Update instream flow assessment using guidance provided by the Oregon Department of Fish and Wildlife (ODFW). The proposed approach will use existing data (Basin Investigation Report [BIR]-based recommendations for reaches with existing instream water rights and modeled flow data for important tributaries that currently lack flow targets). Results of the updated analyses will provide a starting point for better understanding basin-wide needs and will guide the development of a more focused suite of tools to refine instream flow needs at high-priority locations. The UGRRW Partnership is committed to continuing to work with ODFW to update instream demand estimates utilizing an agreed-upon method (to be finalized during implementation of this Step 5 Plan).
    - Support maintenance of the operation of the current stream gauges (write letters to support gauges in basin).
    - Meet with OWRD hydrogeologist to determine next steps to prepare for future groundwater study.
    - GRMW water quality study begins; report outcomes.
    - Develop progress tracking and adaptive management system.
- Years 2 through 5
    - Support groundwater study.
    - Support instream flow study.
- By 2040
    - Objective 1.2 - Fill surface water data gaps (instream flow now; complete by 2040).
    - Objective 2.2 - Fill water quality data gaps (by 2040).
    - Objective 3.1 - Complete a groundwater study (by 2035).
    - Objective 3.2 - Implement plan based on study results.

4) Non-structural Water Storage and Habitat Management - This strategy seeks to educate stakeholders about the efficacy of non-structural water storage and habitat management and prioritize areas for implementation on non-structural water storage projects based on the GRMW's Ecological Atlas geomorphic potential rankings (GRMW, 2021).

Purpose: Raise awareness of work being done and how this work addresses goals of the UGRRW Partnership; prioritize and pursue non-structural storage projects in strategic locations.

Step 4 Recommended Action: Determine the best way to assist partners with increasing water storage capacity through natural processes using non-structural means.

Narrative: This strategy builds upon work being done by other organizations and seeks to utilize GRMW's Ecological Atlas to identify areas of high geomorphic potential and pursue non-structural storage projects. This strategy will also utilize existing projects to educate Stakeholders about the efficacy of non-structural storage.

Progress Summary:

- Meetings January 19, 2021, January 26, 2021, and February 17, 2021
- OWRD Feasibility Study Grant (storage and instream flow study) recommended for funding.

Milestone Summary:

- Years 1 through 2
    - Update Stakeholders on ongoing work (present findings/data from floodplain projects and field tours).
    - Develop list of projects that have high geomorphic potential (GRMW's Ecological Atlas) and those that are high priority (water deficit/storage need) for Partnership (current projects and future opportunities).
    - Project development strategy.
- Years 2 through 5
    - Continue project development strategy (adaptive management).
- By 2040
    - Implement projects with the potential to improve water quality and quantity. Understand the baseline is moving. Adaptive management needed.
    - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).
    - Objective 2.1 - Reduce each water quality issue (by 2040).

5) Land Management - Public Land - This strategy seeks to educate stakeholders about work being conducted on public lands and find opportunities to work on projects/policies together that support mutual interests (including non-structural water storage).

Purpose: Information sharing and communication between public land management agencies and Stakeholders to identify potential areas of mutual support.

Step 4 Recommended Action: Determine best methods to assist in public lands management to improve water quality and quantity.

Narrative: This strategy was determined to be important to the Partnership because of the large amount of land area in the UGRRW that is publicly owned (mostly by the U.S. Forest Service [USFS]). This strategy relies on working directly with the USFS to support and advocate for actions on USFS land that would benefit Partnership objectives and USFS objectives (particularly

those related to non-structural storage of water and water quality). This work will be led by the USFS, with the Partnership in a supporting role. Educating Stakeholders about work done on public lands is an integral part of this strategy.

Progress Summary:

- Meeting January 20, 2021

Milestone Summary:

- Years 1 through 2
    - Update Stakeholders.
    - Field trip for interested group members (show hydrologic benefits of restoration projects).
- Years 2 through 5
    - Depending on group needs, develop projects for implementation.
- By 2040
    - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).
    - Objective 2.1 - Reduce each water quality issue (by 2040).

6) Infrastructure/Land Modification - This strategy seeks to identify flow characteristics of the UGRRW (initially through a sediment study and a Bureau of Reclamation [Reclamation] hydraulic modeling project) to identify potential actions to reduce negative flooding impacts in the Grande Ronde Valley.

Purpose: Reduce the frequency and severity of damage due to flooding now and in the future.

Step 4 Recommended Action: Study potential actions to reduce negative impacts of flooding in the Grande Ronde Valley while increasing retention and recharge potential in a way that will benefit water quantity, quality, habitat, agricultural, and municipal lands.

Narrative: This strategy is focused on understanding and mitigating negative effects of flooding in the UGRRW. First, the Union Soil and Water Conservation District (SWCD) will prepare a scope of work (and the Partnership will develop a funding mechanism, if required) to expand an existing Reclamation hydraulic model to cover areas of flooding concerns (generally in the Rhinehart Gap area). The work group will also seek to expand a sedimentation study being conducted by the GRMW to determine effects of sedimentation in areas of high flooding risk. These two analyses will enable identification of pinch points and other areas to focus project work to alleviate flooding. These recommended projects are anticipated to be identified in a natural hazards mitigation plan. This group will also convene a meeting with OWRD and irrigation ditch users to investigate the potential to use ditches to alleviate flooding (this practice is currently not allowed within existing laws and could require advocating for a change in water law). The feasibility study conducted to assess built storage as a strategy for meeting instream and out-of-stream needs might also consider the beneficial aspects of storage on flood control and management.

Progress Summary:

- Meetings January 20, 2021, February 17, 2021, and March 18, 2021

Milestone Summary:

- Years 1 through 2
    - Reclamation Hydraulic Study - develop scope/fund work/complete work (Union SWCD to develop scope).
    - Sediment Study - develop scope/fund work/complete work.
    - Irrigation ditch opening meeting.
- Years 2 through 5
    - Natural Hazards Mitigation Plan Development/project list.
- By 2040
    - Objective 4.1 - Develop natural hazards mitigation plan (by 2030).
    - Objective 4.2 - Implement mitigation measures identified in plan (by 2040).
    - Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030).

7) Administrative Actions - This strategy seeks to educate stakeholders about how administrative actions can improve water quality and quantity. Administrative actions are defined as publicly available actions to utilize existing laws to use water for different purposes in different times of the year (water market/management framework). Administrative actions would be voluntary and non-regulatory.

Purpose: Increase awareness of how administrative actions can improve water quality and quantity. Administrative actions are defined publicly available actions to utilize existing laws to use water for different purposes in different times of the year (water market/management framework). Administrative actions would be voluntary and non-regulatory.

Step 4 Recommended Action: Study the feasibility of developing a coordinated suite of publicly available actions to utilize existing laws to use water for different purposes in different times of the year (water market/management framework).

Narrative: This strategy includes numerous ideas generated by the Partnership for using existing water laws to allocate water for different purposes and address deficits. Because of the complexity of these regulations, and lack of awareness of them, this work group intends to focus on educating both Stakeholders and legislators on these methods, with the ultimate goal of increasing adoption of voluntary practices that would benefit instream and out-of-stream needs.

Progress Summary:

- Meetings January 21, 2021, and February 17, 2021

Milestone Summary:

- Years 1 through 2
    - Prepare outreach material (and outreach strategy) for landowners (gather existing resources).
    - Prepare outreach material for legislators (split season leases, bills/advocacy, etc.) and Partnership name and approval.
    - Determine how best to support Trout Unlimited in new environmental water transaction role in the basin.
- Years 2 through 5
    - Survey of interest and potentially adoption of programs.
    - Fund and implement improvements or projects.
- By 2040
    - Understand the baseline is moving; Partnership will focus on "secured water" put into stream (quantify as a result of transactions). Adaptive management needed.
    - Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).

8) Land Management - Municipal Land - This strategy seeks to increase coordination among Union County and the seven cities in the planning area initially through improved resources sharing and emergency management (via Natural Hazards Mitigation Plan Update coordination).

Purpose: Improve city-to-city coordination to respond to natural hazards, increase water conservation, and support water infrastructure efficiency improvements.

Step 4 Recommended Action: Coordinate with municipalities to determine how the UGRRW Partnership could best assist with providing support to multiple municipal systems and land to improve water quality and quantity. The UGRRW Partnership would first determine if such a plan would be supported by municipalities. The plan could evaluate the potential to implement the following practices in municipalities. Ideally, actions will be taken in the seven cities, by self-supplied industrial users, and unincorporated users, to increase efficiency of water use and distribution.

Narrative: This strategy focuses on increasing coordination among Union County and cities for water system improvements, conservation, and emergency response. Initially, it will focus on assisting cities with a strategy for sharing water conservation resources and helping cities participate in the Union County Natural Hazards Mitigation Plan Update.

Progress Summary:

- Meetings January 20, 2021, and February 18, 2021
- Information presented at mayors meeting January 20, 2021
- Union County Natural Hazards Mitigation Plan Update meeting (with cities) held March 23, 2021

Milestone Summary:

- Years 1 through 2
    - Determine if mayors of cities want to work on a plan for shared resources for water conservation.
    - Update Partnership on cities' water/stormwater/flood activities.
- Years 2 through 5
    - Federal Emergency Management Agency-approved Union County Natural Hazards Mitigation Plan Update to cover all cities.
- By 2040
    - Objective 4.1 - Develop place-based planning specific Natural Hazards Mitigation Plan (by 2030).
    - Objective 4.2 - Implement mitigation measures identified in plan (by 2040).
    - Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030).

9) Outreach and Education - This strategy seeks to keep the Partnership's outreach plan up to date, support actions to improve water quality, and conduct outreach for other strategies as needed.

Purpose: Inform the public about water quality issues and UGRRW Partnership activities.

Step 4 Recommended Action: Update the UGRRW Partnership's outreach plan to include support or action on water quality issues.

Narrative: This strategy group will be responsible for updating the Partnership's outreach plan and assisting with outreach needed by the other strategy groups. Initially, water quality issues will be highlighted through outreach, and a digital story project will be produced.

Progress Summary:

- Meetings January 22, 2021, and February 18, 2021
- Contacted the Oregon Department of Environmental Quality (DEQ) for input on January 22, 2021.

Milestone Summary:

- Years 1 through 2
    - Prepare and distribute outreach material on lawncare issue to cities/county.
    - Digital water quality outreach to county residents (reassess after first year).
    - Digital storytelling project to be completed.

- Years 2 through 5
    - Update outreach document.
    - Field tour/workshop.
- By 2040
    - Objective 2.1 - Reduce each water quality issue (by 2040).

Resource Needs

At this phase, resource needs are described in individual strategy implementation plans. Generally, funding is a need for each task.

Implementation Team

Each strategy has a separate implementation team, as identified in Appendix A - Implementation Schedule. The Implementation Team Lead is listed below in parentheses:

1) **Built Storage - Aboveground Storage and Underground Storage (Union County)**
2) **Land Management - Agricultural Land (NRCS)**
3) **Data Collection, Monitoring, and Research (GRMW)**
4) **Non-structural Water Storage and Habitat Management (Union SWCD)**
5) **Land Management - Public Land (USFS)**
6) Infrastructure/Land Modification (Union County)
7) Administrative Actions (Confederated Tribes of the Umatilla Indian Reservation)
8) Land Management - Municipal Land (City of La Grande)
9) Outreach and Education (DEQ)

Team leads are responsible for coordinating strategy team meetings and providing updates at quarterly Stakeholder Meetings. Union County will continue to coordinate these quarterly update meetings.

Teams will be responsible to work together an ensure strategy integration occurs. Quarterly meetings of the Partnership will allow for information sharing and also allow for the different strategy teams to offer support to or request support from other strategy teams. Examples of strategy integration that are anticipated to occur, or are already occurring, include:

- Land Management - Agricultural Land team is providing input to the built storage team.
- The Built Storage team is starting a feasibility study that will require support for instream flow studies from the Data Collection, Monitoring, and Research team, as well as assistance with evaluating non-structural storage opportunities from the Non-structural Water Storage and Habitat Management Group.
- The Data Collection, Monitoring, and Research team is anticipated to support all other strategy teams.

- The Infrastructure/Land Modification team is scoping a Reclamation study of UGRRW hydrology that will be shared with the Data Collection, Monitoring, and Research team.
- The Outreach and Education team will support other teams in distributing relevant information (such as water quality reports) and ensuring the outreach plan is updated.

Keeping the Public Engaged

The outreach and communication plan will continue to be used and updated. Generally, it is assumed that the quarterly Stakeholder Meetings will be the place for new people to get involved in the implementation work or for interested members of the public to hear updates. A new digital storytelling project is in progress. Newspaper articles, radio ads, presentations, social media, and the Union County website will continue to be methods to keep the public engaged.

6.0 - References

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 2020. Presentation by Anton Chiono, CTUIR, Department of Natural Resources - Water Resources Program. Aquifer Storage and Recharge Options under Oregon Water Law. February 26, 2020.

Grande Ronde Model Watershed. 2021. Ecological Atlas geomorphic potential information. Accessed September 29, 2021. < https://grmw.org/>

National Marine Fisheries Service (NMFS). 2020. Presentation by Sarah Fesenmyer, NMFS. Endangered Species Act Review Process. February 26, 2020.

Oregon Department of Agriculture (ODA). 2012. Upper Grande Ronde River Subbasin Agricultural Water Quality Management Area Plan. Developed by The Upper Grande Ronde River Subbasin Local Agricultural Water Quality Advisory Committee with assistance from the Oregon Department of Agriculture and the Union County Soil and Water Conservation District. September 15, 1999. Revised November 15, 2012.

ODA. 2020. Presentation by Margaret Matter, ODA. Reservations of Unappropriated Water in the Upper Grande Ronde Basin. Potential Options for Meeting Future Water Supply Needs. May 20, 2020.

Oregon Department of Environmental Quality (DEQ). 2000. Upper Grande Ronde River Subbasin Water Quality Management Plan. Prepared by Grande Ronde Water Quality Committee. April 2000. <https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-Grande-Ronde.aspx>

DEQ. 2017. Upper Grande Ronde River TMDLs. Presentation April 12, 2017.

National Research Council 2011. Climate Stabilization Targets Emissions, Concentrations, and Impacts over Decades to Millennia(2011). https://www.nap.edu/catalog/12877/climate-stabilization-targets-emissions-concentrations-and-impacts-over-decades-to

Northwest Power and Conservation Council. Grande Ronde Subbasin Plan. 2004. https://www.nwcouncil.org/sites/default/files/GRSPfinal.pdf

Oregon Department of Fish and Wildlife (ODFW). 1975. Fish and Wildlife Resources of the Grande Ronde Basin, Oregon, and their Water Requirements. Allan K. Smith. Report with recommendations to the Oregon Water Policy Review Board, from ODFW. August 1975.

ODFW. 2018. Oregon Department of Wildlife, 2018. “Step 3 Determining Instream Flow Ecological Needs.”

Oregon Water Resources Department (OWRD). 2015. Draft Guidelines A Tool for Conducting Place-Based Integrated Water Resources Planning in Oregon. February 15, 2015. <https://union-county.org/wp-content/uploads/2016/09/2015_February_Draft_Place_Based_Guidelines.pdf>

OWRD. 2018. Water Use Report. <https://apps.wrd.state.or.us/apps/wr/wateruse_query/>

OWRD. 2019. Characterization of Groundwater in the Upper Grande Ronde Basin. Memo to Upper Grande Ronde River Watershed Place-Based Planning Partnership. Final Draft January 16, 2019.

Smith, J.E. 1975. The Fish and Wildlife Resources of the Grande Ronde Basin, Oregon and their water use requirements. Aug. 1975. A report with Recommendations to the Oregon State Water Resources Board from the Oregon State Game Commission, Federal Aid to Fish Project F-69-R-10; Job Number 5 Portland OR 27 p.

The Freshwater Trust (FWT), OWRD and CTUIR. 2019. Presentation by Tony Malmberg, FWT, Steve Parrett, OWRD, and Anton Chiono, CTUIR. Water Markets and Water Right Transactions Tools. January 16, 2019.

Upper Grande Ronde River Watershed (UGRRW) Partnership. 2017. Governance Agreement. Union County, Oregon, USA.

UGRRW Partnership. 2018. Place-based Integrated Water Resources Planning State of Water Resources Report. Union County, Oregon, USA. “Step 2 Report.”

UGRRW Partnership. 2019. Place-based Integrated Water Resources Planning Demands and Vulnerabilities Report. Union County, Oregon, USA. “Step 3 Report.”

UGRRW Partnership. 2020. Place-based Integrated Water Resources Planning Integrated Strategies Report. Union County, Oregon, USA. “Step 4 Report.”

Appendices Table of Contents

APPENDIX A
Implementation Schedule

Built Storage

Lead: (Union County); Team: Rodger H, Curt H, Jed (just Underground) Brett, Scott (just Underground), Anton, Cheryl

Purpose: Address specific water supply deficits in each subwatershed through advancing possible built storage projects

last updated: 4/21/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Above Ground Storage**			**Active**		Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	whole watershed.
1a	Aboveground Storage Feasibility Study (OWRD application)	Grant Submitted 10/14/2020; Wait to hear if selected April 2021					
1b	Aboveground Storage Feasibility Study (BOR application)	Submit application Jan 19, 2021	Decided not to apply. Not eligible	Inactive			
1c	Aboveground Storage Feasibility Storage (OWEB application)	Submit application April 2021	Not sure of application date yet				
1d	Agency assistance - reach out to BOR and USACE to see if they can assist or lead the study		Brett to contact SWCD to contact BOR; Brett to contact USACE		Brett		
1e	Feasibility Study	--	hire someone to produce the study (AP or advertise and select) Union County would put out an RFP	Inactive	Union County		
1f	funding for design and permitting for selected alternative(s)	--		Inactive			
1g	design and permitting for selected alternatives	--		Inactive			
1h	funding for construction	--		Inactive			
2	**Underground Storage - Catherine Creek Site**			Active			
2a	Catherine Creek Underground Storage - meet with agencies	Organize meeting early 2021 (fish agency concern is with water quality - NMFS/USFWS/ODFW - concerned with changing the chemistry of the water) - what questions need to be answered? What can this aquifer (hall ranch or city of union wells) actually hold? - need to ask geologist	Dana to set up meeting (presentation?)		Dana		
2b	Catherine Creek Aquifer Capacity Analysis funding application	Apply for technical assistance grant from OWEB April 2021; look at possible funding sources (including BPA - who paid for first study)	revisit - whether we want to target hall ranch, or go lower to tribal property revisit - would water go in stream or could it go directly to users	Inactive			
2c	Catherine Creek Aquifer Capacity Analysis	--		Inactive			
2d	Catherine Creek funding for design and permitting	--		Inactive			
2e	Catherine Creek design and permitting	--		Inactive			
2f	Catherine Creek funding for construction	--		Inactive			
2g	Catherine Creek construction			Inactive			
3	**Project Management**						
3a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 21, 2021 and February 17, 2021
October 2020 - Oregon Water Resources Department grant application submitted and recommended for funding.

Milestone Summary:

Years 1 through 2

Apply for Oregon Watershed Enhancement Board (OWEB) Technical Assistance (TA) grant for Aboveground Feasibility Study.
Apply for OWEB TA grant for Aquifer Capacity Study (Bonneville Power Administration).
Begin Feasibility Study to look into Aboveground Storage (both built and non-structural) and conduct PHABSIM instream flow studies to both support storage efforts and assist with filling data gaps for instream demands. Study to evaluate new storage locations as well as evaluating deepening existing reservoirs (such as Beaver Creek).
Initiate Catherine Creek Underground Storage consultation with agencies (via Kaizen process) to determine the permitting pathway for storage of 10 CFS of water in Catherine Creek area to benefit instream flow.

Years 2 through 5

Depending on results of aboveground Feasibility Study - design and construction.
Depending on results of underground storage meetings - design and construction.

By 2040

Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).
Develop storage for each subwatershed to reduce each deficit.

Agricultural Land Management

Lead: (NRCS); Team: Mike B, Curt R, Matt, Jed, Darrin Walenta, Tim W, Jim W (contact Rodger for range representatives)

Purpose: Conduct research when needed and provide subsequent educational outreach to support water management actions that maintain water quality and expand capacity for water use efficiency.

last updated: 2/17/2021

Num	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Address high flows in spring and deficiencies in late season by contributing to the Built Storage Group**		Determine AF of water in a reservoir; offer farmers ability to buy in (fund project) and utilize water; could form a special management district (or Union SWCD). Would be good for tourism too. Agricultural group could fund the project and could provide information to Built Storage. How will the stored water be managed and allocated? Talk to stakeholders now. Special districts for water management Ensure hydroelectric power is included in feasibility analysis				
2	**Conservation Innovation Grant or CESU cooperative ecosystem studies unit**		Identify grant (CESU/CIG) to provide case studies for on-farm conservation/efficiency projects Pilot Project of about 6 farms	**Inactive**	Mike (NRCS)		Pilot (6 farms)
1a	Relevant stakeholder meeting	Meeting in Q1 2021	Meeting (Jed, Curt, Livestock producers - need a core of people to go) *Darrin to help (similar to biodiversity workshops - focus through exsiting group); someone from Walla Walla need to educate people toward these programs (how to do them, explain benefits/motivate for change) promote events and make people familiar. People have to see it working somewhere else (and need incentives to minimize risk) **Periodic workshops to keep it fresh in people's minds (target might not be grass farmer but dry land farmer) NRCS lead an "invitation" meeting (Melvilles - a panel to talk about what works and what doesnt with rotations and cover crops; could also include irrigation efficiency) 10-12 people that have tried it "conservation innovation grant" (CIG grant - just organic matter and carbon sequestration; 6 people try it in our area "early adopters are examples") or CSP (conservation stewardship program - multiple practices with a 5 year contract) CSP is highest level of conservation SWCD - outreach to landowners (purpose and expected outcomes) try diverse range of practices. OSU extension could provide outreach (regional group) OSU extention - PNW 30 case studies developed for dry land seeding (printed and public presentation forum) - Darrin to send CESU - cooperative ecosystem studies unit (provides funding to fill knowledge gaps through research. Establishes a pathway to get projects on the ground. non competitive process through NRCS.				
1b	Apply for Grant		Determine what should be included in CIG (Mike Writes CIG grant)				
1c	Begin Program						
3	**General Incentive Program Outreach and Education**			**Active**	Curt		
2a	Develop list of programs avaliable for conservation and funding sources	Q2 2021					
2b	how to rank whether strategy meets objective of water deficit reduction		resources for individuals to rank and also for ranking for our group to support (IWM is one we know works)				
3	**Increase irrigation efficiency (IWM)**			**Active**	Dana		
3a	Develop list of funds for this work	Q2 2021	*catherine creek and little creek important to NRCS *could be a stand alone component. - only missing thing is funding *look for funding (this strategy is already proven)				
3b	Apply for grant	Q3 2021 depends on deadline					
4	**Precision agriculture needs preliminary assessent**			Inactive			
4a	review existing programs, determine needs						
4b	funding/staffing for new work						
5	**CREP or CRP program feasibility preliminary evaluation**		*could create new program/funding for improve - funds from lottery (always open) - to be in program, qualify and then in	Inactive		Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	
5a	quick survey to determine interest						
5b	funding/staffing for new work						
6	**Incentive-based programs review and prioritization**		1) support existing NRCS programs 2) new programs 3) funding (only have abour $400,000 per year) *purpose to help people try new techniques and then when they find something that works they will stick with it (even without the incentive)	Inactive		Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	
			look into state wide efforts for "designing working lands for oregon agriculture" - climate change/water (ODA) CARBON Programs. Need to try and identify some levels of successful tactics and practices. We would like to learn more about the actual cover crop species that work in our system (some research on screening crops could be benificial) Drought tolerant cover crops				
6a	organic matter content in soil		*Identify a program to integrate cattle to working land (look into temp electric fences); or cover crops (but if you aren't careful you can use more water with cover crops than without)				
6b	mitigate against nitrogen and phosphorus loading		example: buffer strip around water bodies; timing of application Darrin is looking into nitrogen efficiency in cropping systems (currently applying for federal grant)				
6c	increase irrigation efficiency (IWM)		*catherine creek and little creek important to NRCS *could be a stand alone component. - only missing thing is funding *look for funding (this strategy is already proven)	Active - moved to 3 above			
6d	alternative crops		Incentives to switch to crops that use less water				
6e	high residue farming						
6f	farming practice improvement						
6g	floodway easement compensation						
6h	contamination prevention when flooding occurs						
	cover crops/bio-fumagant crops		yellow mustard, arugla (act as a fumagant) - effort to reduce pesticide load in system. Organic benefit. BT work in cerals and blue grass. *new research for high residue farming and study soil to see what water holding capacity is at beginning and end of trial (also discuss cost) - variety trials for crops done in the region by extension agents. opportunity to introduce new farming practices				
	carbon sequestration		many work to reduce water demand - may not reduce deficit, maybe help the natural hazards one				
7	**Project Management**				Jed		
7a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 20, 2021, January 26, 2021, and February 17, 2021

Milestone Summary:

Years 1 through 2

Provide input as needed to built storage group from agricultural perspective (water management and project funding).

Identify grant (National Resources Conservation Service) to provide case studies for on-farm conservation/efficiency projects.

Develop list of programs - share.

Funding strategy for Integrated Water Management (IWM) projects.

Years 2 through 5

Implement Pilot Project Grant.

By 2040

Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).

Attain Step 3 assumed efficiency improvements:

• 90 percent of flood irrigation can be converted to a sprinkler of some kind.

• 33 percent of wheel lines can be converted to pivots.

• 75 percent of unconverted wheel lines will be upgraded to new nozzles, drains, etc.

• 75 percent of pivots that are not new (90 percent of total) can be upgraded with new sprinkler packages.

• Intensive IWM is used on all converted/upgraded systems.

Build before and after comparison of changes for next 20 years.

Data Collection, Monitoring, Research

Lead: (GRMW - Jesse); Team: Steve, Bill, Anton, Winston (ODFW?), Larry, Shad

Purpose: Coordinate data collection to fill data gaps, support working groups, and inform water management in UGRRW.

last updated: 2/17/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Priortize data gaps from step 2 and 3 reports**			Active		Objective 1.2 - Fill data gaps (instream flow now; complete by 2040)	
1a	List of data gaps from step 2/3	complete - located in Step 4 report					
1b	Prioritize data gaps, categorize/associate them with strategies to ensure they are addressed	Complete prioritization of gaps first					
2	**Develop and fund plan/set of plans for monitoring and data collection to fill Step 2/3 gaps**					Objective 1.2 - Fill data gaps (instream flow now; complete by 2040)	
	Surface water data collection and Monitoring	Obtain a technical assistance grant from OWEB (consider a partnership with GRMW)				Objective 2.1 - Reduce each water quality issue (by 2040)	
	Draft letter of support to keep existing gages	Letter to Salem; Letter for GRMW	GRMW has been helping on funding for 12 gages in area (BPA tried to eliminate)				
	Meet with Shad to discuss gage needs (exisiting and new)		Identify locations of all stream gages and determine additional beneficial locations; *biggest goal is to shore up funding to maintain existing long term gages would be beneficial to line new gages up with non structural water storage and habitat group				
	Install and operate additional stream flow gaging stations in strategic locations		*stretch goal - unlikely, want to keep what we have	Inactive			
	Coordinate interagency data sharing (specifically of stream flow gage data)	Review Alex's map - share with others?					
	Instream Flow Study	CTUIR and ODFW to lead					
	obtain funding for Catherine Creek and Grande Ronde	application submitted (hear back April 2021)		Active			
	conduct studies						
	Groundwater Data Collection and Monitoring	Task for a grad student? OSU (same a Walla Walla?) (or univ of montana - winston)	need to come up with creative ways to get enough data to support getting more funding (set up ourselves up for bigger study).			Objective 3.1 - Complete a groundwater study (by 2035)	
2b.1	Based on available funding and resources determine the size and scope of the study	Ask Phil for small steps to lay groundwork for study				Objective 3.2 - Implement plan based on study results	
2b.2	Improve our understanding of the data already collected through coordination with Oregon Health Authority and OWRD	Review Harney Basin Water Study for ideas (did they use existing data before data collection) - state geologist give overview of study (to whole group?)					
2b.3	Develop a network of observation wells to develop an understanding of groundwater movement and variability throughout the basin by determining the geometry of the water table over time		installing wells very expensive, need to be strategic				
2b.4	Characterize the hydrogeologic framework of the basin, and how varying landforms and lithologies relate to groundwater movement and storage						
2b.5	Improve groundwater quality monitoring - (nitrates, arsenic, coliform). This could include increasing the quantity of wells sampled, increasing the frequency of wells sampled, increasing the number of sampled analytes or some combination of these methods						
2b.6	Characterize and understand the groundwater resource, including an estimation of the annual groundwater budget, total storage and aquifer extent, seasonal variability in response to drought and usage draw, rate of change in groundwater elevation and flow direction						
	Develop an Instrumented Watershed/pilot project for data collection	USFS to lead					
2d.1	Initiate discussion with PNW scientists to better understand the possibilities for this kind of research at Starkey			Active	Bill reach out to PNW scientists		
2d.2	Study paired forest plots (30 percent canopy reduction to allow for water storage - Starkey) in coordination with the USFS			Inactive			
	Improve Water Use Monitoring						
2e.1	Improve on-farm efficiency monitoring		Ultimate goal toapture total out of stream use of monitoring and modeling for analysis (maybe could we get to this with modeling?)	Inactive			
2e.1	Locate pilot project site or landowners where there is interest in efficiency monitoring		Important to quantify gains in efficiency	Inactive			
2e.3	Improve monitoring of water use (surface and ground water)		Improve quantification of consumptive water use in UGR basin				
	Synthesis of total use (groundwater and surface water)						

3	**Research to address Step 2/3 data gaps**						
	Historical research						
3a.1	Reservoir research - begin by reviewing prior reservoir feasibility studies provided by Stakeholders	BOR and ODFW have phillips reservoir fish information					
3a.2	Flooding and fire histories (recorded and oral)						
3a.3	Collect anecdotal information from users to see what parts of the UGRRW have issues with flooding and drought						
	Water Quality Research						
3b.1	Identify areas for improvement in data collection and analysis related to water temperature, dissolved oxygen, flow limitations, nutrients, and bacteria concerns	GRMW is currently engaging in a 2 year Water Quality study in the basin - support that project and utilize information		Active			
3b.2	Determine if mercury levels in water are a concern in the UGRRW						
3b.3	Determine if nitrate contamination is a concern in the UGRRW						
3b.4	Investigate potential sources of pollutants and solutions to reduce input						
3b.5	Re-examine 303(d) standards to determine if the UGRRW Partnership should advocate for them to be changed						
	Water Quantity Research						
3c	Review existing studies of area geology						
	Nonstationarity Research	ODA/CIRC to lead (reevaluate now that M. Matter left ODA)		Inactive		Objective 4.1 - Develop natural hazards mitigation plan (by 2030)	
3d.1	Expand investigation into long-term data records for temperature, precipitation, and snow water equivalent to better understand basin hydrology and changes, including trends, that may be observed			Inactive		Objective 4.2 - Implement mitigation measures identified in plan (by 2040)	
3d.2	Compare to results of model simulations of historical records			Inactive		Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030)	
3d.3	Review projections, including literature reviews			Inactive			
3d.4	Organize periodic non-stationarity workshops (with specific and focused topics); cover approximately two to three related topics at each workshop every 1 to 2 years			Inactive			
3d.5	Collaborate with researchers to conduct investigations into and develop new methods for conducting hydrologic analyses that incorporate non-stationarity of hydrology and climate.			Inactive			
4	**Project Management**						
4a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 20, 2021 and February 17, 2021

OWRD Feasibility Study Grant (instream flow study) recommended for funding.

Milestone Summary:

Years 1 through 2

Prioritize data gaps.

Support maintenance of the operation of the current stream gauges (write letters to support gauges in basin).

Meet with OWRD (Phil) to determine next steps for groundwater study.

Grande Ronde Model Watershed water quality study begins - report outcomes.

Years 2 through 5

Support groundwater study.

Support instream flow study.

By 2040

Objective 1.2 - Fill surface water data gaps (instream flow now; complete by 2040).

Objective 2.2 - Fill water quality data gaps (by 2040).

Objective 3.1 - Complete a groundwater study (by 2035).

Objective 3.2 - Implement plan based on study results.

Non-Structural Water Storage and Habitat Management

Lead: (Union SWCD); Team: Jim W, Curt R, Rodger H, Adrienne/Winston (ODFW), Jesse, Bill, Mike Burton (NRCS), Tony Malmberg, CTUIR (Allen Childs or Anton)

Purpose: Raise awareness of work being done and how this work addresses goals of the Partnership; prioritize and pursue non structural storage projects in strategic locations

last updated: 2/17/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Outreach and Education about what habitat actions are**	SWCD/GRMW/ODFW anticipated to lead. First meeting on 1/19/21.		Active			
1a	Plan for field tours/presentation for awareness		*Scope and scale of all work going on in UGRRW *one project doesn't seem like it does much, but large affect over all (how hydrologic response response to issues we identified) - tangable results (restore meadow - what does that mean with AF-water) (ex: Bear Creek increased water flow as result of construction) *This group could secure funding for monitoring and measurements *alluvial storage model to put a number to potential for water storage (Jesse to send) (baseflow recharge potential of floodplains - researchers give talk on paper from Jim/Allen?) Good example (Birdtrack springs; longley meadows; Meacham; older and more recent floodplain reconnection projects;) *education around ATLAS process (not just fish habitat; other applications; high level mapping of confined and unconfined reaches - could use that for modeling for non-structural storage)				
2	**Prioritize Areas for Non Structural Storage**			Active		Objective 2.1 - Reduce each water quality issue (by 2040)	
2a	Use the ATLAS geomorphic scores in combination with Place-based Planning outputs to identify high priority areas for meeting water deficit and quality needs.	develop list of locations					
2b	Develop list of projects that have high geomorphic potential and those that are high priority (water deficit) for Partnership (current projects and future opportunities)	develop list of potential projects					
	Evaluate water storage projects (feasibility studies, funding, priority)	select most feasible project (timing, landowners, funding, effectiveness) - one more goal to add to scoping/prospectus (does it meet PBP and fish goals)					
2a	upland management		Public Lands group and Agriculture group have a direct influence and can address upland improvements.				
2b	floodplain management						
2c	riparian habitat management						
2d	instream habitat management						
2e	wetland management		Wetland Reserve Program (WRP) - share information on how much water is stored in that				
3	**Identify Project areas to implement/support**		BOR Water Smart Grant (Due Jan 19, 2022) potential for funding 100k of a habitat restoration plan if needed. After areas identified, we can help with funding or other areas.	Inactive			
3a	identify potential funding sources		DEQ 319 grants (riparian restoration, ag land fencing, temp bacteria) newport- turbidity monitoring – DEQ website. Harney watershed council 319 grant to compile water quality for the basin	Inactive			
3b							
4	**Project Management**						
4a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 19, 2021, January 26, 2021, and February 17, 2021

OWRD Feasibility Study Grant (storage and instream flow study) recommended for funding.

Milestone Summary:

Years 1 through 2

Update Stakeholders on ongoing work (present findings/data from floodplain projects and field tours).

Develop list of projects that have high geomorphic potential (atlas) and those that are high priority (water deficit/storage need) for Partnership (current projects and future opportunities).

Project development strategy.

Years 2 through 5

Continue project development strategy (adaptive management).

By 2040

Implement projects with the potential to improve water quality and quantity.

Understand the baseline is moving. Adaptive management needed.

Objective 2.1 - Reduce each water quality issue (by 2040).

Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).

Public Land Management

Lead: (USFS); Team: Bill G, Union County (Donna)

Purpose: Information sharing and communication between public land management agencies and Stakeholders to identify potential areas of mutual support

last updated: 1/20/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Support Collaborative Forest Partnership Projects - outreach**	USFS to lead		Active			
1a	Identify the best methods to support the Forest Collaborative and federal, state, and local forest managers	NBFC meetings scheduled monthly and open to public. SOPA published on FS website and updated regularly.	Attend monthly Northern Blues Forest Collaborative (NBFC) meetings to stay abreast of FS collaborative projects and offer input and support. Engage with forest projects through monitoring of schedule of proposed actions (SOPA) and providing input/support through public involvment and scoping processes				NBFC addresses collaboratively developed projects across the Umatilla and Wallowa-Whitman NF's. Each forest maintains a Schedule of proposed actions (SOPA) that summarizes all proposed planning projects across each forest.
1b	Outreach for stakeholders on USFS projects		Field Trip for interested group members (show hydrologic benefits of restoration projects)	Active			
2	**Support Restoration Projects of interest to the Partnership (that will improve water quality and quantity)**					Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	
2a	Increase soil organic content		Retention of coarse woody debris and effective ground cover are standard soil productivity mitigation measures applied to FS forest management activities aimed at maintain organic matter content/long term soil productivity			Objective 2.1 - Reduce each water quality issue (by 2040)	Soil productivity/organic matter retention measures are applied to all projects on FS lands.
2b	Identify and protect existing high-quality habitats that are important for water quality or quantity.		USFS project planning and design includes protection of water quality through application of riparian habitat conservation areas as outlined in PACFISH/INFISH and forest plan. Additional high quality habitats are also often identified and protected as part of project planning and design.				Applied across all projects on FS lands
2c	Restore floodplain-riparian-instream connectivity and complexity		Current and future aquatic restoration projects on FS lands include objectives to restore floodplain-riparian-instream connectivity				Much of the aquatic restoration work is focused in the Upper Grande Ronde basin including mainsteam Grande Ronde and tributaries on both federal public and private lands. With GRMW
2d	Upland spring, wetland and meadow protection		Current and future aquatic and upland restoration projects on FS lands often include objectives to restore springs, wetlands and meadows.				Applied across all projects as applicable on FS lands
3	**Support Vegetation Management Projects (to improve water quality and quantity available)**						
3a	Grazing management on federal lands (range management of wild and domestic ungulates)		Grazing management on federal lands is regularly assessed and adapted through allotment management plans and annual operating instructions that include addressing resource and administrative issues/opportunities including water quality				Applied to all active allotments across the national forest
3b	Timber management on federal lands (management of forest canopy)		Forest management activities on federal lands often considers effects of changes in foreset cover/canopy on water quantity and quality. Opportunities may exist for increased focus on water related objectives in future forest mangement project activities.				Applied to most forest management projects across the WW and UMA.
3c	Upland land management		Forest management activities on federal lands address a suite of upland conditions including forested and non-forested upland settings with overriding goals of restoring ecosystem function and resilience.				Applied to most forest management projects across the WW and UMA.
3d	Vegetation management - opportunity and costs for each type of project		??				
3f	Fire management		Integration of use of fire in forest management activities is an integral aspect of most current forest management projects and a key objective tied to the recent selection of the Northern Blues Collaborative Forest Restoration Proposal.				Applied to most forest management projects across the WW and UMA.
4	**Sediment and Erosion Management**						
4a	Road management for allowing runoff to recharge groundwater locations, sizing culverts appropriately, and decreasing sediment yield		Assessment of road related impacts on sedimentation and watershed connectivity and actions to address are often included as part of forest management projects and aim to reduce road related sediment and hydrologic impacts.				Applied to most forest management projects across the WW and UMA.
4b	Monitor uplands for erosion (sediment)		??				
4c	Buffer zones (review City and County riparian buffer zone requirements/standards and see how well they are being implemented)		Forest management activities include incorporation of riparian habitat conservation areas following PACFISH and INFISH guidelines including incorporation of riparain buffers.				Applied to most forest management projects across the WW and UMA.
5	**Project Management**						
5a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:
Meeting January 20, 2021
Milestone Summary:
Years 1 through 2 Update to Stakeholders. Field Trip for interested group members (show hydrologic benefits of restoration projects).
Years 2 through 5 Depending on group needs - develop projects for implementation.
By 2040 Objective 2.1 - Reduce each water quality issue (by 2040). Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).

Infrastructure/Land Modification

Lead: (Union County); Team: Curt Howell, Jed H, Jim W, Cheryl, Brett, County Road Deparment (JB Brock), Mike Burton (NRCS), Anton

Purpose: Reduce the frequency and severity of damage due to flooding now and in the future

last updated: 2/17/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Study potential actions to increase flow through the Grande Ronde Valley and reduce flooding while protecting water quality and summer through late fall baseflows.**			Active		Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040) Objective 4.1 - Develop natural hazards mitigation plan (by 2030)	
1a	Conduct basinwide hydraulic study to determine causes and locations of flooding and backwater areas) - add and update exisiting model. Add local/historical knowledge from landowners related to flooding.	Talk to BOR - Jim and Jed (2/25) Local information from flood - Cheryl (ask Curt H too)	*BOR hydrologic model (2010) - no funding to implement; potentially BPA funding/NRCS. Can they extend to our area? (how much water to expect through our system) *BOR - original run was 1D model. limited cross sections in the valley. Hope to see 2D model with scenarios. existing condition model (include hydraulic grade line) *Bill K from FEMA stated there is potential funding here through state programs (PDM provides funds for hazard mitigation planning and projects on an annual basis. https://www.oregon.gov/oem/emresources/grants/pages/hma.aspx) (FEMA funding could assist with sediment and hydrology) - wait to contact FEMA until BOR study results are known *Ask Scott if UC is a planning partner with FEMA (additional funding avaliable) *aerial maps, and fema map, draw flood extent on it, and correlate to gages		Jim/Jed		
1a1	Investigate and identify flow constriction points that create backwater and specific areas of flooding where floodplain modification may reduce impacts			Inactive			
1a2	Evaluate options for development of a levee system for flood control (coordinate with the USACE)			Inactive			
1a3	Evaluate the potential for constructing a parallel flood channel to alleviate flooding issues			Inactive			
1b	Create a flow model to determine the benefit of maintenance (sediment removal) from upstream of Rhinehart Gap and other flow pathways through the valley	Talk to Kayla - on existing study and openess to new work	*Kayla at GRMW has been working on sediment deposition study in upper basin (BPA) does not go below Hilgard. Green Lidar data from GRMW - to dl		Jim		
1c	Floodway conservation program - survey landowners for interest	More information from Mike to be ready for next flood	*This is part of the emergency watershed protection program, eligability is only triggered after a natural disaster (flood event). There is an easement part that landowners can particpate in - market value of land and restore to natural conditions	Active - but limited eligability	Jed		
1b	Apply for funding for a flow study			Inactive			
2	**Irrigation ditches to reduce flooding**	Dana to set up second Q 2021 (OWRD anticipated to lead)	*Moved from ag land management to infrastructure (1/20/2021)		Dana	Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	
2a	assess legal reqirements and meet with watermaster		see if legally (risk of letting water out and hurting other people) or physically feasible				
2b	determine if this is a feasible approach to manage flood water						

2c	create flood control district						
3	**Flood mitigation measure study**		moved to infrastructure group				
3a	Obtain funding to conduct research on legal flood reduction measures for cities and landowners (i.e., County planning grant, Federal Emergency Management Agency [FEMA])						
4	**Project Management**						
4a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meetings January 20, 2021, February 17, 2021, and March 18, 2021

Milestone Summary:

Years 1 through 2

Bureau of Reclamation Hydraulic Study - develop scope/fund work/complete work (Union SWCD to develop scope)
Sediment Study - develop scope/fund work/complete work.
Irrigation ditch opening meeting.

Years 2 through 5

Natural Hazards Mitigation Plan Development/project list.

By 2040

Objective 4.1 - Develop natural hazards mitigation plan (by 2030).
Objective 4.2 - Implement mitigation measures identified in plan (by 2040).
Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030).

3.18.2021 meeting

Jim: Jim talked to Kayla about sediment model - possibility of running the model down to the gap. Initially it looks costly.

Jed notes:

I thought I would give a brief summary of our GRMW valley subgroup meeting today with Brandon Barrow and Christopher Cuhaciyen, of BOR, regarding their hydraulic modeling work:

Our allotted meeting time went by very quickly! Almost the entire meeting time was used to describe some recent modeling runs they've done on lower Catherine creek, with not much time for discussion afterward. They built upon the modeling done around 2011 with updated (HEC-RAS 2?) software, but have not yet incorporated the newly available green lidar data. The current runs were done to model existing conditions of the Feb. 2020 flood event. The main purpose was to assist ODFW with improving conditions for outmigrating smolts during spring high flow events. During these events, the area around the confluence of the State Ditch and Catherine Creek floods, backing up water to the point that water flows up Catherine Creek, which is presumed to have a negative impact on the downstream migration of smolts in that part of Catherine Creek. Much of the focus of this investigation was on streamflow velocities in Catherine Creek and ways they could be increased. The spatial extent of the modeling was lower Catherine Creek, from the confluence with the State Ditch up to around the historic confluence with the Grande Ronde.

I got a chance to ask about modeling for our project at the end of the meeting. It sounds like there might be some overlap between what we're looking to do and work they had planned to do anyway, specifically to extend the model downstream to the constriction points around Rhinehart gap. I asked if the Catherine Creek velocities could be increased by opening up downstream constriction points. They didn't know, but sounded interested in extending the model downstream to find out.

Questions

What have you modeled? What area (and extents), and what modeling has been completed? Has this been compared to base flood elevations (BFEs) or extent? A: 2d model just CC area. Brandon to reach out to TSE in Denver to find out what was modeled in 2012

***no sediment sampling (we would like to extend it down to the gap) look at different flood elevations**
action: Jim coordinate scope and map and goals with Brandon - jim put together a scope of work for bor
How much have the levees changed over time? And how has that affected flood events? Anedotally, changes in levees seem to affect flow localy
Work was done in lower Catherine Creek - Could BOR extend the model to the gap/have you already done this with 2d model
Model 100 year flood in area of exising model and compare with regulatory floodplain (original map done with only 1970 aerial photography)
original model of channel profile - could we compare it to data the BOR has collected (we have more recent bathymetry data)
how far downstream does green lidar extend? Gap to up catherine creek and grande ronde. Compare this to 100 year flood data
have extents of flooding changed over time?
what can be done do improve situation? At this point we would take a look at downstream effects in elgin
Can we look at pinch points in the 2d model? Want to see where channel capacity is reduced
can look at water surface elevations, can look at grades
la grande through island city stretch is a growing problem.
Are we seeing more flooding (exceedences of the 100 year flood event) than we have historically? Is 100 year flood event still the 100 year event?
Why are we seeing increased flooding? (hydrology/increased flows, geometry/sedimentation?)
How did they define flows for 100 flood event (sometimes driven by CC runoff or GR runoff - or both)? Examine reoccurance event based on troy gage
if 100 year flow is 10cfs, run through 2d model (however the different inputs from CC and GR are not represented - flooding happens differently based on different stages from CC and GR)
What solutions can address increased flooding (address pinch points etc)?

how could that be funded/implemented:
potentally NRCS - CREP levee setbacks and easement payments)
Land trusts, or easements, or working lands program (allows some use)
if we could demonstrate a fish benefit from a levee setback and riparian easements - we could potentially get BPA funding for fish benefits

Administrative Actions

Lead: (CTUIR); Team: Tony M, Steve P, Anton, Levi Old, Jim Webster, Shad, Winston, Adrienne

Purpose: Increase awareness of how administrative actions can improve water quality and quantity. Administrative actions are defined publicly available actions to utilize existing laws to use water for different purposes in different times of the year (water market/management framework). Administrative actions would be voluntary and non-regulatory.

last updated: 2/17/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Outreach and Education**						
1a	Prepare outreach material (and outreach strategy) for landowners (gather existing resources)		Education provides more tools in the toolbox. Landowners and implementors/funders need education too. Need to get OWRD (Shad) to attend meetings/share information to landowners about other uses for water Secured water instream is not a zero-sum game (all users can benefit through these actions)	Active			
1b	Prepare outreach material for legislators (split season leases, bills/advocasy etc) (Partnership name and approval)		Would we be interested in supporting Idaho dam breach plan?	Active			
1c	Determine how best to support Trout Unlimited in new QLE role in basin		Anton contact Levi (possibly a national WR coordinator or Aaron Penvost, Boise	Active	Anton		
2	**Evaluate a water market/management framework**					Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040)	
2a	Because many of these actions require the voluntary participation of water rights holders, they will be surveyed first to see if there is interest in some of these actions before allocating additional resources to developing water market frameworks		*educational awareness around these topics before survey (outreach materials - Use OWRD information and obtain real life examples) - from QLE (qualified local entity - BPA) or columbia basin transfer program *education for landowners and legislature (allocation of conserved water - presentation recorded by Terri at OWRD) - in person forums valuable (Revisit - Steve/Anton's presentation) *need to build relationships and trust and word of mouth recommendations *support TU				
2b	Determine the best funding source for whatever work is needed as a result of the water rights holder survey						
2c	Conduct a feasibility study/develop draft water market framework and study the following:						
2c.1	Outline methods to utilize water reservations (for storage strategies)						
2c.2	Cross basin transfers (currently prohibited in the Basin Program Rules)						
2c.3	Voluntary water right leases and transfers, including split-season instream leases		1-2 page documents about this; this sunsets in 2 years				
1c.4	Method of allocation of conserved water						
1c.5	Method to obtain new instream water rights and instream flow protections						
1c.6	Minimum flow agreements						
1c.7	Source water exchanges		Explore feasibility of replacing surface water deficits with groundwater				
1c.8	Wetland mitigation bank (or potentially a stream mitigation bank to incentivize wetland creation and restoration)		non profit?				
1c.9	Water bank						
1c.10	Apply for new instream water rights						
1d	obtain funding for implementation if positive outcomes are yielded from the study						
3	**Project Management**						
3a	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 21, 2021 and February 17, 2021

Milestone Summary:

Years 1 through 2

Prepare outreach material (and outreach strategy) for landowners (gather existing resources).
Prepare outreach material for legislators (split season leases, bills/advocacy, etc.) and partnership name and approval.
Determine how best to support Trout Unlimited in new Qualified Local Entity role in basin.

Years 2 through 5

Survey of interest and potentially adoption of programs.
Fund and implement improvements or projects.

By 2040

Understand the baseline is moving; partnership will focus on "secured water" put into stream (quantify as a result of transactions). Adaptive management needed.

Objective 1.1 - Reduce current deficit (begin studies immediately; complete by 2040).

Municipal Land Management

Lead: (City of La Grande); Team: Kyle, Leonard, Dave J.; JB Brock

Purpose: Improve City-to-City coordination to respond to natural hazards, increase water conservation, and support water infrastructure efficiency improvements

last updated: 2/18/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Coordinate with municipalities to determine how the UGRRW Partnership could best assist in providing support to multiple municipal systems and land to improve water quality and quantity.**		Maybe this formalizes our agreement to help (ODOT also has emergency agreement - one like this) - grants/cooperative agreements (equipment sharing list - reduce duplication of resources) - contact list (when certifications lapse, need someone to sign off - would be nice to have cities help each other sign off when needed) *FEMA emergency response plan - only 3 cities are in the County's plan, could other cities get amended into that (plan is expired; plan is not anticipated to be FEMA approved).				
1a	The UGRRW Partnership would first determine if such a plan would be supported by municipalities.		*Mayors meeting - ask if Mayors want to support group effort *Need FEMA approved Natural Hazard Mitigation Plan		Leonard Flint		
1b.1	If supported, obtain funding to study and implement the following:						
1b.2	Require bioswales (vegetation infiltration of stormwater) for new construction; add new bioswales to increase infiltration.						
1b.3	Find additional locations that would benefit from filter strips.						
1b.4	Review point source control technology and look for efficiencies.						
1b.5	Improve municipal water efficiency and redundancy including needed infrastructure improvements.						
1b.6	Improve existing stormwater facilities (pipes and ditches) to help channel and control water flow; look into the potential for stormwater collection for reuse.						
1b.7	Nonpoint source control - Reduce impervious surfaces and direct runoff.		*to look into: Depave.org is a non-regulatory option that may be accessed.				
1b.8	Review potential to develop or update Water System Master Plans, Water Management and Conservation Plans, or Water Curtailment Plans for each city and a coordinated approach to conservation, system testing, and maintenance, which could help smaller cities by producing conservation and long-term infrastructure planning to reduce the impact of potential demand increases.		*WMCP - only needed over 10k *stormwater master plans needed *cove: revise analysis, upsize culverts etc				
1b.9	Look for opportunities for water reuse.						
1b.10	Evaluate feasibility of non-traditional water supply techniques including rainwater, stormwater, greywater, and/or other novel and innovative technologies.						
1b.11	Ensure all communities are covered in Union County Emergency Response Plan	Contact Donna related to plan lapse (completed 1/20/2021 - wait for response)	Need FEMA approved emergency response plan - Union County wide plan to include all cities				
2	**Project Management**						
2b	Prepare Quarterly update to UGRRW Partnership		First update to start June 2021 (After OWRD grant expires)				

Progress Summary:

Meeting January 20, 2021 and February 18, 2021
Information presented at Mayor's meeting January 20, 2021.
County Emergency Manager contacted January 20, 2021 related to Emergency Response Plan update.

Milestone Summary:

Years 1 through 2
Determine if mayors of cities want to work on a plan for shared resources for water conservation.
Update Partnership on cities water/stormwater/flood activities.

Years 2 through 5
Updated Federal Emergency Management Agency Natural Hazard Mitigation Plan to cover all cities.

By 2040
Objective 4.1 - Develop natural hazards mitigation plan (by 2030).
Objective 4.2 - Implement mitigation measures identified in plan (by 2040).

Objective 4.3 - Create an adaptive management protocol to apply new climate change data to goals (by 2030).

Education and Outreach

Lead: (Union County); Team: Kyle, Roxy, Donna, Darrin

Purpose: Inform the public about water quality issues and Partnership activities

last updated: 2/18/2021

Numb	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	**Update the UGRRW Partnership's outreach plan to include support or action on the following items:**		Water Quality topic of the month on County or City website		Ask Roxy for material from other groups		
1a	Provide education and outreach support to other working groups as needed		ex: Ag land and built storage				
1b	Promote awareness of local DEQ Environmental Cleanup Site Information Database-listed sites (potentially through posting a link on the County's website).		County website link		County		
1c	Meet with the DEQ to discuss their pilot data sharing project (cleanup program information)		Wait to discuss with Roxy	Inactive	DEQ	Objective 2.1 - Reduce each water quality issue (by 2040)	
1d	Promote the recycled chemical program (for pesticides from agricultural and municipal sources). This could potentially be done through fliers, supporting agencies working on this, or posting a link on the County's website.		Darrin Larvik Waste Pro - call and ask if any extra help promoting events from Union County. Example: Pesticide/Ag Chemical Collection-by the Clackamas Soil and Water Conservation District, Clackamas Water Providers, and Pesticide Stewardship Partnership Contact: Lisa Kilders. Lisa said that she has lots of outreach materials to share if you're interested. Email: lkilders@conservationdistrict.org				
1e	Inform the public about best practices for lawn care (i.e., inform the public about the risks of over-application of lawn care products and fertilizers flow to the creeks). This could potentially be done through new homebuyer packets, fliers, and links on County's website.		Could talk to cities to include in annual water quality report Lawn care education materials- Clackamas SWCD - https://conservationdistrict.org/resources/yard https://wmswcd.org/projects/soil-school/		Union (Donna) - Dana blurb (ask mayors what is helpful)		
1f	When relevant, conduct public outreach related to local toxic algae blooms (potentially through newspaper articles, radio ads, or public postings).		Ask Winston - for clarification, what would be helpful				
1g	Distribute relevant information from city water reports and additional information such as how and where people can get well water tested to unincorporated users in the County (determine the best way to do this with the City of La Grande). Potentially contact the Portland Water Bureau for outreach material ideas.		Work with Elkhorn media group to get link out there to all county residents - need to determine interest				
1h	Support educational events promoting conservation farming practices (discuss the best method of support with OSU Agricultural Extension Office of Union County).		Talk to Darrin about event promotion (4h) Master Gardener program (https://extension.oregonstate.edu/program/all/mg/events) https://wmswcd.org/types/farm/ Darrin will obtain water quality related materials for master garderner program https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9125.pdf https://catalog.extension.oregonstate.edu/		Could add to La Grande's website		
1i	Develop outreach materials related to improving municipal water conservation and use efficiencies. Potentially contact the Portland Water Bureau for outreach material ideas.		Future stewards day for 3rd grade. Look into what PWB has on website		Dana to research		
1j	Determine interest in supporting landowner tours and hands-on workshops.		maybe make water the main focus of the farm tour Eastern Oregon Rodeo is working with OHA to have it		Donna to check in		
1k	Update the text of the Outreach document						
1l	Digital storytelling about partnership	in progress - to be completed end of 2021	Story Gorge training	Active	Donna (Union County) and Alex (GRMW)		
2	**Project Management**						
2a	Prepare Quarterly update to UGRRW Partnership						

Progress Summary:

Meeting January 22, 2021 and February 18, 2021
Outreach to Department of Environmental Quality for assistance on January 22, 2021.

Milestone Summary:

Years 1 through 2

Prepare and distribute outreach material on lawn care issue to cities/county.
Digital water quality outreach to county residents (reassess after first year).
Digital Storytelling project to be completed.

Years 2 through 5

Update outreach document.
Field tour/workshop.

By 2040

Objective 2.1 - Reduce each water quality issue (by 2040).

Project Management

Lead: (Union County)

last updated: 9/28/2021

Number	Task	Status/Deadline	Notes	Active/Inactive	Lead	Connected Objective	Scale and Scope
1	OWRD Feasibility Study Grant	Awarded	Working on contract 9/28/2021	Active	Union County - Dana		Entire UGRRW
2	OWRD PBP Grant	Waiting for additional $50,000 contract					
3	OWEB TA Feasibility Study Grant	Ranked 2/6 by tech committee 9.28					
4	BOR Grant	Deadline - January 19	Did not Apply; consider for 2022	Inactive			
5	OWEB Grant	Expires March 30, 2023	Need to complete Strategic Action Plan				

Progress Summary:

Submitted OWEB Progress Report 12/30/2020

Milestone Summary:

Year 1-2

Submit OWEB Progress Reports 12/30/2021; 12/30/2022

Year 2-5

By 2040

APPENDIX B
UGRRW Partnership Participation (2016-2021)

Organization	Name	Sector	MOU Signatory (Yes/No; if Yes, non-voting noted)	Number of Meetings Attended	Additional Responsibilities	Primary interests (Instream, Agricultural, Municipal)	If reduction in participation, why?	Eligible to Vote on Step 5 Report
Anderson Perry & Associates, Inc.	Dana Kurtz; Brett Moore	Consultant	No	98	Assist on all committees	N/A	N/A	No
Oregon Department of Fish and Wildlife	Tim Bailey; Nick Myatt; Adrienne Averett; Danette Winters; Ana Packman Stevens; Coleen Fagan; Winston Morton; Jeff Yankee; Joe Lemanski	Government	Yes	91	Steering Committee; Instream Demand Group; Technical Committee	Instream	N/A	Yes
OWRD	Shad Hattan, Harmon Burright; Jason Spriet; Jen Woody; Kim Ogren; Nick Teague; Rachel Lovelford; Robert Harmond; Steve Parrett;	Government	Yes	90	Steering Committee; Municipal Demand Group	Instream	N/A	Yes
Union County	Donna Beverage; Scott Hartell; Lorcinda Johnson; Darcy Carreiro; JB Brock; Mark Davidson;	Government	Yes	89	Steering Committee	Municipal	N/A	Yes
Union County Farm Bureau	Jed Hassinger	Agricultural	Yes	78	Steering Committee; Agricultural Demand Group; Technical Committee	Agricultural	N/A	Yes
Grande Ronde Model Watershed		Non-Profit	Yes	68	Technical Committee; Data Strategy Group	Instream	N/A	Yes
City of La Grande	Kyle Carpenter	City	Yes	63	Steering Committee; Municipal Demand Group; Municipal Strategy Group; Outreach Strategy Group	Municipal	N/A	Yes
Confederated Tribes of the Umatilla Indian Reservation	Anton Chiono; David Haire; Allen Childs; Chris Marks; Ian Wilson	Tribal	Yes	55	Technical Committee; Instream Demand Group; Storage Strategy Group; Learning Partnership Representative; Bend water planning Conference representative	Instream	N/A	Yes
Oregon Department of Agriculture	Margaret Matter; Tom Demianew	Government	Yes-Non Voting	53	Agricultural Demand Working Group; Natural Hazards Group; Bend Water Planning Conference Representative	Agricultural	Lack of Capacity	No
US Fish and Wildlife	Gary Miller; Gretchen Sausen; Marisa Meyer	Government	No	39	N/A	Instream	N/A	No
The Freshwater Trust	Tony Malmberg; Jessica Humphreys; Caylin Barter; Aaron Maxwell	Non-Profit	Yes	38	N/A	Instream	Lack of Capacity	No
Department of Environmental Quality	Smita Mehta; Tonya Dombrowski; John Dadoly; Randy Jones; Roxy Naler	Government	Yes	34	Technical Committee	Instream	Lack of Capacity	No
Oregon State University Extension	Darrin Walenta; Leticia Henderson; Robin Maile; Kacie Melville; Maria Zamoraire; Abigail Tomasek	Education	Yes	34	Agricultural Demand Work Group	Agricultural	N/A	No
Farmer	Curt Ricker	Agricultural	Yes	33	Union County Farm Bureau Representative; Union Soil Water Conservation District Representative; Agricultural Demand Working Group	Agricultural	N/A	Yes
Private Citizen	Larry Larson	Agricultural	Yes	32	N/A	Agricultural	N/A	Yes
Union County Cattleman	Rodger Huffman	Agricultural	Yes	32	N/A	Agricultural	N/A	Yes
US Forest Service	Bill Gamble	Government	Yes - Non Voting	28	Natural Hazards Group	Instream	N/A	Yes
Union County Soil Water Conservation District	Jim Webster; Katheryn Frenyea; Aaron Bliesner, Deric Carson	Non-Profit	Yes	27	Habitat Strategy Group	Instream and Agricultural	N/A	Yes
NRCS	Mike Burton; Nick Vora	Agricultural	Yes-Non Voting	25	Agricultural Demand Working Group	Agricultural	N/A	No
Farmer	Tim Wallender	Agricultural	Yes	21	N/A	Agricultural	N/A	Yes
Fescue Comission	Matt Insko	Agricultural	Yes	20	N/A	Agricultural	N/A	Yes

Organization	Name	Sector	MOU Signatory (Yes/No; if Yes, non-voting noted)	Number of Meetings Attended	Additional Responsibilities	Primary interests (Instream, Agricultural, Municipal)	If reduction in participation, why?	Eligible to Vote on Step 5 Report
Farmer	Cheryl Murchison	Agricultural	Yes	17	Storage Strategy Group	Agricultural	N/A	Yes
City of Cove	Dave Johnson; Del Little; Doug Kruse	City	Yes	15	Municipal Strategy Group	Municipal	N/A	Yes
City of Union	Lenord Flint; Rod McKee	City	Yes	14	Municipal Strategy Group	Municipal	N/A	Yes
Farmer	Curt Howell	Agricultural	Yes	12	Storage Strategy Group	Agricultural	N/A	Yes
US Senator Ron Wyden	Kathleen Cathey	Political	No	12	N/A	N/A	N/A	No
Bureau of Reclamation	Darrell Dyke	Government	No	11	Agricultural Demand Working Group	Instream; Agricultural	Retirement	No
Farmer	Ann Hulden	Agricultural	Yes	9	N/A	Agricultural	N/A	Yes
Union County Seed Growers	Brett Rudd	Agricultural	Yes	9	N/A	Agricultural	Lack of Capacity	No
Business Oregon	Melissa Drugge; Jeremey McVeety; Brian McDowell	Business	No	7	N/A	N/A	N/A	No
Merkley	Karen Wagner; Jessica Keys	Political	No	6	N/A	N/A	N/A	No
OTEC	Susan Snider; Nina Valerio	Electricity	No	6	N/A	N/A	N/A	No
Eastern Oregon University	Maren Peterson	Education	No	5	Technical Committee	N/A	Lack of Capacity	No
Trout Unlimited	Levi Old	Non-Profit	Yes	4	N/A	Instream	Lack of Capacity	No
City of Island City	Delmer Hanson; Rob Ray	City	No	3	N/A	Municipal	Lack of Capacity	No
Farmer	Jim McDonald	Agricultural	No	3	N/A	Agricultural	Unknown	No
Ford Family Foundation	Maurizo Valerio	Non-Profit	No	3	N/A	N/A	N/A	No
National Marine Fisheries Service	Sara Fleshmyer; Rebecca Viray	Government	No	3	N/A	Instream	Lack of Capacity	No
Walden	Tucker Billman	Political	No	3	N/A	N/A	Unknown	No
City of Imbler	Mike McLean	City	Yes	2	N/A	Municipal	Lack of Capacity	No
Governor's Office	Courtney Cromwell	Political	No	2	N/A	N/A	N/A	No
GSI	Jason Meledy	Consultant	No	2	N/A	N/A	N/A	No
Nez Perce Tribe	Bobby Hills	Tribal	No	2	N/A	Instream	Felt CTUIR had it covered	No
Private Citizen	Michael Bettis	Agricultural	No	2	N/A	Agricultural	Unknown	No
Baum Smith	Delon Lee	Legal	No	1	N/A	N/A	Unknown	No
Boise Cascade	Bart Barlow	Industrial	No	1	N/A	Municipal	Retirement	No
CIRC	Cathey Delo	Education	No	1	N/A	Instream	N/A	No
Farmer	Austin Bingaman	Agricultural	Yes	1		Agricultural	Unknown	No
Farmer	Kurt Bowman	Agricultural	No	1	N/A	Agricultural	Unknown	No
Farmer	Dennis Murchison	Agricultural	No	1	N/A	Agricultural	Unknown	No
Imbler FFA	JD Cant	Education	No	1	N/A	Agricultural	N/A	No
Observer	Cherise Kachelie	Media	No	1	N/A	N/A	Unknown	No
Powder Valley Control District	Lyle Umpleby	Agricultural	No	1	N/A	Agricultural	Out of area	No
Private Citizen	Levon Baremore	Agricultural	No	1	N/A	Agricultural	Unknown	No
Private Citizen	Mauri DeLint	Agricultural	No	1	N/A	Agricultural	Unknown	No
Private Citizen	Peter Nilsson	Agricultural	No	1	N/A	Agricultural	Unknown	No
Private Citizen	Bill White	Agricultural	No	1	N/A	Agricultural	Unknown	No
Water Watch	Kimberly Priestly	Non-Profit	No	1	N/A	Instream	Out of area/lack of capaticy	No