UPPER GRANDE RONDE RIVER WATERSHED PARTNERSHIP

UNION COUNTY, OREGON

DRAFT PLACE-BASED INTEGRATED WATER RESOURCES PLAN

April 2021

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

Commented [PRT - Sug1]: Overall, the Plan would benefit from editing with an eye for clarity and thoroughness. Although it is an option to refer back to previous reports (as outlined in the Step 5 Guidance), the Partnership should keep in mind that readers - and most importantly, local implementers and citizens - picking up the Implementation Plan as is may struggle to draw the linkages of how/why these actions were decided upon, and have little detail on how those actions will reach the desired outcomes because few quantifiable metrics were included. This could be resolved through providing more detailed sections for each of the strategies, clearly outlining the linkages between how the work of previous stages has led to the identified actions, and what the anticipated outcome of those actions will be. However, we also understand the need to balance adding this detail with keeping the plan at a manageable length

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Suggested Citation: Upper Grande Ronde River Watershed Partnership. 2021. Place-Based Integrated Water Resources Plan. Union County, Oregon, USA.

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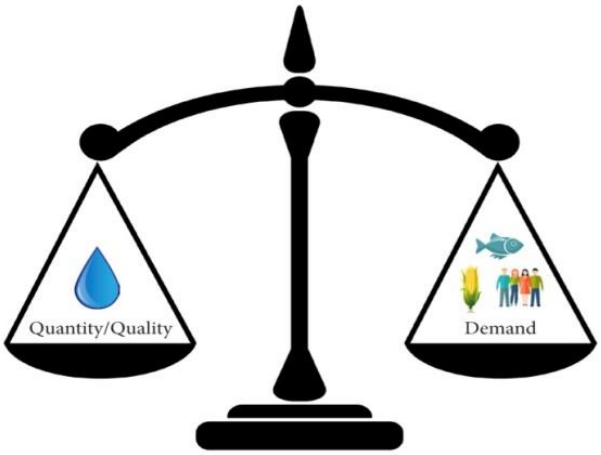
Partnership Approval Date: The Upper Grande Ronde River Watershed (UGRRW) Partnership supports the conclusions and recommended strategies contained in this Place-Based Integrated Water Resources Plan as determined by a vote of the UGRRW Partnership on April 20, 2021.

Final Approval Process: Once the UGRRW Partnership approves the Plan, it will be 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 will be addressed and approved by the UGRRW Partnership. A final Plan will be submitted to the agencies for approval. Once approved by the agencies, the Plan will be submitted to the Oregon Water Resources Commission for formal recognition.

Commented [PRT - Sug2]: Recommend a 30-day public review of the Final Plan or broader public outreach as you begin implementation.

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.



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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~~.~~. ~~See Figures ES-1, ES-2, and ES-3 for County location, UGRRW location, and the project timeline.~~ to develop a place-based integrated water resources plan consistent with the State of Oregon's guidelines. This plan helps to 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 both 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

Commented [PRT - Req3]: Required: The plan must acknowledge a link between the place-based Integrated Water Resources Plan and the Statewide Integrated Water Resources Strategy. Please include a statement in the plan (proposed language included).

Commented [PRT - Req4]: Required: The plan must recognize the public interest in water as well as state authorities and responsibilities. Please include a statement in the plan (proposed language included).

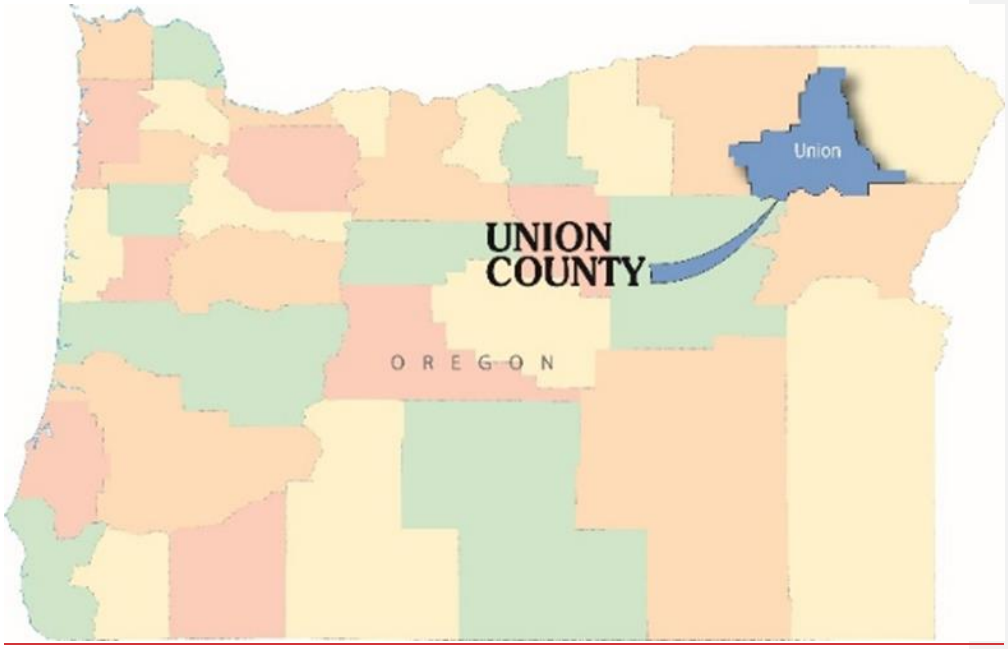


Figure ES-2
Location of Upper Grande Ronde River Watershed

Section 1.0: The Planning Process

More than 25 groups signed a memorandum of understanding 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 Planning Guidelines (UGRRW, 2017).

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

Commented [PRT - Sug5]: Include the exact number of signatories. Consider listing these groups/individuals in the Executive Summary.

Commented [PRT - Sug6]: Are there other outcomes worth highlighting here?

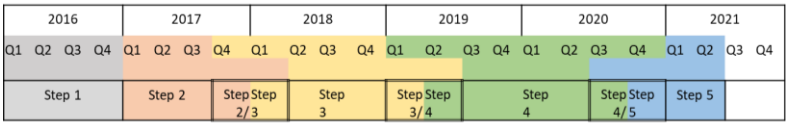
Commented [PRT - Sug7]: Consider referencing the planning guidelines and including a citation in the text and at the end of the document. Also consider including a link.

Commented [PRT - Sug8]: Consider referencing the planning guidelines and including a citation in the text and at the end of the document. Also consider including a link.

Commented [PRT - Sug9]: Why is this citation included? Does not appear to be essential.

Commented [PRT - Sug10]: Consider describing each of the different planning steps for readers who may not be aware.

Commented [PRT - Sug11]: Briefly describe each of the reports that were generated and the process used to generate and approve them. The reader will be unaware of your history. Include a link to the reports.



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

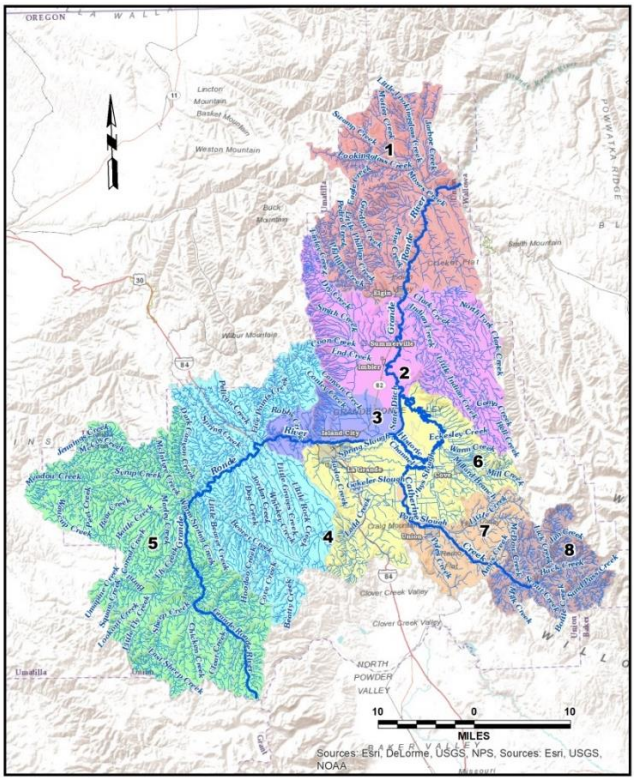
Section 2.0: Water Resources

For planning, the UGRRW is divided into eight subwatersheds, as shown on Figure ES-4.

Commented [PRT - Sug12]: Consider including bullets describing the current status and any critical issues identified to aid the reader who may be less familiar with the topic.

Commented [PRT - Sug13]: Is there a simple way to describe how these 8 sub-watersheds were determined? Or point to another document where this is described?

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 (WRIS) 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 underestimated since instream water rights, the only quantified instream demands in the UGRRW, are an incomplete approximation of demand, and cover only a portion of all the streams in the UGRRW and do not account for the full range of ecological 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. 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. 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. A basin-wide program to facilitate mitigation does not currently exist. Municipal systems appear to have the lowest vulnerabilities of the three demand groups.

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 self-supplied domestic and livestock uses, self-supplied industrial uses, recreational water uses, hydroelectric power, and groundwater dependent ecosystems (such as springs) were not formally assessed in the current version of this plan.

Commented [PRT - Sug14]: The first part of the sentence states that the groundwater budget was computed and the latter part of the sentence states it could not be computed. Please reconcile.

Commented [PRT - Req15]: Required: Revise as suggested for accuracy.

Commented [PRT - Sug16]: Can you include what portion of streams are covered?

Commented [PRT - Sug17]: Despite your inability to calculate it, would you agree that the instream demand is likely to increase under the selected RCP. Consider mentioning this.

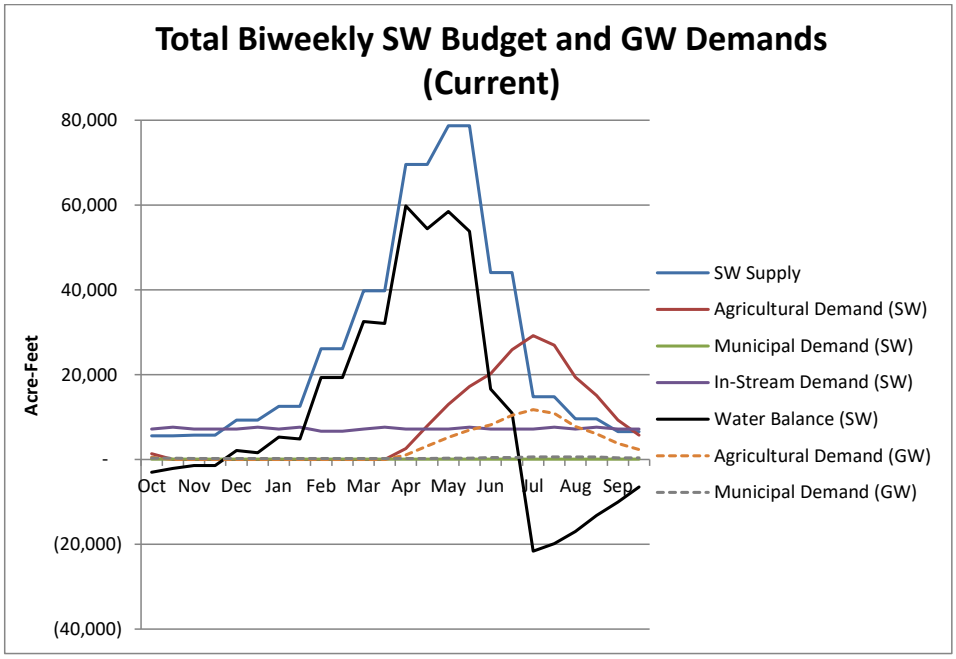
Commented [PRT - Sug18]: Do you know the percentage of water consumed by agriculture relative to other uses? Consider including.

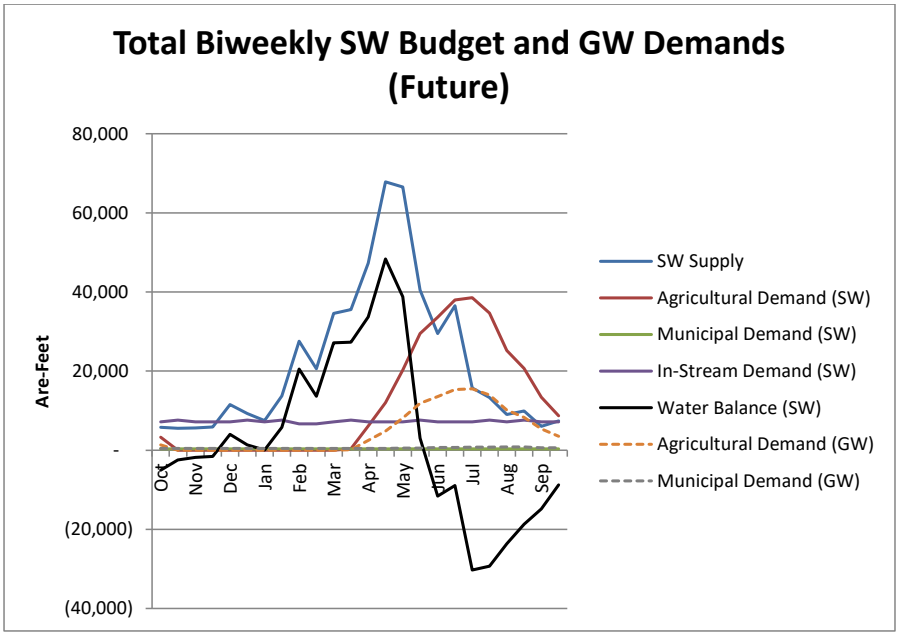
Commented [PRT - Sug19]: How did you make this determination?

Commented [PRT - Sug20]: While there is some uncertainty regarding these connections, the connection should be acknowledged.

Commented [PRT - Sug21]: Is this based only on water quantity and water quality? What criteria were used to make this determination?

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





Area water quality concerns include temperature, bacteria, sedimentation, dissolved oxygen 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 (TMDLs) have been established for Temperature and Bacteria, with the main 303(d) listed concerns being high temperatures and low dissolved oxygen (DO), which are associated with seasonal low flows, as well as sedimentation and pH (UGRRW, 2019).

Commented [PRT - Req22]: Water Quality is not adequately addressed and does not reference or acknowledge important key findings from DEQ's TMDL Report. The TMDL overview is inaccurate. Suggested language is proposed here and later in the document.

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.

Table ES-1
Subwatershed Summary

Subwatershed	Total Acres	Land Use	Municipal Water Use (all groundwater)	Estimated Surface Water Quantity (Natural Streamflow) (acre-feet per)	Estimated Mean Annual Precipitation (inches)	Estimated Mean Annual Evapotranspiration (inches)	Surface Water Quality	Groundwater ~~Quantity~~ Use	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~~sub-watersheds.
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.

Commented [PRT - Sug23]: Very helpful table. For an outside reader it can be difficult to correlate the numbers to the locations, consider co-locating the table with a map or finding a way to add some of these values to a map.

Consider also including:
Acres of irrigated agriculture in each sub-watershed.
Miles of river with an instream water right in each sub-watershed.

Commented [PRT - Sug26]: Using ground water right permits to estimate water quantity (p.8) only reflects an estimate of groundwater withdrawals, and does not provide an estimate how much water there is in general (outside of human uses).

Commented [PRT - Sug24]: Is this for all vegetation? Or just crops?

Commented [PRT - Sug25]: Consider adding a column with surface water use as well (low to high use).

Commented [PRT - Sug27]: Are these statements associated with municipal water use? If not, consider removing. The same goes for statements made below.

Commented [PRT - Sug28]: What is meant by this?

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, Section 7.0, Tables 7-3 and 3-4).
2. There is significant uncertainty with groundwater supply. The UGRRW Partnership needs ~~a plan~~ 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.
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, Tables 2-1 and 3-4).
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, Section 3.0, page 3-45, and Step 3 report, Section 6.0).

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 - Reduce groundwater declines and supply uncertainty**
   - Objective 3.1 - Complete a groundwater study (by 2035)
   - Objective 3.2 - Develop and implement plan based on study results

~~2.~~3. **Issue/Goal 3 - 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 declines and supply uncertainty~~
   - ~~Objective 3.1 - Complete a groundwater study (by 2035)~~
   - ~~Objective 3.2 - Develop and implement plan based on study results~~

~~6.~~4. **Issue/Goal 4 ~~- Natural -~~ 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)

Commented [PRT - Sug29]: Include a reference to the appropriate Step report(s) like the other issues.

Commented [PRT - Sug30]: No discussion of these issues included in the Executive Summary. Consider including a few bullets.

Commented [PRT - Sug31]: This is confusing. Is the goal to reduce groundwater declines? Reduce groundwater supply? Or reduce uncertainty regarding groundwater supply and trends?

Commented [PRT - Sug32]: Is there currently a natural hazards mitigation plan for any of the municipalities?

- 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 the top five strategies (see Table ES-2 below) while retaining other strategies for use as appropriate (UGRRW, 2020).

Commented [PRT - Sug33]: Clarify what it means to prioritize the top five strategies?

Commented [PRT - Sug34]: Clarify what you mean by "for use as appropriate"?

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 and implementation lead, a brief description, purpose, and selected milestones.

Table ES-2
Strategy Summary

No.	Strategy (Implementation Lead)	Description/Purpose	Selected Milestones
1	Built Storage - Aboveground Storage and Underground Storage (Union County)	Address specific 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.
2	Land Management - Agricultural Land (Natural Resources Conservation Service)	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 (Grande Ronde Model Watershed)	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. • ~~Conductinstream Conduct instream flow studyystudy (determine instream demand).~~ Conduct updated assessment of instream flow needs to guide future instream flow studies
4	Non-structural Water Storage and Habitat Management (Union Soil and Water Conservation District)	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 ~~Oregon Department of Fish and Wildlife's~~ Ecological Atlas geomorphic potential information).
5	Land Management - Public Land (U.S. Forest Service)	Information sharing and communication between public land management agencies and stakeholders to identify potential areas of mutual support.	• Update Partnership on U.S. Forest Service projects. • Plan field tours.
6	Infrastructure - Land Modification (Union County)	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 (Confederated Tribes of the Umatilla Indian Reservation)	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)	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)	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.

Commented [PRT - Sug35]: It is good to see storage and instream flow studies advancing jointly.

Commented [PRT - Req36]:

Commented [PRT - Req37]: Required: The Atlas referenced is a collaborative effort with many contributors that appears to be hosted by Grande Ronde Model Watershed (not an ODFW-specific product). It needs to be correctly referenced throughout the document and included in the references.

Commented [PRT - Sug38]: If this is specific to floods, consider renaming to make it clearer to an external audience. Be sure to link flooding with other strategies such as storage (both built and natural).

Commented [PRT - Sug39]: This terminology may not be well understood by an external audience.

Commented [PRT - Sug40]: This appears to be less about municipal land management and more about collaboration between water providers. Consider renaming.

This Step 5 report 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. This entire Plan may be updated every five years, if needed.

Commented [PRT - Sug41]: How will you determine if/when it is needed?

Suggest adding the partnership will review the plan at least every 5 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 both 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.

Commented [PRT - Req42]: Required: The plan must recognize the public interest in water as well as state authorities and responsibilities. Please include a statement in the plan (proposed language included).

Commented [PRT - Sug43]: Great to see photographs. Consider including more photographs of the people and place in any outward facing documents.

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 to implement the State of Oregon's Integrated Water Resources Strategy and related policies.

Commented [PRT - Req44]: The plan must recognize the public interest in water as well as state authorities and responsibilities. Please include a statement in the plan (proposed language included).

The UGRRW Partnership is composed of a diverse representation of more than 25 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

Commented [PRT - Sug45]: Include the actual number.

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.

Commented [PRT - Sug46]: Can you include any information about the economic value of ag to the community?

Commented [PRT - Sug47]: Other statements suggest they rely exclusively on groundwater.

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

Commented [PRT - Sug48]: It would be helpful to know how many of these supply their own water, the type of industry, the source of water, and the general amount of water.

Commented [PRT - Sug49]: Is there any information on the economic value of tourism/recreation?

Commented [PRT - Sug50]: This plan could go a lot further in acknowledging the Tribal nations who lived on these lands prior to contact with Europeans, how water factors into their existence then and now, and the importance that water and the wildlife have in their culture and survival today. Name tribes and describe tribal interests.

Commented [PRT - Sug51]: Describe impacts of these actions.

Commented [PRT - Sug52]: Please describe how this planning area is connected to other areas – How are you considering downstream interests and impacts? How do you propose to coordinate with other basins that may be affected by your actions?

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.

Steering Committee

- Oregon Department of Fish and Wildlife (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*; Confederated Tribes of the Umatilla Indian Reservation* (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* (Darrin Walenta, Robin Maille); City of Cove* (Dave Johnson and Del Little); Grande Ronde Model Watershed* (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 (~~c~~Maurico 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 Meta, Tonya Dombrowski, Randy Jones, Roxy ~~Nayler~~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 ~~Packenham~~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

Commented [PRT - Sug53]: •It would be useful to have some characterization of continued participation across the planning process. Did certain sectors drop out or significantly reduce their participation levels? If so, what are the reasons?

Commented [PRT - Sug54]: Are Steering Committee members also members of the Stakeholder Committee? Did they sign the MOU? Can they vote? Please also provide additional information about the role of the Steering Committee relative to the Stakeholder Committee.

Commented [PRT - Sug55]: In Section 1.0, the Stakeholder Committee and Interested Public sections could be presented in a table that includes signed individual/organization, contributing individuals, whether they were on the steering committee, and whether they are voting/non-voting, the sector represented, and whether they are voting/non-voting. It would be helpful to identify their primary interests as they relate to water.

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

Kurt Bowman; Powder Valley Water Control District (Lyle Umpleby); ~~Senator~~Representative Waldon (Tucker Billman); Senator Wyden (Kathleen Cathey); ~~Representative~~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.

Signatories must live or work in the UGRRW. The interested public is notified of UGRRW Partnership activities and encouraged to participate in the process. *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.

Commented [PRT - Sug56]: While many people had touchpoints with the project over the years, it is unclear who was participating enough to vote and potentially influence decision-making. There is a focus on agriculture, agricultural needs, and solutions, which is indicative that agriculture interests that were primarily represented in the planning process. Provide breakdown with statistics on who attended enough meetings to participate in votes.

Commented [PRT - Sug57]: Include link to the Governance Agreement.

Commented [PRT - Sug58]: How was this determined by the group?

Commented [PRT - Sug59]: How was the public notified and encouraged?

Commented [PRT - Sug60]: This does not read like a vision statement, but rather is stated like a goal.

Commented [PRT - Sug61]: This sounds more like a caveat, less like a vision.

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.

Commented [PRT - Req62]: Required: The Plan should reference the IWRS and its guiding principles suggested language is provided.

Public Outreach

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

Commented [PRT - Sug63]: Are these activities documented in more detail elsewhere, especially regarding frequency of radio advertisement and newspaper articles, and what presentations were delivered?

The plan would benefit from a description of past or proposed outreach to the interested public, with special attention paid to interests that were not a part of the planning effort (e.g., self-supplied domestic users, recreational interests, and other businesses/industries that rely on water). This could include providing a quantitative summary of each public outreach method used (e.g. 10 newspaper ads).

- Public meetings (notice in Briefly section of the La Grande Observer, and on the Union County website)
- Presentations to various groups in the region
- Radio advertisements
- Newspaper 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.

Collaborative, Open, and Transparent Public Process

Commented [PRT - Sug64]: 1.It is unclear how the group created an inclusive process that was sensitive to different communication preferences and abilities for involvement. For example, were submitting written comments an option? Were meetings scheduled at varying times to accommodate those who had occupations or responsibilities that precluded consistent attendance during evening meetings? Please discuss in this report.
2.Describe if there was a way for those unable to attend meetings or uncomfortable speaking publicly to comment in other formats? If so, were these comments adequately considered by the Partnership?
3.Please include all sources of funding and in-kind contributions supporting the planning group and planning process.

All decisions were made through consensus and collaboration with supporting information available on the Union County website. More than 38 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.

Commented [PRT - Sug65]: It could be valuable to list some examples here – what public meetings did you attend and present at?

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.

Commented [PRT - Sug66]: Include a link to the Step 2 summary report.

Water ~~Resource~~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. OWRD has noted that there are observed groundwater level declines in both the alluvial groundwater system and the volcanic groundwater system. Groundwater quality is not known to be a concern at this time.

Commented [PRT - Sug67]: Describe the causes of these impairments. Are they also caused by summer heat and low stream flows?

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

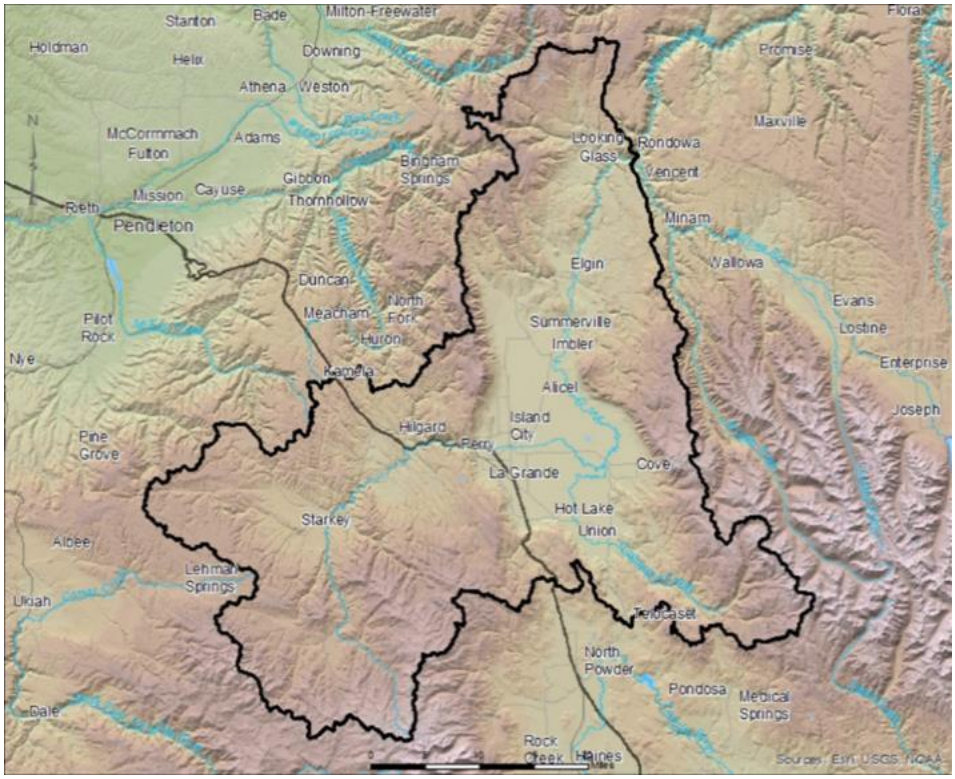
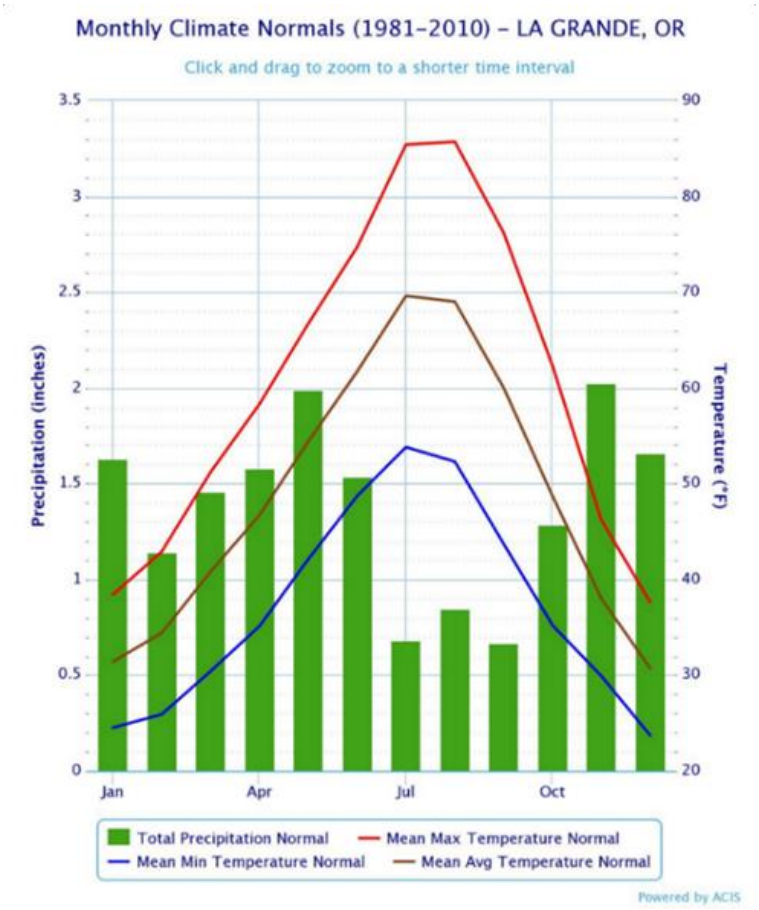


Figure 2-2
Average Precipitation and Temperature



The surface hydrology of the UGRRW is dominated by snowmelt runoff. Groundwater predominately descends from this 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.

Commented [PRT - Sug68]: This is a confusing statement

Figure 2-3
Geologic Overview

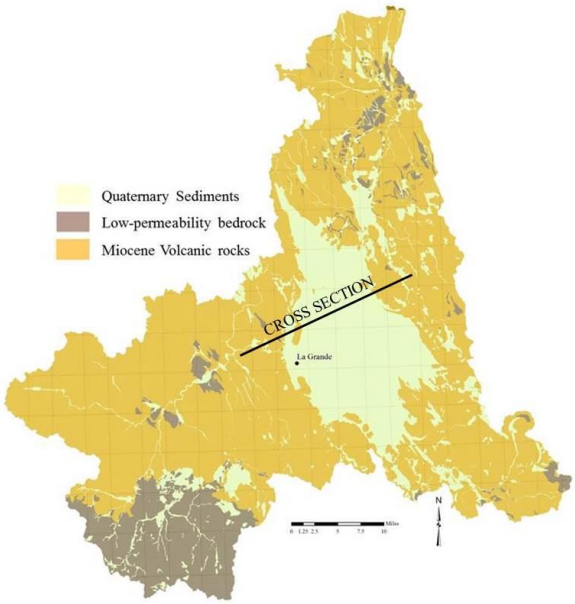
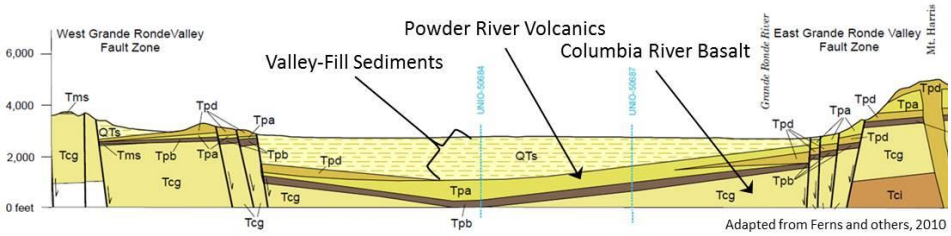


Figure 2-4
Geologic Cross Section



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.

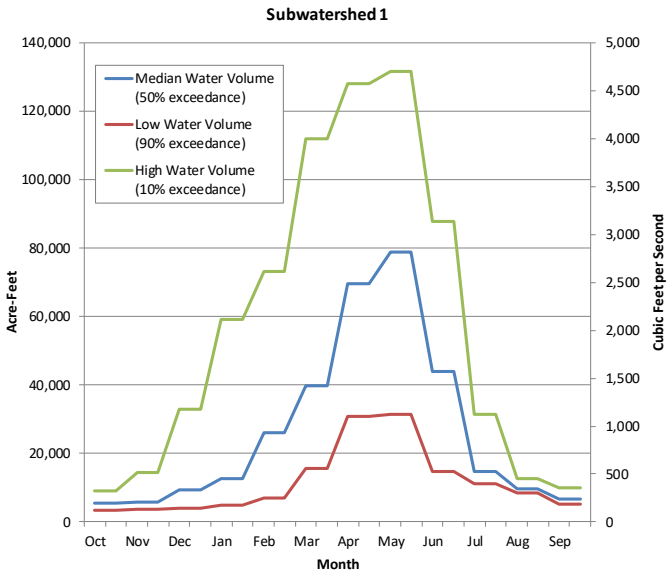
Surface Water

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 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.

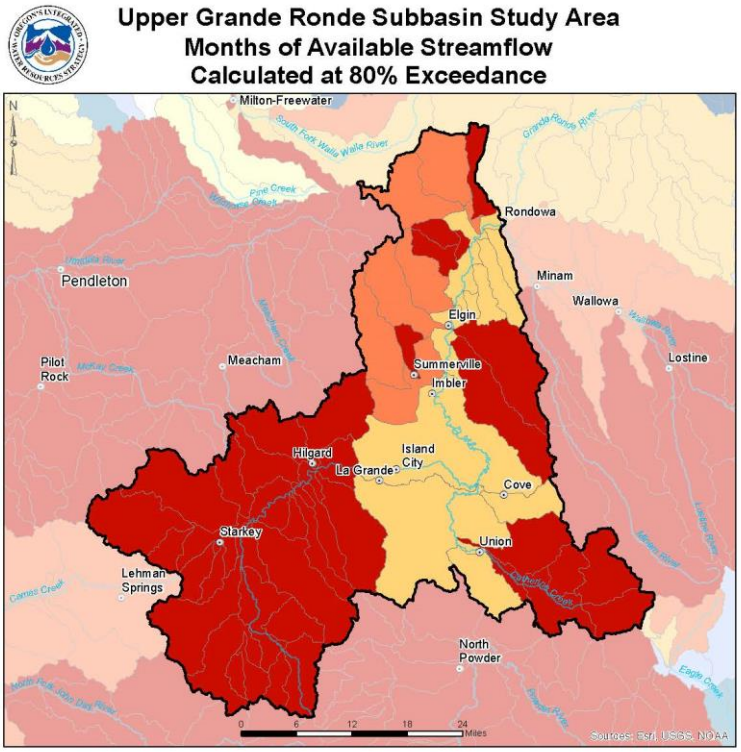
Figure 2-5
Subwatershed 1 High, Low, and Median Flow Volume by Month



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 available for allocation at 80 percent exceedance only in the central and northern portions of the UGRRW (and only for three to six months per year). Other laws and rules influence legal availability for new allocations. See Figure 2-6 for locations.

Commented [PRT - Sug69]: Consider adding a figure to show 50% exceedance – this is the number generally used to assess availability of water for storage. Given that storage is a featured strategy, it would be beneficial to display whether, where, and when water is generally available for that purpose.

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



There is very limited built aboveground storage in the watershed. All permitted reservoirs store a total of 7,230 AF.

Commented [PRT - Sug70]: Can you show this on a map? Who do the existing reservoirs currently serve?

There are many references to storage as a water management tool. The document mentions the existing storage of 7,230 AF – it would be helpful to know where these are located (e.g. a map), and the size categories – are they mostly, small individual ponds, or does the watershed include larger federal or municipal facilities? This info can help make the case for why storage is needed. Constructing significant new storage projects in the state will be a challenge. The plan could reference the key considerations from OAR 690-410, which are also summarized in the state planning guidelines. This could help the general reader or community understand the lift involved for siting new facilities.

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 water bodies that do not meet water quality

Commented [PRT - Req71]: Water Quality is not adequately addressed and does not reference or acknowledge important key findings from DEQ's TMDL Report. The TMDL overview is inaccurate. Suggested language is provided.

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 ~~water quality~~ 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 in the UGRRW are temperature, pH, DO, and bacteria, sedimentation, habitat modification and flow modification, and ammonia toxicity.

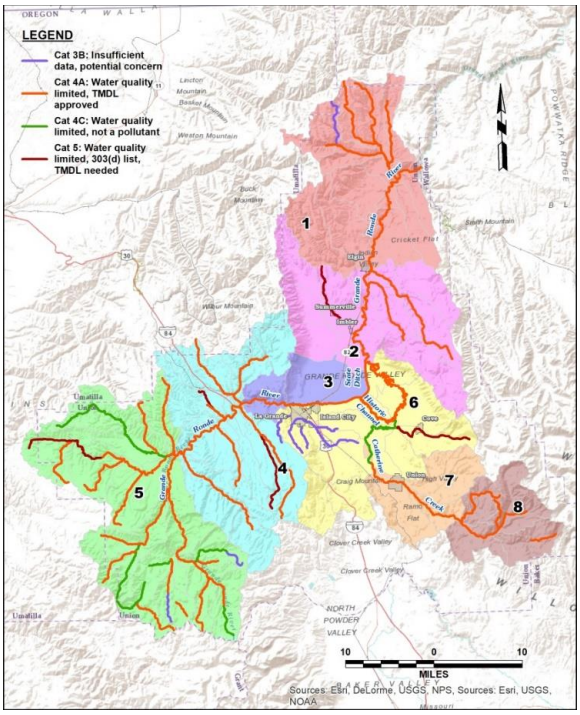
The three parameters commonly listed throughout the Subbasin: habitat modification, sediment and temperature, can all be improved through management decisions that would lead to improving vegetation condition. Riparian habitat degradation is the most serious problem in the basin and improving these riparian areas will improve temperature, stability, sediment, other water quality factors and habitat (DEQ 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 greatly affected by a variety of human activities, including:

- Removal of trees and other shade-producing vegetation from stream banks which allows direct sunlight to heat the water;
- Reduction of summertime stream flows which can cause larger temperature increases in stream segments where flows are reduced;
- Widening of stream channels which increases the stream surface exposed to solar radiation.

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 2-7 below for the extent of surface water impairment.

Figure 2-7
Department of Environmental Quality 303(d) Listed Reaches Impaired for Water Quality



The DEQ established a set of 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:

http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-Grande-Ronde.aspx (Oregon Department of Agriculture, 2012).

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. ~~TMDLs for the UGRRW were approved in 2000 and focus on temperature, DO, pH, and sedimentation.~~

Existing TMDL standards are referenced in this Plan. The existence of these standards does not mean they are achievable for every area in the UGRRW.

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

TMDLs and associated goals for the Upper Grande Ronde are listed below (DEQ, 2017):

- Temperature (summer)
- Work to reduce solar heating and increase effective shade
- DO/phosphorus (summer), aquatic weeds and algae (summer) and pH (summer),
- Nutrient reductions (20 to 60 percent)
- Temperature TMDL measures
- Bacteria (meeting criteria)
-
- Continued monitoring
- Sedimentation
- ***Beneficial Use Overview***

Beneficial Use Overview

Beneficial Uses are defined in 340-041-0002(17) as, "Designated Beneficial Use" 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 and 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 purpose"reasonably efficient use of water without waste for a 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 Oregon Administrative Rules 340-041-0151, Table 151A (DEQ, 2017a):

- Public Domestic Water Supply*

Commented [PRT - Req72]: Required: The intent and purpose of this phrase is unclear. Please cite a reference or explain more completely.

Commented [PRT - Sug73]: The goals do not appear to be listed below.

Commented [PRT - Sug74]: This list of bullets is confusing. What are these bullet points trying to convey?

Commented [PRT - Sug75]: Suggested: Add rule references for different agency definitions. Or note WRD beneficial uses in a separate section of the plan in order to focus on DEQ beneficial uses under this section.

Commented [PRT - Sug76]: Here is the definition of "beneficial use" in OWRD's administrative rules, since you have DEQ's references, I might be helpful to add this parallel:

(5) "Beneficial Use" means 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.

From: 690-300-0010

OWRD has more beneficial uses of water than just these three uses.

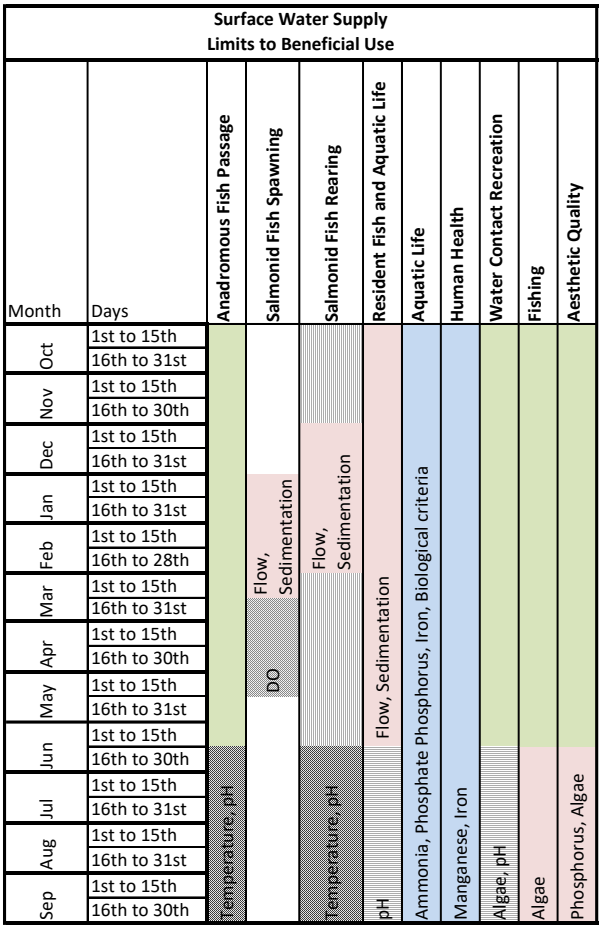
- Private Domestic Water Supply*
- Industrial Water Supply
- Irrigation
- Livestock Watering
- Fish and Aquatic Life
- Bull Trout (12°C, 53.6°F)
- Core Cold Water (16°C, 60.8°F)
- Salmon and Trout (rearing and migration, 18°C, 64.4°F)
- Salmon and Steelhead (migration corridors, 20°C, 68°F)
- Wildlife and Hunting
- Fishing
- Boating
- Water Contact Recreation
- Aesthetic Quality
- Hydropower
- ** With adequate pretreatment (filtration and disinfection) and natural quality to meet*

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

Commented [PRT - Req77]: Required: If you look at the table where they pulled this list from, Commercial Navigation and Transportation are not 'checked' as applicable Beneficial Uses. Remove from list for accuracy.

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



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. Generally, subwatersheds in the

Commented [PRT - Sug78]: When referencing "species of concern" consider connecting back to the Tribal importance of the same species.

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. 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.

Commented [PRT - Sug79]: It should be noted that groundwater flow paths may not resemble surface water flow paths.

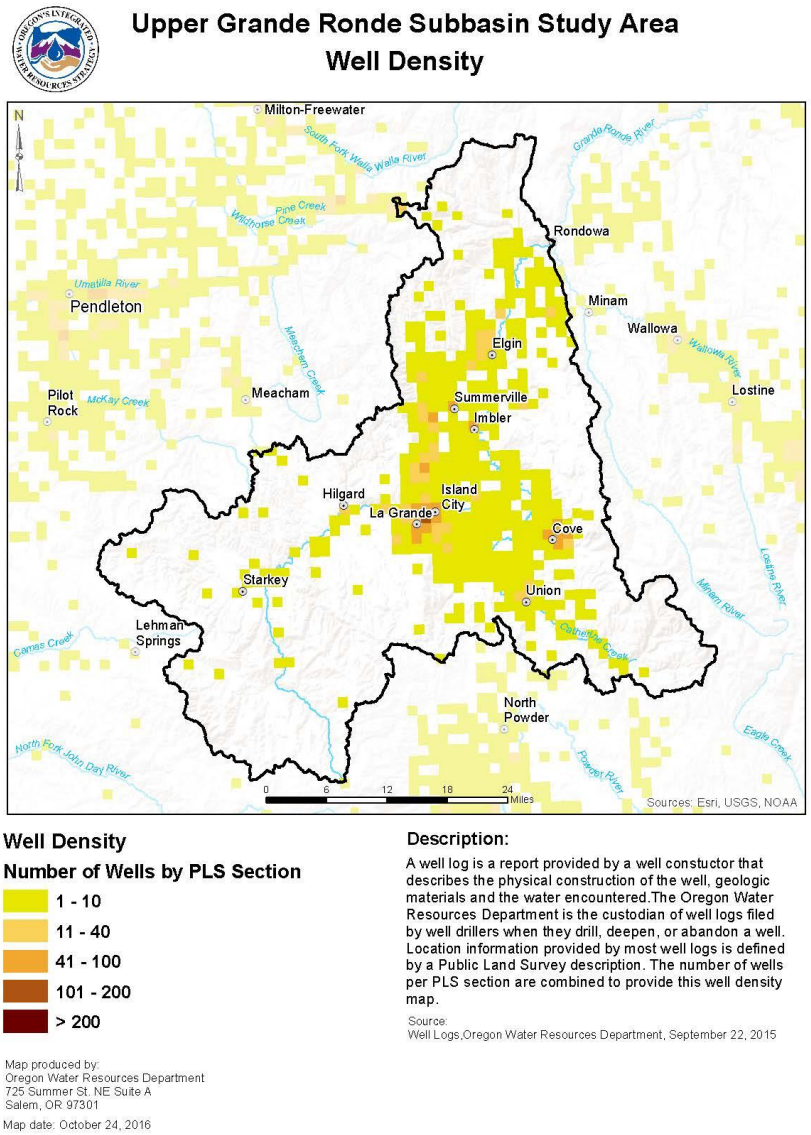
Commented [PRT - Sug80]: There was more information provided in the 2019 "Characterization of Groundwater in the Upper Grande Ronde Basin" memo than was utilized or acknowledged in the report. Expanded water level monitoring and groundwater budget description (along with other components of groundwater basin studies) will improve understanding and support additional planning. However, what data we do have shows that groundwater levels are declining in some areas of the volcanic aquifer system, and pumping from the alluvial system impacts fully allocated surface water flows. Planning and action to reduce volcanic aquifer water level declines and potentially mitigate alluvial aquifer surface water impacts can occur based on this information before a basin study is completed.

Please include a reference to the Groundwater Memo produced by OWRD and/or include it as an Appendix.

Commented [PRT - Sug81]: Include citation?

Commented [PRT - Sug82]: Using ground water right permits to estimate water quantity (p.8) only reflects an estimate of groundwater withdrawals, and does not provide an estimate how much water there is in general (outside of human uses).

Figure 2-8
Well Density



Throughout the UGRRW, primary irrigation accounts for approximately 81,365 AF per year of groundwater use, 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 sedimentary aquifer wells in the UGRRW require mitigation for impacts to the Grande Ronde state scenic waterway (SWW) because available indicate that groundwater discharge supports baseflow in valley streams and the cumulative impact of groundwater rights issued since the SSW was designated have exceeded the thresholds established in law (see ORS 390.835(9) and (12)). Gaps in existing data need to be addressed to better understand the relationship between surface water and hydraulically connected groundwater.

Groundwater level declines have been documented in the City of La Grande municipal basalt wells in previous decades, but these declines appear to have stabilized in recent years. Groundwater level declines in the City of Imbler municipal alluvial well are an ongoing concern. Figure 2-9 shows a decline in a basalt well (UNIO 940) that has stabilized in a nearby well (UNIO 2098) which 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. UNIO 2496 shows seasonal recharge and declines as well as a general declining trend. The Oregon Water Resources Department noted in a memo that groundwater levels are generally declining in both aquifer systems, though most notably in the volcanic aquifer system. Groundwater level declines vary across the basin and are impacted by localized recharge, patterns of groundwater development and use, and localized geology. The basin would benefit from greater spatial distribution of water level data over time, especially in the volcanic system where there are limited observations. More information is needed to determine overall groundwater trends.

Figure 2-9
Hydrograph of Columbia River Basalt Group and Alluvial Wells

Commented [PRT - Req83]: Required: This section does not accurately convey what is known about groundwater/surface water connections for the alluvial aquifer. The language needs to be modified. Suggested language is included.

Commented [PRT - Sug84]: Additional data collection can refine our understanding of the groundwater-surface water connection. However, the connection has already been established with a level of certainty sufficient to take action under the existing groundwater laws and policies.

Commented [PRT - Sug85]: Has yield declined too?

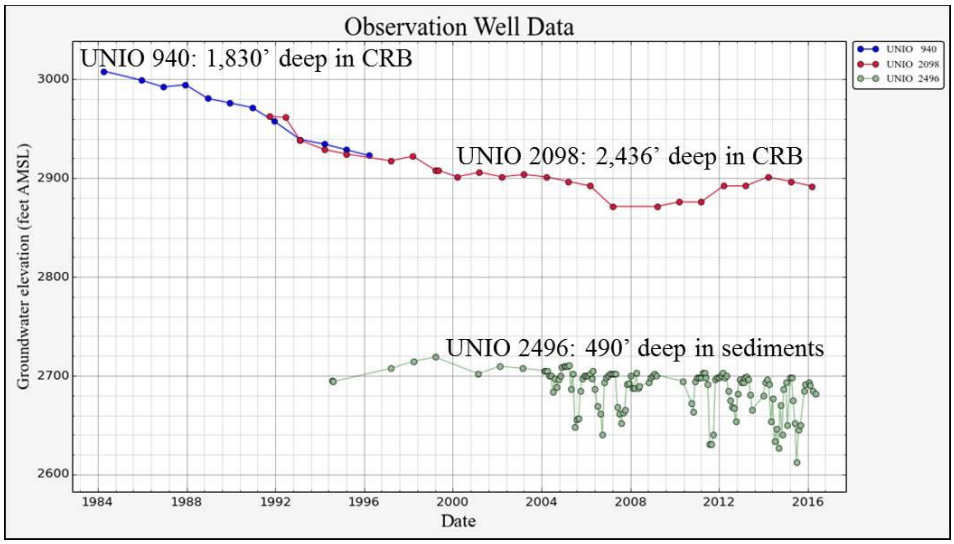
Commented [PRT - Sug86]: It would be helpful to know what this may be attributed to

Commented [PRT - Sug87]: Seasonal or inter-annual?

Commented [PRT - Req88]: Required: Of the observable data, OWRD has noted that there are groundwater level declines in both the alluvial and volcanic systems, though the rate and total declines vary across the basin. By selecting a set of wells where groundwater levels have stabilized it could lead a reader to believe that groundwater levels are stable throughout the basin, which is not the case. Please modify the language to reflect what is currently known about groundwater level declines. Suggested language is included. Also, please make sure to specify that UNIO 940 and UNIO 2098 are different wells.

Commented [PRT - Sug89]: Consider including the summary of key findings from the OWRD groundwater memo.
- Groundwater supplies are controlled by recharge, available storage, and discharge within the basin and groundwater interflow between the two major aquifer systems, as well as the underlying geologic structure of the basin
- Groundwater pumping, especially from the alluvial system, captures some natural groundwater discharge, and has the potential to reduce flows in hydraulically connected streams/rivers
- Groundwater levels are declining in both aquifer systems, though most notably in the volcanic aquifer system
- New allocations of groundwater from the alluvial aquifer may occur if an approved approach to mitigation is established
- The lack of spatially distributed water level data, as well as data over time, prevents a more complete understanding of characteristics of the aquifers

Commented [PRT - Sug90]: Only including these hydrographs may lead a reader to believe that groundwater levels are stabilized in the volcanic system and does not represent what is currently known about the groundwater system.



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 this out in the Grande Ronde Basin. Overall, groundwater quality is not known to be a concern.

Commented [PRT - Sug91]: Has not carried what out, specifically? Toxic monitoring? A groundwater quality study?

Ecology and Watershed Health

The reports generated for Step 2 and Step 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 Grande Ronde Model Watershed Website: https://www.grmw.org/data/assessments/. The key takeaways are as follows:

Commented [PRT - Req92]: Required: The plan must include a brief description of ecological considerations. Please add key takeaways from Step 2 and 3.

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. 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.

Commented [PRT - Sug93]: Did OWRD conduct this analysis? Include a citation. Include a statement regarding the uncertainty of these estimates (+/- %)

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

Commented [PRT - Sug94]: Include sources of information.

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

Commented [PRT - Sug95]: Is this ET from ALL vegetation?

Commented [PRT - Sug96]: This will likely raise questions, it may be worthwhile to discuss the significance of this value.

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-1, which summarizes the findings by subwatershed.

Commented [PRT - Sug97]: Include the Table from ES-1 here. This section is confusing and appears to be incomplete without more information provided.

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, do not ~~representing~~represent current conditions, ~~and are based on stationarity assumptions. Stationary assumptions do not take into account~~or changing conditions ~~over time.~~and assume stationarity.
- The use of OWRD's Water Availability Reporting System to quantity 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 a ~~comparison to independent~~comparisons between modeled and measured data to estimate the deviation between predicted and actual values. There was

Commented [PRT - Sug98]: Consider making separate statements regarding period of record and stationarity.

Commented [PRT - Sug99]: •The surface water deficit is likely inaccurate given the period of record for the WARS model. Moving forward, it may be important for the group to perform additionally hydrologic analysis to understand the current surface water supply. Current and future irrigation water use demand assume no surface water shortage in meeting crop demands, which is documented to occur. Consider applying methods that account for this. Additionally, new data and tools will be available statewide in the next few years to support quantification of irrigation demands each year. These data may help the planning group refine the estimate of the water balance.

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.

- 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 permitted groundwater rates and do not reflect the volume of water available, the depth at which it is being extracted, or the rate or source of recharge. Groundwater supply was estimated using permitted pumping rates, not actual pumping measurements. Return flow to surface water and groundwater after an initial use is unknown, as is a detailed understanding of surface water-groundwater ~~interaction generally~~interactions.

Commented [PRT - Sug100]: The statement, as originally written, casts significant doubt on the validity of any information presented in this section. Consider what statements you want to make about the accuracy and usefulness of various data sets as it will color the reader's perceptions.

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.

Commented [PRT - Sug101]: Include a link to the Step 3 report.

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 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).

Commented [PRT - Sug102]: What repairs are needed? Is this a need?

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).

Commented [PRT - Sug103]: It would be helpful to see this broken out by category:
Municipal
Unincorporated
Self-supplied industrial

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 and so are rated as having **low** vulnerability~~;~~ Imbler is the exception, as decreasing groundwater levels have been documented~~.~~ ~~However, some~~ and the city indicated their concern. Some vulnerabilities appear to exist relative to ~~establishing~~the lack of redundancy of supply for individual cities~~.~~ , in the event that their primary source is no longer available. Water quality issues were not identified as a limiting factor for municipal needs.

Commented [PRT - Sug104]: Based on what data?

Commented [PRT - Sug105]: Clarify what indicators/metrics were used to assess this vulnerability level. Is this based solely on water quality and water quantity? What about other vulnerabilities?

Commented [PRT - Sug106]: Other issues, needs, concerns identified by municipal water users? What is the status of infrastructure? Other issues, needs, concerns identified by unincorporated water users or self-supplied industrial water users?

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.

Commented [PRT - Sug107]: Is there a way to estimate private land that is suitable for irrigation that currently does not have a water right?

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).

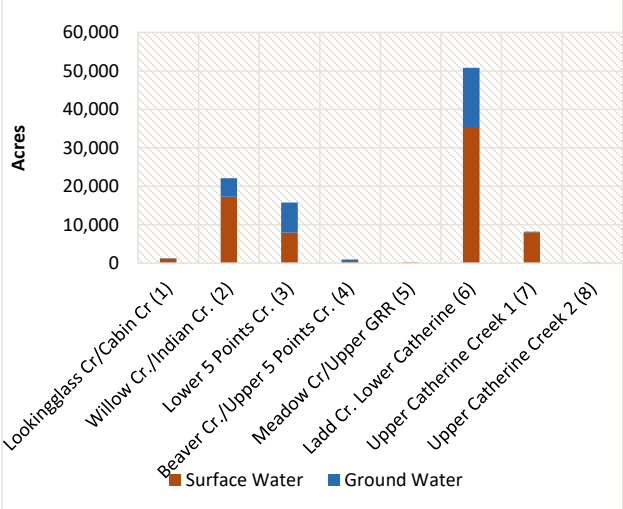
Future demand was calculated using estimated future ET based on precipitation and temperatures projected by the Representative Concentration Pathways (RCP) 8.5 climate scenario. Future demand was calculated for two scenarios: the first only accounted for changes based on future weather parameters, while 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.

Commented [PRT - Sug108]: Not significantly different. It will be interesting to look at these estimates using OpenET when it is available.

Commented [PRT - Sug109]: How do these numbers compare to the Statewide Demand Forecast?

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 appear 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

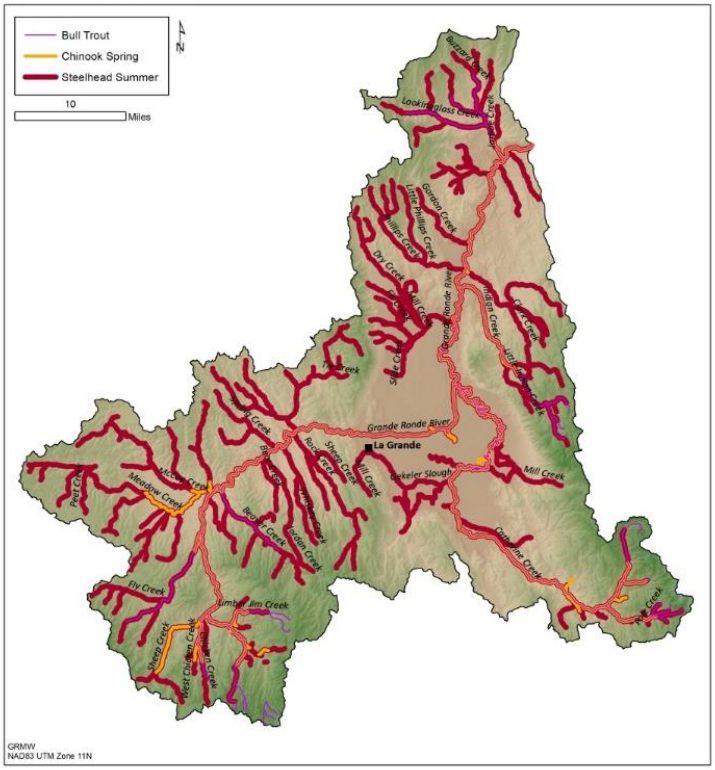
Instream demand is complex; numerous processes contribute to the amount of water needed for instream use. Instream demand for aquatic life is driven by several factors: species, water needs, stream variables, and future changes. Instream flow demand recognizes the value and importance of suitable flows 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 ~~GUGGRW~~UGRRW Partnership quantified species and water needs and described instream ~~and future~~ 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 public uses served by ISWRs.~~,,, and the fact that these water rights were based on a dated (nearly 50 years old) instream demand study that may no longer be accurate.~~ ISWRs exist only in limited stream segments, and many reaches bearing ESA-listed species do not have ~~This~~. The instream water rights. See Figure 3-2 below. 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.

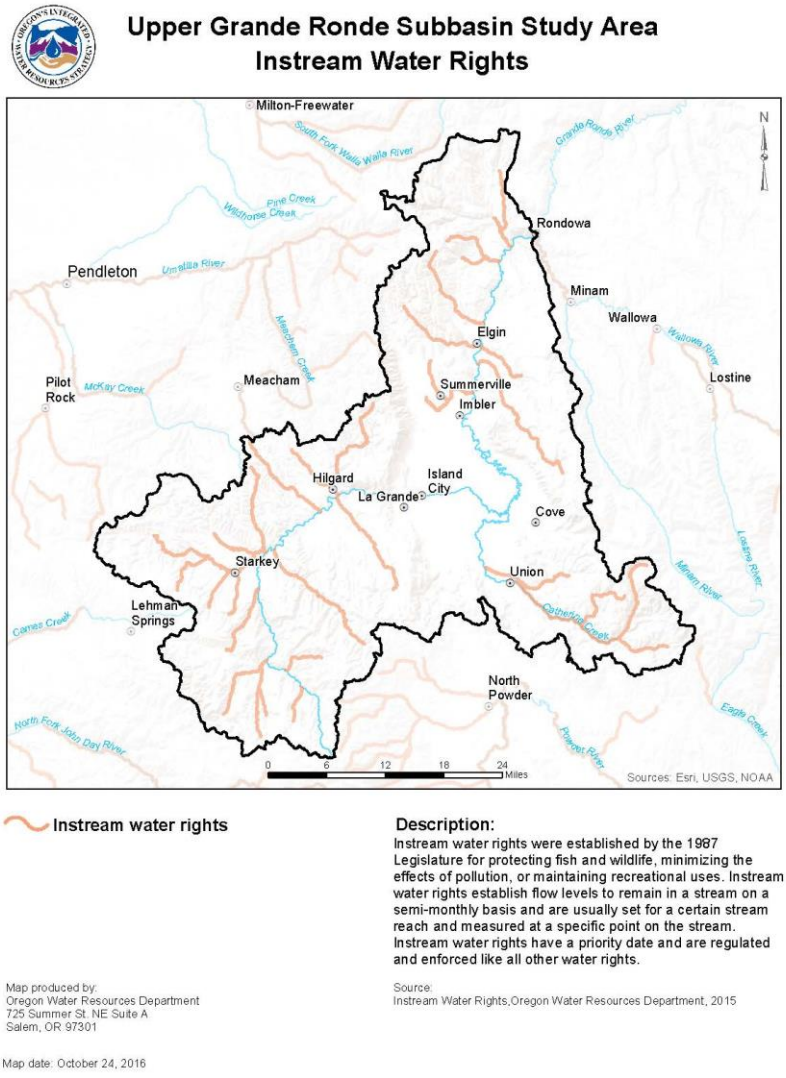
Commented [PRT - Req110]: Required: Characterization of the instream needs is inaccurate or misleading. Suggested language is provided.

This analysis was supplemented through exceedance flow analysis as described below. Scenic Waterway flows are necessary to maintain the qualities of a state designated state scenic waterway downstream of the project area, including protection of the free-flowing character of designated rivers as well as scenic and natural values, recreation, and fish and wildlife values. 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 and Instream Water Rights



Commented [PRT - Sug111]: This is a separate Figure. And should be listed separately.



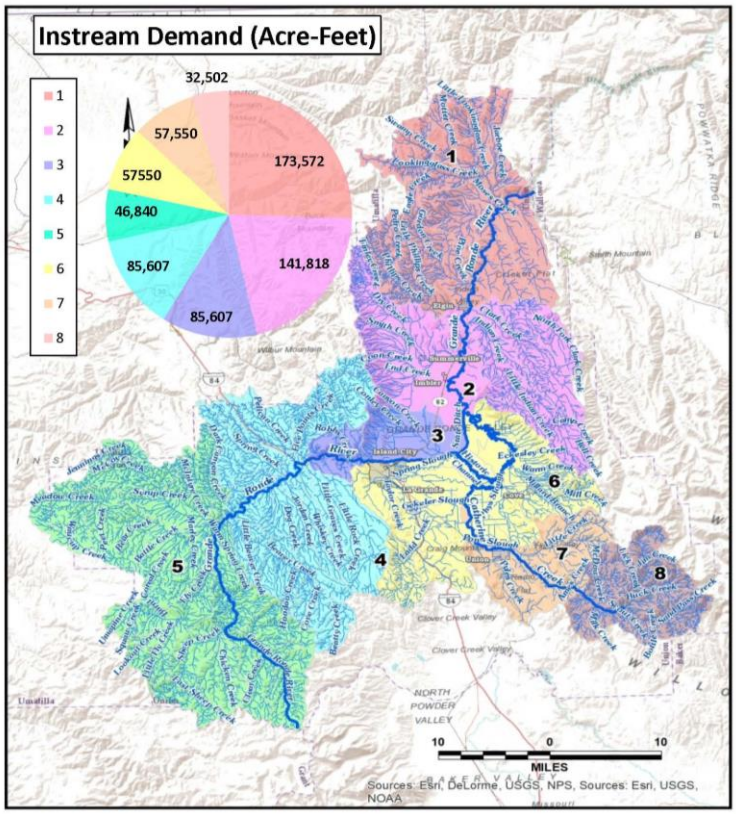
When considering water needs for aquatic species, multiple variables were considered. Aquatic species, such as the salmonid species of elevated concern in the UGRRW, are highly reliant on water flow, temperature, volume, velocity, depth, water quality, and timing/seasonality. ~~Water rights based on fflow~~Flow needs for salmonid spawning, incubation, passage, and rearing in the Grande Ronde Basin were studied in the late 1960s~~-early 1970s, and the recommended flow values in the resulting Basin Investigation Report (BIR) (~~Smith, 1975~~) were ~~and~~ used to ~~compile a map of water demand for aquatic species per region (see~~ inform amounts requested on subsequent instream water right applications. Figure

Commented [PRT - Req112]: Required: Add this document to the reference list.

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 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 or the generally junior nature of most ISWRs. 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



Commented [PRT - Req113]: Required: Characterization of the instream needs is inaccurate or misleading. Oregon Method or BIR instream flow studies are mischaracterized as "obsolete" which is misleading. Suggested language is provided.

Commented [PRT - Sug114]: Is this figure based on the 1960s study referenced above, or does this "demand" depict the volume of EXISTING instream water rights? The paragraph above describes both elements, so this map might need a revised heading or lead in.

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 (1958-1987) 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% exceedance, or water expected in the stream at least 80% 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% exceedance, or water expected in the stream at least 50% 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% of the time), instream flows are not likely met across the basin.
In practice, this means that fish migration can be threatened in the fall in reaches where there are
In practice, this means that fish
migration can be threatened in the fall in reaches where there are inadequate flows.

It should be noted that ISWRs were used because the flow volumes are based on specific flow studies (ODFW, 1975), not because of their administrative/legal status as water rights. 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 gaging stations in the sub-basin 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 ecological 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.

In addition to calculating instream demand at the pour point (point that the stream enters) of each
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In addition to calculating instream demand at the pour point (point that the stream enters) of each subwatershed, the OWRD water availability tables were utilized to provide an understanding of the degree instream water rights are being met at both the 50 and 80 percent exceedance levels. The results of this exercise show that flows are not available to meet the instream need throughout the year at many locations, particularly at the 80 percent exceedance level.

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 (NRC, 2011). This will reduce the ability to meet instream demand in future forecasted scenarios.

Commented [PRT - Req115]: Required: Required: Acknowledge the limitation of WARS to perform this analysis. Suggested language is included.

Commented [PRT - Req116]: Required: The description of the analysis and findings in this section are confusing and needs to be re-worked. Suggested language is included.

Commented [PRT - Req117]: Required: Please clarify. Does this intend to say that flow studies were used rather than ISWRs? The statement is confusing as written. It should be noted that flow recommendations in the Basin Investigation Reports oftentimes exceed the instream water right (ISWR). OWRD limits ISWRs to 50% exceedance value even if the ODFW flow recommendation is higher than that value. Consequently, ISWRs oftentimes underestimate instream water needs.

Commented [PRT - Req118]: Required: Please clarify what analyses were or were not performed to understand instream water needs/demands and how that affects any conclusions. Suggested language included.

Commented [PRT - Req119]: Required: Please clarify. It is not clear how this statement differs from the one above. Essentially it appears you are saying that the flows provided in flow studies and the flows provided in instream water rights were assessed separately? This is confusing as written and should be removed or reworked.

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. The rationale for selection of RCP 8.5 is explained in this section. Overall, modeled estimates of climate change suggest an increase in the frequency and magnitude of some natural hazards.

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

Subwatershed Demand Summaries
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:

Commented [PRT - Req120]: Required: Please include a statement about current conditions and future conditions, considering both quality and quantity.

Commented [PRT - Sug121]: Given that his is highlighted as a critical issue, it would be beneficial to include more information in this section. What is the frequency and intensity of various natural hazards (floods, droughts, wildfires)? What are the impacts?

Commented [PRT - Sug122]: The Plan should discuss implications of declining snowpack, and rising temperatures on water quantity, quality and instream needs.

Commented [PRT - Sug123]: Where is it explained?

Commented [PRT - Sug124]: Solutions and actions to tackle natural hazards (flood, drought, wildfires) are mentioned several times, however, the plan does not document the severity of these hazards. Consider adding more supporting text to the document to provide a basis for the recommended actions.

Commented [PRT - Sug125]: Consider briefly summarizing the key points from those plans to provide a basis for actions related to natural hazards.

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 exclusively reliant on groundwater sources, while instream demand is exclusively reliant on surface water sources. 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 (before taking into account all of the instream needs); however, bi-weekly surface water deficits are present generally July through November in most subwatersheds. As noted above, the instream flow section states that the full range of ecological flows (such as channel forming flows) 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. As a result, the instream flow needs are likely underestimated.

Commented [PRT - Sug126]: Instream flows are fed by groundwater contributions. Also, groundwater is likely fed by streamflows. Instream flows are partially reliant on groundwater contributions. Furthermore, groundwater may feed springs and other groundwater dependent ecosystems.

In future plan updates describe the presence and water needs of groundwater dependent ecosystems such as springs, wetlands, etc.

Commented [PRT - Req127]: Required: This characterization of winter water as surplus does not recognize the ecological value of these flows. Suggested language is included to address this issue.

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., though available data indicates declining groundwater levels in both the alluvial and volcanic groundwater systems and groundwater pumping has the potential to affect streamflows or affect other groundwater uses. Groundwater balance graphs are not included in analysis because of lack of certainty about supply. There are few wells with flowmeters installed within the basin, rendering pumping estimates highly imprecise.
- 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).
- ~~Uncertainty related to how aquatic species will react to temperature changes.~~
- Instream demand calculations were incomplete, ~~utilizing information from a potentially obsolete study,~~ 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.

Commented [PRT - Req128]: Required: This statement is inaccurate. The temperature impacts on aquatic species, particularly ST&E fish is well-understood. Delete text.

Commented [PRT - Req129]: Required: Oregon Method or BIR instream flow studies are mischaracterized as "obsolete." Suggested changes are provided.

While it doesn't need to be included in the text, the following language provides additional context for the Partnership:

The Oregon Method (the basis for the state's 1960s and 1970s Basin Investigation Reports (BIR)) is based on the same hydraulic and biological principles used in current IFIM studies, and fish species' biological flow needs haven't changed over time. The Oregon Method is a habitat-based method that may result in species-specific flow recommendations that are higher than expected natural flows at a given time of year. ODFW currently places BIR-based flow targets within a framework of naturally-occurring flows based on hydrologic data. While additional data collection and analyses are encouraged, the BIR studies are important for understanding instream flow needs for indigenous species; they are not "obsolete" simply because the research was performed 50-60 years ago.

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). There is a need to assess the full range of instream needs throughout the year including the ecological value of higher flows during the winter and spring.
2. There is significant uncertainty with groundwater supply. The UGRRW needs ~~a plan~~ 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. According to OWRD, groundwater pumping, especially from the alluvial system, captures some natural groundwater discharge, and has the potential to reduce flows in hydraulically connected streams/rivers. New groundwater allocations from sedimentary aquifer wells in the UGRRW require mitigation for impacts to the Grande Ronde state scenic waterway (SWW). Furthermore groundwater levels are declining in both the alluvial and volcanic aquifer systems. 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

Commented [PRT - Sug131]: What does this mean for Goals 3 and 4?

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.
The aspirational goal is to eliminate 100 percent of the seasonal surface water deficits in each sub-
The aspirational goal is to eliminate 100 percent of the seasonal surface water deficits in each sub-watershed 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. 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 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. 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. Projected water deficit may increase in magnitude, frequency, and duration by 2068 (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. As noted above there is a need to assess and account for the full range of instream needs throughout the year, including the ecological value of higher flows during winter and spring.

- 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

Commented [PRT - Req130]: Required: The Plan as written does not sufficiently communicate how instream and out-of-stream water needs will be balanced during implementation. Furthermore, it does not necessarily present projects in an integrated way. This will be especially important for funders who are looking to fund multi-benefit projects that meet social, economic, and environmental needs (both instream and out-of-stream). The reviewers suggest modifications to this section to better reflect how solutions will be balanced and integrated, or make a statement regarding the commitment of the Partnership to pursuing implementation in a balanced and integrated way and developing a way to track and report progress in achieving balance and integration in project identification, design, and execution.

Commented [PRT - Req132]: Required: This characterization of winter water as surplus does not recognize the ecological value of these flows. Suggested language is included to address this issue.

Commented [PRT - Sug133]: Reducing 100% of the deficit for every use may not be possible. It may be more important to determine a sustainable balance of uses given that water is a finite resource and it serves many functions both instream and out-of-stream. Identifying and managing the tradeoffs will be a significant accomplishment.

Commented [PRT - Sug134]: Specify what kind of storage projects (above and below ground, on-channel, off-channel, large, small, built, natural).

active flow management strategy to retain water during periods of excess flows with controlled release to mitigate periods of deficit. Validation of instream rights above base flows is essential for planning in the UGRRW.

Objective 1.2

By 2040, fill data gaps identified in the Steps 2 and 3 reports. 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. The aspirational goal of quantifying basin-wide instream flow demand is currently unattainable given the lack of quantified data and research needed to estimate and validate this assessment. prioritize studies of
The UGRRW Partnership will update its instream flow needs assessment using updated guidance from ODFW, and the information will be used to determine where additional Instream Flow Incremental Methodology (IFIM) studies are needed to support recommended actions in the priority strategies. Municipal demand, agricultural demand, and supply (surface water and groundwater) data gaps will also be addressed.

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 dissolved oxygen, pH, and insufficient flow. As mentioned previously herein, sedimentation, nutrients, *E. coli,* and iron were also found to be impairments in the subbasin, 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, 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

Commented [PRT - Sug135]: What does this mean?

Commented [PRT - Req136]: Required: The meaning of this language is unclear and may conflict with previous statements in the plan. The plan acknowledges that the junior priority dates make it ineffective. Is this meant to communicate that an understanding of instream flow needs above base flows must be improved as described in the next objective? Please clarify.

Commented [PRT - Sug137]: Quantifying instream flow needs is not currently unattainable. Please remove.

Commented [PRT - Req138]: A summary of the suggested approach is identified on p. 5-6.

Commented [PRT - Req139]: Water Quality is not adequately addressed and does not reference or acknowledge important key findings from DEQ's TMDL Report. Suggested language to address these issues are included in this and other sections.

Commented [PRT - Sug140]: This was listed as Issue 3 in other portions of the plan. Consider re-ordering.

Commented [PRT - Req141]: Required: Bacteria is one of the parameters where the TMDL is exceeded in the basin and should be noted in water quality discussions.

Commented [PRT - Sug142]: Mention other plans or efforts currently underway.

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*.
. The primary parameters of concern in the UGRRW are temperature, pH, DO, and *E. coli*.
. 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-August especially in the lower and central parts of the UGRRW. The approved Temperature TMDL has identified the following activities as nonpoints sources of temperature warming in streams: excessive inputs of solar radiation because of streamside vegetation removal or reduction, anthropogenic 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 (Chen et.al., 1998).

The basin experiences dissolved oxygen and pH water quality standards violations related to excessive periphyton growth. Excessive growth is due to a number of factors including elevated nutrient concentrations, high water temperatures, excessive solar radiation, high width to depth ratios, and inadequate stream flow rates.

Objective 2.2

By 2040, fill data gaps identified in the Steps 2 and 3 reports with respect to water quality, including temperature and other parameters important for beneficial uses.

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.

Commented [PRT - Sug143]: Suggested: This has been stated earlier and may not need to be repeated here.

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Commented [PRT - Sug144]: Important to remember that the groundwater supply is likely to be intrinsically linked to surface water in most cases, therefore it is a holistic, conjunctive approach.

Commented [PRT - Sug145]: Please clarify whether the Partnership would seek to complete a study, or whether they would be requesting that the state complete a study in this timeframe?

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 the Step 5 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).

Commented [PRT - Sug146]: Is that this document? Or an alternate document?

Issue/Goal 4 Natural Hazards/Climate Change

Commented [PRT - Sug147]: This is not a goal as written – suggest rewriting to say "Mitigate Impacts of…" or "Increase Resiliency to…" or "Prepare for…"

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. 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.

Commented [PRT - Sug148]: Will this be a separate plan?

Commented [PRT - Sug149]: What does this mean?

Objective 4.1

By 2030, develop a Natural Hazards Mitigation Plan (set of projects and actions to be included in an update to the Step 5 Implementation Plan) to reduce or mitigate the impact of flooding, fire, and drought.

Commented [PRT - Sug150]: Does Union County already have a NHMP? Would it be a new or updated plan?

Commented [PRT - Sug151]: Is this different from the Step 5 Strategic Action Plan mentioned above?

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 Implementation 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. These 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. Elements described included:

    - Strategy Type
    - Description
    - Issues Targeted (and Metrics)

Commented [PRT - Sug152]: This has not been discussed in detail in the plan. Please provide a basis or point to existing materials

Commented [PRT - Sug153]: This has not been discussed in detail in the plan. Please provide a basis or point to existing materials.

Commented [PRT - Sug154]: It is difficult to discern what is meant by these three categories based on the titles alone.

Commented [PRT - Sug155]: Why was this terminated? What is the purpose and value of including this process step in the plan? It is unclear how this plays into the plan since it was never completed, finalized, or approved.

- 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.
    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 Ecological Atlas geomorphic potential rankings.
    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

Commented [PRT - Req156]: Required: The Atlas referenced is a collaborative effort with many contributors that appears to be hosted by Grande Ronde Model Watershed (not an ODFW-specific product). It needs to be correctly referenced throughout the document and included in the references.

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 Strategic Action Plan and the remaining strategies would be retained. This was approved by a consensus vote of the UGRRW Partnership in April 2020.

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.

Commented [PRT - Req157]: Required: The plan needs to acknowledge the integrated nature of the critical issues and potential solutions. The plan needs to make explicit that it will simultaneously advance both instream and out-of-stream solutions. One approach to do this would be to make explicit that the Partnership will prioritize filling critical data gaps to effectively advance both instream and out-of-stream solutions.

Commented [PRT - Sug158]: Suggest including a description of how MOU signatories currently feel about the final list of 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 Implementation 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, 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 3 - Reduce Groundwater Declines and 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 4 - 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		

Commented [PRT - Sug159]: It is unclear why this is only tied to Administrative Actions. It seems like this could tie into land management, data, non-structural water storage and habitat, infrastructure, etc.

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.

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.
- 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 **overall implementation** milestones are as follows:

Commented [PRT - Sug160]: The plan could benefit from a very high level description of costs and an analysis of costs and benefits.

Commented [PRT - Sug161]: While an adaptive management component isn't required, it would certainly strengthen the overall Plan and make it more appealing to funders. A formalized adaptive management component should prioritize filling data gaps, evaluating project efficacy, providing additional context for alternatives assessments, and using the information from each of those components for future project planning/implementation. This would seem to fit nicely within Strategy 3 (Data Collection, Monitoring, Research), and a robust 'Progress Tracking and Adaptive Management' element is a critical value-added component when applying for implementation funds.

Commented [PRT - Sug162]: What does it mean for these top five issues to be considered priority strategies? How do they differ from the other strategies? The assumption was made by readers that no work will happen on strategies 6-9, which caused concern that there might not be equal attention paid to both instream and out-of-stream issues and strategies. Upon looking at the Appendix it appears that work is being proposed on all strategies. It should be clarified what it means to prioritize these five strategies over the others.

Commented [PRT - Sug163]: While it is understandable the team favors built storage, this priority #1 action may be less feasible than other priorities. Priority #4, non-structural water storage and habitat management is an ongoing action in the project area. The team of restoration practitioners in Union County have been doing this work for years, they are adept, and funding sources are available. Habitat work including floodplain connectivity, riparian restoration, side channel development, and wetland creation at increased scale in the project area will yield improvement to both stream flow, water quality, and perhaps improve groundwater quantities.

Commented [PRT - Sug164]: •Suggest Outreach and Education also be identified as working across all teams. •Suggest updating the outreach plan, the outreach needs will change as the partnership moves from planning to implementation.

Commented [PRT - Sug165]: The timeline to reach goals could be expanded. Currently, the plan identifies actions to be implemented immediately, some within years 2-5, then there is a gap until 2040. Supplementing the improved Implementation Plan/Schedule with graphical elements, like a Gantt Chart, would provide a quick and easily-understood reference that will also be beneficial to reviewers, potential funders, and the UGR Partnership as they track implementation progress.

Commented [PRT - Sug166]: By looking at Appendix A it seems that the group intends to make progress on all of the strategies and that the group is advancing strategies to understand and meet both instream and out-of-stream needs. This could be more clearly stated.

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.

Commented [PRT - Sug167]: Anderson Perry & Associates seems to have been heavily involved in this process, yet they are only mentioned once in the Draft Plan (p. 5-2). Information regarding their role in the Partnership should be included for transparency.

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 report, and quarterly as needed in Appendix A - Implementation Schedule.

Commented [PRT - Sug168]: •There are a number of projects listed in Appendix A, however it is unclear how (if) they fit into the final plan, and implementation as most of them are not included in the Strategies section. Please explain the purpose of including Appendix A.
•Appendix A in its current form could be much improved as an Implementation Plan/Schedule. Clear distinction between actions, objectives, goals, and ideas within the strategies is needed; for a reviewer, it currently reads more like a brainstorming exercise and doesn't resonate as a plan (though perhaps it is not written for an external audience). Projects being considered for implementation should be prioritized, actions and timelines should be built out (it can be noted that they are subject to change), and potential funding sources and partners should be clearly identified.

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).

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.

Commented [PRT - Sug169]: Provide discussion about existing feasibility studies that have already looked at storage project opportunities. The Plan should explain how its proposed scoping and planning for storage projects is not repeating work that has already been completed. An explanation about why this is being considered despite the conclusions from previous studies should be explained.

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 NRCS and the including NRCS, and Oregon State University Extension office. The Oregon Department of Agriculture 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, site potential vegetation riparian vegetation is the Temperature TMDL target and 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 Partnership identified a concern that many principles have not been 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 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

Commented [PRT - Req170]: Required: It is important to acknowledge ODA's authority and role in this area. Suggested language is provided.

Commented [PRT - Sug171]: Suggested: Explain/justify this statement. What principles have not been proved? All the practices proposed by the pilot have been established as effective methods for the interrelated benefits of improved soil health, increased soil moisture, etc.

- 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 ODFW. The approach will use existing data (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.
  - 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.

- 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 Oregon Department of Fish and Wildlife's (ODFW) Ecological Atlas geomorphic potential rankings.

   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 ODFW'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.

Commented [PRT - Req172]: Required: The Draft Plan does not identify a path to address the critical data gap regarding instream needs. The Plan should clearly identify data and analyses that will improve instream need estimates in aquatic priority areas that lacked sufficient data earlier in the planning process, not just at possible storage sites.

The suggested path provided here can be performed using existing data (ODFW will provide a guidance document and the appropriate BIR-based recommendations). This action would move the Partnership forward in further understanding and meeting instream needs, and it would demonstrate the Partnership's commitment to pursuing balanced and integrated solutions.

Commented [PRT - Req173]: Update reference appropriately

Commented [PRT - Req174]: Update reference appropriately

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 (ODFW 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).

Commented [PRT - Req175]: Update reference appropriately

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 the potential for flooding to have negative impacts in the Grande Ronde Valley while increasing retention and recharge potential in a way that will benefit both water quantity, quality, and habitat.

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).

Commented [REQ176]: Required: Consider how actions related to flooding may be integrated with other issues/actions. For instance, there is a tie in to storage (both built and natural), habitat restoration (e.g., reconnecting floodplains), as well as instream flow needs during the winter months. The objective should be to slow down and retain water rather than trying to "increase flow through" the valley. Increasing flow through channelization has been a historic practice to address flooding that may exacerbate other issues. This issue, along with others, should be considered holistically. Suggested word change included.

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.

Commented [PRT - Sug177]: The plan doesn't clearly address who is responsible for implementation, how the strategies work together in an integrated manner, or how implementation will potentially be funded. Clarify roles and responsibilities for plan implementation. For instance, it is unclear if the Partnership seeks to undertake its own groundwater study or whether they will advocate to have the state complete a groundwater study.

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

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