BSWG: Whychus Subgroup
January 26, 2015, 11:00- 1:00 PM, Sisters City Hall
Draft Meeting Notes

Attending

Tom Davis, Native Reintroduction Network
Dave Dunahay, Central Oregon Flyfishers
Kate Fitzpatrick, Deschutes River Conservancy/BSWG Process Co-Coordinator
Kyle Gorman, Oregon Water Resources Department
Jonathon LaMarche, Oregon Water Resources Department
Bonnie Lamb, Oregon Department of Environmental Quality
Peter Lickwar, US Fish and Wildlife Service
Paul Lipscomb, Oregon Land and Water Alliance
Lauren Mork, Upper Deschutes Watershed Council
Mary Orton, The Mary Orton Company
Jeff Perreault, Citizen
Mike Riehle, Sisters Ranger District, USDA Forest Service
Bob Spateholts, Portland General Electric
Marc Thalacker, Three Sisters Irrigation District (Chair)
Pamela Thalacker, Three Sisters Irrigation District
Mike Tripp, Trout Unlimited
Zach Tillman, Deschutes River Conservancy
Mark Yinger, Mark Yinger Associates

Also Attending

Ken Lite and Josh Hackett of the Oregon Water Resources Department and Marshall Gannett of the US Geological Survey attended as presenters.

Anne George, The Mary Orton Company, LLC, attended as the facilitator.

Agenda

The group used the following agenda as a guide during their meeting:

1. Welcome
2. Introductions
3. Overview and approval of agenda
4. Groundwater Presentation (Ken Lite, Marshall Gannett, Josh Hackett)
5. Review and Discussion of Task Table
6. Meeting Evaluation
7. Adjourn

Welcome, Introductions, and Agenda

Marc convened the meeting and welcomed everyone.

Mike Riehle made a comment that he would like to check with ODFW to make sure they are comfortable with the approach to refining instream needs that was discussed at the last meeting (to review the existing temperature-flow analyses).

Groundwater presentation (attached to email)

The presentation took place in three parts:

1. Ken Lite (OWRD) gave an overview of the Upper Deschutes Basin Groundwater Flow System, focusing on the Whychus Subbasin.
2. Josh Hackett (OWRD) shared the results of detailed analysis of springs in the Whychus Subbasin
3. Marshall Gannett (USGS) discussed the updates to the groundwater model in the Upper Deschutes Basin that are underway.

Major points included:

- OWRD tracks long-term observation wells.
- The shallower wells track the climate signal well, with levels dropping during drought periods and responding in wetter years.
- The deeper wells followed this pattern until the last recharge event after 2010. The wells have not rebounded with the climate signal since then.
- This indicates that some change at the level of the regional aquifer is happening, while the locally-recharged springs have not seen the same change.
- Josh shared in-depth research on springs in the Whychus Subbasin. Using chemistry, isotopic signatures and looking at thermal impacts on Whychus Creek, the study sought to understand the source of the springs and where they are being recharged.
- Josh described two groups of springs on the east side of McKinney Butte - the Camp Polk Springs and the McKinney Butte Springs (including Frank and Chester springs).
- Isotopic signatures indicate that the Camp Polk springs are recharged at similar elevations, which indicates a local source of recharge. The McKinney Butte springs are recharged at high elevations in the Cascades, and indicate a more regional flow path for groundwater.
- The study also gathered temperature data, placing loggers in the springs and upstream and downstream of the springs in Whychus Creek. Results showed significantly-more diurnal fluctuation upstream versus downstream of the springs, suggesting that the springs provide an important thermal buffer to high temperatures. Springs likely provide thermal refugia in times of high temperatures/low flows.

Camp Polk Springs is recharged at an elevation similar to the creek, so it is probably recharged by local water.

- The Frank and Chester Springs are recharged at a very high elevation and are likely recharged by much deeper water.
- Marshall discussed the existing groundwater modeling capabilities in the basin and modeling improvements currently underway through the development of the GSFLOW model.
- Generally, groundwater models take inputs, run them through a simulation model and produce outputs. These can be used to understand impacts to streamflows, for example, of increased well pumping over time and in specific reaches.
- The current groundwater model was completed in 2000.
- USGS ran a 2008 simulation that updated climate information, pumping information and included canal lining completed at that time.
- GSFLOW will have a finer resolution, will be able to simulate lakes, and extend further into the Crooked Subbasin. The model will integrate:
    - Surface processes (e.g. snowpack accumulation, storage and melting; soil moisture storage)
    - Unsaturated zone process
    - Groundwater flow (MODFLOW)
- The timeline for final development of the GSFLOW model is as follows:
    - Model development phase -current
    - Model calibration phase: March-May 2015
    - Preliminary scenario testing: June-August 2015
    - Report development, model approval and release, early 2016
- Marshall is working with Jennifer Johnson (climate change modeler for Reclamation) and they are discussing how this model could be used in the Basin Study to help predict flow regimes of various scenarios.
- Jonathon and Marshall emphasized the difference between the movement of pressure changes and the movement of water itself. It is possible to see the effects of groundwater pumping, for example, well

before it is possible to see the actual water itself. He said the effects of a wave can be seen on the east side of the Cascades perhaps within two years. However, the physical movement of water may take hundreds of years. He used the example of a garden hose to describe the effect, in that a full garden hose will exit water almost immediately. However, in an empty hose water would need to flow through the entire hose before it exits..

The members had questions for the presenters and discussion followed. Major points included:

- Water coming out of a well might be able to be tested for its source depending on the construction of the well.
- Zach asked Ken about the 20 foot fluctuation and asked if there was any correlation on groundwater levels and spring input. Ken replied that the climate and precipitation signals…. He said they studied a series of wells and said it would take a large amount of recharge to move water very far.
- The farther water is from its source the less impact there is from a recharge because the pulse is not large enough.
- Riverware and GSFLOW can be integrated, depending on study needs, but the benefit of that integration differs by study.

Review and Discussion of Task Table (Attachment 2)

Kate discussed with the group how the Task Tables used at the last meeting and the comments received on the tasks were incorporated into the new Task Table. The group discussed the non-bolded (Whychus-specific) tasks line-by-line.

Task 2.3: Evaluate water rights availability based on 70 years of gage data in an effort to determine what quantity of "paper" water rights will equate to "wet water" instream to meet baseline flow targets (State of Oregon instream water rights).

- **Agreement: Change "70 years of gage data" to "all gage data."**
- It was noted that the more relevant data is the last 15 years.

Task 2.4: Peer review/evaluation of existing flow/temperature analysis, and include analysis for spawning periods.

- **Agreement as written.**
- Confirmation that this includes Chinook, steelhead, redband trout, and bull trout.
- The 2013 Upper Deschutes Watershed Council analysis is summarized in a technical report on its website: http://www.upperdeschuteswatershedcouncil.org/wp-content/uploads/2014/12/2013-Whychus-Creek-Monitoring-Report_FINAL2.pdf
- 2014 analysis is ongoing and should be out in June.
- UDWC has data that starts in April, which should cover spawning periods within the irrigation season
- Tom Davis inquired about the analysis Lesley Jones did. Marc said the district is not comfortable with the analysis. Lauren said the current analysis incorporates the base data, but that the Jones work may have some limitations. Tom agreed to talk with Ryan and Lauren more about this topic.
- Bonnie mentioned that HeatSource could look at spring inputs and tradeoffs.
- **Action Item:** Mike Reihle will check in with ODFW to make sure they are ok with temperature being used as a proxy to understand instream flow needs.

Task 4.1.1: Evaluate groundwater-surface water switches as a potential opportunity (analysis of impacts included in tradeoff analysis).

- The district has supplemental wells. The idea would be to incentivize farmers and the district to use wells and leave natural flow in Whychus Creek in dry periods.
- Legal constraints and opportunities were discussed.
- Zach said the DRC sees this is an important tool to assess meeting instream flow goals in dry years.

- Marshall said that tradeoff analysis is possible, using basic analytic tools, to understand what pumping "x" does to stream reach "y."
- Actions related to this task in the Basin Study could include:
    - Documenting opportunities (i.e. existing wells)
    - Documenting legal/policy constraints and/or frameworks
    - Incorporating information documented into scenarios for trade-off analysis
- Noted that the location(s) of pumping is important – do you remember why? If so, can we include that here?
- Marshall offered himself as a resource to the group as the group refines its work

- **Agreement:** Add the italicized language so the task reads: "Evaluate groundwater-surface water switches as a potential opportunity (analysis of impacts *t**o quantity and quality of springs*** included in tradeoff analysis)"

Task 4.1.2: Evaluate Conservation Opportunities (TSID canals, on-farm efficiency; municipal conservation).

- **Agreement**: "TSID canals" becomes "TSID canal efficiencies" in Task 4.1.2. Task 4.1.2 will now read "Evaluate Conservation Opportunities (**TSID canal efficiencies**, on-farm efficiency; municipal conservation).

Task 4.1.3: Evaluate the opportunity for water rights transfers
- **Agreement as written.**
- Marc stated that there are two opportunities for permanent water rights transfers: the Sokols and the City of Sisters.
- Kate clarified that this would mean that the group would not be considering district lands as permanent transfer opportunities and asked if there were any questions/discussion on this.
- Marc clarified that the district is not OK signing off on a Basin Study that considers permanently transferring water off of TSID lands as a water supply option.
- Kyle suggested noting that in the narrative notes that support the Task Table.

Task 4.1.4: Evaluate policies/pricing of TSID leasing to optimize program.
- General agreement; no discussion.

Task 4.1.5: Develop a Drought Management Plan based on existing information and optimization of tools available.
- **Agreement as written**.
- The district may have a plan as required by state and federal statutes, and this group would like a plan that meets multiple goals, including instream.

Task 4.1.6: Evaluate habitat restoration opportunities
- **Agreement as written.**
- Group discussed that restoration that reconnects floodplains and provides natural water storage, could possibly attenuate flows and provide benefit in dry periods.
- Tom noted calculating flow benefits would be extremely complex.
- The group discussed doing this evaluation at a high-level.
- The group discussed a suggestion to consider adding the wording "non-structural storage," but opted not to make any changes to the task wording.

Task 4.1.7: Evaluate Aquifer Storage and Recovery
- **Agreement:** Break this task into two tasks: Aquifer Storage and Recovery (ASR) and Aquifer Recharge (AR).
    - **4.1.7. Evaluate Aquifer Storage and Recovery**
    - **4.1.7.b Evaluate Aquifer Recharge**

- Generally, AR is allowing water to leak back into the aquifer; ASR is an effort to put water in a natural reservoir with the express purpose of storing it and then removing it for a different use at a later date.
- Both AR and ASR require water rights.
- It was discussed that AR could be a good companion piece to groundwater-surface water switches in a scenario analysis, as AR could recharge the aquifer, potentially offsetting impacts.
- It was suggested that AR could also be linked to off-channel storage.
- **Action Item:** Kate will provide more background on these two options and their legal frameworks before the next meeting.

Task 4.1.8: Evaluate off-channel storage options (evaluation of legal constraints to help guide level of analysis)

- **Agreement as written.**
- Legal constraints need to be acknowledged in this evaluation.
- Marc stressed future flood danger should be addressed in this evaluation.
- Marc described a lower reservoir that would only be activated during flood flows, saying it would be "taking the top off."
- Marc suggested using the Plainview Canal and putting a reservoir in the forest.
- Infrastructure that was capable of "taking the top off" would need to be assessed.

Budget Recommendations

- Many in the group said they felt uncomfortable discussing specific budget numbers without details about the tasks or how budget estimates would be derived.
- The group suggested leaving the budget for Tasks 2.3 and 2.4 as noted, and increasing the budget for the tasks in group 4 to $50,000.
- Marc and others suggested that a prioritization of tasks could be more important than specific budget estimates at this point.

The meeting was adjourned.

Attachment 1: Basin Study Requirements

Basin Studies address basin-wide efforts to evaluate and address the impacts of climate change. Funding is available for comprehensive water studies that define options for meeting future water demands in river basins in the western United States where imbalances in water supply and demand exist or are projected.

Each Basin Study will include four basic components:

1. Projections of water supply and demand within the basin, or improvements on existing projections, taking into consideration the impacts of climate change.

2. Analysis of how existing water and power infrastructure and operations will perform in the face of changing water realities such as population increases and climate change.

3. Development of structural and nonstructural options to improve operations and infrastructure to supply adequate water in the future.

4. A trade-off analysis of the options identified and findings and recommendations as appropriate. Such analysis simply examines all proposed alternatives in terms of their relative cost, environmental impact, risk, stakeholder response, or other attributes common to the alternatives. The analysis can be either quantitative or qualitative in measurement.

(Sources: http://www.usbr.gov/WaterSMART/bsp and http://www.usbr.gov/WaterSMART/bsp/require.html, accessed September 10, 2014)

Draft

Whychus Sub-Group 1/22/2015

Basin Study Element	Task	Description	Budget Estimate - Reclamation and IDIQ Contractor		Budget Estimate - Non-Federal Cost Share Partner	
Analyze Existing Supplies & Future Projections	**1.1**	**Summarize existing information on current water supply (surface water and groundwater)**	**1.1**	**$1,000**	**1.1**	**$7,500**
	1.2	**Develop climate change analysis projections.**	**1.2**	**$60,000**	**1.2**	**$1,800**
Develop Climate Change Scenarios Affecting Water Supplies	**1.3**	**Apply climate change analysis to current supplies.**	**1.3**	**$65,000**	**1.3**	**$1,800**
	1.4	**Write Technical Report #1.**	**1.4**	**$3,000**	**1.4**	**$5,500**
Analyze Existing & Future Water Demands	**2.1**	**Summarize existing information on current and future water demand (instream and out of stream).**	**2.1**	**$1,000**	**2.1**	**$7,500**
	2.2	**Evaluate current and future groundwater/mitigation demand.**	**2.2**	**$2,000**	**2.2**	**$10,000**
	2.3	Evaluate water rights availability based on 70 years of gage data in an effort to determine what quantity of "paper" water rights will equate to "wet water" instream to meet baseline flow targets (State of Oreogn instream water rights)	2.3	$1,000	2.3	$2,500
Develop Climate Change Scenarios Affecting Water Demands	2.4	Peer review/evaluation of existing flow/temperature analysis, and include analysis for spawning periods.	2.4	$4,500	2.4	$2,500
	2.5	**Apply climate change analysis to projected future demands.**	**2.5**	**$60,000**	**2.5**	**$1,800**
	2.6	**Write Technical Report #2**	**2.6**	**$3,000**	**2.6**	**$5,500**
Analyze How Existing Water & Power Infrastructure will Perform in the Face of Changing Water Realities	**3.1**	**Identify and evaluate current water and power infrastructure in the basin, and develop metrics of measuring baseline system reliability.**	**3.1**	**$5,000**	**3.1**	**$20,000**
	3.2	**Characterize projected water and power infrastructure performance based on climate change projections**	**3.2**	**$60,000**	**3.2**	**$1,800**
	3.3	**Write Technical Report #3**	**3.3**	**$3,000**	**3.3**	**$5,500**
Develop Options to Meet Future Water Supply Needs	4.1	Evaluate water conservation and re-allocation options and packages of options/projects. Identify viable options for meeting the water supply needs for irrigation, instream and municipal/water suppliers. Identify legal and administrative requirements for option implementation. Options to include:	4.1	$5,000	4.1	$40,000
	4.1.1	Evaluate groundwater-surface water switches as a potential opportunity (analysis of impacts included in tradeoff analysis).				
	4.1.2	Evaluate conservation opportunities (TSID canals; on-farm efficiency; municipal conservation)				
	4.1.3	Evaluate the opportunity for water rights transfers				
	4.1.4	Evaluate policies/pricing of TSID leasing to optimize program				
	4.1.5	Develop a Drought Management Plan based on existing information and optimization of tools available.				
	4.1.6	Evaluate habitat restoration opportunities				
	4.1.7	Evaluate Aquifer Storage and Recovery				
	4.1.8	Evaluate off-channel storage options (evaluation of legal constraints to help guide level of analysis).				
	4.7	**Write Technical Report #4**	**4.7**	**$3,000**	**4.7**	**$5,500**
Conduct Evaluation & Trade-Off Analysis of Options Identified	**5.1**	**Develop scenarios to meet water supply and demand imbalances based on future near-term and long-term projections, district conservation and management plans, and opportunities identified in prior tasks (Two sets of scenarios - one with "new" storage, the other without).**	**5.1**	**$100,000**	**5.1**	**$200,000**
	5.2	**Identify cost and funding options, for both near-term (lower cost) and long-term (higher cost) projects, associated with each scenario.**	**5.2**		**5.2**	
	5.3	**Model outcomes of identified scenarios.**	**5.3**		**5.3**	
	5.4	**Evaluate changes in supply and demand imbalance with each near-term and long-term scenario.**	**5.4**		**5.4**	
	5.5	**Conduct trade-off analysis of options accounting for costs, environmental impact, including groundwater impacts, stakeholder response and other potential attributes.**	**5.5**		**5.5**	
	5.6	**Write Technical Report #5**	**5.6**		**5.6**	
Draft and Final Basin Study Developed	**6.1**	**Incorporate Technical Reports and comments into a consolidated Draft Basin Study Report: upon review of the draft, Prepare and Publish Final Basin Study.**	**6.1**	**$30,000**	**6.1**	**$40,000**
	6.2	**Technical Sufficiency Review**	**6.2**	**$25,000**	**6.2**	
				$10,500		$45,000

Notes:
****Sub-basin sub-totals account only for task budget that is specific to the sub-basin, overarching task budgets are not included***
Tasks and budget numbers in bold represent items tasks that run across all sub-basins