**Clean Drinking Water Starts Upstream:**

**Partnering to Restore Watershed Health for Communities and Fish**

Wenatchee, WA

April 10, 2018

## Watershed Protection - Land Manager and Conservation Practitioner Perspective

### Presenter: Barbara Carrillo, Upper Columbia Salmon Board

**Barbara Carrillo** provided an overview of the Upper Columbia Salmon Board (UCSRB) and its work to restore viable populations of salmon in Okanogan, Methow, Wenatchee, and Yakima subbasins. UCSRB has several partners including local non-profits, three counties, and two tribes. Funders include the Bonneville Power Association, Yakima Nation, National Ocean and Atmospheric Administration (NOAA), Washington State Recreation and Conservation Office, and Washington Department of Fish and Wildlife. From 1996-2015, UCSRB completed 370 projects.

Ms. Carrillo shared several current UCSRB initiatives. The Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan was released in August 2017 and focuses on Spring Chinook and Steelhead Salmon recovery. The North Central Washington for Health Collaboration was launched in 2013 and is facilitated by UCSRB. It works to advance forest health through transparent actions that improve forest resiliency, preserve terrestrial and aquatic wildlife habitat, protect natural resources, provide recreational opportunities, promote utilization of natural resources, and support local economies in Chelan and Okanogan Counties. The Upper Wenatchee Pilot Project is currently being implemented to restore the forest health and sustainability by re-establishing a health range, age, and diversity of tree species. Another component is planned burns to increase fire resiliency.

The Snow Pack online tool was created in partnership with the Washington State Department of Ecology’s Office of the Columbia River and Ecotrust to develop a forest restoration decision support tool aimed at increasing water yields across North Central Washington. Snow Pack helps assess the effects of forest restoration activity and assists restoration practitioners who support salmon recovery across North Central Washington.

In outreach and legislative efforts, UCSRB emphasizes that Washington funds facilitate not only salmon recovery but additional benefits, including contributions to the economy, job creation, and citizen engagement through scientific programs.

Following her presentation, Ms. Carillo responded to participants’ questions:

* **What type of outreach is most effective in your work?**Our most successful outreach is connecting with legislators at the local and national level. Supporters serve as voice in the community. UCSRB also conducts public outreach and education in the Upper Columbia via articles and outreach activities in Washington DC and Olympia.
* **Does UCSRB clean up spills?**No, other organizations in the Columbia basin focus on spills.
* **Is there a decline in the salmon population due to sea lions?**Yes, sea lions eat the salmon. There are conflicting values as sea lions also have protections and groups who advocate for them. UCSRB is planning on conducting legislative outreach on this issue.
* **Are the locations of UCSRB’s restoration projects mapped?**Yes, the restoration projects in the Okanogan, Methow, Wenatchee, and Yakima subbasins are mapped in the Habitat Work Schedule.

### Presenter: Mike Kaputa, Chelan County Natural Resources

**Mike Kaputa** noted that, while drinking water isn’t their main focus, the Chelan County Natural Resources Department does conduct projects that support drinking water. The department works with lots of organizations represented at today’s workshop, but could do a better job of understanding what these organizations do. Current areas of work include the Lake Chelan Watershed Planning Unit, Entiat Watershed, and Wenatchee Watershed. The department has several active restoration and conservation projects.

The Icicle Work Group focuses on the Icicle Creek subbasin in Leavenworth and works to improve instream flow, protect tribal and non-tribal fisheries, and secure the water supply. The Work Group is ambitious in bringing together many partners, including the City of Leavenworth, NOAA Fisheries, U.S. Forest Service, Trout Unlimited – Washington Water Project, City of Cashmere, Cascadia Conservation District, Washington Water Trust, Ecology – OCR, Chelan County, Confederated Tribes of the Yakama Indian Nation, Confederated Tribes of the Colville Reservation, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service – Leavenworth National Fish Hatchery, Washington State Department of Fish and Wildlife, Washington State Department of Ecology, Icicle and Peshastin Irrigation District, Cascade Orchard Irrigation Company, and Icicle Creek Watershed Council.

The Lake Chelan Watershed Planning Unit works to protect and monitor water quality, ensure long-term water supply including for hydropower, improve habitat, protect drinking water supplies, and address aquatic invasive species, including zebra mussels. The Unit has received $20,000 for five years for this work.

The Keep It Blue Campaign is a new citizen science initiative supporting the health of Lake Chelan. Chelan County works with partners to measure water quality, address aquatic invasive species, and conduct outreach and education activities. Mr. Kaputa noted that this kind of work in becoming more popular for the County, which is a change from 10 years ago.

The Stemilt Partnership is a coalition of agriculture, wildlife, recreation, development, and conservation interests that works to protect water, wildlife and recreation activities, and forest health, and to conduct recreation planning. The Partnership and Chelan County worked to prevent the privatization of several acres of DNR upland forest in the Stemilt Basin. During a public meeting on the sale of the land, 150 people attended in opposition, which spurred the county to purchase the land, now known the Stemilt-Squilchuck Community Forest. The Stemilt Partnership meets regularly to review the management of the Forest.

The Mission Creek Watershed Council uses an integrated approach to address water supply and quality, recreation, drinking water protection, forest health, agriculture, and habitat restoration. Dirt and mountain biking are common on U.S. Forest Service roads and, while the County supports recreational activities, they want to ensure proper sediment management in East Fork Mission Creek.

Poison Creek has historically seen a lot of agricultural grazing and tree removal. Activities like this led to the Creek having less water storage and more sediment. The County worked to restructure the Creek to raise the creek bed, so it can access its flood plan. Riparian buffers were added, which act as fire breaks.

Mr. Kaputa shared lessons learned from his work, which include: that integrated planning works, you need to bring all interests to the table, change is hard and slow, collaboration should be focused, multiple benefits can result from various protection and restoration initiatives, and drinking water protection efforts may be underrepresented.

Following his presentation, Mr. Kaputa responded to participants’ questions:

* **How did the integration come about?**Through the Drinking Water Providers Partnership.
* **What are things we can do that have benefits downstream?**Think about upland restoration projects through the lens of who we are. Work to identify metrics that connect projects to series of benefits. For example, for a water treatment plant budget, one single source cannot fund all the projects, but you could combine multiple sources of funding. Funding is usually tied to something, like a forum. Cities have their own priorities, so think about how the work you do is related to their priorities.
* **Do you conduct any projects on microbial contamination?**Yes, in Mission Creek and in failing septic systems.

## Source Water Protection - A Utility Perspective

### Presenter: Corina Hayes, Washington State Department of Health

**Corina Hayes** provided an introduction to drinking water treatment and types of filtration. She noted that surface water and bodies of water are exposed to the atmosphere and subjected to surface runoff. There are rules for treating drinking water, as people get sick when water is not properly protected and treated. Drinking water treatment specifically targets microorganisms such as Giardia, Legionella, heterotrophic bacteria, and Cryptosporidium. Turbidity, another important indicator of water quality, is a measure of cloudiness in water caused by particulate matter and is measured in nephelometric turbidity units (NTUs).

Ms. Hayes described four types of treatments for raw water: bag filters, slow sand, diatomaceous earth, and membranes. There are limitations to the effectiveness of each method. Bag filters are small and simple, but may not be a good fit for larger treatment plants. Slow sand is the oldest type of municipal water filtration. Diatomaceous earth filtration is a mechanical separation of solids and microorganisms from raw water.

### Presenter: Arnica Briody, City of Leavenworth

**Arnica Briody** shared a water treatment plant operator perspective. The intake valve at Icicle Creek is one mile from the treatment plant. River water quality is impacted by macroinvertebrates, microinvertebrates, blue-green algae, parasites, and natural causes, such as floods and mudslides. Seasonal changes can bring challenges such as freezing at the intake valve.

The Leavenworth water treatment plant uses several types of filtration, including conventional direct filtration, slow sand filtration, and new filtration technology, such as membranes and cartilage sand. Conventional filtration is able to handle high amounts of turbidity. Direct filtration has the same setup as conventional filtration, but cannot handle high levels of turbidity. The coagulation used is a polyaluminum chloride that sticks to colloid material, making it heavy enough to settle and be filtered out. In slow sand filtration cells, the schmutzdecke stack (the biological layer) builds up and needs to be cleaned off regularly. The filter is backwashed every two days, except in the summer when it is backwashed every day, to keep some biological matter in the filter. The treatment plant uses a chlorine contact chamber and vacuum system that pulls the water into the drain. It takes four active filters to provide enough backwash for one filter.

Staff conduct regular jar testing, checking for bacteria. They also test the turbidity of the raw water coming through the intake value. The testing procedure mimics the filtration and treatment process.

Ms. Briody shared some challenges and threats to the plant, which include a rise in sediment in the fall and spring. There is an older dam holding in a lake reservoir located eight miles from the water treatment plant. The plant might be affected if there is high runoff or if too much pressure causes the dam to release water. The intake is also near a popular swimming hole and occasionally there will be litter, including toilet paper, that could get into the drinking water supply. Another potential impact is that many water treatment plant standards were developed based on the water quality when the plant was first built. Plants need to adjust to new water quality issues and rules.

Following their presentations, Ms. Hayes and Ms. Briody responded to participants’ questions:

* **How often is jar testing conducted at the Leavenworth plant?**Jar testing is conducted on a weekly basis and there is additional testing during seasonal changes.
* **When is well water used?**The plant relies on wells when there is a landslide or if there are major projects in progress at the plant.
* **What are the state and local regulations?**Not all states have the same regulations, and state drinking water programs can also have voluntary components. Additionally, state drinking water programs do not have control over landowners who own and manage land in watersheds.

## Source Water Protection - A Local Utility and Conservation Partnership

### Presenter: MarySutton Carruthers, Cascadia Conservation District

**MarySutton Carruthers** noted that, while the city of Leavenworth is small, it has a high number of visitors, which can increase the city’s population almost tenfold at certain times. The Enchantment Area Wilderness Permit lottery has seen a 650% increase in applications in the last six years, not including day use permits. While there is an estimated economic increase in $3 billion in state and local tax revenue and $740 million spent annually by visitors, there are significant impacts to the watershed, as the forest has high importance to drinking water.

Cascadia Conservation District has partnered with organizations that have local knowledge and technical expertise to improve drinking water sources. A baseline survey for this initiative, which surveyed 54 people in the community, found that 93% live or work near a recreation site and only 19% knew the Icicle Creek was a source of ground water. Threats to drinking water quality include improperly managed human waste and a lack of understanding of the impact humans can have on water quality. Key messages of the initiative are proper disposal of human waste, “leave no trace” concepts, education about treatment plant activities that impact drinking water, and suggestions for how people can protect their drinking water.

Phase I is currently underway and focuses on outreach and education, which includes educational materials at U.S. Forest Service trailheads, camps, and day use areas, as well as community events such as cleanups. Direct outreach is conducted in heavy use areas. Additionally, region-wide outreach is also conducted through newsletters, articles, and brochure distribution. They are working with the U.S. Forest Service graphic designer so that materials match the look and feel of Forest Service documents.

Phase II focuses on monitoring and implementation and will occur in 2018 and 2019. Components include project planning and coordination, trail and campsite monitoring, restoration project implementation, and a feasibility study of Blue Bay.

Following her presentation, Ms. Carruthers responded to participants’ questions:

* **What do you do about illegal camping?**When illegal camping is identified, it is documented and shared with U.S. Forest Service for collaboration on addressing it.
* **What are blue bags?**They are bags for human waste and are sometimes provided at trailheads, but the policy for these bags can be unclear.
* **In addition to human waste, is pet waste a problem?**Yes, many people do not pick up their dogs’ waste.

## Site Visit, City of Cashmere Surface Water Treatment Plant

Participants had the opportunity to visit the Surface Water Treatment Plant in the City of Cashmere. Mayor Jeff Gomes was on site to greet participants. He has been involved in the Icicle Work Group for the past three years. Cashmere works with Leavenworth, public utility districts, and other water groups to partner on how best to meet the Total Maximum Daily Load as a region. One barrier for Cashmere is that water rights have not been expanded since the 1940s. Mission Creek is running out of water due to drainage, which impacts homeowners.

The plant is an economical system and it is currently not running at full capacity. At the time of the site visit, the plant was using well water as the turbidity in the river was too high due to a recent storm. One well is always in use and the rest are reserve. The plant has a two-day water supply in the well reserves. The Washington Department of Health sets the standards for what treatment activities can occur at the plant.

Cashmere will start to see the spring snowmelt in May and June, and they are hoping for a slow melt. The lowest level of water they have seen in the river is 225 cubic feet/second; however they did not need to ration the water supply during that low flow period. During that time, the plant issued a “level one” warning, where residents are encouraged to voluntarily refrain from outside watering.

The plant uses slow sand filtration. Each water storage cell has three feet of sand and four feet of gravel. Each cell can hold approximately one million gallons of water and is filled with raw water, which then moves through the sand and is filtered. The total water supply is three million gallons, which is steady for the majority of the year. One reason for this is because Cashmere is not as impacted by tourism as Leavenworth. Staff regularly test the water in the cells for fecal contamination as birds often try to swim in the cells.

Staff can control everything in the water treatment system, including the wells. They are able to manipulate the system to meet specific needs; for example, during a fire, staff can direct water to feed to the fire trucks’ location. Staff can conduct these activities through an iPad or cell phone onsite or remotely. They are able to view the parameters of each location and can check trends to identify items that need to be addressed. The system will also send alerts when issues occur.

## Report-Out from Source Water Protection Breakout Groups

Participants were divided by the subbasin they represented. Each breakout group reported on the results of their brainstorming sessions. See the **Appendix** for photos of the flip charts used by each group.

### Wenatchee Subbasin

* Priorities and Common Goals
  + Resiliency: fire risk reduction and recovery after fires.
  + Sediment: low flow in the summer in the City of Cashmere.
  + Addressing failing septic systems.
* Relationships and Collaboration
  + U.S. Forest Service has incomplete road maps on Forest Service land, which makes it difficult to identify problem roads and culverts.
  + Orchards: how can they become involved in the Salmon Safe Program?
  + U.S. Department of Transportation: how can we work with them to reduce fertilizer derivatives used in winter?
  + Landowners: how to engage them regarding septic issues.
* What’s Next?
  + Additional work on current projects in Mission and Poison Creeks.
  + Beaver dam analogs to increase water storage.
  + Outreach in Leavenworth: could a brewshed alliance be formed, similar to the one in Oregon?
  + Identify opportunities for engaging landowners on septic issues.
* Implementation Resource
  + The GRAIP light roads assessment tool could be used to identify problem roads and culverts. There will be future trainings with EPA Region 10 on this tool.
  + Rebecca and Alissa to work on a local septic loan program.

### Upper Yakima Subbasin

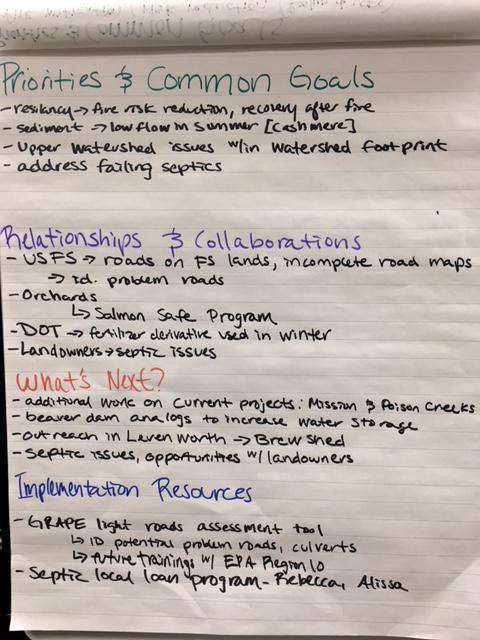
* Priorities and Common Goals
  + Fire mitigation and fire risk reduction are important to both the City of Roslyn and the U.S. Forest Service.
* Relationships and Collaboration
  + Roslyn is working to find on-the-ground partners to assist with funding opportunities.
  + Roslyn and the U.S. Forest Service could collaborate on fire risk reduction.
* What’s Next?
  + Roslyn will cast a wide net for funding sources, including Yakima Basin, Drinking Water Providers Partnership, Bureau of Reclamation (Michelle to assist with finding the best contact), and The Nature Conservancy.
  + Understand what permits as needed, including the U.S. Forest Service special use permit.
  + Create a watershed protection plan.
* Implementation Resources
  + For the watershed protection plan, an updated watershed assessment with the best available data is needed.
  + GIS tools.
  + Grants for planning projects.

## Workshop Themes Identified by Participants

* Stakeholders have different values - where do they see eye-to-eye?
* Stakeholders are working in different sections of the same area - how can we overlay maps and coordinate efforts?
* Plans do not matter if you are unable to implement and enforce them.
* Build a network of contacts, so you know whose authority you need to get what you want.
* Look for non-traditional sources of funding for your work.
* Change can be hard and slow, but there are multiple benefits to collaboration.
* Drinking water protection efforts may be underrepresented, so speak up on what matters to your group.

## Appendix: Breakout Session Flip Chart Photos

### Wenatchee Subbasin



### Upper Yakima Subbasin

