

February 13, 2023

Dr. Tim Deboodt, Crook County  
498 SE Lynn Blvd  
Prineville, OR 97754  
541-903-5903

To: House Committee on Agriculture, Land Use, Natural Resources and Water  
Re: Testimony - HB 3142

Chair Helm and Committee Members,

Drought is often thought of as the significant reduction in annual precipitation when compared to some long term average. We think of its impacts through the lens of reduced plant productivity, reduced water for irrigation, fisheries, recreation and usually associate it with elevated wildfire risk. Central and eastern Oregon's rangelands have also been experiencing a drought of a different kind for decades. A drought due to the presence and dominance of western juniper on the landscape. We look for ways to make the water pie bigger, HB 3142 does that.

My name is Tim Deboodt, OSU Associate Professor Emeritus and currently serving Crook County as its Natural Resources Policy Coordinator. I spent 32 years working for Oregon State University Extension Service. A significant amount of that time was spent working with landowners, federal land management agencies and the research community studying the impacts of western juniper on our landscapes.

Western juniper is a native species, unique to Oregon and the northern portions of California and Nevada. Western juniper has increased the number of Oregon acres it occupies 10 fold since the late 1800's. The beginning of juniper expansion coincides with the introduction of livestock grazing, the decline in fire on the landscape and a period of wet and cooler temperatures throughout the west. Western juniper acreage in 2004 was estimated to be over 10 million acres in eastern Oregon (Azuma et al., 2005).

Since 1936, acreage increases by County are:

County	Total County Acres	1936 <sup>a</sup> Juniper Acres	1999 Juniper Acres	Percent Increase
Crook	1,964	509	1,136	223
Deschutes	1,932	329	357	108
Jefferson	1,140	63	504	800
Klamath	3,804	106	278	262
Lake	5,207	222	847	381
Harney	6,486	189	1,212	641
Wheeler	1,097	50	509	1010
Grant	2,898	41	837	2041
Baker	1,964	20	418	2090

<sup>a</sup> Estimates of juniper based on 1936 vegetation map from Oregon Department of Forestry  
Source: The Western Juniper Resource of Eastern Oregon, PNW-RB249, 2005

Much has been learned about the biology and ecology of western juniper over the last 60 years. Since the 1960's, research and juniper treatments have focused on improving wildlife habitat (deer winter range), forage production, reducing soil erosion, and restoring sagebrush plant communities. Today, thousands of acres are being treated to improve sage grouse habitat in southeastern Oregon.

In 1994, the Camp Creek Paired Watershed Study was established in SE Crook County in response to inquiries about how the expression of water would change following the removal of juniper. Observations from juniper removal activities in the 1980's and early 90's included noting increases in output from known springs, new springs appearing where before treatment they were not recorded, and increased channel flow resulting in a few intermittent streams turning perennial. The Camp Creek Paired Watershed Study is a joint research project with OSU Department of Animal and Rangeland Science, Prineville District BLM, Hatfield High Desert Ranch, Crook County SWCD, OWEB, EPA and many others. The study area consists of over 500 acres and is the longest running juniper research project focusing on water in the western U.S. nearing its 20 year anniversary.

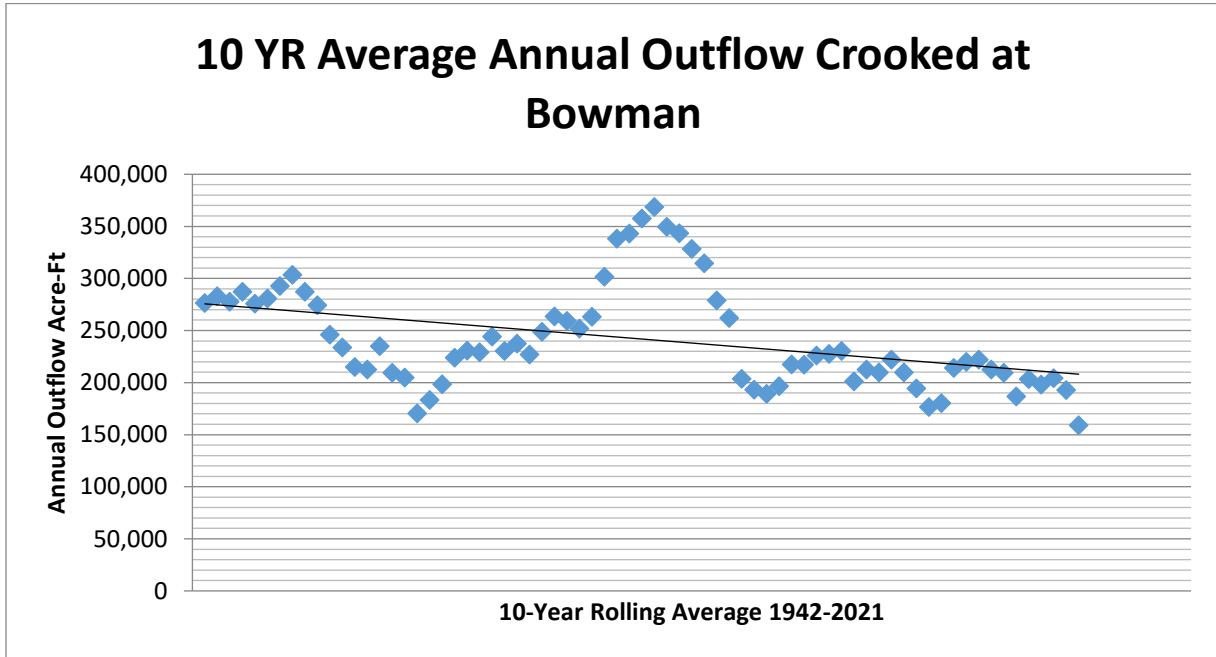
#### Western juniper – Eco-hydrologic Characteristics

- 10 – 18 inch precipitation zone
- Maintains photosynthetic material year-round
- 20 – 50 percent of precipitation is intercepted by tree canopy
- > .3 inch precipitation event for thru-fall
- 90 percent of precipitation events < .3"
- 25- 40 gallons per day per tree (12 inch dbh)
  - (The total gal/tree/year is 4815 for trees)*
  - (juniper saplings evaluated used 70.7 gallons per tree per year)*
- 9 – 35 large trees per acre (13 inch precipitation zone)
- Mature tree densities 10 – 300 + /acre
- Post treatment findings: increased spring flow, perennial streams, ground water connectivity

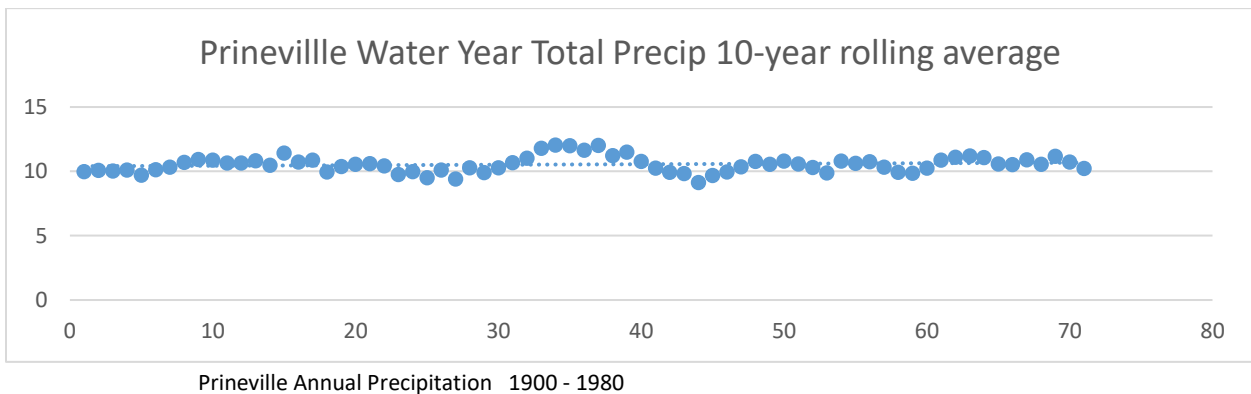
Seventy percent of eastern Oregon's precipitation occurs between the months of October and April and falls as a mix of rain and snow. This is time when plants are dormant and the timing of precipitation is important for soil moisture and groundwater recharge. Western juniper, being evergreen and capable transpiring water year round significantly changes the ability of the site to recharge both soil moisture and groundwater. Western Juniper with its juniper canopy intercept (20 – 50 percent of the annual precipitation) plus actual water use by the juniper can account for all the precipitation delivered to the site. In Crook County, with its current stand characteristic, juniper water use can account for over 150,000 ac. ft. of water per year. Prineville Reservoir's annual capacity is approximately 150,000 ac. ft.

Given current acreage estimates by County, the project area defined by HB3142 as the ability to change how a significant amount of precipitation is expressed once it comes in contact with the soil surface. The following is an illustration of the amounts of **annual** water attributed to juniper use:

County	Juniper ac. increased since 1936	Annual water equivalent
Crook County	627,000	145,000 ac ft
Deschutes County	28,000	6,500 ac ft
Jefferson County	441,000	102,000 ac ft
Wheeler County	459,000	106,000 ac ft
Lake County	625,000	144,000 ac ft
Klamath County	172,000	40,000 ac ft
Harney County	1,023,000	237,906 ac ft



- Outflow from the Crooked River has been monitored since 1942 (10 yr rolling ave.)
  - Maximum 689,000 acre-ft in 1984
  - Minimum 39,000 acre-ft in 1961
  - Fitted trend line shows a decrease of 85,000 acre-ft per year



The success of this bill will not only be measured in the number of acres treated but also by actual (measurable) changes in how precipitation gets to express itself. Soil and Water Conservation Districts are well positioned to provide on the ground leadership. They have decades of history implementing successful conservation practices. Monitoring is critical to the success of this program. Dr. Carlos Ochoa, Professor OSU Department of Animal and Range Science is the lead researcher of Camp Creek Paired Watershed Study. Under Dr. Ochoa's leadership, monitoring of the projects proposed under HB3142 will provide you and the State with how well the projects worked in restoring the hydrologic function of Oregon's Rangelands.

In closing, I would like to remind the Committee that Crook County is the only county in the 11 western states that is still in the most extreme category of drought as reported by the Natural Resources Conservation Service, USDA. And that this designation has been in place for almost 3 years. This bill is critical in helping to address the long term impacts of drought and vegetation change. It is Crook County's hope that you pass this bill as soon as possible and to include it in any drought package that the legislature will pass. We are always looking for ways to make the pie bigger, this bill will make the water availability pie bigger.

Thank you!

Azuma, D.L., B. A. Hiserote and P. A. Dunham. 2005. The Western juniper resource of eastern Oregon. Resource Bulletin PNW-RB-249. USDA Forest Service Pacific Northwest Research Station. 18 p.