



DESCHUTES RIVER
CONSERVANCY



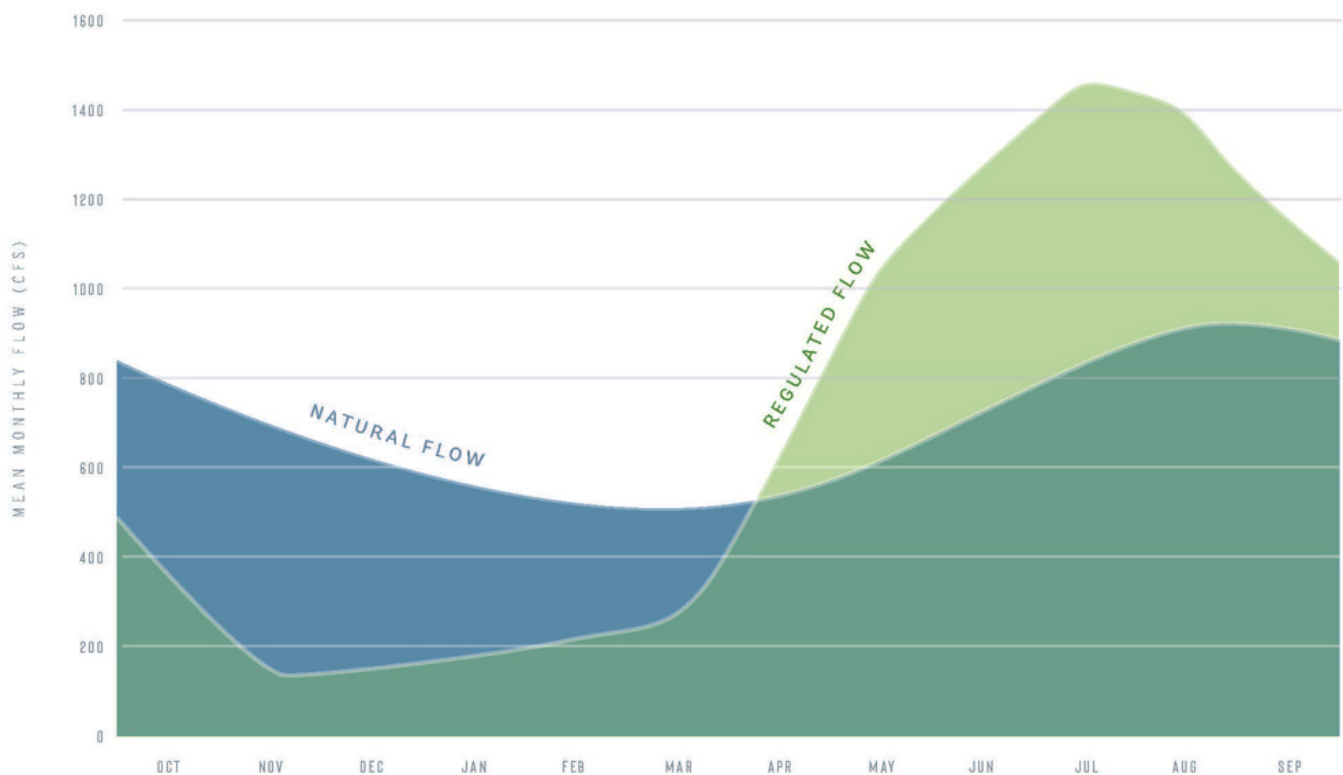
The Deschutes Basin

Notes from "What's Going on with the River?"

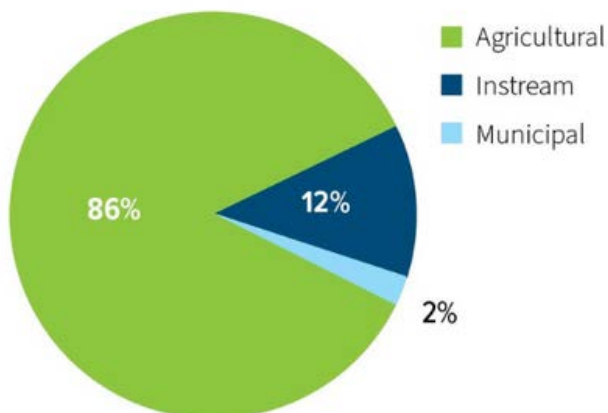
- Historically, the Deschutes River was one of the most consistently flowing rivers, year-round, because it is fed primarily by groundwater/springs.
- Compared to the rest of the state, the Deschutes basin has very little surface water. This is due to the young volcanic geology that absorbs most of the precipitation, which is then discharged into the river via springs.
- There are more water rights (demand) than there is water (supply) naturally occurring in the river. Reservoirs were built to store winter flows in order to increase summer supplies. This has altered the natural flow of the river and created huge fluctuations in the flow, impacting the Upper Deschutes in the winter and the Middle Deschutes in the summer.

Hydrograph of Natural and Regulated Streamflows:

Deschutes River below Wickiup Reservoir (1983-present)



Current distribution of water rights:



STAY INFORMED



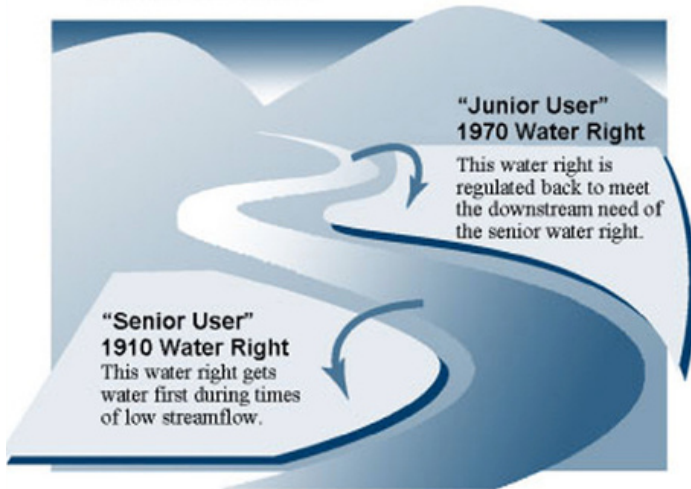
Join our river community



www.raisethedeschutes.org

Notes from "Whose Water is it Anyway?"

Prior Appropriation: an example
"First in time, first in right"



Water Rights: What You Need to Know

- Water in Oregon belongs to the public
- One has the **right** to **use** the water for beneficial purposes
- Leaving water in the river was not legally considered beneficial **until 1987**
- First in time, first in right
- Rights are tied to specific parcels of land
- If you don't use your water, you could lose it

An example of prior appropriation at work

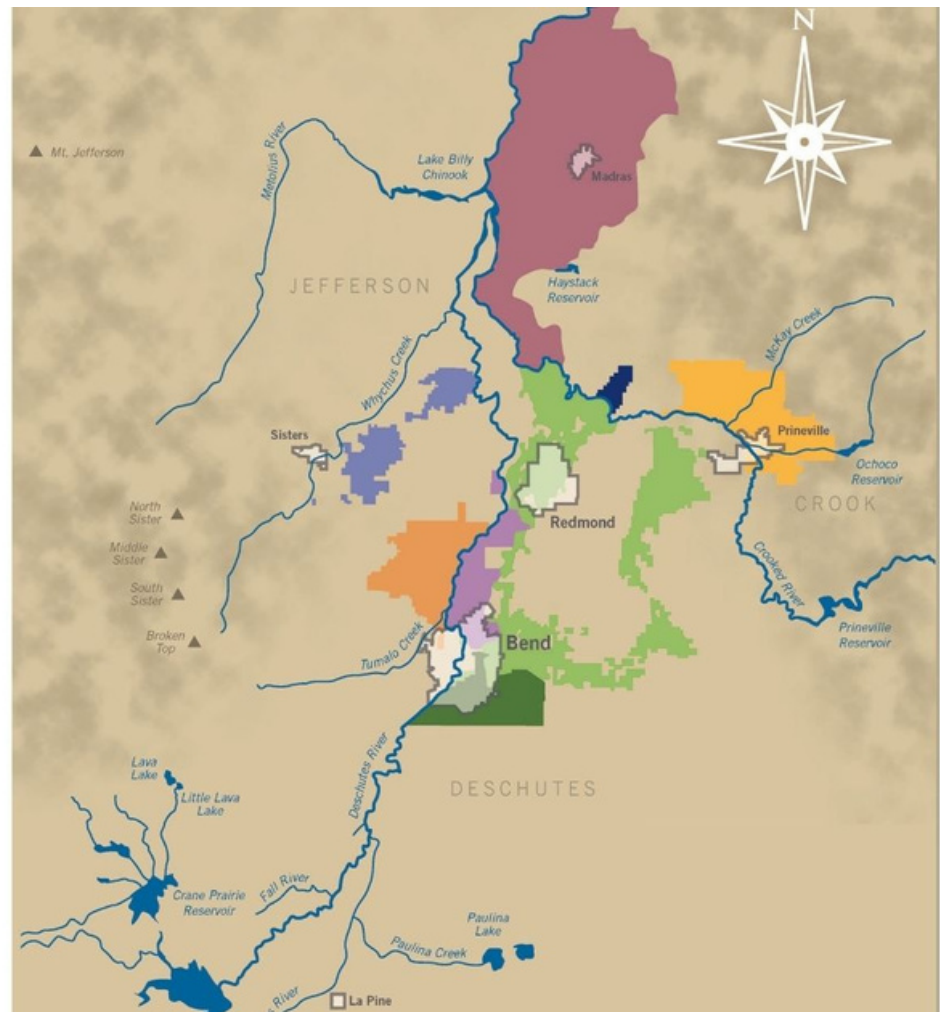
Prior appropriation ensures that the first water user to obtain a water right has first access to water in times of shortage. **Senior water right holders** with earlier priority dates get all their water rights before any **junior water rights holders** can get their water.

DESCHUTES BASIN IRRIGATION DISTRICTS

Priority Dates for Water Rights

- North Unit Irrigation District 1913
- Central Oregon Irrigation District 1900, 1907
- Swalley Irrigation District 1899
- Arnold Irrigation District 1905
- Ochoco Irrigation District 1905
- Lone Pine Irrigation District 1900
- Tumalo Irrigation District 1905
- Three Sisters Irrigation District 1895
- The Deschutes River 1983

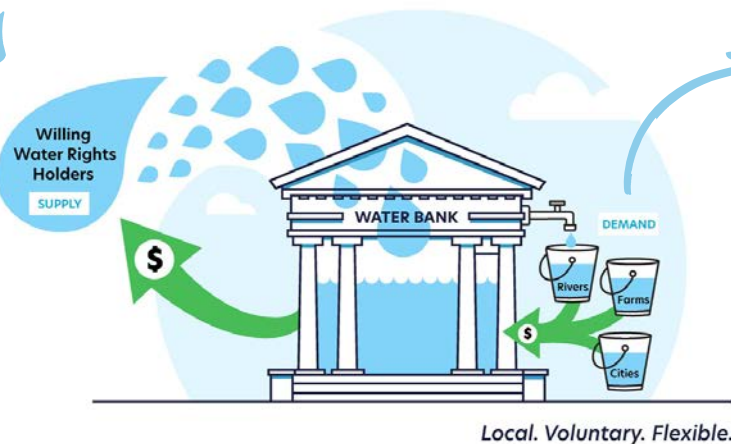
*Priority dates vary by stream



Notes from "Why Water Banks Make Sense"

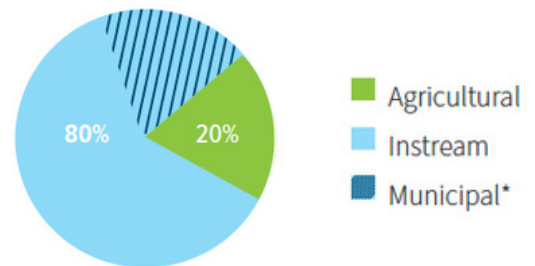
- The Deschutes Basin has significant unmet water needs stemming from how water is managed in our region.
- Water banks are a tool to voluntarily redistribute water from willing water rights holders to help meet unmet needs in the basin, such as for junior water rights holders and rivers.
- **Tools to generate water for the water bank are instream leases, temporary transfers, permanent transfers, piping canals, water conservation projects, and the 2022 Water Bank Pilot.**

Water Banking Moving water around to meet needs



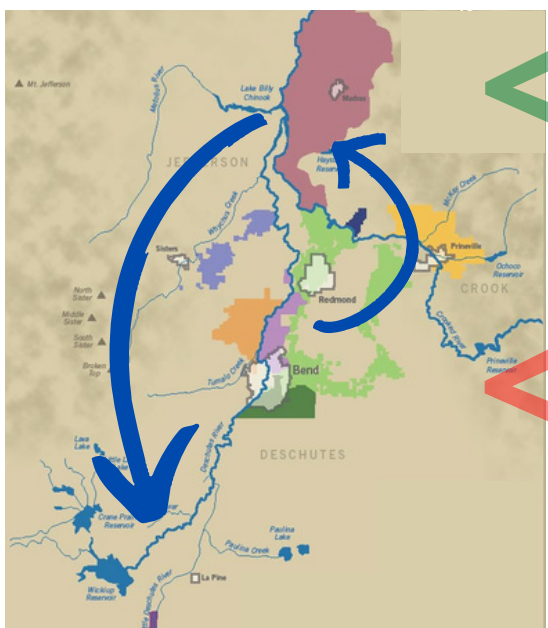
Unmet Needs in the Deschutes Basin

Of all the water needs in the basin, rivers, junior irrigators and cities have the most significant shortfalls.



*Municipal demand is overlaid on instream demand because water for mitigating groundwater pumping is dedicated instream.

Why a Water Bank Can Work in Central Oregon: Today and into the Future



Jefferson County
Average Per Farm Income

\$31,281

Junior District
Water Allocation

2.5 acre feet of water per acre in a **good** water year. In times of drought, that is significantly cut back. In 2022 it was **0.45 AF/acre**.

Deschutes County
Average Per Farm Income

-\$12,866

Senior District
Water Allotment

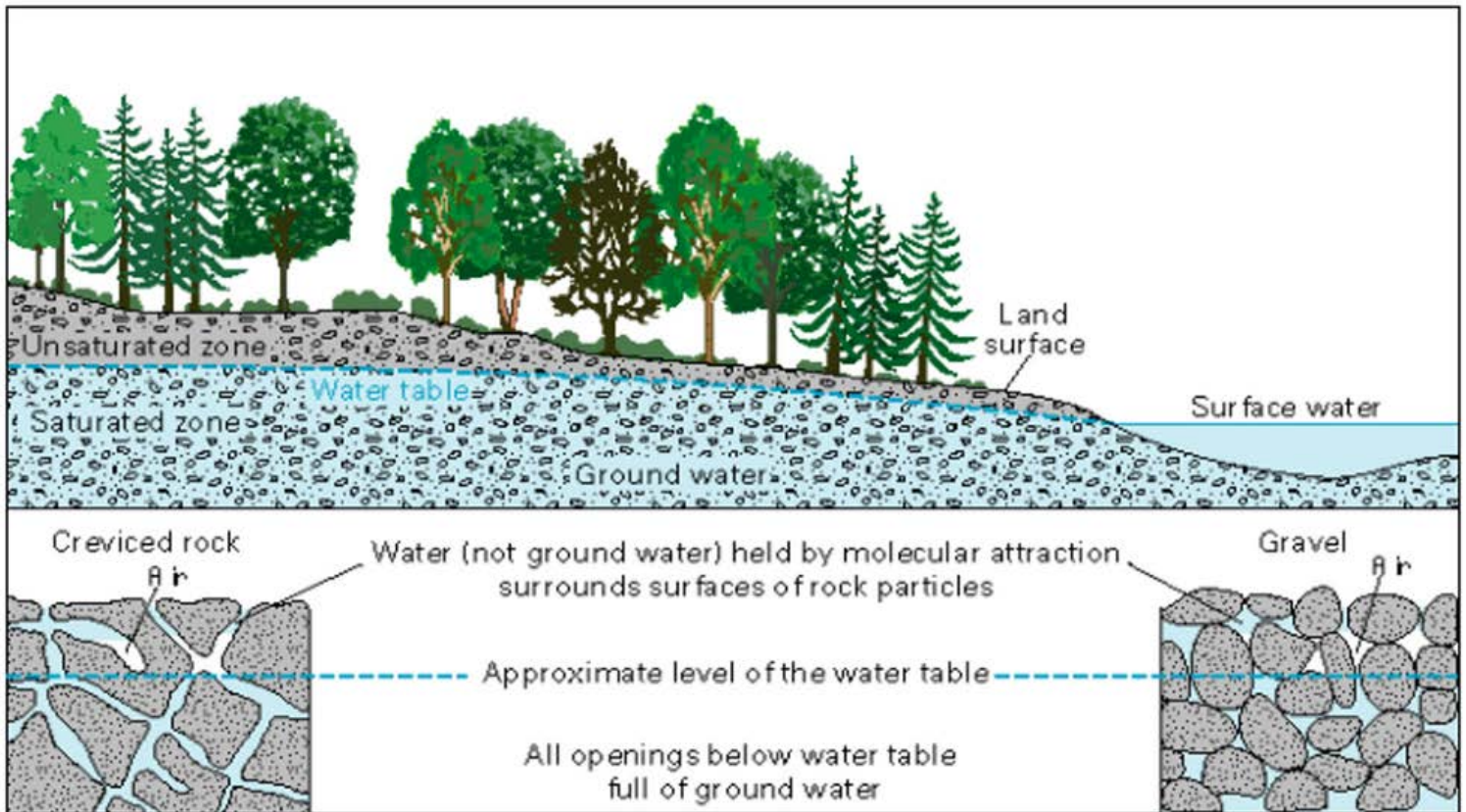
Water rights for **5.45** acre feet of water per acre, but has a target delivery rate of **4.3 AF/acre**

- Irrigators closer to Bend have access to more reliable water, yet many don't rely on farming as a primary income.
- Through foregoing use, increased efficiency, and water conservation projects, irrigators with adequate water could have the option to move water to more productive farmland.
- As junior districts increase their water reliability, they can use less stored water and, as a result, increase flows in the Deschutes River.

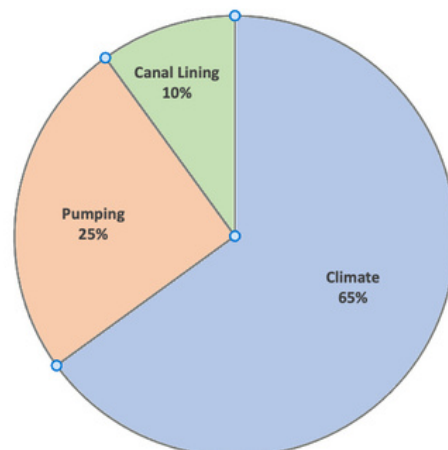


Notes from "Groundwater in the Upper Deschutes Basin"

- **Recharge** = water entering the system *Example: snowmelt, rain, streams, canal leakage*
- **Discharge** = water exiting the system *Examples: streams, springs, wells, evapotranspiration*
- Groundwater and surface water are connected—they are essentially one source of water.
- Several areas in the basin are showing declines, with climate change being the primary driver.
- Generally, groundwater recharge occurs in the Cascades and discharge occurs in the northeastern part of the basin near Lake Billy Chinook.

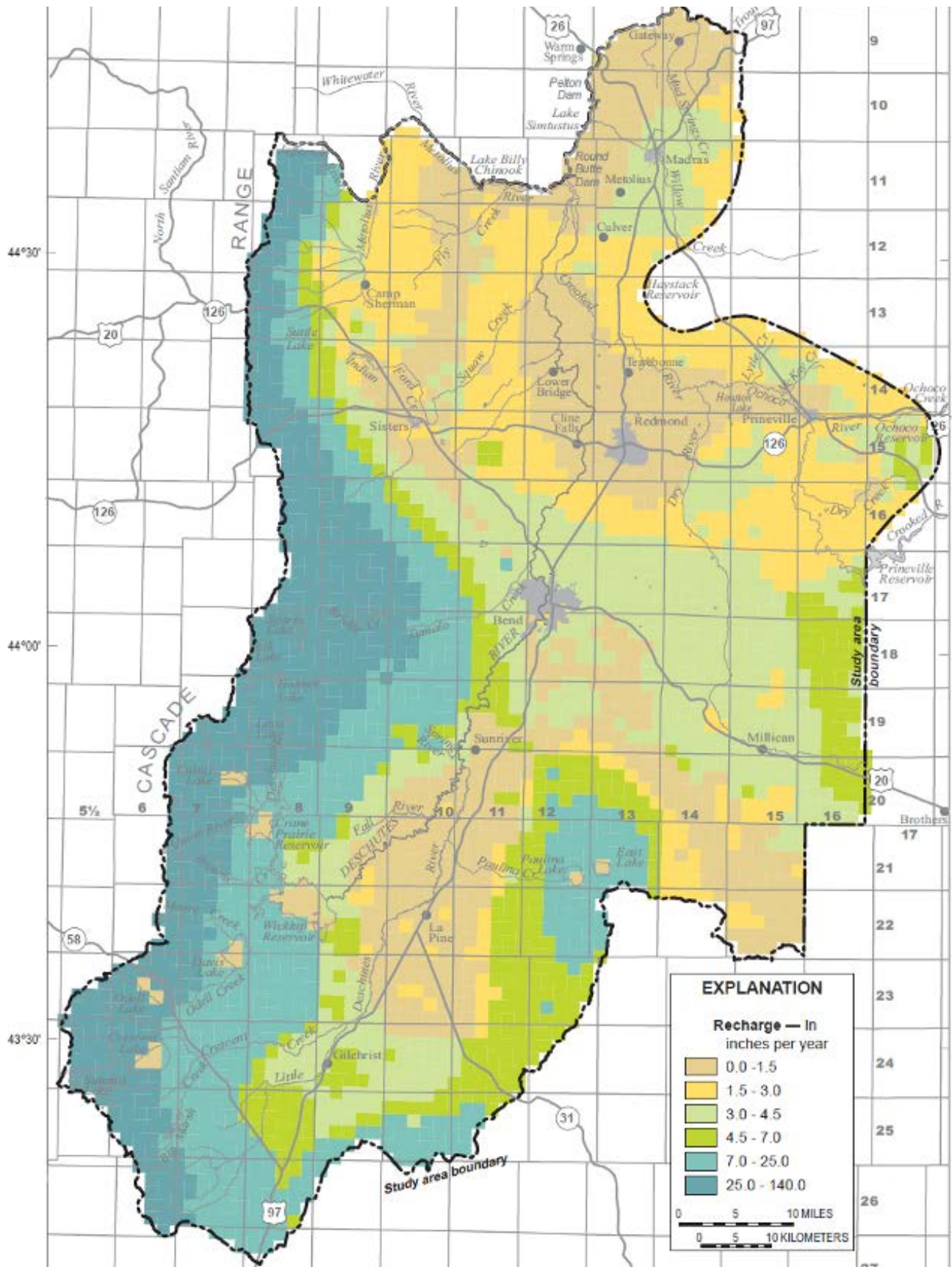


Estimated Causes of Groundwater Decline*



*Gannett, M.W., and Lite, K.E., Jr., 2013, Analysis of 1997–2008 groundwater level changes in the upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2013-5092, 34 p., <http://pubs.usgs.gov/sir/2013/5092>.

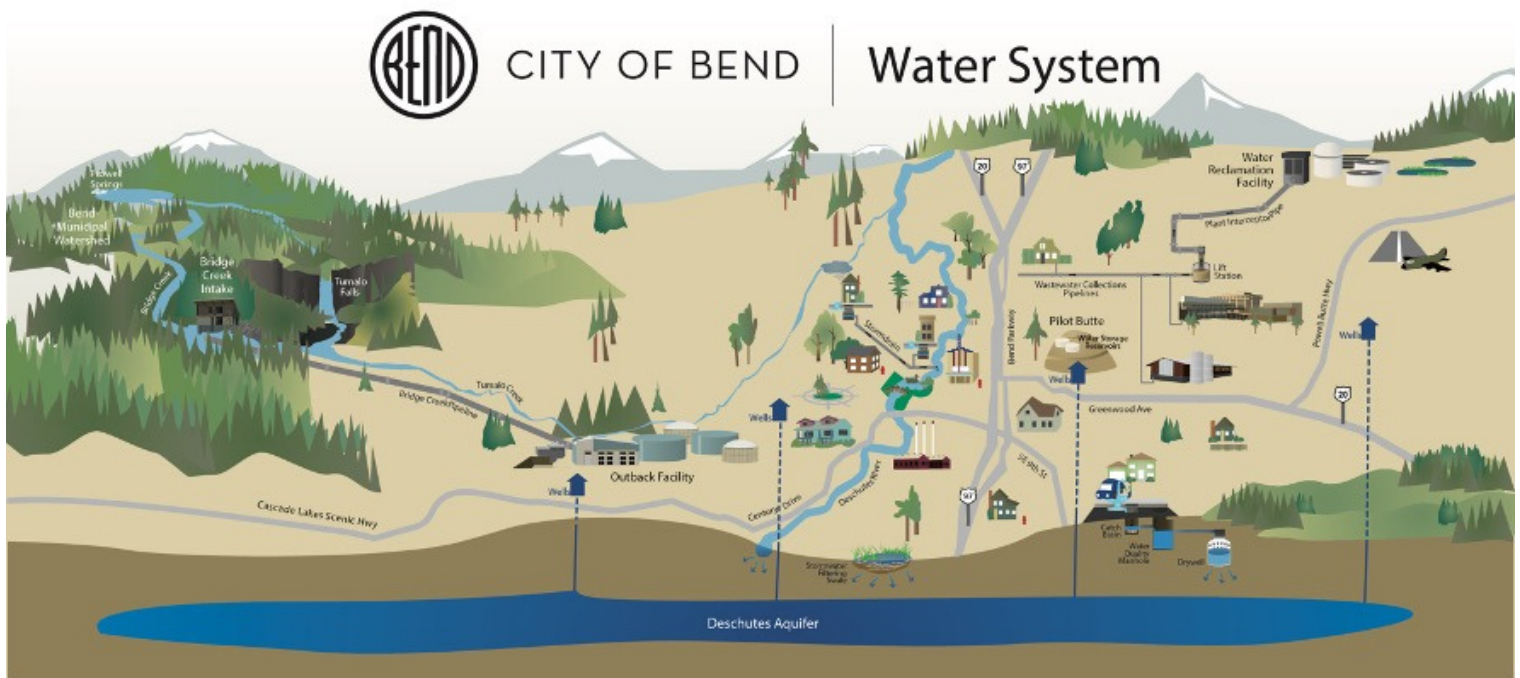
Recharge in the Upper Basin



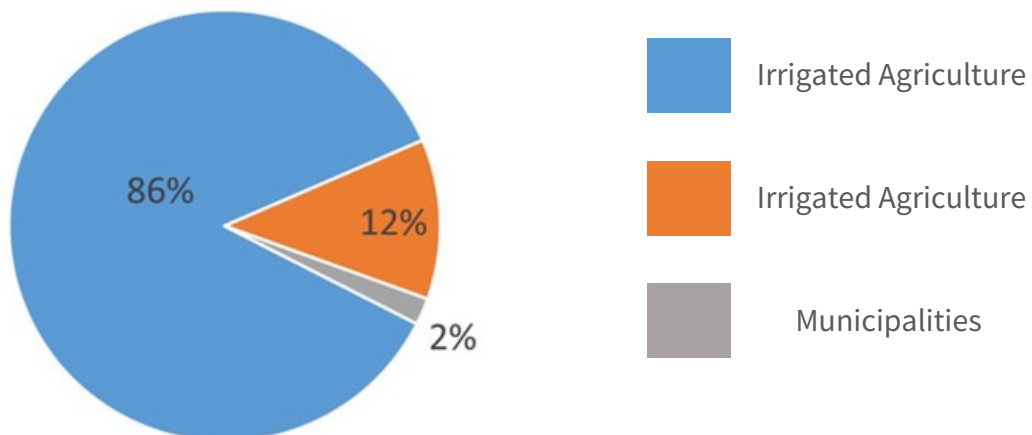
Source: Gannett, M.W., Lite, Jr., K.E., Morgan, D.S., and Collins, C.A., 2001, Ground-water hydrology of the upper Deschutes Basin, Oregon: U.S. Geological Survey Water-Resources Investigations Report 00-4162, 74 p.

Notes from "Urban and Suburban Water Use"

- Bend has a dual water source. 40% of the City's water comes from Bridge Creek, via Tumalo Creek, and 60% comes from groundwater wells, which are used primarily in the summer months to meet the needs for outdoor water use.
- Municipal water use accounts for only 2% of the total use in the Deschutes Basin.
- In addition to drinking water, the City of Bend also manages both wastewater and stormwater.
- Water conservation accounts for a portion of the city's water "supply".
- Beer production only accounts for 1.7% of the City's water use.
- Sign up for a Watersmart account to get notifications and helpful tips about how you can save water: bendoregon.gov/watersmart

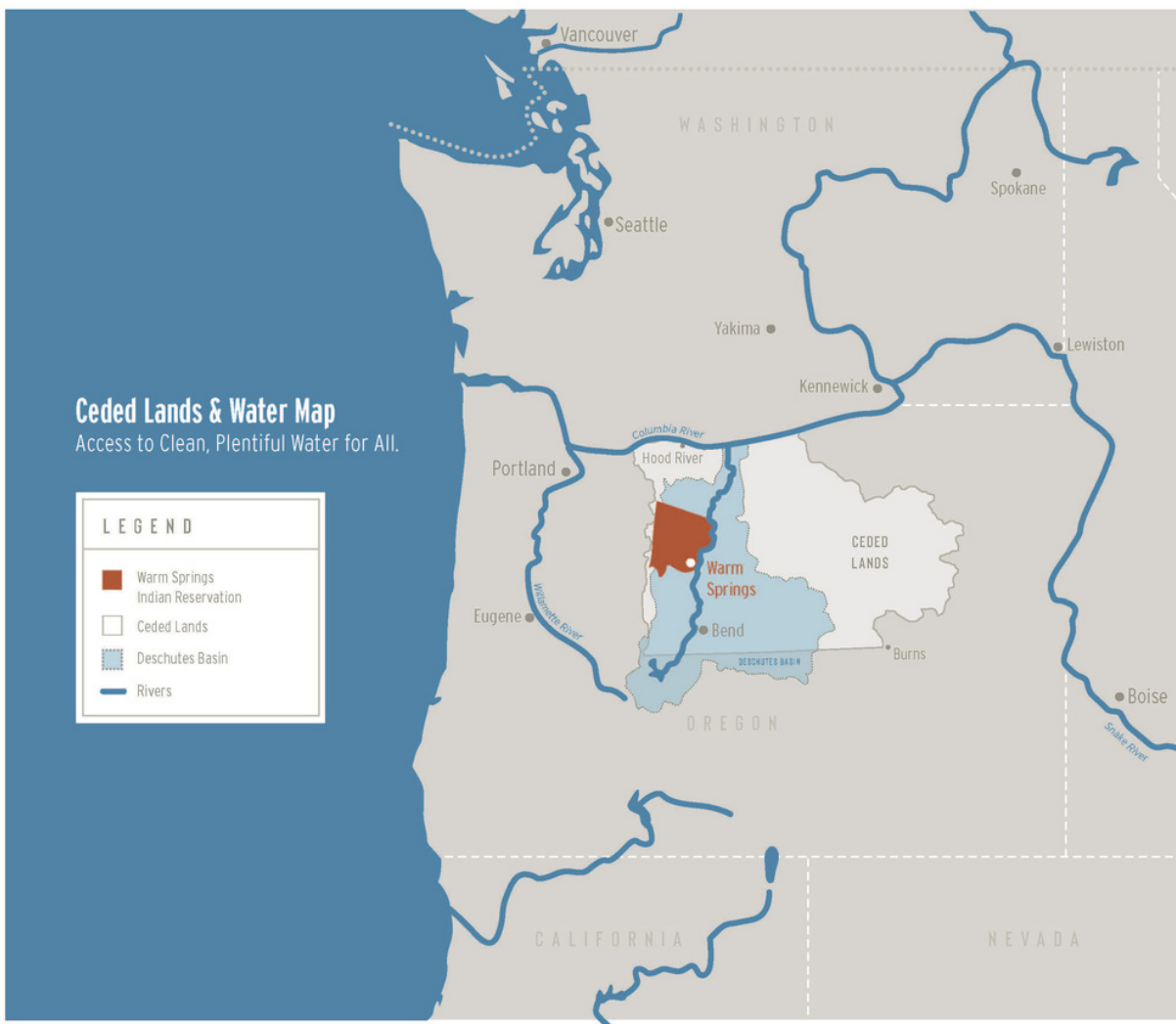


Deschutes Basin Water Rights Distribution



Notes from "Indigenous Water Rights"

- There are three tribes that make up the Confederated Tribes of Warm Springs: Warm Springs, Wasco, Paiute. The Warm Springs and the Wasco people are from the Columbia River. The Paiute people come from the plateaus to the southeast of the Columbia River.
- The Treaty of 1855 reserved the tribes' right to access water for fishing, hunting, and other traditional uses.
- Water is considered the first gift of the Creator and is therefore a crucial element in the cultural and spiritual traditions of the Confederated Tribes of Warm Springs. Water, fish, wildlife, roots, and berries and all considered gifts and are deeply connected to Tribal members' lives, history, and identity.
- The Tribe's water right dates from time immemorial, and is senior to all other water rights in the basin.
- The Warm Springs Reservation has several water sources, including natural springs, groundwater wells, and surface water from the Deschutes River. Since the Reservation is downstream from the region's major population centers as well as agricultural lands, water from the Deschutes River needs significant treatment before it is safe to consume.



Notes from "Fish Reintroduction"

- The Upper Deschutes Basin was historically home to anadromous fish species such as Chinook salmon and steelhead. However, water diversions and the construction of dams have led to the decline of these species in the area.
- The relicensing of the Pelton Round Butte complex in 2005 was the catalyst for anadromous fish reintroduction and the resulting efforts in Whychus Creek.
- Fish reintroduction in the Upper Deschutes Basin involves efforts to restore habitat and improve fish passage, including streamflow restoration, removing barriers to fish passage, installing fish screens to keep fish out of irrigation diversions, and restoring floodplains.
- The Deschutes Partnership along with countless other federal, state, local, landowner and nonprofit entities have been critical in implementing this work.



Partners

- Upper Deschutes Watershed Council
- Deschutes River Conservancy
- Deschutes Land Trust
- Crooked River Watershed Council

Focus Area

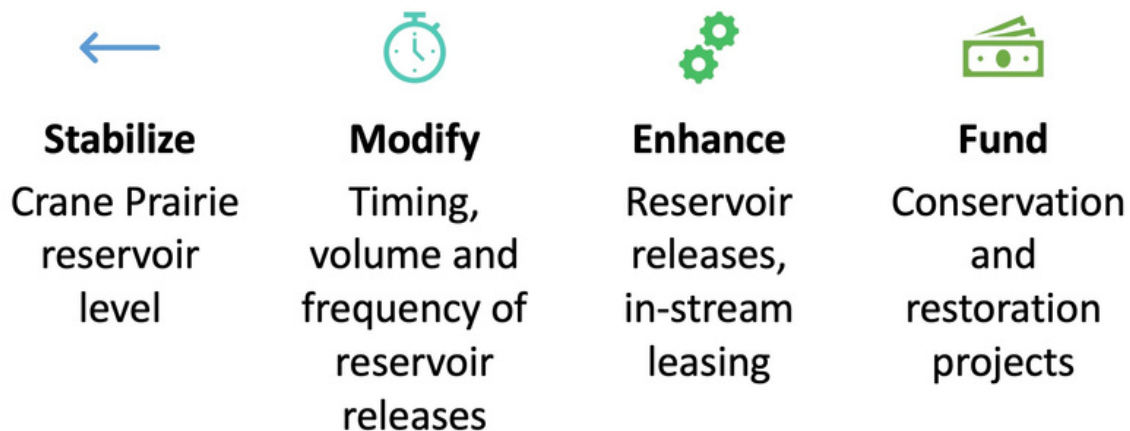
- Habitat restoration and fish passage
- Streamflow restoration
- Land acquisition and conservation easements
- Habitat restoration and fish passage



Notes from "Habitat Conservation Plan"

- The Oregon Spotted Frog was listed as threatened under the Endangered Species Act (ESA) in 2014. Bull Trout were listed in 1999.
- The Oregon spotted frog and bull trout (managed by the US Fish and Wildlife Service) and Mid-Columbia steelhead and sockeye salmon (managed by the National Marine and Fishery Service) are covered in the Habitat Conservation Plan.
- "Take" is a technical term that refers to anything that harms an ESA-listed species.
- The HCP provides a permit that allows the permittees, the eight Deschutes Basin irrigation districts and the City of Prineville, to continue their usual activities that might result in "incidental take," as long as the Permittees follow the conservation measures outlined in the HCP to minimize harm to the species.
- Usual activities covered by the HCP include:
 - **Surface Water Management:** Storage, release, diversion, pumping, and return
 - **Groundwater Management:** Withdrawal, pumping, and discharge to surface water

Conservation Strategy: Oregon Spotted Frog

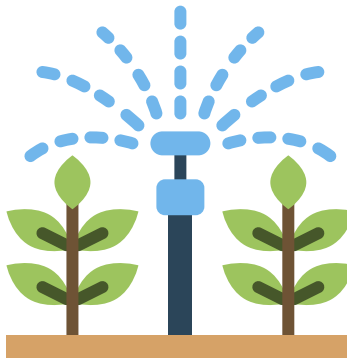


Conservation Strategy: Bull Trout



Notes from "Irrigation Modernization"

- Irrigation modernization is the process of upgrading old and inefficient irrigation systems to improve their performance. This includes piping canals and laterals; utilizing telemetry for improved water measurement, monitoring, and management; and converting irrigation systems to more efficient methods, such as from traditional flood irrigation to sprinklers, (pivots, wheel-lines, or hand-lines) or drip irrigation.
- Irrigation modernization can also include improving irrigation practices such as adopting low-elevation sprinkler applications, soil moisture monitoring, and careful crop selection for optimal water usage.
- Piping is a key part of irrigation modernization due to its ability to drastically reduce water loss. For instance, in Central Oregon alone, there are approximately 700 miles of canals, which are estimated to be leaking about 50% of their water. This means that irrigators need to divert twice as much water from the river as is actually needed on the farm; half is lost along the way.
- The modernization of irrigation systems not only promotes water conservation but also improves agricultural productivity, a critical factor in sustainable farming and responsible resource management.
- Many of the irrigation modernization projects in Central Oregon are being funded in part through the USDA's Natural Resources Conservation Service (NRCS).



Infrastructure Improvement:
on-farm efficiency and piping
laterals to connect to larger-
scale piping



Water Measurement:
installation of telemetry
to increase measurement,
monitoring, and management
capabilities