

Clean water - all the way to Portland



Water flowing out of Roaring Springs combines with other sources to make the McKenzie River's 40 percent contribution to the Willamette system.

For anyone who knows and loves the McKenzie River, the stream of praise flows as quickly as the river's current — sparkling water, gorgeous scenery, great trout and steelhead fishing and a wild ride in a raft or kayak. But for research hydrologist Gordon Grant, who is working to understand the river's "plumbing system," the McKenzie is much more than the sum of its superlatives.

"The McKenzie is our poster child river," says Grant, who is with the U.S. Forest Service's Pacific Northwest Research Station in Corvallis. "It's a true Cascade Mountains spring-fed system." That may sound like something that only a scientist would find interesting, but that fact explains a great deal about why the McKenzie is the kind of river it is and offers insight into how its benefits reach all the way down the Willamette River to Portland.

There are two basic types of rivers that flow out of the Cascade Mountains and into the Willamette River. One group has its headwaters in the upper elevation areas, called the High Cascades, which are fed by springs or pristine wilderness streams. The other group of headwaters originates in the lower-elevation Western Cascades and are dependent upon runoff from snowmelt and rain to maintain their flow.

When it comes to water quality, where

a river's water comes from, either subterranean streams or surface runoff, makes all the difference in the world. Grant and his colleagues have been prowling the headwaters of the McKenzie in search of the springs that sustain it. To date they have found about a half-dozen major springs that contribute around 90 percent of the river's water. That includes one very large, remote spring that represents more than 10 percent of the McKenzie's total flow.

"In a sense, the McKenzie is blessed because all this cold water in the river is from the springs," says Grant. "It's really high quality water because it is being filtered through this big groundwater system." This also means that, since the McKenzie is a major tributary of the Willamette River, it is feeding that high quality water into the Willamette at a relatively steady rate year-round.

On the other hand, the surface-water dependent tributaries that flow out of the Western Cascades dump large volumes of water into the Willamette in the winter months. Flow then drops off significantly during the summer. Because these lower elevation tributaries pass through areas of various human activities ranging from logging operations to subdivision development — as opposed to the more pristine environment of the high mountains — the water is generally of lower quality

and often suffers from higher loads of sedimentation and pollution.

This makes the McKenzie River's contribution all the more significant, especially during the summer. According to Grant, the McKenzie River accounts for up to 40 percent of the total flow of the Willamette River at Portland. "The McKenzie is essentially the Willamette in the summer," says Grant.

The researchers are now focusing on the dynamics of the McKenzie's underground spring system. This includes trying to find out where the water that recharges the springs originates and how old that water is.

Grant is particularly interested in the groundwater system's resilience to climate change since some predictions for the Pacific Northwest call for warmer, wetter winters and warmer, dryer summers in the years ahead. This would decrease mountain snowpacks causing water shortages in river systems dependent on spring snowmelt, reducing the availability of water for human uses as well. Groundwater supplied river systems, in theory, would be considerably less affected.

If that scenario plays out, the McKenzie may be a step ahead of the game. Says Grant, "The McKenzie is a wonderful river that is really going to be appreciated."