

WATER FIXERS

STORY & PHOTOS BY DAVID HANSON

A FLOOD, A FIX AND A PATENT HAVE LED TO A HOOD RIVER NON-PROFIT'S INSPIRING EFFORT TO MODERNIZE CRUMBLING IRRIGATION SYSTEMS THROUGHOUT THE WESTERN UNITED STATES

The first week of February 1996 was not unusual. A deep freeze wrenched down on the valley, cracking water pipes, icing slow-moving streams, and solidifying the heavy snowfall that had blanketed the area a week prior. But on Feb. 6, the jet stream shifted and a Pineapple Express bore down on the Columbia Gorge, carrying warm South Pacific clouds dripping with moisture. The deluge was so sudden that for a while the runoff flowed atop ice layers in frozen-over irrigation canals. But soon the ice and snow melted, unleashing one of the largest floods in the Gorge's history down the Hood River Valley's steep natural plumbing system.

One hundred mudslides were reported in the Portland area. A 50,000-ton mudslide closed I-84 east of Troutdale, and smaller slides shut down the freeway east of Hood River. Highways 35, 26 and 14 closed, as well. Most of the Gorge was in lock-down with no way in or out for almost 24 hours.

Eventually the rain stopped. The streams and rivers drained into the Columbia, revealing the catastrophic damage to the valley's vital irrigation system. In this case, the adage "necessity breeds invention" bore out, and a few savvy locals developed a replacement system that not only saved the 1996 growing season, but is now poised to reshape irrigation and water use throughout the West.

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Les Perkins, *above*, manager of Farmers Irrigation District, at the Dead Point Farmers Screen and, *below left*, at a decades-old irrigation canal. *Below right*, Perkins and staff at Dead Point. *Previous page*, Pete Siragusa's pear orchard benefits from modernization efforts by the FID.

In 1996 Les Perkins had just graduated from college and begun working as a microbiologist at Wyeast Laboratories in Odell. He remembers biking out to the Middle Fork of the Hood River and seeing a mess of blown-out bridges and scattered debris.

Perkins grew up in the upper valley, his dad a metal fabricator and his grandparents farmers and loggers. He'd always been fascinated by the irrigation canals contouring along the hillsides especially in the mid-80s when hydropower was installed, allowing the irrigation water to generate electricity en route to farms, orchards and the Columbia River. The districts that managed the irrigation canals in the valley were household names.

"It's a little tribal here," Perkins says. "If you lived in Middle Fork Irrigation District (MFID) you were proud of your water. It was pressurized, clean and rates were low. Farmers was a good one, too." Perkins is now manager of the Farmers Irrigation District (FID) that serves over 6,000 acres of farm and orchard land in the northwest corner of the Hood River Valley.

"There have been open ditches in this valley for well over a hundred years," Perkins says. "Our current irrigation canal routes were dug by hand using mules and Chinese labor in the late 1800s and early 1900s, and some of them were originally log flumes. Reservoirs like Kingsley were mill ponds that gathered felled trees to be milled or sent down flumes to mills on the valley floor."

Farmers often dug a narrow channel leading from a creek to their downhill fields so a portion of the creek water flowed out of its native channel and to the farm. Growers installed small pumps and diversion screens to keep debris from clogging their irrigation ditches. It wasn't all Wild West free-for-all, though. In 1874 the Water Supply Company of Hood River Valley formed to irrigate 1,000 acres. In 1905 the Hood River Irrigation District took over and expanded to 5,275 acres, and a year later the Farmers Irrigation Company organized to sell water rights shares to growers. A few late summer water shortages led to the construction of reservoirs in the upper basin. By the 1920s most water rights had been adjudicated to landowners.

And that was it. Not much changed over the remainder of the 20th century. The irrigation system plodded along in open ditches that gathered debris, trash, and runoff and needed to be constantly monitored and cleaned. The trenches leaked like sieves. Fish would get confused, take a wrong turn at a diversion canal and swim up a ditch, never to return to their native river.

Then the '96 flood ripped everything to shreds, leaving in its wake panic and a massive opportunity



The Farmers Screen allows fast-moving water to pass through, carrying fish and debris back into the river, while a specialized weir lets slow-moving water fall into the irrigation canal, *above*. *Below*, water flows down a stream from the pass-through at Dead Point.

"That's when the FID went to the agencies and said, we want to try something different," says Perkins. "Jerry Bryan, the manager of the Farmer's Irrigation District at the time, and his climbing buddies, the Hukari brothers, along with FID employees and other farmers within the district, designed a prototype for a new diversion fish screen."

They had a few months to fix the problem before growers would need summer irrigation water. Bryan and the Hukaris' screen was simple but revolutionary. The horizontal design funneled fast-moving water down one side while a weir captured slow-moving water into a parallel trough. The fast-moving water would flow unimpeded back into the native river channel, carrying fish and debris with it, while the slow-moving

water would lag behind and be diverted into the irrigation channel. It allowed for safe passage of fish back into the native stream and it required no maintenance to clear debris. Bryan and the team built a hydraulic lab in a grower's barn and tweaked the design. They installed more screens. By 2003 they had settled on the final product, the Farmers Screen.

Pete Siragusa bought a 100-year-old pear and cherry orchard on the steep slopes above the West Fork of the Hood River in the late 1990s.

He'd worked in ag sales around the west before settling into orchard life with his family. Siragusa grows 25 acres. His irrigation channel travels about a mile from snowmelt diversions up high.

"When I first started here, the water came down an open ditch," he says. "There was continuous maintenance. Water would just stop flowing and we never knew what happened. I'd have to drop everything and take the four-wheeler up to assess the damage along the canal."

Siragusa's problem was every farmer's problem. They were relying on a century-old plumbing system that had no roof to protect it. The Farmers Screen proved to be the linchpin to a system-wide overhaul. The screen allowed for reliable flow to growers but also consistent current into the irrigation system's hydropower stations, meaning more revenue for the district and less labor and maintenance costs because they no longer needed 24/7 patrols of clogged diversion screens. With more revenue, the district could install enclosed pipes in the old ditches.

"Now that we have the pipe," says Siragusa, "I don't even think about water anymore. That whole problem of worrying about the ditch being blocked is gone."



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The success snowballed. The old ditches lost 50 percent of their capacity to leaks. More pipes meant 50 percent more water into the turbines, yielding more revenue. More revenue allowed the district to centralize its pumping into one main pump, which took 1,400 small pumps offline, saving 1.5 million kilowatt hours per year. With clean, pressurized water coming from one centralized pump, farmers like Siragusa could switch to micro sprinkler systems that are more efficient, leaving even more water in the irrigation system for fish, hydro and growers during droughts.

"Our flow is dead-on steady," Perkins says. "That's a huge selling point for farmers and for hydro because consistent flow means consistent revenue. It handles the debris, too. We now use half the water as we did 30 years ago for the same 6,000 acres. In 30 years our hydro has earned almost \$50 million, all of which stays in the district to pay to pipe nearly 70 miles and

Modernizing irrigation systems allows farmers to install efficient micro sprinklers, *left*. Julie O'Shea, *right*, is executive director of the FCA, which is expanding into a larger office due to its growth.

do upgrades. Combined, FID and MFID generate about 18 percent of the county's power needs."

Jerry Bryan and the FID team knew the Farmers Screen was a game changer. But they weren't out to cash in personally. The screen had been developed for the public good so when they applied for a patent in the early 2000s, they assigned the patent to Farmers Irrigation District. Seeing the potential for widespread application of the screen, Bryan and FID created the Farmers Conservation Alliance (FCA), a non-profit entity tasked with marketing the Farmers Screen to other districts. They hired Julie O'Shea as FCA's executive director.



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It took years for O'Shea and the small FCA team to address endangered species concerns for fish, finally resulting in federal approval for the Farmers Screen in 2011. Since then FCA has evolved into much more than a distributor and evangelist for the Farmers Screen.

"In Oregon we have roughly 70,000 diversion points for irrigation," O'Shea says. "In the western states there are about a million. Eighty percent of our diverted water goes to irrigated agriculture. If those diversions don't have a functional fish or debris screen, all the debris gets clogged in this system, along with millions of fish being trapped.

"We were out talking to farmers and irrigation districts about installing the Farmers Screens, but we realized that these irrigation systems are 100 years old. We started our Irrigation Modernization Program to advise irrigation districts on full-scale modernization and then we advocate for funding, which can be hundreds of millions of dollars."

Thanks to success in the field and subsequent grants, FCA went from

four to 25 employees in the last two years. It is currently expanding into the old Sheppard Building in downtown Hood River.

"Our success is because we build solutions that benefit both ag and the environment," O'Shea says. "People think we're audacious and bold but we're working toward some serious goals."

Siragusa's orchard sits just downstream of the main diversion point for FID — a diversion blown out by the 1996 flood. Back then, FID was just another irrigation district working with old plumbing. Now it's a working example of how modernization can save water, fish, farms and growers.

"We're one of the most progressive water districts in the West," Siragusa says. "It started out as a fix for our problems but now they're taking it down the road to solve other people's problems. We're proud of that."

David Hanson is a writer, photographer and video producer based in Hood River. Find his editorial and commercial work at ModocStories.com and weddings at CascadiaStudios.com.