

# Salmon: System could increase salmon numbers

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nile salmon headed downriver to the ocean, the consensus in the group was to help salmon returning upriver to spawn.

"Fish ladders had not entirely solved the problem as evidenced by declining returns, so mathematically you could have a much greater impact on returning one adult pair upstream than aiding two juvenile downstream," Bryan said.

For a variety of reasons, a huge percentage of adult salmon die before reaching spawning beds in the far reaches of tributaries. And juvenile salmon that do hatch from their eggs are often food for invasive fish species.

On top of that, sea lions consume large numbers of salmon heading from the ocean up the Columbia River at Bonneville Dam. Also, on hot summer and early fall days, fish ladder water gets too warm, causing salmon to turn away, seeking cooler water.

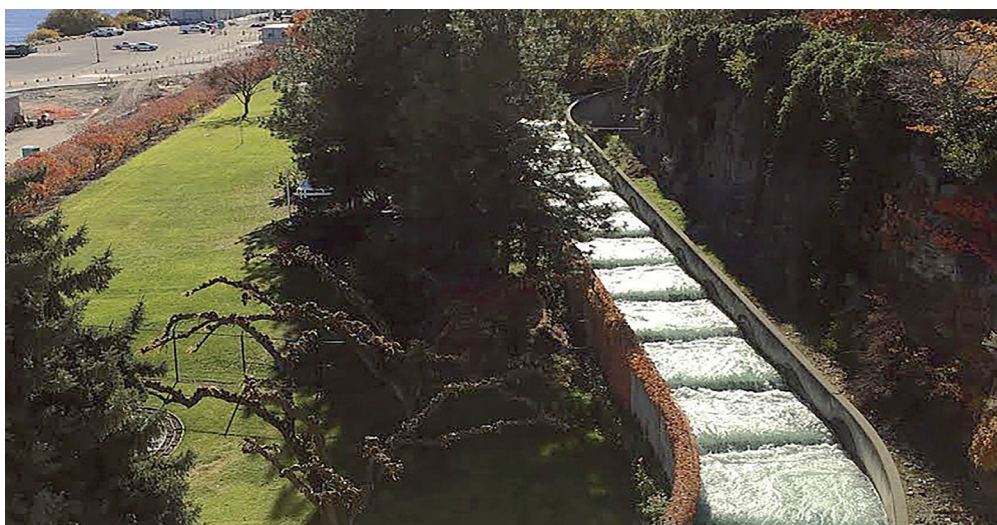
By using his system to divert invasive fish and getting more salmon to spawning grounds, their numbers will increase, Bryan said. It can be done more efficiently and at a lower cost than fish ladders and saves the 5% to 10% of the riverflow from going down fish ladders. That water can instead be used for more power generation.

## Developing Whooshh

In 2013, Bryan changed the name of his Seattle company from Picker Technologies to Whooshh Innovations Inc. and for the next two years worked on developing fish-friendly transport tubes and the accompanying systems that move fish over dams quickly and efficiently. The system could also be used to move fish in commercial aquaculture and in processing plants.

The name, Whooshh, was chosen to replicate the sound of fish going through tubes and, eying international sales, everyone could relate to it. The company also trademarked the name "salmon cannon."

There were design, engineering, prototypes, testing and regulations. There were new studies every time a component was added or changed. Some 20 studies were done by



Dan Wheat/Capital Press

**Fish ladders such as this one at Rocky Reach Dam, north of Wentachee, Wash., have been installed at some dams. The Whooshh system is less expensive and easier on the fish, its inventor says.**

## ONLINE

Whooshh Innovations: [www.whooshh.com](http://www.whooshh.com)

## VIDEOS

<https://www.youtube.com/watch?v=gVxcHc7NPuA&feature=youtu.be>

<https://www.youtube.com/watch?v=HN6sjnUjJoM&t=38s>

independent laboratories.

"It's not an approval process but more akin to 'we won't object,'" Bryan said of working with governmental agencies.

"We proved it's as good or better than alternatives. We asked skeptics to step back from the river through their backyard and look at the bigger picture," he said.

Part of his pitch was that wind and solar generation won't be able to meet the demand if the public wants a non-carbon-powered electrical grid. That means hydropower — dams — must remain part of the picture, and for that to happen fish passage must be improved.

Gilbert Sylvia, professor of marine resource economics at Oregon State University and director of its Coastal Oregon Marine Experiment Station in Newport, said the Whooshh system is "very intriguing and creative technology."

"I once saw it in operation and was impressed. Especially moving large animals over long distances with minimal handling and mortality," he said.

Sylvia said he has not done an economic analysis or reviewed any economic or financial analyses by others, but that the real question is

whether state and federal agencies believe the costs, including morbidity and mortality, are lower than other methods, including trucking and fish ladders.

Bryan said multiple independent studies show that to be the case and are available on his website. He said he works closely with NOAA Fisheries, the main agency on salmon migration and permitting, but that it can't approve a technology, only a site.

Bureaucracy is slow to recognize and adapt to better ways of doing things and won't until people demand that politicians push for change, Bryan said.

While the U.S. Army Corps of Engineers was helpful last summer with a demonstration of the system at Chief Joseph Dam on the Columbia River, it is spending \$200 million to update a trap-and-haul fish passage systems at the Buckley Diversion and Mud Mountain dams in King County. Whooshh could provide better passage for \$20 million, Bryan said.

"From our perspective this is a question of bureaucracy and a lack of impetus for people to do things differently even though there is overwhelming evidence what they

have been doing is not good enough," Bryan said. "If scientists and agencies paid attention to the science they would not be hesitating. They can look at the data on our website. We can talk about this stuff forever, or actually do it."

## Whooshh sales

Whooshh sold its first system at the end of 2014 to the Washington Department of Fish and Wildlife to separate wild and hatchery fish on the Washougal River near Vancouver.

Whooshh has now deployed 20 systems, not all dam fish passage systems, to sites in the Northwest, Sweden and Norway. It has signed an agreement in Argentina and on Oct. 21 met with representatives of China.

A scanning system Whooshh installed this spring at Bonneville Dam showed 14% of salmon with major injury, mostly from sea lions, that will prevent them from spawning, Bryan said.

Of the 20 systems, five provide seasonal fish passage at dams. The longest is 1,700 feet and 180 feet high at the Cle Elum Dam in the Washington Cascades.

On Aug. 22, about 200 people attended a demonstration at Chief Joseph Dam, the second-largest dam on the Columbia after the Grand Coulee Dam.

A limited number of salmon went into a tube during the demonstration, traveling 500 feet to the top of the dam, mak-

ing a U turn and traveling 500 feet back down.

Salmon migration ends at the Chief Joseph and Grand Coulee dams because Grand Coulee, about 350 feet tall from the downriver to upriver side, is too tall for a fish ladder.

For years, the Colville Confederated Tribes and others who support native fish runs in the Columbia have desired some means of helping salmon past those dams. Bryan believes his system is the answer and foresees it being used on other dams on the Columbia and other rivers in Washington and British Columbia.

Fish ladders can be long and exhausting for fish. Whooshh tubes can move salmon over dams much faster and with less stress and mortality to fish. The tubes are modular and portable and typically cost 60% to 80% less than a fish ladder or truck operation, Bryan said. Over time, ladders also fill with sediment, which has to be removed.

Dam operators can pay for the system in extra power generated from water no longer diverted into fish ladders, he said.

## How it works

Whooshh Innovation's fish tubes are made with a flexible, soft, translucent material. Water mist is injected into the tube to make it nearly frictionless for the salmon.

Salmon are attracted by a flow of water to an 18-inch-wide entry point, narrow enough that fish enter one at a time swimming slightly uphill. Then they slide downhill into a dewatered trough where a computerized, optical system sorts hatchery salmon, identified by tags or clipped adipose fins, from wild salmon and from invasive species.

Hatchery salmon are diverted to a hatchery, invasive fish can rerouted for several uses and wild salmon continue into the tube and over the dam.

The system can handle up to 40 fish per minute, which is more than 57,000 fish in 24 hours. If the need is greater, a second system can be added, Bryan said.

A goal is to limit a fish's tube travel time to less than 1 minute. The top speed for the

1,700 feet at Cle Elum Dam is 32 feet per second, or 22 mph, decelerating in the last 300 feet. The National Marine Fisheries Service requires they exit the tube at no more than 25 feet per second.

"We've done our work on the technical side, now we're trying to help operators with the financing side and then it's just scaling up the number of systems we can produce in a year," Bryan said.

## Family efforts

Bryan developed an interest in marine biology during his high school years in Edmonds, Wash., and was involved with his parents, Vincent Bryan Jr. and Carol, as they bought alfalfa fields and sagebrush overlooking the Columbia River southwest of Quincy and developed orchards, vineyards and a winery. His father, a neurosurgeon, got the wine bug from a colleague.

"So we flew to France and took soil samples from the best vineyards," Bryan said. "We asked a realtor to find property with that kind of soil and that's how we ended up here (southwest of Quincy)."

Their first winery was Champs de Brionne, meaning Bryan's field. With it grew an outdoor entertainment amphitheater that became the Gorge Amphitheater. The family sold it, along with Champs de Brionne, to MCA Concerts in 1993.

The family then built the Cave B resort and winery next door. It later sold the resort but still owns the winery, vineyard and orchard. Bryan's wife, Janet, is chief financial officer of the winery. His sister, Carrie, does winery marketing and Carrie's husband, Freddy Arredondo, is the winemaker.

Bryan, now 54, became an attorney specializing in contract law, worked for the Adobe software company and helped the family sell the amphitheater and with other transactions.

His sister, Janine Bryan, is a scientist who developed the vaccine Gardasil to prevent human papillomavirus, the second leading cause of cervical cancer. She is Whooshh vice president of biology.

## Wine: Group calling for no new wine-specific legislation

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Oregon already has some of the highest wine labeling standards in the country. If a bottle is labeled as being of a certain variety from a certain region — such as world-renowned Willamette Valley Pinot noir — then the grapes must be at least 90% that variety, and 95% from that region.

Last year, a California-based winery was accused of deceptively labeling wines made from Oregon grapes without following those higher standards, prompting the introduction of SB 111.

Jason Atkinson, a former Oregon state senator from Ashland, helped organize an industry coalition that fought to defeat SB 111 over concerns that out-of-state customers would no longer buy their grapes. The same group went on to form the backbone of the Oregon Wine Council.

Atkinson said members of the council feel the Oregon Winegrowers Association does not support them in policy.

"We created the Oregon Wine Council really as a substantial counterbalance, and as a way to bring the industry together," Atkinson said. "We're tired of playing defense."

Johnston, the council's co-chair, said they will hold a retreat Nov. 21 in Eugene to begin discussing policy and finalize a membership roster. In the meantime, he said the group is calling for no new wine-specific legislation heading into the 2020 short legislative session.

"We just don't think the time is right," Johnston said. "We have to find policy solutions that are good for everyone, not just one region. We're all in this together."

Jana McKamey, vice president of government affairs for the Oregon Winegrowers Association, said members of the council have reached out to them, and they are taking the request into consideration.

"Similar to the (council), we are committed to the industry being

based on collaboration," McKamey said. "I think we share that same goal of trying to foster dialogue to see if we can uncover what these different challenges are and try to uncover solutions."

Sam Tannahill, co-founder of A to Z Wineworks in Newberg and a member of the wine council board, said the success of his winery is founded upon the success of growers statewide.

A to Z Wineworks is one of the state's largest wineries, sourcing grapes from about 3,500 acres from the Columbia River Gorge to the California border. For those vineyards to stay in business, Tannahill said they need to be able to sell grapes outside Oregon, which is why SB 111 posed such a threat.

"In basic terms, we don't have the infrastructure to crush all the grapes we grow here in Oregon, and there's also not the demand," Tannahill said, adding that in 2017 between 20% and 25% of the Oregon winegrape crop was sold out of state.

The Oregon wine industry also continues to expand. According to the latest Vineyard and Winery Report conducted by the University of Oregon Institute for Policy Research and Engagement, overall production jumped from 91,342 tons of winegrapes in 2017 to 100,133 tons in 2018. Growers also planted nearly 2,000 more acres of vineyards, up to 35,972.

About 56% of Oregon winegrapes still come from the northern Willamette Valley, though the fastest rate of new growth is in the Rogue and Umpqua valleys of Southern Oregon.

Tannahill said he sees the council as a catalyst for potential change in the rapidly growing industry.

"There is no one answer, and there are no easy answers," Tannahill said. "What we want to do is to find consensus and move forward on a unified basis. If the divide in our industry continues, other states and other industries are going to take our place on (store) shelves."

## Hemp: USDA issues new regulations

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farmers were only required to test for delta-9, not THCA, said Sunny Summers, cannabis policy coordinator for the Oregon Department of Agriculture.

The new USDA regulations implement provisions of the 2018 Farm Bill, which effectively legalized hemp nationwide. Before that, state governments were able to enact pilot programs for growing hemp under the 2014 Farm Bill.

State governments will have one year from the effective date of the new federal rules to clear their plans for overseeing hemp with the USDA. Until then, they will be able to continue operating under their pilot program rules.

Oregon's shift to the stricter THC testing protocol in 2020 raised concerns that hemp harvested this autumn would have to be destroyed in January if it contains enough THCA to push it across the 0.3% limit for THC.

However, the Oregon Department of Agriculture's new protocol will not apply retroactively to hemp grown in 2019, only to crops produced after the change became effective, said Courtney Moran, an attorney and president of the Oregon Industrial Hemp Farmers Association.

"It doesn't change to non-compliant hemp," she said. "If it's harvested as hemp, it stays as hemp."

Realistically, the stricter USDA standards will likely force hemp farmers to harvest the crop earlier to avoid having it cross the threshold into marijuana, which in turn will reduce the levels of cannabidiol, or CBD, contained in the plant, Moran said.

While CBD isn't psychoactive and is considered to have healthful properties, such as treating inflammation, concentrations of the substance tend to be associated with higher levels of THC.

"There's definitely a correlation between the two," she said. Early harvesting will be an



George Plaven/Capital Press File

## Hemp grows in Southern Oregon near Central Point.

immediate solution to the problem until hemp cultivars are developed with high levels of CBD that remain low in THC, Moran said. "Breeders have been working on it and farmers have been looking for it."

Rick Bush, the hemp farmer near Salem, said he's disappointed in the hype about hemp and it's profit-earning potential when there's insufficient capacity to process Oregon's 60,000-acre crop.

The stricter testing protocols for THC will result in farmers growing hemp to maturity that turns out too "hot" to be salable, he said. "They poured money on the ground and expected it to multiply, but it's not that simple."

While Bush considers the USDA's testing standard arbitrary, he acknowledges the transition to federal regulation may cool the eagerness to invest in hemp.

"At least we have one year to figure out whether we're going to get in or get out," he said.

Barry Cook, a hemp grower near Boring, Ore., said he's still reading the USDA rules but is concerned about how hemp will be regulated after harvest.

Limiting the total THC level to 0.3% may be justified for "smokable flower" that is sold directly to consumers, he said.

However, hemp is often further processed to extract CBD, which in turn also elevates the THC lev-

els beyond 0.3%, Cook said.

This "crude oil" is further processed to remove or dilute the THC, bringing it back into compliance with the 0.3 percent level, he said.

However, the temporary step involving elevated THC and CBD is necessary as the hemp is brought toward the "finish line" of consumable product, which should be understood by regulators, Cook said.

"You can't penalize the process as we move toward compliance," he said. "Everything is getting lumped together, and that's the problem."

Under the Oregon Department of Agriculture's existing regulations, the elevated level of THC in hemp extracts is considered allowable as long as it's eventually stripped out or sufficiently diluted, said Summers, the agency's cannabis policy coordinator.

"Right now, as long as it's not sold to an end consumer, it is legal," she said.

Under the interim federal rules, extracts and derivatives of cannabis with more than 0.3% THC are considered marijuana.

How the USDA will approach the issue of hemp processing for CBD is unknown at this point, Summers said. "The USDA doesn't really address what happens when it leaves the farm. They don't cover processing."