

"Beaver" dams aid fish restoration in John Day River drainage

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Ecologists and biologists working in a tributary of the John Day River in northeast Oregon are encouraging the building of dams to restore degraded stream habitat – beaver dams, that is.

The stream recovery operation has already significantly increased wild juvenile steelhead survival in Bridge Creek as opposed to the control tributary Murderers Creek.

The researchers from NOAA Fisheries Science Center in Seattle did this by increasing the local beaver population's ability to maintain long-term and stable beaver dams. The outcome is a healthier stream habitat that is less channelized and has less annual erosion from floods.

Because Bridge Creek, along with other John Day tributaries, has suffered erosion and channelization, annual flooding tends to remove beaver dams, the very structures that could restore connections between the channelized stream, its floodplain and riparian zone, and increase the habitat complexity needed for juvenile rearing, according to the report Working with Beaver to Restore Salmon Habitat

(<http://www.nwfsc.noaa.gov/research/divisions/fe/wpg/beaver-assist-stld.cfm>). The report was funded by NOAA Fisheries and the Bonneville Power Administration.

The initial habitat degradation in Bridge Creek and many other streams in the arid and semi-arid west could have happened in the late 1800s and early 1900s, said Michael Pollock, ecosystem analyst at the NOAA Fisheries Science Center.

“Regardless of how this happened, the important thing now is salmon habitat recovery,” he said. “Can we use the beaver to accelerate the habitat recovery process?”

Bridge Creek beaver dams are often short-lived because they are built within these channelized or incised trenches, so when annual flooding occurs heavy water flow is concentrated on the beaver dam rather than those flows being naturally dissipated across a larger floodplain. Consequently, most beaver dams are breached in the first year, according to the report. This has an impact on both stream habitat and the beaver population.

Rather than using conventional, disruptive and expensive stream restoration techniques, researchers Pollock, Chris Jordan, Nick Bouwes, Joseph Wheaton, Carol Volk, Nicholas Weber, Jason Hall and Josh Goldsmith set out to help the beavers build longer lasting dams by providing a structural basis for dams.

Still, even natural beaver dams are transient features in the stream. The numbers of dams on any given stream will increase or decrease as the resulting ponds fill with sediment and dams are no longer useful for beaver. However, “even abandoned beaver dams reduce erosion and help retain sediment, increasing the diversity and complexity of stream habitats.”

Blown out dams from high stream flows give none of the protection or habitat improvements. Beginning in 2009, they began this work to encourage the local beaver population to build long-term dams.

“We predicted that stable beaver colonies would gradually aggrade the incised reaches of Bridge Creek enough to raise the alluvial water table and reconnect the stream to its former floodplain,” the report said. “Therefore, encouraging long-lived beaver dams would be a cost-effective method to produce measurable improvement in riparian and stream habitats, and subsequently in abundance of native steelhead.”

They set out to provide four reaches of Bridge Creek with beaver dam support structures. They didn't build the dams for the beaver, they built the underlying structures that lend strength to the dams beaver would build themselves and hoped the beaver would move in and finish the job.

Their low-cost answer was to install untreated and stripped Lodgepole pine fence posts at 0.5–1 meter intervals across the channel and its potential floodplain surface. They used several designs:

- A post line
- A post line with a wicker weave (most frequently used)
- A starter dam of postline, wicker weave and sealed with clay (least used).
- Reinforcement of an existing dam with a post line
- Reinforcement of an abandonment dam with a post line with wicker weave.

The most successful structure was the post line with a wicker weave. While beaver readily adopt them, the study found, even when beaver don't use them, they have a positive impact on stream health. A result of the work is that initial monitoring of steelhead survival is showing improvements.

Analysis by Mary Conner at NOAA Fisheries, is showing that “steelhead survival has increased both in absolute terms and relative to survival in Murderers Creek, the control stream.”

Biologists will continue to monitor both the stream's health and the health of the threatened steelhead in the stream. They are also considering expanding the techniques used in this project to the remainder of Bridge Creek. In the meantime, Pollock is fielding phone calls from interested agencies throughout the West, his crew is producing a how-to manual and they will hold workshops on their techniques in the winter of 2014-15.

“It's been exciting to see the number of agencies interested in using beavers for stream habitat recovery,” Pollock said. “It's an affordable technique and very effective.”

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