



Tea Lambert (left) and Angelita Soto stand atop one of the Coeur d'Alene Tribe's structures used to slow down and raise the stream channel and increase the stream's ability to store water.

WHAT'S IN YOUR STREAM?

Restoration projects vary depending on resource needs, funding, and landowner objectives

By Steve Stuebner

Perhaps you've just retired and you've purchased a home with forested property in North Idaho, and that property has a stream running through it. How nice! It's always a bonus to own your own creek!

As you watch the creek flow by, maybe you'd like to learn more about it. How clear is the water? What is the water quality like? Does it have turbidity issues? Does it have eroding streambanks? Is it carrying sediment? Or, maybe you'd like to increase the potential for fish and other aquatic creatures to thrive in the stream.

University of Idaho extension educators from North Idaho put on a one-day workshop recently about on "Restoring Idaho Streams" in St. Maries to share information with forest landowners and natural re-

source professionals about how to assess stream health, how to identify methods for restoring streams and how to finance the restoration work.

"Streams are important to landowners," says Chris Schnepf, a University of Idaho Extension Educator based in Kootenai County. "There's two parallel issues – many landowners want to do right by their stream, they want to take care of it. And secondly, there could be issues affecting their stream banks, water quality, or they could be even losing their property because of streambank erosion. We've seen instances where people are losing one to two feet of stream bank in a year."

Schnepf organized an excellent slate of experts to share information about re-

storing streams at the workshop, including Jim Ekins, a UI Extension water educator who covered the basic principles of assessing and improving stream health, Bill Lillibridge, an engineer for the Idaho Soil and Water Conservation Commission who talked about a range of low- and high-cost tools for restoring streams, and Ree Brannon, District Conservationist for NRCS in St. Maries, who covered the different ways NRCS can finance stream-improvement projects and provided some detailed examples of restoration work.

In the afternoon, workshop participants learned about stream-restoration activities that the Coeur d'Alene Tribe has been working on for 15 years on Benawah Creek by taking a field trip to several restoration sites along the creek. "The work that the

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Workshop participants looked at several restoration sites along Benewah Creek as part of the workshop afternoon program.

tribe has been doing on Benewah Creek is really wonderful,” Schnepf said.

By the time the workshop was over, the speakers had inspired the participants to consider getting involved in monitoring or assessing stream health (69% expect to do that), and more than half of them said they plan to get involved in working to improve the health of their streams and more than half said they plan to seek professional assistance in enhancing stream health.

“Most of our participants were forest landowners with an average of about 130 acres of land, so this was good news,” said Jim Ekins. “We feel like they learned a lot, based on their feedback, and hopefully they’re excited about taking the next steps to improve their streams.”

One of the more interesting aspects of the workshop: Participants learned that stream-restoration work can vary considerably depending on project objectives, budget and engineering. For example, Brannon and Lillibridge presented information about different ways to stabilize streambanks, ranging from low-cost techniques such as planting willows, to more robust and expensive techniques such as using a mix of rip rap and vegetation planting, while using heavy equipment to create a sustainable slope for a streambank.

In the field trip to Benewah Creek, Coeur d’Alene Tribe officials showed how they have been restoring Benewah Creek using multiple methods that involved creating more meanders in the main-stem stream course and deeper pools to decrease stream temperature for native west-slope cutthroat trout. All of that work actually

slows the stream down, which also helps relieve the impact of water velocity on the streambanks. As a result, the restoration work focused more on the stream course, and slowing down velocity, versus streambank stabilization per se.

That’s because their primary objectives had to do with improving steam health for fish. One way to do that was to create deeper pools in the

stream, where fish could hide out in cooler water. “The tribe has goals for improving fishable populations of west-slope cutthroat trout in the whole watershed,” says Angelo Vitale, fisheries manager for the Coeur d’Alene Tribe Vitale. “We’re seeing a lot of positive results.”

In Phase 1 of the project, the tribe built 8,275 ft. of new stream channel, increasing channel length by 1,660 ft., and reduced stream gradient by 58 percent, officials said. “The mainstem restoration has generally had the effect of improving rearing conditions (for fish), [allowing water to spread across the flood plain], raising shallow water tables and reconnecting cold-water habitats,” according to a briefing paper on the restoration work.

In Phase 2 of the project, the tribe has been installing artificial wooden dams in a large meandering section of Benewah Creek in hopes of mimicking the work of beavers to spread the water out in the meadows surrounding the creek. They built 17 of the wooden dam structures. Phase 2 emulates “the ecosystem-engineering effects of beaver to restore both fish habitat and floodplain vegetation communities more rapidly than simply revegetating alone,” the briefing paper says.

They’ve done 39 projects on Benewah Creek over a 15-year period, working together with large and small landowners and Benewah County, Vitale said. They’ve also worked on removing barriers between Benewah Creek and connecting tributary streams to open those areas for spawning and rearing.

High stream temperature and sediment

were two issues affecting fish survival and stream health, Vitale said, noting that Benewah Creek is on the state 303(d) list for those two reasons. A Total Maximum Daily Load (TMDL) plan has been developed to address the issues, but certainly the tribe’s restoration work has accelerated the recovery effort.

Fifteen years of conservation work on Benewah Creek has been decreasing stream temperatures and improving survival for native cutthroat trout, he says, but other factors are at play in Lake Coeur d’Alene that affect fish survival as well. One of those primary factors is northern pike, which grow very large in the lake and prey on the native trout.



These structures also designed by the Tribe slow down the stream, raise the stream channel and increase the stream’s ability to store water



In order to better understand pike habits and how they impact native cutthroat trout in the lake, the tribe is offering a reward of \$5/fish for catching pike and reporting on the location of the catch, and it also offers larger rewards if people catch a large pike that’s been tagged. The rewards are offered in the southern third of Lake Coeur d’Alene, the portion owned by the tribe. Benewah Creek flows directly into the lake in that area. Rewards for tagged fish run \$50 to \$1,000, Vitale said, adding, “We just

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Bank bars on the Little Weiser River slow the velocity of the stream and redirect it away from the bank.

gave out a \$1,000 reward last month.” For more information on this reward program, you can visit www.cdatribe-nsn.gov/natural/Fisheries.

The Coeur d’Alene Tribe’s work on Benewah Creek provided an insightful demonstration of how stream dynamics and velocity work, and they relied on a similar playbook

that Bill Lillibridge explained in his presentation. In an ideal world, Lillibridge encouraged workshop participants to restore streams to their natural condition as much as possible. That means slow the stream down with natural channels, natural meanders and woody debris and vegetation along the stream banks, he said.

In explaining stream hydraulics, he showed a formula for calculating stream velocity, which is Slope divided by Manning’s Friction. In a natural situation, a stream will meander to decrease its bed slope until the erosion and deposition come into balance, he says.

“The best-case scenario is to restore a stream,” Lillibridge said, “but most real-life scenarios require us to make adjustments for landowner needs,” noting that a natural stream evolved over many hundreds, if not thousands of years. Often development pressures lead to narrowing streams or channelizing them, increasing velocity, erosion and sediment.

Assessing and Improving Stream Health

In Jim Ekins’ presentation, he talked about how one might assess the health of a stream. From a 30,000-foot level, he points out that a stream running through your property is part of a larger watershed. For instance, the St. Joe River drains the Bitterroot Mountains in the St. Joe National Forest, and then it drains into Coeur d’Alene Lake, and from there, water flows into the Spokane River and the Columbia River.

What factors might be affecting your stream? Are there industrial plants upstream of your property? If so, you may have point-source discharges that release industrial pollutants into the stream. But those point sources are regulated by the EPA, and the discharges should meet water quality standards. If there is no industry upstream, there might be non-point sources of contamination such as sediment, nitrates, phosphorous or bacteria affecting water quality.

The question landowners should ask, he said, is

Hydraulics

$$V = \frac{k}{n} R_h^{2/3} S^{1/2}$$

(MANNINGS EQUATION)

$$\text{Velocity} \approx \frac{\text{Slope}}{\text{Mannings Friction}}$$

whether their stream meets beneficial uses. Is it fishable? Is it swimmable? Does it support growing crops? Does it support recreation? Does it support aquatic life and cold-water biota? There are ways to measure these criteria, he said.

Ekins manages a statewide water quality monitoring network called IDAH20. Citizen scientists who have undergone basic training about in water quality monitoring become responsible for monitoring a stream close to home, or perhaps a stream in your their own backyard. They have more than 425 people participating in the IDAH20 program so far, monitoring about 100 sites statewide.

The IDAH20 program looks at three different types of assessments for determining a stream’s health:

1. Habitat
2. Physical/Chemical characteristics
3. Biological characteristics



The streambank on the left has not been treated and shows significant erosion. The adjacent property owner has worked with NRCS to treat the bank and isn’t losing soil.

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As for habitat, does the stream have pools and riffles? In terms of physical characteristics, what is the shape of the stream? What kind of rocks are in the bottom of the creek? Are the rocks clean, or is there dirt between the spaces in the rocks? The dirt may indicate some erosion issues upstream, Ekins says.

Have you noticed any bugs living in the stream? Fly fishers will know some of the bugs to look for, he says. People can wade into a stream and turn over rocks and see if they find some nymphs and bugs underneath ... maybe even snails? "I want people to learn about their streams and see them in a more complex and sophisticated way," Ekins says. "But everything in a watershed can have an effect on a stream."

People should look at their streambanks and take notes on what they see ... are the banks eroding or stable? Is it a vertical cut-bank or a sloped bank? How much cano-



Streambank work on the St. Joe River in North Idaho.

py cover exists on the streambank? What kind of riparian vegetation is growing on the bank? "The more canopy cover, the better," he says.

People should also look at the stream clarity and check for odors ... if the stream is cloudy, there may be some turbidity issues. If there are odors, what do the odors indicate? A petroleum spill? Human or animal waste? Does it smell fishy? Perhaps the biological life in the stream is stressed and causing bad odors.

These are the kinds of things that the IDAH20 program looks at to gauge stream health, information that can assist the

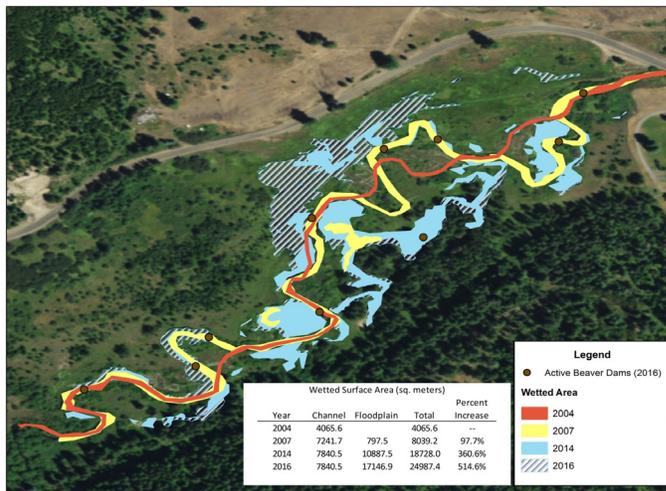
Idaho Department of Environmental Quality in monitoring streams state-wide. If people are interested in getting involved in the IDAH20 program, see the following web link: <http://www.uidaho.edu/extension/idah20>

How to plan and execute stream improvement projects

Ree Brannon of NRCS and officials with the Idaho Department of Environmental Quality and Trout Unlimited provided information on how to get financial assistance with setting up stream-improvement or restoration projects. Brannon outlined programs funded by the Farm Bill and Congress through the NRCS Environmental Quality Incentives Program (EQIP), and DEQ officials talked about Section 319 grants offered by DEQ and EPA.

"I covered the importance of identifying resource concerns so we can provide technical and financial assistance," Brannon said. For instance, if a landowner has excessive sediment in the stream or soil erosion issues, there may be a deeper cause to those issues that can be discovered through a site visit. She walked participants through the process of investigating whether a project might be possible to stabilize the streambank as well as correct any problems adjacent to the stream.

What's the cause of erosion? Is there livestock grazing on the streambank? Maybe the landowner needs to install riparian fencing to protect the streambank. Or maybe an off-site water development project would keep the cattle away from the stream. EQIP projects provide financial assistance for a portion of the cost of fencing or a stock water development project, as well as to provide a portion of the cost for the streambank stabilization, as an incentive for the landowner to implement the project, she said.



Benewah Creek's meanders have increased over time.

Prior to looking at those investments, NRCS will write a conservation plan for the property, and they might want to do a grazing management plan, as well.

"We want them to continue to use the land for agriculture and forest management and at the same time, reduce resource concerns," she says. "But it's good for them to know that there are experts that work here locally who can come out and visit their property and come up with a plan to improve things."

Every county in Idaho has a local conservation district to help identify problems and recommend solutions. They work with NRCS, Conservation Commission, and other professionals to plan and execute conservation projects.

The U.S. Fish and Wildlife Service can sometimes fund conservation projects on private lands, and that's true also with Trout Unlimited, Schnepf says.

"The Bonner County Conservation District was really creative with how they funded projects," he said. "They grew their own willow cuttings for their district's riparian projects. It's so easy to grown your own that I hate to see people spend money on willows, unless they're really cheap."

For more information about the stream restoration workshop, contact Schnepf at cschnepf@uidaho.edu or call 208-446-1680. □

Steve Stuebner is a regular contributor to Conservation the Idaho Way.

INTRODUCING: NEW COMMISSION STAFF!

From time to time our staff moves on to other places and opportunities, and new folks join us. We've been very fortunate to attract great employees, and this month, we introduce three new ones!



Corrine and her husband, Tom

Corrine Dalzell

Corrine began working for us in early August as an Administrative Assistant. She came via the Dept. of Health & Welfare and has worked for the State of Idaho for a little over 4 years.

"I have a degree in Environmental Biology and I'm very excited to finally be "working in my field," says Corrine.



Huskies, Ilya and Jojo.

Corrine is married and has two sons (camera shy) and two huskies (not camera shy).

She's lived in a few different states including Arizona and Kentucky, but truly loves living in the beautiful state of Idaho. She has

been here over 17 years and has lived in American Falls, Pocatello and Boise. Raising her sons in Idaho, she greatly appreciates the values and kindness she has seen here.

She understands the importance and value of caring for our natural resources while simultaneously caring for the farmers and ranchers who depend upon it for their livelihood. While working at the State Labs, Corrine heard about a project of cleaning farm water run-off through the construction of wetlands. She has great interest in projects that use natural resources to improve other natural resources and enhance biodiversity too!

She's excited to learn more about all that the Conservation Commission does and we're excited for you to meet her.



Jon Beals

Jon is our newest addition, joining us in mid-August. He works out of the Marshing office as a water quality resource conservationist. Jon comes to the Commission with a BS Degree in Biology from Northwest Nazarene University, an MS Degree in Natural Resource Management from Humboldt State University (Go, Lumberjacks!).



Jon in his happy place, with friends (one of whom is less happy than the other two)!

He worked for the Idaho Dept. of Fish and Game for 15 years as a wildlife biologist, and most recently for the Office of Species Conservation for 9 years as a project manager/financial officer.

Jon and his wife Cathy live in Nampa, have been married for 29 years, and have a 18 year old son and a 15 year old daughter. His personal interests include hunting, fishing, hiking and traveling. He was born and raised in Northern Utah, but he's now lived in Idaho longer than anywhere else. "Idaho has been a great place to live and raise a family," he says. "We try not to take for granted how spectacular our State is."

Jon says, "All lands have tremendous agricultural and natural resource potential. Agricultural priorities and the needs of fish and wildlife can be effectively and reasonably balanced." We agree and are excited to be working with him!

Maria Minicucci



And last, but not least, Maria is our new Technical Records Specialist 2, working with Delwyne to provide district support services, and with Chuck, assisting the Conservation Reserve Enhancement Program team in their record-keeping.

Maria's overriding reason for joining us was to assist Idaho producers of all shapes and sizes to produce safe and quality food.

Maria's interest in Ag products focuses on consumption, one of her life's passions! "If money were no object, I'd implement my vision of a network of local establishments to shorten food miles for the processing, distribution, sale, and of course consumption of locally-produced food," says Maria.

Maria has quickly become a valued member of the team! You're going to enjoy working with her too! ☐

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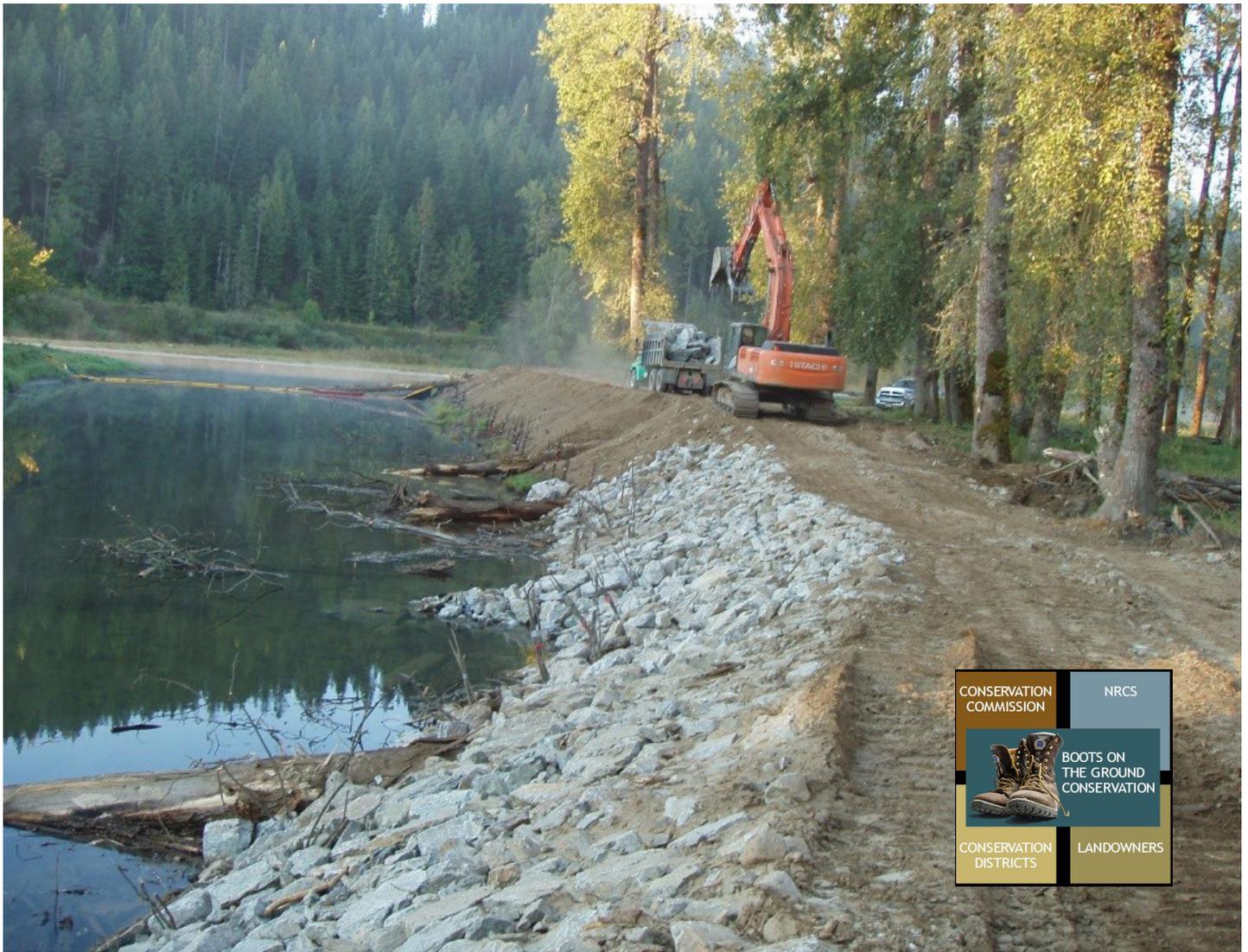
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Visit www.swc.idaho.gov to locate your local district!

