



Volunteers install two Post-Assisted Log Structures (PALS) on the East Fork of the Potlatch River last summer. (photo by project volunteers, who were provided by the Palouse-Clearwater Environmental Institute and AmeriCorps.)

WOODY IN-STREAM STRUCTURES SLOW DOWN RUNOFF, ENHANCE HABITAT IN 2 N. ID PROJECTS

By Steve Stuebner

The Clearwater Soil and Water Conservation District and the Kootenai-Shoshone SWCD recently completed conservation projects using primitive woody structures called beaver dam analogs (BDAs) and post-assisted log structures (PALS) to slow down spring runoff, reduce sediment flows and enhance fish habitat.

The Kootenai-Shoshone District project led to the installation of multiple PALS structures on 1,100

feet of Schlagel Slough as it flows through a pasture on a cattle and horse ranch owned by Albert Walsh in Cataldo.

"I'm very happy with it so far," Walsh said. "We're trying to get as much water in the soil profile as possible and re-create the riparian habitat that had been turned into, essentially, a gutter."

"It's nice to work with a conservation-minded landowner," said Jenna Ditzel, Natural Resource Conservationist for the Conservation

Commission, based in Coeur d'Alene.

Bill Lillibridge, project engineer for the Idaho Soil and Water Conservation Commission, designed the project. Funding for the project came from a Leading Idaho grant from the Idaho Department of Environmental Quality/Environmental Protection Agency.

"We're trying to hold more water uphill on our landscape," Walsh says. "We can't control how much rain or snow falls on our ranch, but we can control how fast it runs off."

That’s the general objective that can be achieved by installing primitive woody structures like BDAs and PALS in a stream. In a video story produced by the Conservation Commission five years ago, we featured the installation of many BDAs in Baugh Creek, a tributary of the Little Wood River, as a proactive conservation measure post-fire to restore streambank habitat, enhance the flood plain, reduce stream down-cutting, and slow down water runoff in the springtime.

Conservation projects incorporating BDAs and PALS are becoming more popular statewide on private, state and federal lands for the reasons mentioned above.

In the second project we’re featuring in this issue, the Clearwater District worked with multiple partners to install 30 BDAs and PALS in the East Fork of Potlatch Creek to slow down spring runoff, enhance in-stream habitat for fish, reduce sediment flows, and improve riparian habitat and stream function overall.

“There are quite a few conservation goals with this project,” said Annie



First Post-Assisted Log Structure (PALS) installed in Schlagel Slough. While BDAs are usually built river-wide, PALS may only cover a portion of a stream channel. (photo by Kootenai-Shoshone SWCD)

Connor, project manager for the Clearwater District. “Besides storing water, we’re reactivating side channels, creating overhanging stream banks for fish habitat, reducing stream temperature, and smoothing out the extreme effects of high flow and low flow.”

Native fish that will benefit from the project include Clearwater River steelhead and West-Slope cutthroat trout.

About \$32,665 in cost-share funding for the Clearwater District project came from Pacific Coast Salmon Recovery Funds from the Idaho Governor’s Office of Species Conservation. The Clearwater District’s partnerships provided a “whopping” \$20,000 in non-federal

matching funds, Connor said.

“Obviously, this was a group effort,” she said. “Much of the work was done by six dedicated volunteers. We had four Americorps volunteers through the Palouse-Clearwater Environmental Institute (PCEI). Alexandra, Jasper, Elisabeth and Maggie were dedicated to the project for most of August, helping build the BDAs and PALS in the stream. Two other volunteers



It’s hard work to run the hydraulic post-pounder but these two volunteers were up to the task! (photo by PCEI volunteers)

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A volunteer weaves willows through a series of posts to build a BDA on the East Fork of the Potlatch River. Using local woody materials saves time and money when building BDAs and PALS. (photo by PCEI volunteers)

(Phillip and Steppen) showed up for multiple days to assist with project implementation and equipment.”

Other partners that participated in the Clearwater project include:

- PCEI Staff
- Idaho Department of Lands (IDL)
- Idaho Department of Fish and Game
- Clearwater-Nez Perce National Forest
- Trout Unlimited (Local Chapter)
- Idaho Office of Species Conservation
- NOAA Fisheries

Background

The East Fork of the Potlatch River project area is located on IDL State Endowment Lands near Boville in Clearwater County.

Project purpose: To restore and enhance habitat complexity and floodplain connectivity by adding small woody structures to 0.5 miles of the East Fork of the Potlatch River. The work will enhance high-priority

steelhead habitat by adding hand-built PALS, which simulate natural wood accumulations and BDAs, which mimic beaver activity, to the streams, Connor said.

In July 2024, the Clearwater District led a collaborative walk-through of the conservation project to get input from others who have experience building small woody structures in the past. Seven people from five agencies participated in the tour, including Idaho Department of Lands, the Conservation Commission, NOAA Fisheries, and the USDA Forest Service.

Following the walk-through, agency officials suggested adding more structures to the .5-mile project area on three reaches of the East Fork of the Potlatch River. Treatment on a tributary stream, Bob’s Creek, was pushed out to a future project, Connor said.

IDFG has been working on improving steelhead habitat in the East Fork, one of two forks that form the Potlatch River. Some factors that limit steelhead production in the

river include poor habitat complexity and warmer summer water temperatures, according to IDFG.

The BDAs were installed to mimic the hydraulic and geomorphic effects of beaver dams by using a hydraulic post-pounder to drive 2-inch to 4-inch diameter untreated wood posts across the stream channel (spaced 1- 2 feet apart) and weaving them with riparian vegetation and conifer slash, she said.

“Steppen, a retired Forest Service employee who has worked on multiple BDAs and PALS projects using similar equipment and goals, volunteered for six days to advise us on construction techniques, structure placement, and equipment support,” Connor said.

“Phillip, a furloughed IDFG employee, was essential to handling the pounder. He never seemed to tire, and we would not have gotten as much done without him. The PCEI crew of four AmeriCorps volunteers were the backbone of the project, working all 12 days in the field during the implementation of



PALS structure installed on the East Fork of the Potlatch River will slow down the current and deflect flow away from the streambank, while providing hiding and rearing habitat for fish. (photo by Annie Connor, Clearwater SWCD)

our project.

“They were enthusiastic, interested, hard workers. They also provided and handled the logistics of the equipment, including ATV and trailers, lopper and clippers, chain saws, tools, and safety gear. They also organized a volunteer weekend where 10 volunteers, as well as PCEI employees, showed up to collect willows, build structures, and learn about the project. In October, the local Trout Unlimited chapter volunteered to finish off the work on the structures. Even four members of my own family spent time on the project.

“That sure makes it fun to have all of those people out there making improvements to the East Fork of the Potlatch River.”

Project Permitting

The Clearwater District sent an Idaho Joint Permit Application to the Army Corps of Engineers and the Idaho Department of Water Resources. The Corps approved the project in June. IDWR required supplemental documentation for a

proposed BDA/PAL Structures permit. The agency sent a letter of approval in July.

IDWR has received concerns about BDA projects if they adversely impact downstream water rights. Connor noted that there were no issues related to water rights on the East Fork project.

NOAA Fisheries approved the project in May, saying it met the Idaho Habitat Restoration Programmatic Biological Opinion. A cultural survey was completed as well for the project with no effects noted by the Idaho State Historic Preservation Office.

Now the Clearwater District, IDFG and the project partners will watch and see how the BDAs and PALS perform over time.

“It’ll help with temperature extremes and extremes with high flow and low flow,” she said.

Kootenai-Shoshone District project

In the Albert Walsh project, he’s working with the Kootenai-Shoshone District to convert a hayfield adjacent to Schlagel Slough back to a wetland,

while retaining some grazing value for his cattle and horses.

The project is located on the lower end of Schlagel Draw, which flows into the Cataldo Slough.

In the project application, Kootenai-Shoshone District officials said Schlagel Slough is mainly treated as a roadside ditch in the upper watershed and then a field ditch through Walsh’s property. The nearest assessed waterbody is the Coeur d’Alene River, located about 2 miles away, which does not support the following beneficial uses: temperature, sediment and several heavy metals.

The \$24,293 Leading Idaho grant from DEQ/EPA covered the costs of the project along with local cost-share in-kind assistance provided by Walsh, his wife and three children. The total cost of the project was about \$55,000. The Walshes have owned the property for three years.

Permitting? Because Schlagel Slough is not a perennial stream, no permits were needed from the U.S. Army Corps of Engineers, officials said.

Schlagel Slough is a narrow waterway, approximately two feet wide and one foot deep at maximum flow, said Karla Freeman, Kootenai District administrator, who landed the Leading Idaho grant for the project. Final design called for installing nine PALS structures and six brush plugs to slow down water flow during spring runoff and encourage water-spreading across the floodplain.

Overall, 1,100 feet of floodplain-PALS were installed to demonstrate their usefulness in reducing sediment loads and

re-hydrating floodplains. About 370 willows were planted in the floodplain as well to improve habitat, provide shade and catch additional sediment.

During the project installation this year, there were some surprises – water seeped into the ground much faster than expected.

“After we installed the northern PALS, we noted that the uppermost PALS did not fill beyond top of bank,” Freeman said. “We noted some holes where water was washing down into the ground. We first thought they were drain tiles or burrowing animal holes.

“Water flow estimated at 10 gallons per minute. We dug to expose the tiles, but did not find any. We also noted that the soil, even very close to the creek, was relatively dry. We eventually reduced the uppermost PALS plug to half channel height, as all water inflow was somehow infiltrating into the ground. We hope that soils become saturated and begin to pond. As this area has extensive sediments from upstream areas, there may be a sand layer (not located during tile exploration) that is draining water.

“Any water routed onto the floodplain immediately infiltrates. The only exception is a two- to four-foot cordon alongside the existing ditch, where Reed’s Canary Grass is growing. We have no explanation for the high infiltration, and hope that future trapped fines will allow for more water holding



Above, two more PALS installed along Schlagel Slough. (photo by KSSWCD)



■ PALS Brush Structure
■ PALS Brush Plug

Rotated View – North is to the left

prior to infiltration, and that overall infiltration will equate to better water storage in the field.

“By contrast, the southern half of the project has more springs, and does not have issues with water retention.”

As Walsh said earlier in the article, he’s fine with the water seeping into the ground. “The soil will act like a sponge and eventually, we’ll build up the water table and store more water on our farm before it runs off into the Coeur d’Alene River,” he

said.

For more information on the Clearwater District project, contact Annie Connor at annie.clearwater.swcd@gmail.com or 208-476-5700.

For more information on the Kootenai-Shoshone District project, contact Karla Freeman ksswcd@yahoo.com or 208-209-4348.

Steve Stuebner writes for Conservation the Idaho Way on a regular basis.

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