



Novel Approach for Large Woody Debris Placement

A Case Study in Tree Tipping From the Upper Calapooia River

Interview between Cris Salazar, Calapooia Watershed Council and Kayla Seaforth, BEF

KAYLA SEAFORTH: Tell me about the project. How did this idea come about?

CRIS SALAZAR: It was a collaboration between the Calapooia Watershed Council and the Sweet Home Ranger District that started in 2016. My predecessor, Collin McCandless, who's now our executive director, and Lance Gatchell, who is the Sweet Home's, fish biologist and hydrologist originally came up with the idea. There is an Endangered Species Act (ESA) listed population of steelhead in the upper Calapooia, the Upper Willamette population. Like many salmonid populations, it's not doing great. We identified this reach, which is on the Willamette National Forest, as not having all the habitat requirements that you would hope for for steelhead; there wasn't a lot of gravel, there wasn't really any in-stream wood, so we designed a project together with the Forest Service to bring more trees into the stream.

The project was funded in October 2019, and then shortly thereafter the pandemic began. Later in 2020, we had the Holiday Farm Fire. Both of these delayed implementation for a couple of years, and we reassessed things in 2021, to determine if the project was still required — it was. We got it completed in July 2022.

Part of the reason why we used such large trees is because the Calapooia in general, but particularly the Upper Calapooia, is a very powerful stream during the wintertime, and smaller trees don't generally stay put. So we wanted to use large trees with root wads to increase habitat diversity, macro invertebrate abundance and diversity and then provide an opportunity to trap some of the gravel for spawning habitat. These features also provide refuge for juveniles during high flows; they can hide and hunker down behind these large trees, and then also hide under

them during the summertime. But, we needed very large trees to deliver these benefits and it took some time to find a contractor that was able to tip them over. We ended up working with BCI Contracting to remove a big floodplain barrier; there was a road that crossed the stream and the bridge was blown out in the 1996 flood. Both sides of the road were left and it was creating a bottleneck in the floodplain, so we also removed that.

We also hired Blue Ridge Timber Cutting, owned by Mark Villars to do all the tree pulling. Mark has been doing this work for a very long time. He worked a lot on the coast with coho populations and is very well versed in this type of tree pulling work where the goal is to retain that root wad as an anchor, because otherwise the bole of the trees will pick up and float during high flow events. The root wad anchors it in place, and provides more diversity too; often you'll



Cris Salazar

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A graduate of Oregon State University's Fish and Wildlife Science Program, Cris Salazar has been managing the Calapooia Watershed Council's Habitat Restoration Program since 2018. Prior to his time with the CWC he worked for multiple federal agencies monitoring salmon populations from California to Alaska. With roots in the Umpqua Valley, he has been a longtime advocate for protecting and restoring Oregon's rivers and streams.

get pools forming around the root wad in the channel. There was some uncertainty about whether or not we could pull them over and how many we could tip within the project period. We ended up pulling 13 trees into the stream, which was more than we thought we were going to. To get them down Mark uses a high tech synthetic rope instead of a cable. It's very strong and light, which made moving it through the rigging system and from tree to tree very efficient. There's also a reduced risk of sparking with synthetic rope. Mark has a yarder for logging that was converted to fit on the back of a flatbed truck which has the spool on it, and he basically just spooled out the line.

Mark was like a mathematician out there, calculating the angles and the amount of force required to pull these trees over. Part of the pulling process was eliminating some of the smaller trees, mostly alders, in front of the large trees. Dozens of small alders were trapped behind these larger trees, which will act like the backbone of a logjam to recruit smaller wood during floods. Because of the fire, which just barely hit the project area, most of it was upstream, there is going to be a lot of smaller, finer wood moving downstream and getting trapped by these trees which is great for the macro

invertebrate populations. All the fine bits like leafs and twigs will decompose providing food for the bugs and then the juvenile steelhead will eat the bugs. We will be doing snorkel surveys for the next couple of years to track trout and steelhead abundance in those areas. When we did steelhead redd surveys before the project we found three redds in the mile stretch that the project encompasses. Hopefully we'll see a lot more in the future.

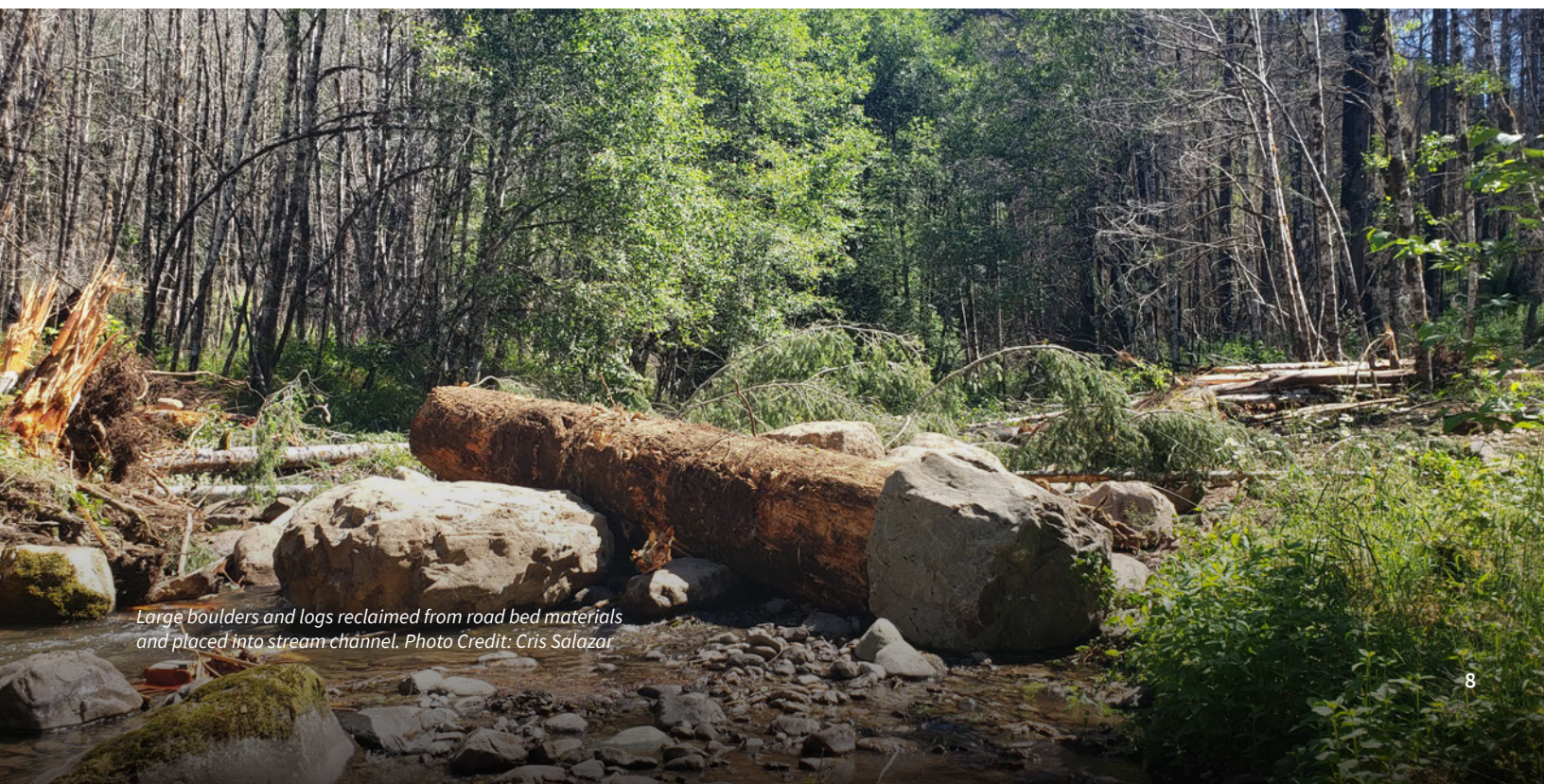
KS: How does tree tipping differ from other methods of large woody debris installation?

CS: There are lots of different ways to introduce complexity into a stream. What we were going for was the addition of really large trees because it is a powerful system, and anything smaller likely would have just been launched out during the next big flood. Fortunately, we had some large trees streamside. Sometimes people helicopter woody debris in, but that limits the size of log you can bring in. The trees that we put in were 200,000 to a quarter million pounds with the tree and the root wad, so helicopter operations wouldn't have worked on this project. Basically, we couldn't have brought in wood of this size from another location, just because of the logistics of getting them on trucks

and the limitations that helicopters have. And really, we were looking to simulate what was once there. A lot of these Cascades streams, historically would have had a lot of large old growth trees in them. And for one reason or another that wood has been pulled out, so we wanted to put things back the way that they once were using the same types of materials. You still see this type of structure in some wilderness areas, which is what this started to remind me of as the project progressed.

KS: What elements need to be in place to make this feasible?

CS: We're lucky on the Upper Calapooia. The project site is fairly remote but there was logging in this area decades ago. However, a lot of the larger trees next to the stream and even up the hillsides were retained. Part of our process was deciding whether or not it was worth it to move these large, sometimes 100 year old trees into the stream. We had an assessment done to determine how many old growth trees were in the area and it ended up that we only needed to take between 1% and 3% of the overall large diameter trees. Initially a few dozen were identified as potentials, then we looked at whether or not any of them had any type of rot that would cause it to snap at the bottom when it was pulled



Large boulders and logs reclaimed from road bed materials and placed into stream channel. Photo Credit: Cris Salazar

over. Those were excluded for safety reasons, and because it would sever the log from the root wad. We didn't include trees that had broken tops, because that made pulling these large trees over more difficult, if a tree has a broken top, you have to pull so much harder, because it doesn't have all that weight at the top that helps guide it to the ground. It ended up being that most of the trees we pulled over were ones that were killed by the fire. We took trees that were already somewhat precarious on the stream bank to begin with; it was likely they were going to fall one way or the other and we just insisted that they fell into the stream.

A standing old growth tree provides a certain swath of wildlife benefits, and then laying down in a stream that tree just provides a different swath of species benefits. With the Calapooia population of steelhead ESA listed as threatened, we thought that it was worth taking down a few of these trees and putting them in the stream for the benefit of our steelhead. The project was ranked number one in the Willamette region, at OWEB's (Oregon Watershed Enhancement Board) open solicitations. That ranking bolstered our confidence, knowing that a large group of experts also agreed with us that it was worthwhile.

On the logistics side, we were lucky to have Mark and Blue Ridge Timber Cutting; they did a lot of the hard work. Once we got it funded, designed, everything was approved, everything was permitted we just stood back and watched them do their thing. It took a lot of time to get the trees rigged up, and all of five minutes to pull them over.

KS: Do you see any drawbacks or challenges to this strategy?

CS: There were some challenges finding a contractor that was able to do the project with the right equipment. If we had used a steel cable, which is the traditional tipping technique, I don't think we would have gotten as many trees down. We might have still been able to accomplish the project, but the amount of productivity that we had, I think, was really enhanced by the fact that we were able to use the lighter rope, which made moving from tree to tree much quicker.

I think that when you're tipping old growth trees, you have to be delicate, realizing that they are gems in most forests. Treading lightly and making sure that we only took what we needed was really important to us. There were a few trees where we had the go ahead to pull them down but we realized it would be redundant, because we already had a few good trees in that location, so we left them standing. It was necessary to keep them in place, and keep this lasting benefit to the forest.

KS: Anything else you'd like to share?

CS: I want to thank the US Forest Service for contributing the trees that were part of the match for the project and

their time. Lance Gatchell in particular spent a lot of time working to get things approved and get the permitting completed. There were other forest service staff that came out and helped evaluate things and determined whether or not the project was still appropriate after the fire. Nikki Swanson, the district forest ranger, was a huge help keeping things moving. Thanks also to OWEB for funding the project. The contractors BCI and Blue Ridge, really, they got the work done. This project was really satisfying, even though the implementation went quickly. I'll try to come back and visit this place every so often just to see how things change and we'll continue doing redd and snorkel surveys to see how fish respond over time.



Douglas fir tree with large root wad that will anchor the tree in place. Photo Credit: Cris Salazar