

Resilience and the Rogue River Basin

Hi, everyone. I'm Caroline Brown. I'm the Communications and Outreach Associate at The Freshwater Trust. Thank you all so much for coming. We're really excited to share our work in the Rogue with you. So to get it started, here's just a rundown of our event. We're going to talk a little bit about our work in the Rogue. Alex Johnson, the Director of our Freshwater Fund, is kind of going to give an overview. Then we'll introduce all of our restoration project managers who are our team. We'll then discuss problems, solutions, and then the Oregon wildfires. And then we will have a half an hour for questions and answers. So as you have questions throughout the event, feel free to ask them. There is a question and answer part of the webinar. You can go up and type them. You can also type them into the chat. So to get us started off, Alex. If you want to go ahead.

[00:03:00] All right. Thanks, Caroline. Hello, everybody.

[00:03:03] My name is Alex Johnson. As she said, I am the Freshwater Fund Director here at The Freshwater Trust. We appreciate everyone spending their evening with us instead of watching the presidential debate. Although from watching the first one, I can't blame you.

[00:03:16] And we're excited to show you a little bit about what's going on in the Rogue and very proud of some of the work that's gone on with both our team and all of our partners.

[00:03:26] The Freshwater Trust, just so everybody is on the same page. We are a conservation nonprofit focused on protecting and restoring river ecosystems in the American West. We really focus on both cutting edge analytics that help drive our work, prioritize our work and understand how much is enough, as well as putting large programs on the ground through Oregon, Idaho, California, Washington, Colorado and other places. But tonight is all about the Rogue River. Hopefully it has some benefit for everybody tuning in. And we're excited, too, to share. So a market for shade. Our predecessor organizations, Oregon Trout and the Oregon Water Trust, both had worked in the Rogue River in southern Oregon in the 90s. But what we hadn't done very much more recently until around 2010, when all of a sudden things started heating up. And we'll get into that in a big way. So The Freshwater Trust had been part of a Oregon group of stakeholders looking at protocols for Clean Water Act compliance for regulated entities. One such entity was the Medford Wastewater Treatment Plant. So from talking with those stakeholders, 2007 to 2009, that got us introduced to Medford and we started working with Medford's specifically in 2010-2011. They were facing a new permit focused on the temperature that they were putting into the Rogue River. The alternatives that they were looking at to comply with the Clean Water Act were either a gigantic holding pond to hold water for a couple months starting in October, or a cooling tower. Those were 16 million dollars or more. And The Freshwater Trust, armed with some new models for how much shade a tree can generate on a river bank, demonstrated that the city of Medford could save a lot of money and really create resiliency by planting trees. So what you see there in the picture is starting to recruit our very first landowner. We contracted with the city of Medford in 2011. And from then on out, we have been hiring staff, managing contractors and most importantly, building relationships with landowners that have access to the riverbanks to plant trees and do a number of other things that help restore the health of the Rogue River.

[00:06:00] And so, importantly, the city of Medford is not our only partner.

[00:06:07] Now you know, we went from starting to plant trees and quantifying the temperature benefits to working with the Bureau of Reclamation on biological opinion compliance, which is another whole regulatory regime that required the Bureau of Reclamation to plant trees, as well as do large wood placements, which some of our project managers will discuss in detail. And all told, that we've brought in a number of other partners and funders that are all focused on the same thing, looking to prioritize environmental benefits in the places that they're most needed and quantify the benefits that we generate. And year after year, we've seen this program grow really rapidly. And obviously, we have our staff on the line here. We have three folks in Ashland. We have a number of other colleagues around the West that help out. But most importantly, in terms of the Rogue, is a lot of partnerships drive this work. You know, three people can't do this all by themselves. We've said collect since the last eight years. We've collected forty four landowner partners. We've we have contracted with a number of small businesses, nurseries, planting crews, irrigation, livestock exclusion, a number of different things. And all of the different programs have added up to over 14 million dollars put on the ground. And that's not even quantifying some of the adjacent funding that has been brought in by groups that we work a lot with. Those are just the dollars that have that have come through our doors and been put on the ground beyond the city of Medford, which is in its last year, I think, of planting. And the Bureau of Reclamation, we've since partnered with the city of Ashland, the U.S. Forest Service, the Oregon Department of Transportation and the Oregon Watershed Enhancement Board, as well as the Pacific Power Blue Sky Fund. So all those entities and agencies are looking to develop health and resiliency via restoration on the Rogue. And we're more than happy to work that into our ever-growing program. What that looks like on the ground is pretty exciting. Over 13000 trees planted. And importantly, because we are very outcomes oriented. A tree is not a tree is not a tree. We quantify the temperature benefits, in this case, solar load of every planting project that we do. And similarly, we quantify nutrient runoff reductions and we quantify, you know, linear feet of fish habitat, et cetera. And so we're very excited about that. There's a lot more to come. And not only in this session, but we've got plenty of more. We're contracted in the years ahead to continue to kind of roll this snowball. That was a lot in a short amount of time. If you have any questions, please send them in through the chat and we can get to them at the end of this discussion. So our team down here is Hillery, Caitlin and Eugene. Their restoration project managers. And they do a little bit of everything, as you can imagine, with such a lot of work going on in different places around Asplin Medford tributaries, the main stem of the Rogue, etc.. We're going to start with Eugene, where I met him back in 2011. He was with the Rogue Valley Council of Governments. And so we started working with that organization to recruit landowners. And Eugene was a fantastic fit to be our first project manager when we finally saw the need to hire staff to get rolling. So he's been with us really since this thing started ticking up. And he can walk you through, you know, not only what the work looks like, but really what it is responding to in terms of the degraded conditions of this river system. So, Eugene, I pass it over to you.

[00:10:13] Thanks, Alex. And between Caitlin and Hillary, and I think we would like to be able to capture this and also thank you for joining us and taking an interest in Rogue River and the work that we're doing here. You know, rivers throughout the west face many of the same problems.

[00:10:31] Historically, the First Nations people that occupy these drainages, including the Rogue, found them very diverse, resource rich places. And they developed their own management for these places that largely kept it intact and kept it functioning. When our ancestors arrived here, they saw rich resources as well, including fertile farmland on most

of our rivers, floodplains, and so developed and began their clearing to make way for productive farm fields on those acres. And that, you know, over time had an impact on the river. The combination of clearing development for agriculture, modifications to the hydrology, you know, once you cleared a field, you kind of want to protect it. So you changed the course of the river and all that really ended up reducing the thermal buffering capabilities of our riparian areas, which were extant before the time that they began to be removed. And they also, you know, reduced their ability to absorb nutrients and sediment that come off the landscape. So over time, when you combine that with land, livestock, having access to stream corridors, creating a source of disturbance, you know, some grazing is actually good for the land. Overgrazing can be a source of disturbance. And when you combine that disturbance with the presence and growing number of invasive weeds that are in our watersheds, you begin to start a negative feedback cycle where disturbance happens. Weeds capture that ground that's been disturbed. Then the weeds are more susceptible to disturbance. Next time, when the next flood or fire comes and then they're replaced by more weeds and it starts this negative cycle.

[00:12:18] So, you know, when land alterations on the floodplain, altered hydrology and invasive species are really kind of the big problems that we're tackling on the Rogue and many rivers in the west. And this is an example of kind of how that feedback loop can happen. This is a site in Ashland where we've actually done a really nice restoration project. This site was damaged in the 97 flood. The bank got scoured off by a flood of record, our last big flood. We've had an invasive species took that bank back. Subsequently, the bank continues to erode and high water replaced by invasives. And we've since taken this and turned it into a nice native plant landscape along this section of Bear Creek right in this person's yard. So kind of break that cycle. And that's the good news, is that we can break that cycle and return to a more resilient native plant community with simple techniques that we can employ. So, you know, at sites like this, when you see this kind of cycle happening, you're really looking at something that's just only going to get more disturbed if we don't touch it and do something about it. Luckily, The Freshwater Trust programs are well designed to treat locations like this and especially the places where we really need shade, where we need additional shade. We have great tools for predicting that things like our BasinScout® and other models that we use that help us understand where is going to be the most beneficial. Help us key in on these locations. Invasive species treatment is going to be important everywhere in the basin, but there are key locations where it can have the most impact in terms of moderating water quality and water temperature in our streams. There's been some really encouraging research that came out as part of what got me so excited about working for The Freshwater Trust and implementing this work. Just most recently, One Zel and 2019 Journal of American Water Resources. And these researchers found that using, you know, advanced models, they were able to look at the John Day and decide that of all the actions that could be performed, riparian vegetation was going to be by far the most effective at maintaining and actually cooling the stream over time. And if this is the piece that really got me stoked, is it if implemented, if those riparian projects were implemented, that stream would actually be colder in 30 years than it is today, even under the most aggressive climate change scenarios. So it's just very simple. We need to replace the vegetation that is the thermal buffer on our streams and also the filtration for the water that's entering our streams. So we developed some really good techniques and some programs that help us. Get out there and get out that problem and develop that solution. So really, we need stewardship. It's a big piece of this and you can't really do stewardship. You can't. It's one thing to go plant a tree, but you can't really follow through and get the benefits of that tree. Even if you put it in the right place, if you don't have the ability to come back and continue to steward that site for a number of years, we're typically finding that it's, you know, year three, four

and five where these restoration projects really start to establish and become self-sustaining. And up to that point, they do need quite a bit of stewardship, mostly invasive species management type stuff. But The Freshwater Trust, great programs like the water quality trading program, they are 20 year programs, 20 year projects. So they have that long-term stewardship investment. And we're really seeing that even just consistent stewardship in the first five years equates to a much higher success rate and a much more resilient and riparian community that looks like the way you would expect a native plant community to live. So water quality trading's been a great anchor program to help leverage other types of funding sources and get a lot of that work happening. We have dozens of those projects out there. There are large projects on scale, many of them half mile or more in size in terms of stream bank restored. You know, another part of the solution is in stream wood. And Hillary can talk a little bit about this, but we like to build in stream habitat and we do it for a couple reasons. One, it creates instant fish habitat. And, you know, you build good habitat and they move into it quickly. And that's been our observation. But these projects also help to reactivate floodplains. And those activated floodplains are where riparian vegetation thrives. So they're also where filtration takes place, where water storage takes place. So activity in the floodplain is really an important part of our habitat. Work in stream as well as just creating instant good fish habitat. But like I mentioned before, really, a lot of it hinges on stewardship. So management of invasive species is a big piece of it. And that's going to touch into what we're talking about tonight in terms of resiliency. You know, we've known that managing blackberry is important. In other words, it's important to establishing a native plant community. And one that will be able to hold the ground and resist invasion of weeds in the future. What we didn't really realize until a few years into it is that there's a public safety component to that, particularly when you're working in urban streams like Bear Creek. And at that, you know, we were looking at that is mostly what's potable, what's safe for recreating here. How do we make these sites safe and manage transient camping and things like that? So invasive species management has a lot to do with that. And we've actually set about building projects that are not only resilient from the perspective of the environment, but also are safe for the public. And we're finding that those same practices actually equate to resilience against fire on these projects, too. So that's been a really encouraging piece of the work. We're learning that it's not just an environmental benefit, it's a community benefit. And really, you know, we work with a lot of private landowners. That's one of our strengths. And we really have covered a lot of ground that it's really hard to get to. The private lands are generally the hardest places to do restorative work because it relies on so many relationships. So I've covered a lot. I'm going to pass off to Katelyn here and then talk a little bit about some of our project work.

[00:19:08] All right. Thanks, Eugene. My name is Katelyn and I also work in the Rogue. And I'm going to showcase some of the project work that we've been doing in Little Butte.

[00:19:17] And for those of you that don't know the area, Little Butte is a tributary to the Rogue River and the confluence can be found at Tuval Park right in Central Point. Little Butte's known to be one of the best fish producing streams in the area. They have steelhead, Coho, Chinook salmon all spawning there.

[00:19:38] And like many tributaries in the Rogue, it is having some problems with development and especially agriculture. So we have narrowing riparian buffers and we have some water quality issues around cows getting into the stream and eroding banks and things like that.

[00:19:56] So some things that we do are revegetating the banks of the river. Sometimes we also use in stream structures, which is something that Hillary is going to highlight.

[00:20:04] And right now you're seeing a slideshow of some of the changes across time in revegetation. We often start with a head high blackberry or some circle of invasive species like poison hemlock or star thistle, you can see stanthesle on there.

[00:20:24] And we go ahead and we clear these areas to repair them. And then we'll replant with native trees and shrubs that are found in the area.

[00:20:39] Over time, we watch these areas, we will take care to have long term stewardship. Eugene had mentioned and over about five years we get the sites to establish with irrigation and grouse control of caging to protect against beaver and deer. And we will nurture the sites along until we think they get to a point where they're outside of that grouse height and chugging along nicely. So this slide right here is going to show you this head high blackberry that was probably like six to 10 feet tall. And you see a lot of non-native pasture grasses and target weeds in there. And then the next slide is going to show the race against time. So we have three project post-implementation and then several years afterwards.

[00:21:32] One year later. Two years later in the next slide. Yes. And three years later, I'm usually so you can really see the change across time.

[00:21:55] I think I'm going to hand it off to Hilary after that. Actually Eugene.

[00:22:00] Take this one. This is one of my favorite projects. This is the Lone Pine Project. And it's in Medford, right in front of the Medford Airport.

[00:22:08] This is a project we did through the BLR buy up work. The bureau of reclamation said they needed to recreate riparian habitat that had been lost due to flow alterations. We chose this stream because although it looks like a ditch to most people, it actually supports the Steelhead and Coho and even Chinook on occasion. Smolt spawn and rear in here in the airport. We heard they were doing a wetland mitigation project that was going to open up the floodplain a little bit there and create some wetland habitats. So we did this great complementary project where we reestablished the riparian vegetation on the south bank of the stream where the shade was most important and completely lacking before. And now we've got beavers have moved into this site about three years on. Started harvesting our vegetation. They built dams and flooded the wetland and the floodplain and have created a really dynamic and really neat habitat with great fish habitat.

[00:23:02] Out of what was before, basically a dead horse running along in front of the airport. So great partner here with the airport. They've been really wonderful to work with. This is a fantastic project. And we've documented fish spawning within this project multiple years since the beginning of it.

[00:23:19] This project was also one where we sought to model how a project could be community safe. So this project, as it's developed, it's in and around year five. Now the trees are getting tall enough that we can begin to limb them up a little bit underneath and open up some site lanes through this project so that when security patrols around the airport, they're able to see into this area with some visual to see who's in there.

[00:23:45] There's also a nature trail or a kind of a recreational trail that runs along the side of it, used by folks at the airport and BLM office. And they want to build the sea in there so that there's not an ambush situation that could happen. And so typically, you know, you think of these really thick, riparian areas as being a safe haven for wildlife and a cool corridor. They can also attract people. So we are working on designing projects that can kind of meet both community safety objectives as well as demonstrate environmental game. And there have been numerous observations of fish on Neal Creek or on Lone Pine Creek. Since this project went in, Lone Pine Creek's actually cooled down a little bit as a result from this project. And that's really exciting. I can also tell you a little bit about some of our work along the Rogue River, like I mentioned before, we've done a lot of larger water quality trading projects. Some of these slides are from Rogue 127, which is kind of at the base of Lower Table Rock. And this is an area that was disturbed historically by gravel mining. So kind of a tough place to recover. The channel has been altered, but also the banks. And we were able to come in beginning with our very first project one mile upstream, that original slide Alex showed where I was talking with the landowner there. We began with that project and we've since done well over a mile along this section of stream in three consecutive projects, working with a large holding landowners there in that reach. It's an important reach because the river slows down. So tall cottonwood canopy in this area really helps abate solar load that otherwise builds up quickly in that slow-moving section of water. So we really we use our models to find these places where it is going to be most important. And then we work with the landowners to develop projects that are beneficial to their properties that make them more resilient, more beautiful, more manageable in the future, as well as getting these environmental gains that we're after, which is cooling, you know, keeping the river cool longer and creating a lot of really neat riparian habitat, which is kind of the auxiliary benefit of shade for compliance. You know, the other side of that is that you have this huge benefit to the environment for many, many years to come, long beyond the 20-year life of this specific project. I could go on and on about these projects because each one's got an hour's worth of information. I'll hand off to Hilary because there's some good stuff here.

[00:26:30] Thanks so much, Euge. Eugene and Katelyn both talked a lot about some of the restoration actions that we take outside of the river.

[00:26:39] And I'm going to talk a little bit more about some of the actions that we can actually put inside the creek. We've heard a lot about resiliency and complexity and biological diversity, both equal resiliency and large wood placement as some of the actions that we can take inside the stream to restore some of that complexity. And it focuses a lot on fish. And the reason that we do that is because not only do salmon and steelhead serve really important cultural, economic and subsistence, they are a really important member of the ecology. They're also really good indicator species. They are really sensitive to changes in water quality and the reduction of habitat complexity. Each life stage of salmon and steelhead requires different types of habitat. And we've lost a lot of that complexity due to the development that Eugene mentioned. And also in 1964 there was a major flood event that caused the thinking at the time to be that if you removed large wood, if you removed boulders and you disconnected rivers from their floodplain and channelize demonstrating them, that would get water from the mountains to the ocean as quickly as possible and that would mitigate for flood risk. Unfortunately, that was not the case. And it was not a great solution to flooding. And it was really, really bad for fish. So the slides that are going on your screen there just demonstrate some of the different large wood projects that we've done that does increase the habits, that complexity for fish, adding those different limiting factors to fisheries recovery. Sometimes that's called water refugia. Sometimes it's spawning habitat in our Rogue River watershed and its tributaries. It's

actually most often the juvenile fish habitat that is most needed to recover the numbers that we have strictly would have seen in the Rogue River watershed. And that often includes reconnecting rivers with the floodplain through a side channel, historic side channel reconnection, building large wooden structures that provide deep pools and slower slack waters that juvenile fish can have shelter in and find little nooks and crannies where they're safe from predators and can feed for the one or two years before they smolt and go to the ocean. We've also seen really incredible numbers and Neil Creek, Bear Creek and Little Butte Creek of the ecological response to this work. I think all of our work that we do is really rewarding stuff. But these types of numbers that you see, the juvenile fish coming back is just that ecological response that we're looking for, where we're restoring these natural processes. And, you know, rivers want to be rivers and fish know how to be fish. And we just kind of need to get in there and get out of their way most often to get start restoring some of the natural processes. And I'll try to keep it brief, because I know we want to get to the Q&A. So I think, you know, we've talked a lot about resiliency and we have recently undergone a really traumatic community event with the wildfires. And we've seen firsthand how some of our restoration sites fare under a disaster like this. And Eugene is going to talk about our projects and what we've learned with the wildfires and what we plan to do next.

[00:30:40] Thanks, Hil.

[00:30:42] So, you know, when the Alameda Fire broke out, I was at home in Ashland and it started right near a restoration project. It's partly into development.

[00:30:52] It's been cleared of it's invasive, but it hadn't been planted yet. So I was naturally interested in that. And, you know, that's interesting. I wonder how it's going to play out on that site. It only took a few minutes for me to realize that our Wagner Creek project, the one that you're seeing in these slides, was right in the fire line and was probably on fire by the time I had that thought. So I was mostly worried about my property in Phoenix and Talent burning up, and rightly so. The fire did find its way to my house via blackberry growing along the irrigation ditch behind it. I kind of figured this project was toasted because of the fury of the fire. And when I drove up onto Highway 99 and came into Talent, just looking at all the destroyed buildings and everything, I thought, man, that's going to be that's just too bad. And then I turned the corner and I saw this project area and I just went, oh, my goodness. It hardly looked like it had been touched. I mean, it was singed. Even though one hundred percent of the project saw fire in the neighborhood above, it was vaporized in the neighborhood. Below, it was vaporized. So I started looking at this like, well, what is it about this project that made it different? You know, why did it fare differently than so many of the other riparian areas in Alameda? Number one, it didn't have any blackberry growing in it. Number two, it was dominated by native plants. And, you know, even though a lot of those were shrubs at ground level, we plant them so densely that as they begin to mature, they shade out and exclude a lot of the growth on the ground. So we had woody species and very little growth on the ground of blackberry or other fuels. So the fire actually, when it hit this riparian area, it dropped down and it just crawled along the ground singeing the understory and burned around the few bases of a few older trees and where there was some detritus. But generally, this fire was restorative for this riparian area, whereas so much of the rest of the Alameda Fire area, the burn was catastrophic and removed everything. So because the site didn't burn hot, the trees retain their leaves and after the burn, they began to drop them. That leaf drop is covering the soil and protecting it from erosion as the rains come this fall. Seeds from ash and things like that are already falling. And fall onto these sites that will resprout. So in general, the fire actually was restorative for this plant community. And so it really got me thinking that, you

know, some of the things I talked about earlier about community safety, you know, we're now seeing that the same practices that equate to a good quality riparian restoration project also make these projects and these restored plant communities resilient to fire. Our native plants are fire adapted. So when they're not mixed in with a bunch of highly flammable invasive plants like blackberry, they actually don't burn at the same kind of fury and intensity that we saw for so much of the Greenway where blackberry dominated it. And this is also true for the Lone Pine Project. The fire in Central Point crept its way up towards that project. But we had previously through Blue Sky, given Loma Makaziwe Grant to do a restoration at the mouth of Lone Pine Creek. When the fire hit that restoration area where the weeds had been managed, it dropped down and they were able to contain it. And so it didn't lick its way further up into Lone Pine Creek. So restoration can actually act as a firebreak in these areas, too. And hopefully in the future, as we begin to work down the Greenway and recovering it, we will begin to see some real benefits in terms of community safety come out of that work, as well as the water quality stuff that we're after. So this is a picture of a site down in Ashland. This is where that fire where the Alameda Fire started right next to here. This was a native willow community, although it was mixed in heavily with blackberry. You can see it burned hot. The blackberries are going to come back. So are the willows. The question will be: Do we let the willows get ahead and take control of the site through some stewardship? Or will we let it return to a lower functioning condition than what it was previous to the fire? Hopefully we're going to get in there and turn this into something really great. And we want to see that happen through all of Oregon's rivers and creeks. But definitely here we're going to work hard in the road to materialize gains from these disturbing fires.

[00:35:16] Awesome. Thank you, Eugene, Hilary, Alex and Katelyn for sharing that knowledge and perspective on our work here in The Rogue.

[00:35:25] For those of you who I have yet to have the pleasure of meeting, my name is Haley Walker and I am the communications director here at The Freshwater Trust. I know on behalf of all of us, we are so excited that you all could join us this evening for this event. This is the first set of our basin-focused events that we are going to have throughout the rest of this year and then into 2021 as well. We are really excited to offer this opportunity for our followers and our supporters to kind of lean a little bit further into this work and hear directly from some of our brilliant staff members who work on the ground and then also behind the scenes just kind of achieving these really amazing outcomes.

[00:36:05] So I have the pleasure of grilling my colleagues this evening, which they probably would feel like I do on a regular evening anyways. So I'll just roll right in. Alex, this first question is for you. Can you tell me a little bit more and all of our followers just about how philanthropy particularly helps kind of catalyze our work in the Rogue? We've heard a lot about the partnerships and a lot about our contracts with municipalities, but we're interested in hearing a little bit more about the unrestricted dollars that come in the door.

[00:36:41] Absolutely. Thanks, Haley. Yeah.

[00:36:44] You know, I've been a part of a lot of the negotiations around the contracts that are bigger dollar numbers. But I would say the individual donor philanthropy and some of the grants we've gotten are smaller, but very mighty for sure, what we now have in the Rogue. For example, you know, The Freshwater Trust couldn't have even started having discussions with the City of Medford back in 2010, 2011 if it wasn't for our individual donors believing in our effort to figure out new models of bringing more resources into river

restoration, using new technologies, using analytics, etc. We did a lot of analysis for City of Medford on our own dime, which of course is individual donor funded. And that turned into, as we discussed, the first big program, six and a half million dollars. And that led to the success that you just heard about. I think after 2011, once we had the city metro contract, then Bureau of Reclamation and then, you know, Ashland and others, that philanthropy has been just as impactful because every time you get out on site there's little things that don't fit into the contracts. But are really big environmental opportunities. And so the philanthropy has allowed, for example, planting the opposite bank of a small stream that isn't shade generating. But is it really important for fish, livestock exclusion? You know, taking out more invasive species than just the planting area, things like that. And then in 20. What was it? 2018 at our annual golf tournament in Bandon Dunes, which is named Fight for Fish. Hopefully some of the folks on the line have been there or can go in the future. They started a Rogue challenge and that has raised over eight hundred thousand dollars in just two years, which has really helped do some of those projects that just don't fit any of our contracts perfectly. But our really big environmental benefits and then going forward. I have to mention, we like using philanthropy to do what I just described. But we also see the opportunity now for that philanthropy, future philanthropy to be catalytic, because the work we've put on the ground and the analysis we've done give us now a pretty good ability to figure out how much is enough. I don't know how many of you saw, but we just announced a big partnership with Microsoft that we're analyzing the entire Sacramento River, all of the irrigated lands, all the different activities, like the power of the tools that we have now is incredible. And in terms of the Rogue, what we would like to be able to fund and is all like how many activities, what types of actions on forested lands, on agricultural land, stormwater runoff in urban areas, how many of what types of activities, for what price tag can actually fix this river fixed? Obviously, we're not going back to, you know, prehuman habitat habitation in a row, but every river has a tipping point. And if we can get it back on the good side of that tipping point, we know that it'll continue to improve itself. And so we now have the technology to figure out what the finish line looks like and scenarios that in terms of how much it costs. And I think that's the next step for us philanthropically is figuring out how to find those folks that are energized by that type of philanthropy so that we can hopefully in our lifetimes or even sooner figure out how to how to really restore function to the entire river. And, you know, obviously then go to many more rivers beyond the road. But our work here gives us a lot of confidence that that type of stuff is possible.

[00:40:32] Awesome. Thanks, Alex. All right. We have one for you, Eugene. Or if you'd like to pass it.

[00:40:39] That's also allowed. Eugene, is solar load quantified with a model or a field data. And this comes with a follow up question. At what point will results be able to be quantified with temperatures sampling?

[00:40:55] Yeah, that's a good question, comes up a lot with things related to water quality trading.

[00:41:01] So.

[00:41:04] You know, that basically we can quantify the amount of shade kilocalories blocked from the river. We can predict what that is based on vegetation conditions. So we use reference sites that are non disturbed, non project areas as a baseline for sort of what is business as usual with no action. We add what we would do differently and how that might influence the plant community. So say taking an area that's dominated by

blackberries tops out at 12 feet. We can plant a Cottonwood Forest there, grow it to one hundred feet. We can quantify using shade later, which is the kind of accepted model at this point. How much shade is created. But we do annual monitoring on all of our projects. So we're actually verifying at every year that we're on track to achieve those modeled outcomes. So we will be able to track that we have achieved that and adjust whatever shade benefit is derived based on our true data from the site. But actually picking up as a temperature signal in a river, especially a river the size of the Rogue from individual projects, even when they're several miles of them, is very difficult because there's a lot of other factors that influence temperature. Like what temperature is coming out of a dam or what temperature is coming out of an unmanaged tributary. So there's a lot going on there. But on small tributaries, the temperature signal is picked up really quickly. So when you're doing extensive amount of work like we did on Neil Creek, where you do over a mile and you do both sides and you're on a small stream, definitely be able to pick up a temperature signal there within just five or six years with good establishing Dedge. And we do some of that work with temperature loggers. We have a study on Applegate River, where we have a whole bunch of projects clustered, and we also study Neil Creek and other streams that we're working on looking for those signals. So.

[00:43:03] Awesome things, Euge. So this one is for Katelyn and Hillary, I'll let you guys kind of tag team, this one related to the recent wildfires.

[00:43:11] Are there some areas that are better to let nature bounce back naturally? And how will we be monitoring each of these sites differently post-fire to kind of document some of the recovery processes?

[00:43:35] I was going to let Kate take that one because she manages a lot more of the riparian projects. Maybe I'll kick it off, Kate, and then you can take over for me. OK, well, so we have an idea. I think that question could be taken a couple ways. We have some projects that we hadn't planted yet. In which case we have pretty projects, photos that we take that this year happened to be right before the Alameda Fire took off. And so that's a really good visual representation of what the project looks like. And then we went back and took repeat photos from the exact same location that document the conditions post-fire. And then we also have a monitoring procedure that looks at that vegetation and can identify what is coming back.

[00:44:30] We can also assess soil conditions and the burn severity in those locations to see whether it's likely that we'll have existing plant survival. And then when we plant the project, we have what Eugene was starting to talk about, that quantitative and qualitative annual monitoring that occurs. So there's kind of three tiers. There's the visual photos, qualitative assessments and then the quantitative assessments. And that gives you your stem density and canopy closer above data. And that water quality trading project extends for 20 years.

[00:45:09] So we get a get good analytical look at what that project looked like as it recovers from fire. I think I think I got like a part of that question. Maybe Katelyn or Eugene, you can jump in for the second half. I think I think Hillary answered that question really well.

[00:45:29] I think it really comes down to visiting the site and seeing what all was growing on the site before Hillary had mentioned burn severity. So just how hot has that fire burned? What kind of invasive species were there? What kind of native species might

return? And really, each site is just so different. So we really try to cater to the needs of the site and the species that we see there and wanting to return.

[00:45:54] Awesome. Thanks, guys. Alex, my next question is for you, from the audience.

[00:46:00] Have you calculated what the economic benefit is of each additional salmon that spawns in the rogue watershed?

[00:46:09] Aissata? That is an interesting one. We have not done it by salmon spawning, so I would be really interested to learn more. I saw that there was a link there, too. We have done a lot of economic analysis that's more about the overall impact of dollars spent on restoration.

[00:46:29] There is a great University of Oregon study. Probably a decade ago now by Dr Mosley and Dr. Nielsen Ficus that that we definitely have used to understand better. That's I think there's roughly 20 local jobs for every million dollars spent. And we've seen at least that in terms of the you know, the effect of all that money spent on contractors and other partners that it takes to get this work done. So we've definitely looked at the value of the dollar bouncing around. It's certainly much better than the value of a dollar spent on a cooling tower or some other type of grey infrastructure. And certainly, especially during a pandemic. It's nice to be able to offer jobs that are outdoors and pretty, pretty low transmission risk. But definitely we'll look at how to you know, even evolve that per fish or, you know, the restoration economy is another one that we've seen. And certainly the more this program grows, it would be great to get more resources pointed at building kind of those economic success stories as well.

[00:47:43] Great. Eugene, I know a lot of folks are super interested in how our landowner relationships get made.

[00:47:50] You know, this is a pretty unique part of The Freshwater Trust where we are not your traditional conservation organization. We really do partner with real landowners in rural places. So can you tell me a little bit about what it takes to kind of build the trust with these folks who are critical to actually achieving the outcomes that we've talked about during this entire presentation?

[00:48:16] Sure. And you're right. That's such a crucial part of what we do. You know, when I came to The Freshwater Trust in and went about trying to implement water quality trading projects, one of the big hurdles that people envisioned and I saw early on was that we were asking landowners to sign up for 20 years to allow us to reenter their properties, manage these riparian areas.

[00:48:40] That's a lot of trust. I mean, that's a long time to, you know, to bring somebody into your private property unless you really feel good about what they're going to do and about them probably as a person. So a lot of it really had to do, you know, relationship building, which means revisiting people time and time again, developing understanding of their objectives for their land and how our work might integrate into that as well as to benefit them and help them move towards their objective. So at the end of the day, it's about building trust and it's about actions that are complementary to each other and figuring out ways to, you know, really make it make sense for these landowners when they see real gains and benefits for their properties so that they're not just doing it out of goodwill, but they actually see real material benefit that comes from the project as well as the ecological benefits that we're after when we do that. So developing those relationships,

it's like, you know, for these projects, some of them were eight years old now there. You know, I have good friends that I've made across the landscape. I think that we all have, as project managers, connected deeply to these people that we work with, learning about their life, learning about their history and how they manage their piece of the Rogue. We're just really happy to be part of it and to be able to assist them in doing good things on their property that also benefit us as whole in the society.

[00:50:11] Awesome. All right, this one comes from the audience, as I understand it rain or water, abundant streams are not a problem in southern Oregon. Does any of the Rogue have problems with rain for water that new trees need for riparian growth? Or is that a problem that TFT has faced?

[00:50:31] Go ahead, Euge.

[00:50:33] Yeah, I'll take that one. No, we're drought stressed in the Rogue. The Rogue's in the midst of a drought, and it's been through many drought cycles, probably drier than most of the basins in Oregon. Even though it's headwatered, you know, so high in the Cascades at Crater Lake. So, you know, you just have a lot of demands for water. The Rogue River irrigates a lot of acres in the Red Valley, some of Oregon's most productive farmlands. And although we have storage in the system, storage comes at a price. It means altering the hydrology of our waterways in order to fill that storage and release it at the times when it's most valuable to people in farming. And that kind of thing. So water's really limited in the way we've dealt with it is to develop a highly efficient supplemental irrigation strategies to help establish our projects. So we use drip systems and we do them. You know, we manage them very closely to mimic natural conditions that help native plants establish. We use things, some traditional or nontraditional materials like plastic mulch that people often say, oh, plastic. What's that doing out here? Well, it actually is really effective at holding soil moisture and helping plants establish and keeping weeds back from them without the use of chemicals. So we make some tradeoffs like that. We sort of utilize some of the tactics that traditional agriculture and innovative agriculture is using to harness those techniques to establish native plant communities here in the Rogue. Efficiency is the key. And then working with landowners to, you know, either utilize existing irrigation rights or lease and transfer irrigation to the places it's needed. Those are some of the things we do.

[00:52:21] Awesome, either for Euge or Hilary regarding the Neil Creek project.

[00:52:26] How many property owners were involved in that and did they initiate it or did TFT? And what has been the timeline of that work?

[00:52:40] I can tackle that one, too, because I helped make that original connection and now was, you know, a case of I've been driving by that stretch of Neil Creek, it's one single ownership. The historic Dunn ranch was one of the first land claims in this part of Oregon. So really, one of the first developed properties in the Rogue Valley, around 400 acres with almost not a mile of the stream on one single ownership. So I approached those owners and proposed that we do a salmon restoration project that would improve the ranch as well as to improve the habitat. And they didn't believe me. They didn't believe there were salmon in that stream because you couldn't even see the stream through the blackberries. But we cleared it. We built it. We put wood in there. The owner came down with his wife and the first pool we walked up to there were two Chinooks spawning there and it just blew their minds. And, you know, after that, it was like. Game on to do more of that, work with them. They would love, you know, to keep going. Do more.

[00:53:44] Yeah, we highlighted one large riparian restoration project in Neil Creek this presentation. But we also installed a large wood project with Bureau of Reclamation this summer, on Neil Creek, that involved three landowners. And we have two fish passage projects coming up next summer on Neil Creek that will open up more of Neil Creek to juvenile fish migration than our than currently is available. So that's seven landowners right there in this several projects.

[00:54:20] I'd also put in a plug for the analytics that that we all use. You know, doing advanced analysis on these rivers and tributaries means that we know every property. And we know how many environmental benefits, shade, etc, could be generated on those properties. And that means that by and large, although there's a couple of, you know, places where it didn't work exactly this. But by at large, we are initiating conversations and we already have funding at hand and a plan for a private property before they even hear from us. And that's a big difference. You know, there's a lot of money spent on conservation in this country, both federal, state. You know, all over the place. But I would say the dominant way that it that it hits the ground is with landowners raising their hand. And that can work well in some situations. But we've also seen how that can mean that the money just doesn't have much environmental impact, because the landowners that are most interested in getting conservation work on their land or getting incentivized to do different things are generally not the ones that are having the biggest impact. And so since we all have limited amounts of funds, we really push for analyzing, quantifying environmental benefits and having that really lead the way on where we go with our projects.

[00:55:44] So I think we have time for maybe one more. Hil, I'm going to pitch this one to you.

[00:55:52] When you go out to a project site and you're monitoring, I know you don't have props with you, which maybe you do. I don't know. Bring them into this picture. Tell us a little bit about what you're looking for when you're going out and what kind of determines the health of our project site.

[00:56:11] OK. That's a fun question. I am sorry, Hayley. I do not have props with me to do a cameo for you. I mean, I'd say that we rely heavily on procedures. We're a science based organization. And so we have even our qualitative assessments.

[00:56:35] While there are qualitative in nature, we still have a procedure that we follow. So that we're looking at the same characteristics time and time again. And so, you know, the photo point, the qualitative, the quantitative.

[00:56:49] Not only do we follow those procedures every time that are built to help objectively assess a project, but The Freshwater Trust has developed a custom web based application that we use to collect data in the field.

[00:57:05] That also is kind of like a built-in QA/QC on how we evaluate a site. So.

[00:57:14] There we try to take the objectivity out of it. You know, as much as possible. But there's an art to all of this as well.

[00:57:23] You know, there's a fluidity to those land owner relationships, to intuition and how you visit a project. But overall, you know, we're very process based. And we that's

why we rely so heavily on the tools and the science and the analytics that Alex is talking so much about.

[00:57:48] I think that answered it, yeah.

[00:57:49] And you guys can see a lot more of Hilary out in the field and Katelyn and Eugene on some of our social media channels.

[00:57:58] I think given that we only have two minutes left, we're going to have to wrap it up a little bit. So I know many of you had questions that were not answered, but we're really invested as a team here to answer those questions. And we really want to make sure to develop relationships with each of you. So if you have a question or if one comes up as you're cooking dinner later. Feel free to send it to Caroline Brown. Her email is here at caroline@thefreshwatertrust.org. And we're gonna pitch it over to the proper staff who can answer it for you. Additionally, like I said, I really encourage you all to follow along with our work on social media. Another really great thing to stay in tune with is our Uplift Report, which is dropping on Monday. Many of you receive that every year. It is kind of what we call our annual report. But really that quantified outcome piece that you guys have heard Eugene and Katelyn and Alex and Hilary speak about this entire time. It's the most succinct infographics that we have of the results of our work. So if for some reason you didn't get it and you'd like copy. Feel free to also email Caroline about that, and we'll make sure to get one of those over to you again. On behalf of the entire team of The Freshwater Trust, we're so excited that this many folks came out to listen to our work about the Rogue. And definitely stay tuned for our next event, which is going to be about some of the fish response that we've had in the Sandy River basin, which is, of course, really close to Portland. So, again, hope you guys have a really great evening and we'll see you soon.