[I1: Umm. So I'm very familiar with. I'm actually on the board of the mobile chapter for CCA Alabama and I work with Blakely Ellis a lot. He so they have the tag Alabama program through the university and part of my dissertation chapter is tagging fish inshore in Mobile Bay. Umm. Yeah. And then in the Chesapeake Bay workshop, David Sikorsky, who's the executive director of Maryland. Came participated in that case study for us so very familiar with CC as work. So to kind of help inform our workshop in this case study, we've been meeting with doing individual interviews with researchers, researchers, and managers. And then also some resource users just to kind of understand the the most important aspect. Of biodiversity and how people think about this word. So to start off. If you could just talk a little bit more about the work that CCA Washington does. I know that the main focus is on salmon conservation throughout the state. And. It's. Yeah, if you could just talk a little bit more about that in Washington. Think the approach of every state CCH after is is slightly different.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Right. So for salmon in Washington, there's kind of like 4 ages. You probably heard about habitat hydro harvest, OK. You know about the four ages? We focused on the harvest piece primarily and so our focus has really been on. In that Harvest Arena has really been on. Trying to get. Non tribal Gil netting eliminated in this state. That has been a primary focus of ours. There's a little bit up in Bellingham Bay of Non tribal gill netty, and there's a whole bunch on the Columbia River. We share the Columbia River with Oregon, of course. So that is what that is. One of our focuses here, you know, just General Harvest management as well as. Far as putting in check or you know having better controls over the harvest that happens out. The ocean. So you know our famine are born here, right in the in their Natal streams. And then they make their way out through whatever tributaries, major watersheds, into whatever body water you know. They focus on Puget Sound, Puget Sound. So they go from the Nooksack River to Puget Sound, migrate out into the Pacific and then go up and down the coast generally will head north up to Canada and then sort of mature up in waters, international waters off of Alaska. And then when they're ready, they make. Way back home and those fish are subject to. I mean, mostly year round fishing pressure. Obviously they're not year round targeting salmon. But they're year round catching salmon, whether it be incidentally and Pollock fisheries or squid fisheries or and specifically targeted fisheries for salmon off the coast of Alaska and Canada. So anyways, that's another one of our big focuses. There is trying to rein in or control our commercial ocean harvest. But yeah, he's focused on the age, the harvest piece. We weigh in a little bit on the habitat stuff. We've done a couple of habitat projects. Support them, of course. We've done weighed a little bit in on hydro projects. And then the, you know, the other ages, hatcheries there and we have done a lot of work over the years to sustain or maintain or increase hatch reproduction when when possible and when it makes sense. So I know, I know, that's a mouthful, but once you get into salmon management in the Pacific Northwest West. Really really complicated. It's so complicated. In fact, when Obama was president and he wanted to make a joke about inefficiencies in government, he pointed to the management of Pacific salmon as the example that he could find. But I don't know that he would term it as the worst. It. Know what I'm saying? It was a joke about how crazy government can be. Anyways, he used Pacific salmon management as an example. Just listed all the entities that are. Involved, and I think Obama, who probably doesn't even know what a salmon looks like compared to a. For example. You know, he was able to lift off 7 or 9 agencies just off the top of his head that managed salmon. So it's very it's very complicated, it's very complex. Then you add the whole tribal layer and. It takes that complication and, you know, multiplies it by 10, I think.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah, for. It's. I knew a little bit. Like the complexities of salmon management before we came up here to do this part of the project, but it's unlike any other fishery. I thought the Gulf of Mexico was a complicated system. But it it kind of like pales in comparison to the Puget Sound.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, and worst in I just say 1. So I've been doing this for almost 20 years now and I go to a lot of the CC National board meetings. Certainly listened. Almost all the Government Regulations committee national meetings. 11 observation that I would have is that in down in the in the Gulf Coast, I think that fisheries managers and I think it's just common understanding. That there's needs to be a move away from some of this over harvesting of in the ocean. Of commercial fisheries. We're not there yet in the Pacific Northwest and I don't know when we will be, but. We have our. Fisheries are mostly managed by the commercial sector so. Desktop.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Perfect. OK, great. OK, cool. Yeah. So to get into the more specific. Questions that we're trying to understand as part of this project. It's focused around biodiversity, and so we know that this term means a lot of different things to different people. It's measured in a lot of different ways. But just as a starting point, what does biodiversity mean to you? Guess in the context of recreational fishing. And just in this system in general.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: That what does it mean to me?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Oh my gosh, that is a big biodiversity. Oh man, I would just. I mean in civil terms, I would just say it's inclusive of the entire ecosystem. But I mean that's that's pretty simplistic. I. Mean I. Don't know. I don't get caught up on these on these terms a Lot.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah, that's totally fine. There's no right or wrong answers so. So we'll we'll try to break that down a little. So a previous research project that kind of informed what we're doing now generalize these four kind of key components of biodiversity. As like a species could be binned into theoretically, and I'll throw those in the chat so it'll be easier for you to kind of think about them. I'm interested to see. If these resonate with you, if there's something that's missing or something you would take out. And those are habitat forming species, species of conservation concern, harmful organisms and key food web supporting species we've like kind of touched on the 1st 2:00, but we can talk about them all more in depth.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: So you're using this in the context of what biodiversity means, is that right?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yes. So these bins are. As like the scientific literature identifies, the key aspects of biodiversity is made-up of these kinds of species. But we want to know if this resonates with other people.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yep. Yeah, definitely. Those resonate I. The one that I would not stand out to me is something I probably would have come on my. Would be the harmful organisms. OK, but it definitely makes sense.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: OK. OK so. Can you then if these kind of make sense? What kind of specific like habitat forming species are important for salmon recovery and salmon conservation that CCA like cares about with their habitat restoration?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I know it's been really nice to do in person meetings, but then when somebody like, just with the technical difficulties and we've never been here before, you know something like this is bound to happen, but we're good.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, yeah, we're good. We're good. So I'm sorry, I've. Yeah, I think maybe you're trying to ask me questions or something and it was really breaking up.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah, no worries, so. To go back what I was trying to get into, we're talking about habitat forming species and you. You mentioned one of the 4H S for the focus on salmon in Washington is habitats. What kind of so is CCA like supporting habitat restoration or habitat protection for salmon?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: I mean, do we support? Yeah. We don't actively do any of it ourselves though.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: I gotcha, OK.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: I mean, our theory is. I mean, I'll explain it to you this way. So I came from a habitat background. The. That's where I started before I moved into CCA. And you you can build the most beautiful, gorgeous, you know, living space condominiums for 100 people, you know, human beings, wherever you plop it down the middle of wherever you want. If you only let ten of them in the in the facility, it doesn't really make sense to build some beautiful complex that you know where 100 people can live, and so are, you know, our theory is that have great habitat. It's just underutilized because. We kill too many of the fish before they get a chance to to to use it or maximize. So that you know it's not that. Don't support habitat projects. We just, we just don't. Just don't do them. Actively pursue them. And you know, God bless the ones that are out there doing half attack because it's good work.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah. So that's just not the main focus. OK, I got it. OK.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: I would like to the one area where we do some work or have done some work and do a lot more support than other areas is in this area called the nutrient enhancement. You know, it's definitely habitat, it's food also, but. You know. One of the key issues is because we kill so many salmon out in the ocean and don't let a. As adult. And then also because we have a lot of our fish returning our hatchery fish, in fact somewhere you know, depending on the the river and everything. But you know somewhere around probably 80 to 90% are actually return. They go back to 1 area. You have a lack of marine derived nutrients making it back into our. So historically, salmon, you know, they come in, they spawn, they die, their bodies decompose and turn into. Huge food source for not only bugs and insects, but for future generations of St. and salmon through direct and indirect consumption. Because of this lack of salmon making it back to the spawning grounds. We have supported nutrient hormone programs where we go to hatcheries and take carcasses and throw them into rivers, or we've even supported projects where they basically, for lack of a better. Make fish. They call them analogs, but dropping these analogues into these watersheds to provide food also so. You know, or just really increase the nutrient, the nutrient load in these watersheds. It for, I think for my background in Habitat, I came to the conclusion that probably the best we have good habitat in this state. Don't let anybody tell you that we don't. In fact, we have probably the most pristine habitat on the Olympic Peninsula. For example. And there's a there's a couple of rivers over. That are. Actually protected in national parks and are about as pristine a watershed as you are ever going to see on this planet or ever would have seen on this planet. Hundreds of years ago. And they still struggle with returning salmon populations. Go figure. But it's a mystery to our fisheries managers, they don't get it.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah, it seems to be the big. Focus pretty much everybody that we've talked to, even if they're not necessarily like a, a fisheries manager, salmon comes up. Obviously you're a recreational. You represent a recreational fishing group. And salmon is critical for recreational fishing here. But are there other? Services that. Salmon, or the habitat that. Supports salmon. That. Is provided to people like other ecosystem services in the area. So commercial fishing and recreational fishing are have come up.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: So you asking about salmon in particular or just salmon habitat?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Salmon and salmon habitat. Like looking at, I guess the ecosystem as a whole, just the rivers that they're in and then the coastal aspect when they're in the ocean.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah. Yeah. I mean, it's pretty mean of the, the the consumptive use is, is recreational and commercial. You know the habitats are used for all kinds of things. You know, whitewater rafting of. Water is a big key issue here for. You know, irrigating. Yeah, there's there's definitely some shared uses of the salmon. I mean, there's there's development, there's roads, there's houses, all that stuff, docks and Puget Sound. All things that can. Interfere with or in some cases, maybe even benefit. Habitat. Yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: What? So you talked a little bit about development. Is all of that development the peers and the docks is all of that negative?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: It's not all negative though. So for example, there's some. You know some. In particular, is what you're talking about. Yeah, I think a lot of those hard structures they're finding in Puerto Sound, you know the concrete docks and movable concrete docks can can be a detriment to salmon because they lock the shoreline into place and don't allow them to. You know, change over the course of time, but there's I've seen some some projects where there, you know, where the government or whatever quasi government agency is building a park and they do it with a lot of you know what would be. You know, soft structures, trees. Tree stumps and those kinds. Things that create excellent habitat for salmon. So, but to answer your question, I think generally speaking a lot of development does have a negative impact on salmon. You know? And then there's also the development with roads, you know, impervious surfaces where we have run off. Mean. That's a that's a pretty significant harm to Sam and. You know, historically before we had roads and you know, run off and impervious services are rivers, when it rains, would kind of. Rise over the course of a few days on a, you know slowly and then the rivers would drop back down slowly over time. Now with. Habitat the altered habitat we've created our rivers when it rains. Spike really, really, like cries really, really quickly. And then they drop really, really fast. So you have these, you know, but you wouldn't have seen historically 200 years ago on a river, you see these? You know these large. So it rains, river goes up a couple days later, the river drops back down. You know historically that would be a much smoother, you know, slower rise and much slower smoother drop.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Into the I just want to make sure I'm understanding this right. Increase in the speed at which the river rises and drops. Has a an. It creates an influx of nutrients in the water and that's why that's an issue like run off.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082:](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[No, no, no, I'm. This isn't related to nutrients, I mean. Could. It could be flushing nutrients out at a higher rate. That's. But you know these baby salmon rear, you know, grow up in these. You know, riverine systems here in the tributaries. And when the water goes up really fast, they gotta find places to hide and hang out. And so when that happens really quickly, it can wash the salmon out, can kill them. There can be increased sediments in the water. Not good for them. So just it. Just it creates a more harmful. Environment for them to to live in.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: OK. And then are there any other things that? Might be affecting salmon like any other stressors. Besides, you talked a little bit about development.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Well, there's been some research about the other chemicals that are in the water these days. You know. A lot of it is just run off from. Commercial industrial facilities and then also run off from roads from cars. You know brake dust for example is one thing that they've identified as you know, potentially harming the Salmon's ability to return to their Natal streams.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: OK. And then? What kind of management decisions are currently affecting this system? There specific policies that are in place.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Umm. Well, yeah, there's lots of policies in. And you know the getting back to where I started with the comment from Obama, there's policies in. From the. Federal fisheries managers from state fisheries managers, local fishery managers. It's overwhelming.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Yeah, I'm. I'm. And we've heard a little bit already. But I'm curious just from your perspective. With recreational fishing, like, is there specific policies, either at the state level or the federal level, that are are really affecting, like the work that you are doing at CCA? Or that's really significantly affecting the recreational sector as a whole?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Say that would say that that I'd say that just that just the the general. Policies on commercial harvest are they are definitely harming recreational fishing and. Well it. You know our opinion, contributing to the declines in Salmon runs. We just we our our policies are harvest policies we'll talk about are specifically designed to maximize the harvest of salmon every year and so. The The the general. You know the overarching policy for salmon management is, is is called if harvest management is called the maximum sustainable yield. Don't know if you've heard that term yet. It's called, you know, MSY and the issue with maximum sustainable yield is that if you're wrong about. The forecast. For the returning salmon and you over harvest, you created yourself quite a problem. For future generations. And so you have this very imperfect science of trying to estimate. Forecast how many fish are returning from year to year and based on that forecast, fisheries managers set set commercial fishing seasons and recreational fishing seasons. But in the grand scheme of things, recreational fishing is miniscule compared to the amount of salmon that are taking commercially. I mean it. It's not even close. In comparison, you're you know you're talking, you know, maybe. 5% versus 5%. Something like that, maybe 90, maybe 9010 on some odd species. But that maximum sustainable yield means that. At the end of the day. Really that we don't have a salmon problem because. You know, we're harvesting them larvae, and if they were in decline or there was a problem with them, we would slow down harvest and we just we don't do that. So but but. Definition. You know, maximum sustainable yields are harvest management policy in this. In Pacific Northwest. When you really dig into. Means that we don't have a problem with. I think people will tell you differently, but the managers will tell you there's not that we got there and we have to harvest as many as we possibly can. And that has resulted in the situation that. In. And they, you know, forever be it.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: And so. From what you're saying, fisheries managers just in general are kind of favoring the commercial sector over recreational or just like in terms of allocation. That's how they're managing. So in your eyes is the solution just. I guess changing allocation or is there another policy solution that you would see that could help like? Protect the population.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, I mean, I mean it's it's not. Not an allocation. It's not an allocation issue. Because when you talk about allocation, you're just talking about how you gonna split the last dead fish. That's not what we're interested in. We actually want fish to return to the spawning grounds to, you know, healthy. That healthy, sustainable numbers where they can self sustain. And reproduce on their own. And so, you know, yeah, policies could and should. So you know, for example, they should eliminate bycatch, you know. You may have heard of the recent story here in Vancouver, BC, where just one trawler dumped over 20,000 struggling cessation of salmon. Now 1 drawl or and you know a couple of days fishing dumped overboard 20,000. It up. You know in Puget Sound when you talk about allocation? Groups will fight over one or two. Fish. One or two fish. And here you have one incident up in Canada where they just dumped in 20,000 dead. The allocation is not gonna. Who kills the fish is isn't gonna solve. Isn't gonna save our salmon. Killing less of them is going to killing less wild, killing less wild salmon. I mean, here's one thing that I I guess I didn't talk about earlier. Of these things, you assume people. But I'm guessing you. Do you guys know the difference between a hatchery produce salmon and a wild produce salmon? You talked about that.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[Well, so farm raised is it's a whole different category, but we're we're I'm just talking about wild produced, you know, naturally, what's the word I'm looking for? So we there's two ways pretty much that you know. So your guys are in Puget Sound. You're in. You're at Coleman now, so there's this quality. River is close to you guys. Let's use it as an. And this applies to all rivers here. In this. But there's wild fish that come back to the Nisqually River, and they'll spawn on their own right? Produce their own offspring. The the the there's. Few wild spawning fishes in the squalid river. Depends on the species, but there's there's a few, Sam. There's also hatcheries on the naswali. Well, they will take the attorney returning adults and you know, take out the milk and the the eggs and. Hatch and spawn salmon and hatchery environment and then they will. They will rear them to a certain size, a certain age and then let them go into the river and then they go on. You know, out to the future. And then for Puget Sound out to the. And then they spend their time in the Pacific and they return. Those are hatchery salmon and wild salmon swim alongside each. In fact, they are alongside each other when they out migrate out of the freshwater river systems out into Puget Sound, and then out into the Pacific Ocean. And then the Pacific Ocean as adults. Are intermingled. There's hatchery and wild fish, the commingle and the hatchery salmon in this state are supposed to be marked. There's an adipose fin that salmon have on their backs that. Is cut off for hatchery fish, so even visually identifying them so as a recreational fisherman and most fisheries because hatchery fish are designed for harvest. Designed for harvest. Recreational fisherman's fish was a rod and reel when you real one in, you can easily determine. Yeah, this is hatchery. This is wild. Going to keep it if it's hatchery, I'm going to let it go. If it's wild, we call that Mark selective fisheries. Reparation fisheries are almost all mark selected fisheries. There's and there's. There's none, but there's few cases in in this state where you can keep a wild salmon or a wild steelhead. Commercial fishing, on the other hand, has hold completely different standards out in the ocean. There is no Mark FLECTOR fishing. Keep wild and hatchery alike. You don't know when their bycatch, when you're reeling them in, they're dead anyway. It doesn't matter. You're killing them all out in the ocean. Whether you want to or not. And then even commercial fisheries here in this state, like Gill netting in the Columbia River, they can't fish selectively. So they're just allowed to keep and kill everything that they can. And in fact, as far as I know, and I've asked people this before, believe that this is the only place where you could go to the grocery store if you wanted to and then buy an endangered species. And take it home and cook it. Eat it. Know that you could do. In any parts, other parts of the country. But because commercial fisheries. Basically those. In charge of commercial fisheries are in charge of our. In. They don't want to stop, so they allow that to happen, they they allow. Somebody to go by endangered species and cook it and grill. And eat it in this state. It's mind boggling, and you probably don't think I'm telling you the truth, but you got to research it. It's absolutely true. You can. Go buy a wild and endangered. You can come down here to the Columbia. Right. And from the Treaty, tribes up at Bonneville Dam you could buy. You know, a very endangered steelhead and take it home and cook it. There's no other. In this state that you can keep it in. I mean, it sounds appalling and it like it doesn't make sense, but it's this is what we're up against here. So yeah, you asked about policy. I'm sorry I went on a little weigh on a tangent there, but you ask about policy. Yeah, we could have all Mark selected fisheries in our oceans and we would see a huge reduction in in wild spawning populations and wild populations.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: OK. And then so you kinda brought this up just now a little bit talking about. The Treaty tribes, but are there other stakeholders or groups that are kind of considered in this system besides commercial fishermen and recreational fishermen? Are you, you know, do you work with tribal groups or other groups here in your work at CCA?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: I mean. Try to as much as we possibly can. And you know that relationship between the tribal and the non tribal communities fractures. But you know, you got to agree a little bit of history and you understand why that is. You know, the other group, I would say that's in the mix is what you know what a lot of people call like wild wild salmon advocates. So you have groups that aren't necessarily consumptive users. That just understand the value of salmon and. Are out there advocating for, you know, wild salmon. A lot of those groups happen to be anti hatchery groups, which is unfortunate, but you know they are. They are advocating for wild salmon and not, and not a consumptive group necessarily.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Umm. Can you explain a little bit why people would be anti hatchery?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, there's this. Well, I I shouldn't even call it. I think there's some data that shows that hatchery fish are managed well, but they are detriment to the wild populations of Sam and so that that's that is the just the the crux of the situation. They they believe that hatchery salmon are too large of a detriment to wild fish. And they, you know, they advocate for wild fish only. Well, this being you know, they, you know. On their own. Rear on their own. On their own. On their own, when I say that 'cause you, you know, in in the river environment.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: Right. OK. So it's a perception of like out competing.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah. Yeah. OK. Out competing for food out competing. You know, gravel on the spawning. Yes. Yep.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1:OK. Got it. Umm. I mean that's I feel like most of my questions. Kelsey, is there anything that I'm missing that you think we should touch on?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Yeah, I was just going to ask when you were talking about some of the current management policies and approaches needed. From your perspective, is biodiversity consideration and current current management or something that you think should be more of a consideration in the future?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, I think it would be hugely beneficial for salmon recovery in this in this state because we're we're all too myopic and just too focused on. You know the end, the end product, the consumptive cart. And we. We don't focus enough on the on the bigger picture.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: So it's not really a consideration right now, but you would like to see in the future basically.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: So you like one of the things that we talk about a lot is like ecosystem based decision making is would you guys consider that to be biodiversity or is bio, would you consider biodiversity?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: I would say like ecosystem based management, something that comes Up a lot when thinking about biodiversity. Yeah, like moving more from single species to multi species to ecosystem based management. I think. I think we're definitely considering that as like an all-encompassing. Mechanism to manage for biodiversity is what we're hearing.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, I mean, we don't in my opinion, we don't do. Of that. So yeah, we. We need to, you know. I can't remember what you just asked me, but yeah, we need to move. In that direction, I think.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Yeah, I was just asking if we have any, if we consider biodiversity now, but it's kind of sounding like we need to move more in that space kind of your perspective. Not doing a great job of it right now.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: So I think. Do we think about? Yeah. I mean, I think there's a lot of smart people out here in fisheries management that understand the value of that. I don't think it plays enough of a role in the policy management though. So you know, we have some, for example, we have a Commission here in Washington that sets policies for the Department of Fish and Wildlife, which is the fisheries manage. Ment you got some old school commissioners that are status quo advocates and then you have. Some of these more what I would consider forward thinking folks that consider biodiversity. All these things and. You know, quite frankly with some consumptive user groups are. That popular because it's. Changed. I mean, just a minute. Just don't like change, right? But yeah, well, I mean, I think we're going to be forced into that path personally in same advantage, because very soon here are some of these key species are going to be going extinct. So we're going to be forced into it. Unfortunately, going to, you know, a situation that we could avoid, but. I'd like to think we'll avoid. But the reality that the realist in me thinks we won't.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Right. OK. OK. Yeah. So to follow up on. So Sarah mentioned that framework earlier that we're thinking about these components and you know we talked about Sam and as a species of conservation concern and the salmon habitat being important, going back to thinking about ecosystem based management and biodiversity management. Are other food web species, food web supporting species for salmon in particular? Are. Is that something you think about in your work? That something that's considered management from your perspective.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Food web species? Yeah, for. Right. We haven't talked about that yet, but there is a, you know, you know Sam and need a lot of. Species out in the ocean. Freshwater. I guess that they consume and you know their food web is is changing here. Quite. A lot of a lot of their forage, you know, we call them forage. Fish species smelt, herring and that type of thing. Have struggled recently due to commercial over harvest and. You know, some of that has started to change, I'd say in the last eight to 10 years with, you know, significant national lawsuits that have helped change the policies. And I think we're starting to see more forage fish. Or less I should. Less wars, fish being harvested and so. Yeah, they but answer your. Yeah, there's significant issues. I think with the food web.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: OK. And it sounds like you're saying you're starting to see less. So it's it's fortunate starting to be more of a consideration of management, but haven't historically.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Then the last thing I was going to touch on. Sorry, we might have already talked about this, but the last bin in that framework was harmful organisms. That something that you think about in your work or that comes up in management.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Oh really? I mean that was the one of your bullet points that I said. I understand it, but we just think about that all that often. But. You know there. There is often concerns or comes. It tends to be more with the hatchery fish because they're in smaller, confined places, but. You know with with different bacterias and so forth that will get into the fish and in the you know whirling disease and kill a bunch of them. So it's a concern, but it's just not really on the radar that much, OK. You know, and then I. What's the what's? What's the broader term that we're calling again? I was looking at those bullet points.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Harmful organisms is what we're calling it.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah. Yep. I think that that would probably fall in that category, yeah. Yeah, but, you know, I think with. You know, warmer water conditions that maybe more and more of a concern moving forward too.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Awesome. Yeah, I think that. I think that was that was pretty much all of our questions. Anything else there that you thought of? No, no, that was great. And I guess yeah, like just one last question to ask is like, is there anything that's really important or like a top priority area concern for you that we haven't talked about already that would be helpful for us. To know like other, I guess, other environmental factors that are really important or other, you know, human considerations that we should be thinking about.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: Yeah, I mean the one that. Didn't really talk about. We don't need to spend time talking about it. Mean never. It's habitat related but. Is a big. Big talking point here in the northwest. Mostly on the Columbia river where. Talking about removing. Four big dams. There's a little bit of, you know, talk and Puget Sound, but not much. There's a there's several dammed rivers in Puget Sound. A lot of dam rivers in Puget Sound. But it's just not as. Much of. Talking point up. But quite honestly, I think Hydro falls under habitat anyways.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I1: OK. Well, thank you. So. I really appreciate you taking the time to chat with us. Is definitely like a perspective we just haven't had yet.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[I2: Yeah. No, I'm laughing because, like you said in your e-mail that you didn’t know, if you'd be helpful, but this was. Yeah, exactly what we're hoping to hear from folks like yourself. We really appreciate it. And this. Yeah, this was great. Very, very helpful.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)

[BD082: OK. Well, ladies, enjoy your time. You guys got some pretty good weather here while you're out here.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s160da1fe015f4ffcaf76f5d70d8da60f)