[I1: Great. Good to go. Yeah. So I guess it's a. I'll give you a little bit more background information on our project and then we would love to kind of start by just learning more about your research and then we can jump into some specific questions around. Our research project. Cool. So yeah. So like I said, the e-mail are really high level broad goal of the project is to understand if and how we are managing either. Directly or indirectly, for marine and coastal biodiversity and U.S. Marine resource management. And so you know, that's of course a really high level, daunting research goal. We're taking a case study approach. We have 3 case studies for our project. We're about 2 1/2 years into a three-year project, so Puget Sound is our 3rd and final case study. And so our first two or first case study was Northern Gulf of Mexico. Really became more Mobile Bay. So that's where Steven is now at University of South Alabama. Where Sarah is. And then our second case study was the Chesapeake Bay, which is where I sit at the Smithsonian Environmental Research Center. And then our third case study is here in the Puget Sound. And so we initially had a team. I don't know if you know Phil Levin at UW. Umm.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yes, I do.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah. So he was initially on our team, but then he had to jump off the project when he went to the white. So that's part of the reason we are here for two weeks is to kind of do some networking, build some collaborations and have some on the ground meetings with folks since we don't have a A-Team member. Locally anymore. And so in each of those regions, Sarah and I are doing individual meetings or interviews with a variety of community members and variety of resource users. We're talking with fishermen across different sectors, oyster farmers, Waterford homeowners, ecotourism operators, and then of course, here. Tribal members and then also meeting with resource managers and researchers at the state and federal level and folks working at NGOs. And then in each case study, we're running a workshop where we convene all those different groups of people together to talk about how different management approaches are currently impacting people in different ways and to think about what management approaches are needed in the future to better ensure a. Of access to marine resources. With conservation and preservation of biodiversity. That's why we're working. Happy to answer any questions that you have now, but then kind of to start, like I said, we would love to, you know, hear more about your research and the work that you're doing at the state and and elsewhere.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: I mean, that sounds super fun and. I mean, then you can't go wrong with coastal coastal research. It's a nice. It's a nice niche to be in. And yeah, I mean, so, so are you. So I guess. Given that it's case studies and you have 3 three different sites. Are there are you kind of tailoring these workshops and questions and stakeholder lists or partner lists to those specific locations? Or is there a lot of similarity or overlap as to how you're approaching it? I'm just curious.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, I would say a little of. So eventually what we'll do after we're done with all three case studies is a comparative analysis and manuscript and then hopefully using that product to build some sort of decision support framework to help you know, put forth some recommendations for future management approach. But really, to build that, we want to look at commonalities. Differences across the three. So we have. A broad agenda for our two day workshop that we're trying to replicate as best we can in each of the regions, but of course there'll be some differences based on the specific dynamics. Yeah, each of those resource user groups that we mentioned, we are trying to have representation within each of those groups. At each case study. But again, of course, it's going to be a little context. So like we weren't able to have any tribal representation in our golf workshop. Who's? I think there's only one federally recognized tribe in that county and region we're working in, and we tried to clinic with them, but like we're unsuccessful, to be honest.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: We had two different tribes represented in our Chesapeake workshop, but it was a very different dynamic because neither of them were federally recognized and don't have treaty rights. Yeah. And they because of that, you know, they don't have, like, Dnr's. They were tribal. We actually had to cheat from one tribe, which is really cool, but they weren't managers, whereas like we have met with three tribal resource managers since we've been here. But none. Them were tribal members themselves. So yeah, yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: That yes, I totally get that. Tribes are very, very. Unique by region. And like how they're structured and how they conduct natural resource management. I was in. I worked with tribes in Kansas and then coming up here. It's like a completely different context so.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, yeah, definitely. So that's probably the biggest difference across the three. The other thing is ecotourism has been a bit different, like we actually didn't. Don't think we had any like tourism representation. Chesapeake cause most of the Chesapeake. Coastal and marine tourism is like sailing and boating and. When we were talking people, we didn't really hear that it was like connected to biodiversity very much, and a lot of like the marine mammal sighting is like very southern Chesapeake Bay and offshore. And then we had one like tourism operated the Gulf. Did Dolphin Tours and also was a charter fisherman? But then here we've had, like, really cool meetings with we met with dive instructor a couple days ago and a naturalist for a while watching company. And we've been trying to connect with someone who does like kayak eco tourism. Some. So there's also definitely a bit more like ecotourism presence in this sample than our other studies.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: That makes sense. Yeah, that's cool. Is. Yeah, this is fun.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, it's. we are like, you know, we get to. Here for two weeks and it's been. Bopping around, talking to folks, seeing the sites great.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: In Tacoma's nice, like, even though you've obviously experienced some issues there, definitely some beautiful places. And some great beaches. Yes.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yes, you had recommendations at the end of the. For things to. We just, we actually were staying at. Know in Seattle until. Yesterday and then we switched over to Tacoma and are here until Friday.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: OK, cool. Yeah, happy to provide recommendations. It's definitely like a it's an up and coming. Traumatically transforming place, so even if there may be 5 almost six years, and it's it's almost completely different from what it was when. Was there?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: So you can like we just driving around a little bit last night, you can kind of get that sense like it seems like Main St. Are a lot of new, like really cool and even some like. Higher end restaurants and there's a lot of cool coffee shops and like wine shops and stuff. But then like driving around, you can like see how, like you can very quickly like shift, like socioeconomic dynamics, it seems, yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah. So yeah, we would love to start to learn more about your research here in Washington.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: OK. Yeah. So so I'm currently the conservation social scientist at the Washington Department. Fish and. I've been in my position for about two years as an entirely new position. They did not have any social scientists on staff prior. So I I am part of a team of four, so it's myself and a natural resource economist. And so we are the kind of two social scientists at the. And then I have a team that I supervise of two individuals whose work is either connected to, like human data. Or other human related elements within the fish wildlife natural resource. So I supervise our, it's called our diversity equity and inclusion data analyst. And so their job is to solely work with data, human data related to D EI at the agency. Both internal and external data and then. And that includes spatial data. And then I also supervised our environmental justice coordinator, whose job it is to align our agency with kind of like statewide, EJ related efforts and goals and policies. And then also ensure that that. Content is like science, informed and then integrated into the agency, and so I. I've been at HC for two years, but I've been in Cuba since 2017. Conducting research here. So I was a post doc in the Department of Fisheries, Wildlife and Conservation Sciences at Oregon State University starting in 2015, and I was part of the Human Dimensions Lab working with Kelly Biedenweg, who is a professor there. She's more of a conservation or environmental psychologist by training. And I'm a human geographer by. So different backgrounds, but awesome collaboration. We still collaborate. Kelly has a very lengthy and criminal lustre. His career focus on human well-being and health as it relates to natural resources. And she had her post doc in the future.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[And focused on developing human well-being vital signs which are indicators of human health and well-being as it relates to the health. Sound and she worked with the Puget Sound Partnership, which is another Washington State agency on that effort. And the piece of institute at UW Tacoma, which is a Research Institute in Tacoma. And so my postdoc and a lot of my work kind of built upon the foundation that Kelly created. So a lot of my work during my post OP was really focused on. Human well-being as it relates to Puerto Ricovery and so although it works for Oregon State University, I was funded by the EPA for about 5 years to essentially be the in House social scientist at the Puget Sound. It was like this, kind of. Wacky funding, arrangement, and geographic arrangement where everything I was paid by OSU as part of a lab at OSUI taught at OSU. But I lived and worked in Puerto Rico sounds, and that's where I was based, and that's where nearly all. Of my research was focused. And I really loved. I really enjoyed doing research in the business region and it's like social and ecological, ecologically, really diverse and complex place. There are a lot of different elements and topics that you can look at like scientifically and so. I think you know. Other than just like kind. Focusing on human well-being and sharing that. Human. Being Bioscience and their data are being used within planning and. Which was a big part of my job. You know, it wasn't just. With the partnership, it was with the partnerships partners, so other state agencies. But I also like did other research that kind of tried to build upon that work. So some of that was. Related directly to my post doc so that that particular project focused on integrating human well-being into. Kind of local and regional planning efforts. And so we basically did that work of integration, but then we also did a meta analysis of that process. And so we used a community based participatory research approach, working with local watershed groups known as local integrating organ. Which exists throughout the region and they help with local planning and funding decisions when it comes to restoration. And so we integrated human well-being into those processes, using structured decision making. Another decision support tool. That's fairly common in natural resource management, and so we we are actually in the process of revising a manuscript on that project. And so hopefully that will be done soon. And then we also conducted research on kind of like a meta analysis of doing that same thing but with regional planners, so. People who are based in state agencies who focus on peace and restoration, who are attempting to think more about the human dimensions of that work, and so that led a lot of different ways. It really was tailored to the group doing it because these are like multi state collaboratives that focus on specific niche restoration topics. Like for example I worked with. The marine water quality. Group and that was multi agency. It was led by Ecology and my role was to like. An appendix on the human dimensions of marine water quality that includes human well-being in that appendix, and so like it really varied by group that I work with and then. How I guess like building on that I did conduct some research in the region on kind of coastal sense of place. The geographer really enjoy people, place relationships and examining those things so. I I conducted a survey on. People's senses of place of marine shorelines in Puget Sound. So I did a regional survey on that and I also did some intercepts at four different sites in Puget Sound talking to people directly about. Coastal kind of like shoreline preference and then places. Well, two different exercises including cognitive mapping and also like kind of visual based like preference surveys. And I. Some I think papers about that project out there. I also did a similar project in Highland County that was like solely focused on Island County. Which is obviously island based county. We did a survey, a separate survey there. Kind of using more snowball sampling as opposed to like a research panel or an alternative type of sampling. And we published on that. Done some geographic literacy research, so I worked with the Cdoc society, which is part of UC Davis. They have a. Center on the San Juans. Lucky them. And they had some questions about like whether or not people knew what the Salish Sea was, which is the name of Puget Sound at a different scale. And so we we kind of translated that into a geographic literacy study and we examined. Washington and British Columbia residents knowledge. The sailor sea. What including whether or not they knew? That. Was and that was a super interesting project. Actually like. Sparked another project that I completed last year. Here that if you sound Institute came to me with a similar question of like do people know that Pusan is an estuary? And do people even know what an estuary is? So we conducted a similar kind of like nearly identical study. With just Puget Sound residents. And it was a survey. And we looked at like also a bunch of things. So we looked at geographic literacy with an emphasis on estuaries, but also we looked at. Questions around biodiversity, like whether or not residents. Could define biodiversity, so we actually like asked them to define what that word meant to them, and then we have an education program at DFW that actually has curriculum on biodiversity. We integrated some of the curriculum into the survey. And had survey respondents interact with that to gauge whether or not they could visually understand or comprehend what biodiversity actually means? In addition to a bunch of other. So like, I'm actually hoping to wrap up a manuscript right now on sense of place and its relationship to salmon. And a whole bunch. Other. So like a lot of my work has been kind of. Started within the health human well-being world and has slowly kind of splintered out into different kind of facets of health and well-being. And now it's like kind of moving beyond that. So. Including like. So my dissertation focused on the Baltic Sea region, and I still do some research focus on Estonia, including Estonian coastal communities, and then I I just. Started my first Eastern Washington Non Coastal project focused on kind of sense of place and landscape values. Of. More arid landscapes in Washington. So I know there was a lot.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: No, that was great. Thank you for sharing all that. And like we are kind of looking each other laughing 'cause there's so many overlaps and research that we've both done individually through our PhD work or post Doc work and are doing in this project. Like so excited to talk with you more about a lot of that. Yeah, I was just like, on a personal note, might so my pH.D was in Florida Keys and I did intercept surveys. Creole intercept surveys, looking at phishing access for subsistence and shore based fishers to different shoreline types and trying to understand what shoreline types on a natural. Hard ingredient they. Valued and preferred for shore based fish and then couple that with an ecological survey to look at what near shore fish species and target species were available on that natural hard ingredient. So.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: That's awesome. That's very yeah, very. And that's like obviously how I found Stevens. So it's like, oh, like someone actually studies this stuff. And the social science perspective, this is awesome.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, yeah, that's so cool. And then like related to to this work here in the Puget Sound, I mean first of all when thinking about like snowball sampling, it's been great because. We I feel like we're obviously there's so many organizations is like the biggest thing we've learned, again, compared the different case studies like it's been a little overwhelming. So many people in organization's in the Puget Sound doing environmental work, I would say. Way more than our other two case studies. I mean, in the Gulf of, we narrowed it more on Mobile Bay because Gulf. Mexico is way too large. But yeah, there's so much cool work being done. But it's exciting because a lot of, maybe even all of the agencies that you mentioned, we have connected with. We've been able to talk with. Folks at Puget Sound partnership. Actually one of the dive instructor that we interviewed a couple days ago also works part time for SeaDoc Society. So yeah, and we, we've met with. We met with a group of folks at the Puget Sound Institute at of Tacoma last week, so that's great. Good to check that we're like meeting with. Right, people on the right interview.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: It does seem like and and if you are aware for either of you, I don't know what your your professional next steps are, but they are hiring for I think a social scientist post doc right now.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: We we've been joking cause this is her first time in Seattle. And she's always, like, wanted to come here and maybe move here and she's in her fourth year pH. D. I'm like, this is a joint like post Doc Scoping trip for you.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: I mean, it's an incredible place to be for a lot of reasons. I I went to, I got my masters in in Oregon and I always wanted to come back. So when I graduated, I was like. What? What kind of postdocs exist out here? Please let me go there, you know. It's it's very nice and I think, yeah, I mean there there is such an agglomeration of so many different restoration and natural resource entities here. Really is. It's a really complex landscape of some, like government tribes. Umm, NGO's, universities, private sector in. There's so many environmental consulting firms here, like a lot of my colleagues, who end up graduating from UW in particular, just like end up sliding into these environmental consulting jobs. And doing social science or natural science, science or other things. They just have a heavy hand in a lot of the work that takes place here.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Help you environmental consulting is like 1. That I. I don't know that we. Actually, that's not true. We've met with some folks who like contract for NOAA, but through environmental consulting agencies like natural resource consulting, Cascadia.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah, cascadia's huge here.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Oh, I don't know if we actually met with that. We did. But anyways. And that's one of the reasons why we are here on this trip is. Like, it's so amazing that there are so many organizations, but we also want to make sure that we're not just, you know, doing something that's already been done or is being done. And that's one of the things like. Were so excited that we were able to meet. With the group at Puget Sound Institute. They're doing something. Similar and complementary to our work. And so we're kind of trying to brainstorm with like is there a way for them to participate in our workshop? Know beyond being a participant, but also like having some sort of session, maybe because it seems like the integrated model that they're working on. Has some complimentary. Goals, but definitely I would say a lot of differences and the biggest one being that they're connecting terrestrial to marine environment and we are we are not like going into the terrestrial watershed space because we just felt like. Just one of our three case studies for each case study. We're trying to like somehow constrain the social ecological dynamics 'cause there's, you know, a lot to a lot to do for one. Like, third of our project.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Absolutely. Yeah, I think like so much of my work has been kind of nearshore focused. And coastal and I personally prefer that, but obviously I can't just focus on that anymore. And so I am like it is interesting, kind of like wading into non like nearshore aquatic focus work. My lab was largely fisheries focused, so most of the social scientists that I worked with at Oregon State. Totally focused on fisheries. It was very rare that anyone did. I think we had one student that actually focused on terrestrial wildlife.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Oh, so the other thing I was looking back on my notes when you were from when you were talking, so would love to hear more about the work that you describe talking with folks. And interviewing and doing surveys around what biodiversity means to them. To give a little spoiler of one of the questions we were going to ask you and then we've been asking these conversations and interview stakeholders. The very first question is to ask them what does biodiversity mean to you? Because one of the things we learned very early. This project is that it you know. A variety of things to different. There's even in the scientific world, not a lot of consistency and how people define it or operationalize it, or conceptualize it, and then to community members in particular, it really means. Know it really means different things to a lot different people, especially based on. What components of the resource? They the main resources they rely on or value. So I would love to hear more about that project and kind of from the lens of your work here. You think about when you think about biodiversity and what are the key aspects here in Puget Sound?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah, that's a great question. And I do have like a presentation on that particular question that I that I included in the survey and so and none of this has been published. Was solely asked because our agency has. Our agency received a lot of funding from the state legislature solely focused on biodiversity, and so we've gained a lot of staff doing all sorts of stuff related to biodiversity, including like staff that focus on really specific species that have long been kind of ignored. And or people who focus on niche habitats that have, like also partly been ignored in the past, like like shrimp stuff or sagebrush in Eastern Washington. And then we also have biodiversity communications people, so like people who are solely hired to help the agency communicate about biodiversity and why it matters. Which is pretty, I think, unique for a state agency. The US. Us. And so, so that is partly why we integrated biodiversity into our Puget Sound. So the survey itself, we've it was intended to focus on estuaries and whether or not residents knew anything about estuaries, including what they meant. And so that was the primary purpose of the survey. I think we had like 5 or 6, maybe up to 10 questions just about estuaries and Puget Sound as a whole. And then we added. Because we wanted to ask some other agency specific questions, we added some related to biodiversity and then I wanted to ask some related to salmon incense a place. So we had an open-ended question about biodiversity. Essentially like wanting to understand like what do people think about when they see this word and does it align with maybe how a scientist might think about biodiversity, or a technician that's doing biodiversity like work on the ground? And what we found like overall? Based on my memory. Is that most people seem to to define it. Well, like in a way that like made sense logically. And that there was this like, quote UN quote, diversity of biology or diversity of beings, of living things in a particular location. And I think the location piece was pretty. Well pronounced in a lot of people's. Is that when people think about, like variations of living beings, like cohabitating in some particular place, there was this for many in the hall. There was this emphasis on geographic location or this emphasis on a geographically specific habitat. So it wasn't just like a diversity of beings, it was diversity of beings in a particular place and that really stuck out to me. I. Partly because I'm geographer. But also like looking at the results of like seeing some people kind of omit the importance of place, but then some people like really. Emphasize that piece. And so we also integrate, as I mentioned a question that came from our education.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[So our educational program does have a BI direction curriculum that they use and they work with different school districts across the state with. Wdfw approved curriculum. And and so they actually provided a question that kind of visualizes biodiversity from their perspective. So it has like multiple images of different generic kind of illustrations of species existing or Co existing in the same kind of space. Kind. Also, generically defined like so like a generic like drawing of a frog or or a bird or a fish, or maybe an unknown like all in the same kind of like square, and so they have different variations of that. So obviously the one that has that does kind of reflect biodiversity has more variation of species in a particular square versus the others, in which maybe there's just two or maybe one that's just like 1 dominant species and just a handful of others. And so this one is more the one that is correct or the one that like best reflects biodiversity from agency education progress perspective is the one in which there's like this rich variety in almost.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I guess, like almost near equal distribution of diverse species across a particular space, and so in general, most respondents, I think it was like maybe over 70% of respondents. I can't. Don't have the survey results on me at the moment, but I think over 70% of respondents actually chose the correct image that reflected by diversity. Which was. I think overall the results were super fascinating when it came to the open-ended question about biodiversity, because largely, most people seem to get it. Even if the turn seems. Esoteric or kind of inaccessible. Most people who participate in the survey seem to understand the logic of the term, even if they may have never seen it or heard it. They were able to break the word down into different components that reflected its meaning. And so something that we've been talking about at the agency is perhaps? Creating a glossary of. Because we do have various glossary of of scientific terms that we use. And maybe focusing on having two definitions per term, 1A technical or scientific definition, which is what we already have, and then also having a plain language definition or plain talk definition of each term as well, so that we can better communicate with the public about. Or science related or management related terms. This was something that. They thought about a lot, especially with regards to geographic literacy, because if we're using geographic terms that don't mean anything to people or people don't have a mental. Spatial reference to what we're talking about. They're they're not going to understand what we're doing. There's going to be some degree of a disconnect or mismatch between what we're talking about and doing and what what, what registers in their minds when they hear what we're doing. Like for example, if we say we're. We're spending millions of dollars on estuary restoration, which we do. And a large portion of the population does not know what an estuary actually. Is there a? There's a disconnect, and that could come across as. It could come across as like why are they even doing? I don't even know what that is, and so I think we need to do a better job with communications about what we do. And so I think having more plain talk or plain language definitions of our terms is a potential route that we could take.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Interesting. OK, a lot of things again to follow up on that, with the work that we're doing that's that's so. And yeah, a lot of a lot of synergies I would say with with our work. One thing that we're doing that I didn't mention because we just started it. Not quite sure where it's going to go, but we just had a really great intern the summer who started a policy analysis and. One thing we realize is that, especially at the federal level, the term biodiversity itself isn't included in. Actual policy and. And so she's been using some qualitative coding analysis to build a framework to understand what terms aside from biodiversity are using the documents that actually are indirectly, you know, managing for biodiversity and what jargon is policy using instead. And it's really. Interesting to hear. You talk about the work that DFW is doing with biodiversity and you know having that term and you know, actually have staff focused on biodiversity itself, because we keep hearing in our previous case studies and foods policy analysis that biodiversity is managed directly for at. State and local level and it's not happening at the higher level. And and that's that's yeah. And yeah, and so that's where. Term like comes up time and time again. And one thing that I that I was hoping to get kind of your your feedback and perspective on is a framework that we've built for how to better conceptualize biodiversity specifically for informing decision making. Umm. And that came from some previous work and I'll kind of run through the four terms quickly and I'm happy to repeat. But yeah, so the four terms are habitat forming, species, key food web, supporting species, species of conservation concern, and harmful organisms. And so I'm wondering with with your work in defining biodiversity, does that framework resonate with you and and is there anything you would change and are those? Components. Things that you are considering in. Management or nearby?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: I mean, I definitely think like based on the the results from just like a public participating in a survey, I definitely see some of this resonating or maybe aligning with some. Of what? Those respondents shared especially the habitat forming species. As I mentioned, a lot of people seem to directly connect some degree of place or habitat with species themselves, like those things. That exist without the other. For some people. I also think like food like you said, food web forming. I definitely see that as well. And I think with regards to the agency species of of conservation concern is definitely something. That I think we focus on a lot and I think some of the biodiversity funding that came to the agency really, really emphasized that species of conservation. Maybe greatest concerns, maybe the term we use. And so we had some positions created that focus on specific species that we've long ignored. But we knew like. Our our major, like our major conservation issues 'cause, I think a lot of Fish and Wildlife management has largely focused historically on large carnivores or more like game or you know species that has some connection to. Economics and economic benefits and values. As opposed to, you know, you know a butterfly species. You know. I think a lot of state agencies haven't really been given resources historically to kind of emphasize that. But now we are doing that in Washington more and more and I think, you know our agency. Is is split into three large divisions or departments our programs. Is fish, which obviously focus. That's our biggest program for a lot of. And then we have wildlife focuses on wildlife, and it used to be called the Department of. So mostly game species focus, and then we have habitat program which is the newer 1 and it's more is is more focused on I think. Not just habitat, but also those species that form specific habitats. In the region. So that's where you'll find people that focus on like turtles and frogs and butterflies and other insects and invertebrates of different kinds and and. And I see a lot of the, I think this funding that we're getting going to that particular program.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Observation concern. What are some of those species when you talk about funding and staff going to species that haven't traditionally been focused on what are some of those in the region?](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah, I think I think a lot of it is perhaps like invertebrates, like small invertebrates. I think insects of various kinds like I think I a lot of my work doesn't necessarily crossover that much unless somebody reaches out to me and they're like, hey, I need some social science assistance. Because I'm essentially like an internal kind of like consultant at the. So for example, I think there's a checkered spotted butterfly of some kind, which I think is endangered in the region. I think it's habitat. Really small. And I Don. I think it's. I don't think it like really moves far distances and so there is like a person at the agency that focuses on that species. As part of their work and then, and I think they're funded through this biodiversity funding, I believe. So that's like an example. Mean there are. Yeah, I think I think maybe also I think I want to say Western pond turtle might also be one of those species. So I I think a lot of it is just like like smaller species that aren't game, that aren't like fish fisheries related. That, you know, I think a lot of fish wildlife agencies have largely focused on those and I think we are, we have moved towards these other species that are of great concern and are part of these food web that are part of these habitats. But I. A lot of agencies haven't necessarily had a lot of resources to focus on them.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: OK, got you. OK. Umm. And then going back to the habitat forming species. One of the things I was going to ask you next is what ecosystem services folks connect with these different components of? I think maybe habitat would be a great place to start since you were talking about the connection between habitat and sense of place. Could you talk a little bit more about that and what specific habitats maybe people connect with and what other ecos? Services people connect with biodiversity.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah, I mean, I definitely see in general I think species in general have largely been omitted from a lot of sense. Place research. We had a lot of sense of. Scars haven't necessarily focused specifically on species themselves or biodiversity itself. As in and of itself, contributing to how? Feel. A place there is some research that is fairly niche. But I, but I do see it growing in the literature. And so I think in general. All a lot. I mean, even some of my coastal stuff in here sound like. I think I did a cognitive mapping exercise and like Fish and Wildlife presence, existence. And use were definitely part of people's sense of place of Puget Sound. Shore areas or like what one could call like a coastal sense of place like species, was a component. Was a factor or dimension in that I think for various reasons, whether it's. You know, there's some sort of use or food or recreational. Or work related element to like marine species like fish or shellfish. Or just their existence and presence in a particular location. People like to see wild Fish and Wildlife in person in a particular place. Think people don't necessarily like. I think there should be more research on this, but I think that for many people least out here. The presence of Fish and Wildlife and just species in general and just having a lot of biodiversity of species. Is important. It's it's a factor of what as to why people are here. Choose to move here. More than 50% of Washingtonians weren't born here. And I think many people come here for nature and ecosystem services derived from nature, especially recreation. And I think species play a part in that, whether they are hunters or anglers or not people still like. You know, seeing species like, even if they're not inactive or proactive. Wildlife Watcher bird watch. They're passive in in their interactions in viewing, and I think that that stool. Really. It matters to people. And so that's one. And I think, you know, I'm currently conducting a survey on the east side, which is different on coastal. And I do see a lot of. People responding they can, including wildlife and or biodiversity in their in their responses as to why that place matters to them, and that is a really unique habitat type shrub. So for stage brush. And it's a it's a highly threatened in the region because of development and green energy and a. Bunch of other reasons. But thinking about on again on the West side in this survey that we conducted in Fujison recently. That focus on every single nessaries, but also. Salmon incense, a place I mean. We I think assume we make a lot of assumptions when it comes to sense of place and often is that often comes out like speeches or art or other things. But like, I was really surprised that there hadn't been any study or survey on Salmon's contributions to sense of place like explicitly. Which is. Why we did it and I mean. Like a parent, if it results salmon contribute a lot to how people feel about this place and think about this place. And and I think it's you know we also. We also like included spatial component and so we kind of were the papers not done, but we're looking at Salmon's contributions to not only sense of place, but looking at salmon as place makers themselves as a species. And how salmon are reflected on the social ecological landscape. And so we actually compiled a whole bunch of ecological and social data to kind of reflect and map salmon on the landscape. And it's very clear that this is. The same play huge role which I think we all know, but to actually see it in data is is really cool and. Yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: So what? When you're asking folks about how they, you know, define or conceptualize biodiversity, and you're talking about the role of salmon for sense of place, are other species and, you know, thinking about the people of supporting species going back to that, a species interactions are those things. That people. Include in their definition, or think about when they're connecting salmon and its role in sensitive place.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: I think so. For some people, yes. And so like one of our questions which actually came from another researcher who did some research on like species and sense of place related to fisheries. And they actually asked a cool question of like, what? It was like what species represent this place or what species like refined? Select like this place and so we ask the same question. And I think Salmon was was by far like overwhelmingly the most common response. In addition to fish, cause a lot of people do not have the ability because of their lack of knowledge or familiarity or experience to dig deep into species names, and so a lot of people kind of claim to these generic. Wildlife terms like. Birds, whales. A lot of people can't go that far and so, but we did see quite a few people. Talk about Orca. In particular, I think like salmon and orca are deeply connected here and I think. Lot of people are aware of that. And so I think like if we're thinking about other kind of iconic species that reflect the. Unique food webs here. I think salmon orca in particular 2 standouts, which I think makes sense, and we also are constantly bombarded with information or news stories about both. And. They're often news stories that are connected. And also their images that are just everywhere like we see images of salmon and orca all over the place. Whether it's business ads. Beer, even? You know, like it's it's really. The transit pass in the region is called an ORC card. They get they're just everywhere. They're very pervasive.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yes, that makes sense. OK. And then the last bin that I want to. Back. That I don't. Talked about is the harmful organisms.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yes, I. Like for me at least, I guess like European green crab is definitely something that at least the agency really focuses on. Actually have a European green crab communication specialist and that's their sole job. Is to communicate about that particular invasive species. And I think you know. That one in particular in Puget Sound, I think in like in comparison to any others is probably the most. Kind of pronounced that I've observed. I think when it when it came to like the biodiversity questions that we asked among residents, I don't really remember invasive species coming up. So I don't know if people, and I think it's like like other constructs like. People often kind of lean into maybe a benign or more positive framing of whatever the meeting is, and maybe aren't necessarily thinking about the negatives, just like I think similarly with sense of place, I think often people assume that sense of place is inherently positive even though it. Not there are scholars that actually just study the study negative senses of place. Like it's not always like a positive. It's not necessarily like, even if it's negative, it's not necessarily a bad thing. That's that's like, you know, different. But I think, yeah, like with it, with those like harmful species. Definitely European green crab. I do know that there are specific frog species here that are invasive, that staff Members focus on. Don't remember the name. But I do know that there is like I think I wanna say it's like. I can't remember. Large like as I get all of these invasive species have like geographic running. So I think like it's some sort of like African frog.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: OK, I did not take that frog. So ma'am. OK, cool. So I know that we're almost at the hour. So the last thing really quick like last thing in 4 minutes. Question. But. To kind of get your final thoughts on how biodiversity is considered in management in Washington, I know we've talked about that a little bit, but kind of the the end goal of this project like I'm saying is to understand what management approaches are needed in the future to. Manned biodiversity specifically. Demand for the biodiversity that community members rely on for ecosystem services, so I would love to get some of your final thoughts on that. Yeah.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yeah. I mean, I think that. Biodiversity is hard. Yeah, I think it is hard like management wise, I think especially 'cause you're dealing with institutions that have been around for a long time and have structures that don't necessarily fit a biodiversity construct. Or even like an ecological ecological systems framing of restoration or management. I think we've often historically focused on species. Specific management. And that creates a lot of siloing. It creates a lot of esoteric and it kind of like narrow work and doesn't. Doesn't really take into consideration. The. Like mutually constitutive nature of of the environment and how everything is kind of connected to each other and including humans within that. Think the Twosome partnership has done a really good job. Having been there for, I was there for like 5 years we had. They have a social ecological systems conceptual model that they use to frame recovery, and that is pretty awesome. Now many places has that. And so having a document that people have approved or framework that people have approved and kind of bought into and have created like plans and strategies and funding structures and priorities around super helpful. I. Think more helpful when it comes to like addressing something like biodiversity. Then you have other institutions that have historically been very species or habitat specific, and that makes it a lot harder. I think like you really like a lot of planning and management like relies on. Institutional factors. And you really have to like like have change at that level in order to really transform something. And that's really hard in government. And and then and I imagine that maybe is partly why the Feds have struggled. Talk about like big institutions with the past legacies, but also politics involved, which makes it really challenging so. We at. Do you have a lot of people focused on biodiversity and we, I do hear a lot about biodiversity in many of those conversations like we're currently working on our swap, which is like our statewide. I think it's statewide. Don't quote me on this. See. Like action plan, it focuses on like species. Recovery and management for like all of the species. And it's like, really focused on, like, conservation. And so someone is responsible for. I know biodiversity has been a big part of their those conversations because I think in the past this walk has focused like very species specific, and now they're actually like using almost like habits that are placed to kind of. Frame how they're approaching it. Like like emphasizing like you know. Species are. They are connected through habitat or place, and so people are part of that as well and I. That's really. Great that they're thinking a little bit differently. And I think also like our agency having community like communication specialists to focus on biodiversity and trying to like communicate to the public about like, why this matters and how things are connected. And I think is is important, but it's definitely I think a challenge.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, yeah. Yeah, we a lot of. We hear. Hear time and time again, and that's what we're hoping like to go back to one of your original questions about how we're structuring each of our case studies differently is kind of one thing that we're doing is our workshops a day and 1/2 and. Kind of taking the last hour. To the. Day in each workshop to try to advance and push the conversation on what approaches are needed. So we've kind of been revising and advancing our protocol for that portion of the workshop. At each stage of the workshop. I'm excited. Initially, Puget Sound was very first case study and we ended up pushing it to the last for a variety of reasons and I'm excited. So I think this is a really great case study to kind of advance and push that conversation. Into some more specific to get some more specific results on like actual tradeoffs of management interventions that. Maybe we weren't quite able to get to in our previous case studies, so. Yeah, well, I know that we're out an hour, so I don't want to take any more of your time. Just going to mention, because we did run out of time. You were talking a lot about cognitive mapping. Might be. Know familiar with Steven Scyphers’ work. Steven Gray is also. One of our team members, we developed the mental modeler tool that I imagine maybe you use before.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: I Don't. I don't know that name.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[I1: Yeah, happy to send you the. It's a really cool tool that you can use to build fuzzy cognitive maps or qualitative network models.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)

[BD081: Yes, please share.](https://onedrive.live.com?cid=35262dc0995d5aad&id=35262DC0995D5AAD!s8d97fa7752174717aa6711998b7d21da)