BD064

**Interviewer:** I was wondering if you wouldn't mind just sharing a little bit more background of what the Northwest Straits Commission does and their mission and the research they're doing, and then your specific role at the organization.

**BD064:** Yes. Yeah, happy to. And so the Northwest Straits Commission, we are technically housed in the Department of Ecology, which is a state agency in Washington, but they're mostly just our fiscal agent. We don't have any regulatory authority. We were established in the late nineties as an alternative to a proposed marine protected area. So originally, NOAA was looking at establishing the Northwest Straits Region of Washington. So I know you might not be familiar with this part of Washington, but it's basically North Puget Sound. So Snohomish County, North to the Canadian border, the San Juan, and along the strait of Juan de Fuca as an area that they were looking to establish a National Marine sanctuary, similar to what they have on the Olympic coast of Washington. And when that was proposed, there was a lot of pushback from local communities and tribes in terms of something that was top down, federally managed, felt disconnected from community needs, so many people that live in the area. And so Senator Murray, who was our senator then, and still our Senator now, along with Representative Metcalf at the time, said, let's take a look at alternatives for marine conservation that are a little more bottom up. And so after, there's reports on our website that I can direct you to if you're curious, but essentially they found a model that already existed in San Juan County and decided to replicate it in the seven counties that are the same footprint of what would've been a national protected area. And so all seven counties essentially have something that's called a Marine Resources Committee or MRC as we abbreviate them. They are residents that are appointed by their county government to both be an advisory body on marine resources issues, but they also have funds to do on the ground projects. Lead on the ground projects themselves. So it's really a way to have bottom up, community driven prioritization and actually implementation of marine resource conservation issues. And then the Northwest Strait Commission where I work, we're essentially the regional coordinating body across all seven marine resources committees. So we provide funding for all of them. They have a staff person. Some actually have two now, which is a major improvement. And I started, most of them had just halftime, FTE per MRC, and they were all losing, pulling out their hair. So, we fund them, we fund their projects. And then my role in particular is technical advising and connecting to regional partners across Washington, Salish Sea. And so we both funding and technical support. And that's really kind of the long and short of our organization. So it's really community driven, marine conservation. Where the different communities have a lot of different issues and have different priorities and different ways of approaching things. But we also, because we have this broader connection, have the ability to really share ideas across the region as well. And then when there's things that are of regional interest, so multiple MRCs want to get engaged, that's where me and the staff that I manage in the marine program will take more of a hands-on role in project management and bringing in partners. So things like, I'll give you some project examples. So they work in a broad area besides advisory. They'll do things like education and outreach, community engagement. So they'll do searching for seaweed beach walks to teach residents how to sustainably harvest seaweed or sustainably harvest shellfish, or they'll do events that are place-based community engagement opportunities, like a Fidalgo Bay Day celebration that happens in Anacortes near where you are right now. They also do a lot of monitoring, so participate in community science, forage fish monitoring, bull kelp surveys that are done by Kayak. Pigeon guillemot. So a lot of different citizen science programs that happen that are run through our MRCs and their volunteers. And then they'll also take on restoration and conservation initiatives. And those can kind of vary from partnering with a nonprofit partner that we have that does shoreline restoration. So they'll do help with site selection and things like that. And then conservation approaches, they'll do things like write stewardship plans for certain areas in San Juan County, or there's one in, that's a crossover between island and Snohomish County off of Camino Island. And another thing they do is voluntary, no anchor zones, so eelgrass protection from boat anchoring. So again, voluntary approaches to prevention, preventative measures to protect eelgrass from anchor scour. So things like that are kind of really all this. A big example of community led initiatives for marine conservation. So my role in that as the marine program manager had been in this job for almost six years, and it's a mix of going to all the different MRC meetings, building individual partnerships and relationships and trust with the members, understanding the different priorities of the different MRCs. And I do my best to try and connect all of their different work. We're essentially like an amplifier to something that they're running with, to connect to state agencies or tribes or academia and things like that to really make sure that the work they're doing is linked in and relevant or also know, “Hey, this other MRCs already tried that. Look at this report or talk to this person and learn from each other”. I also chair -or not chair -in the staff coordinator for our science advisory committee, and they support all of the MRCs and project development as best they can. Topical symposium kind of engagement. And then, like I said, we have three project staff that I help oversee in the marine program. So those are for regional projects, derelict vessel removal and prevention measures, bull kelp monitoring by kayak. We wrote- co-developed with partners across Washington, the Puget Sound Kelp Conservation and Recovery Plan. We also have staff that are working on European green crab trapping and removal in a number of areas. So it's a big mix of topics. I often say I'm kind of an inch deep and a mile wide in things, so I don't specialize in anything.

**Interviewer:** My research is very interdisciplinary. So yeah, I always say I'm hard to be an expert in one thing when you do so many different things. Yeah. Okay. That was super, super helpful. Thank you.

**BD064:** It was also a lot, so please, ask questions

**Interviewer:** Yeah, I was going to ask, so how are the community members in the MRCs, I'm sorry, what was the name of the one or two people? They’re staff at the MRC, is that correct? So do they usually have a science background or how does that person come about into that position?

**BD064:** That's a mix. So even though we fund them, they're hired through the county and each county has the MRC housed in different departments. And so it's pretty varied and we don't have any say in who they hire, but the MRCs will have volunteers that are part of the hiring committee. And so often I'd say the staff do have some sort of science background. I don't think it's required most of the time, but it is generally the type of people that will gravitate towards applying for those jobs. The biggest thing that is also very important that they learn by- kind of -trial by fire is project management and people management skills. A lot of it is just meeting the volunteers in there, how to focus them. Because the biggest challenge we have is all of our volunteers have big, big ideas. And turning that into a project that's doable and chewable at the scale that volunteers can implement it, and the budget we have is a big challenge. And that's where the staff person's really important. I work with them a lot and we'll feed things to our science advisory committee too. So that's really where I think the biggest need for them is. So probably science is like a secondary

**Interviewer:** That makes a lot of sense. Yeah. So how do you decide, especially with appropriate funds, how do you decide and select the projects of how to proceed forward with what the MRC will do?

**BD064:** We don't. That’s the beauty of it. All the MRCs get -all seven, MRCs get the same amount of money, and it's up to them to prioritize how, they so a portion of that, I think they get about $200,000 a year now. And depending on the county, a portion of that goes towards the staff time and the rest. But most MRCS probably have about $30,000 to $50,000 a year so that they put towards projects. And it's all up to them. That's why it's bottom up. We help them get to yes, for all of the different projects to make sure they're meeting grant requirements for federal or state funding, which is why so much of it's like back and forth project -collaborative project development where I'm basically like the bumper rails on a bowling lane of just they have the vision, they know what they want to do, we just help them break things down into small phases and keep them kind of in the lane that our funding allows us to operate in. But it's all up to them how they spend their money.

**Interviewer:** Gotcha. Okay. And can you speak to the processes within the MRCs and these counties of how they engage with the community members and how the volunteer base is built?

**BD064:** So I'm going to preface every answer I'm going to give you is; it varies in each RC. With that statement. I can give you examples in some, I'd say have more success at that than others. Skagit County, MRC. So again, the county that you're in, you're in Cortez. They have a program called Salish Sea Stewards where they do, it's something that similar to Beach Watchers, I don't know how familiar you are with a lot of Washington state.

**Interviewer:** Someone gave us this great book called We Are Puget Sound. And there was a whole list of organizations in it, and I think Beach Watchers was in it.

**BD064:** They don't operate in many of the counties in the Northwest Straits anymore because it's funding stuff like that is challenging long term. Those type of organizations. It falls through, I think they were funded through WSU extension, so it lost funding and ability to operate in Skagit County a number of years ago, like 10 or so years ago. And the MRC said, this is a big priority, so they decided to step in and fill that. So they fund it now as Salish Sea Stewards, which is they provide 40 hours of in-class training to people that sign up. And then the expectation is they then fulfill 40 hours of volunteer time annually. And they've built a massive volunteer base of people that continue to stay engaged. It's like a feeder system for not only the MRCs Projects, but also a lot of the other nonprofits in the area. And so that's an example of an MRC that has a very successful volunteer engagement branch of the MRC scope. I'd say others don't, and they struggle with it. And they have distribution lists and all their meetings, they have monthly meetings. Their meetings are open to the public. They'll do things like speaker series to try and keep community engaged, and they'll target tabling at events, but it's slower going for some of the other MRCs. And then in terms of, so one thing I missed when I was giving you the overview of the MRCs is, and again, this is different at every county, many MRCs have specific seats. So they operate by consensus, and they're actually meant to have a diversity of seats represent different viewpoints in their communities. And that structure is in each county bylaw, it's different. So many will have a recreational seat or two that's meant to represent people with recreational interests versus academic or citizen at large port and industry are often seats at the MRC as well as tribal seats. So some MRCs have kind of unspecified tribal seats. Others have specific tribal seats for each of the tribes that have UNAs in their area. And a number of them are trying to understand opportunities for youth seats now to kind of have increased engagement in youth. Because to be a volunteer on an MRC often means that you have the financial stability and are often retired to provide time as a volunteer, then looking at opportunities in terms of engaging with high school students and things for different requirements. And so getting back to your question about community engagement, the idea that they're meant to represent different viewpoints and interests and perspectives in their counties, but I'd say that's something that we've been having a lot of internal conversations about is they have their own individual viewpoints, but how are they really going back to their community to get broader buy-in and weigh in, besides from asking people to come to them and come to their meetings and voice concerns. And so we partnered with UW’s Evans School of Consulting Labs, so the policy school, and we actually did a needs assessment kind of framework test with one of our MRCs and the student consulting team and tested that with interviews. It's something that another MRC has done. So we're trying to see that initiative as a way to support the MRCs in doing a little more backend, getting feedback from their community will be something that will take off. But I'd say we're moderately okay there. They don’t have that much time for all of this, the challenge.

**Interviewer:** Yeah, sounds like a lot for sure. And we know as social scientists, we know how long and time consuming community engagement in and of itself is. So yeah. So I was looking at your website beforehand and I saw the big categories under the work of the European Green Crab and the Kelp recovery and Forage fish. So are those kind of big bins or themes that each MRC has research within or what is the structure of that framework within the MRCs?

**BD064:** So those projects that we feature on our website are mostly ones that we lead because there is regional support. I'd say green crab's a little more localized to Whatcom and Skagit County at the moment, but bull kelp monitoring six out of the seven participate. No one's required, but we really try and put staff time towards things that multiple MRCs care about. So I'd say if you're curious, what I can, I mean I can send you this, but really each MRC also has their own list, their own website, and they list all of their projects on their own websites too. So it's not like a collective massive list because we will, in terms of grant administration and funding them, my partner Sasha and I, we review all the proposals that they put in every two years for all of their projects. And there's about, I think this current two year cycle, there's 45 to 50 projects that in total across seven MRCs that are happening that they range in budgets from a hundred dollars for just gas reimbursement to get to a beach versus some might be close to 20,000 or 30,000, but most are in the 100 to $5,000 range in total for project cost. But there's a lot, so that's why they're not all listed in one place.

**Interviewer:** I see. Okay. Makes sense. Okay, very cool. Okay, so yeah, do you mind talking a little bit about some of those regional issues that are listed on the website? I guess green crabs is an example of, I haven't heard a ton about that. I know I'm from New England and I know about green crab invasions over there, so I don't know a ton about it here. So it'd be helpful for us because you're one of the first people we're actually meeting with here. So we're also really interested in these meetings of learning more about the top priorities and areas of concern in the research in the area and in the Puget Sound

**BD064:** And each of our regional projects, I feel like their origin story is a little different and not always in line. And I will say unofficially that our green crab work is something that we're discussing internally is mission drift. So I wouldn't say it's a perfect example of the number one priority that's risen to the top based on this bottom up structure. Because we aren't really, we're kind of a state agency, but not, and really with the MRCs, we don't have specific directives. And so we have this ability to be this go-to convener, but also responding to emerging issues in creative problem solving in a way that state agencies don't have that nimbleness to do. And so Green Crab's a good example there where we were approached by a fish department of Fish and Wildlife in Washington state and a nonprofit partner of ours asking for emergency support for this new emerging invasive species threat in two counties that overlap with the MRCs and they care about it. And we kind of stepped in to stick our fingers in the hole and help plug the leak for the moment. We're looking at shifting long-term as green crab as a whole is kind of shifting from emergency management. There's a declaration from the governor to starting to look at long-term invasive species strategies and planning. And so we're also in turn evaluating what our role will be going forward and really bringing it back to the community engagement piece of green crab management. I'd say in terms of site prioritization for what environments are the biggest concern for trying to manage any green crab populations, having MRCs participate in that, as well as things like blitz trapping to get big bunch of community members out in the mud. Learning about green crab is an immersive learning to imprint a little more. So things like that are kind of what we're starting to look at, but I wouldn't say emerged as a priority because of MRCs coming to us. That one.

**Interviewer:** I see, okay.

**BD064:** Every project different. A little convoluted

**Interviewer:** Okay, cool. Okay. So do you mind just talking a little bit about some of the other projects and the other priorities listed on that website? I know Kelp Recovery was one, I think, and there was a forage fish section, those kind of big bins.

**BD064:** So kelp, I think is a great meandering story to tell you about how it originated. So I think this was before my time in about 2013 or 2014, 1 of our MRC members in Island County, so on Whidbey Island just asked the question, what's happening with the bull kelp in the area? It feels like I've been seeing it decline, but I can't really figure out where there's data on it. And so they came to us, the woman that was in my position at the time, with that question, and then she kind of helped rally partnerships and funds. So we ended up working with NOAA and a Holling scholar to develop a protocol that's kayak-based monitoring for volunteers to survey the perimeter of bull kelp beds because they figured out there was a bit of a data gap in knowledge of bulk help distributions in our area. And so that turned into creating a community science protocol. And then that started a long-term monitoring effort that we still have to this day. So we have six or seven years now of data for a number of sites. So the MRCs prioritized what areas where they knew -they kind of scouted bulk kelp beds in the area. They prioritized what was one safe to access and reasonable and size, but also areas that they cared about. And so they routinely go out. And then we do a lot of the ongoing data synthesis management piece for that as well as partnering with Department of Natural Resources who now integrates our data into this. Sorry, there's so much jargon in the Puget Sound recovery world. So there's this thing called vital signs indicate that- I'm sure the human well-being must be a thing that you've been tracking. So there was a recent canopy kelp indicator that was developed as the first of its kind to be multilayered with different data sources interwoven to create one big picture of canopy trends of kelp in the states. So that's not only state-gathered aerial data, but it's also inclusive of the MRCs community science water-based data as well as indigenous knowledge all pooled together to create one indicator. So our work was getting the MRCs not only wrangled to do all the protocols and help with the data analysis, but then to leverage to make sure that their data is useful and used beyond just to them and their communities. And then I'm going to continue my rambling because of our work with NOAA and the MRC monitoring bulk kelp, we were asked by NOAA to write a Puget Sound kelp conservation and recovery plan because we aren't really regulatory agency, but have this kind of longstanding trust across a lot of partners. So the idea was could you create something collaborative? And so that's when I came into this role as we worked for almost three years on developing the Puget Sound Kelp conservation and recovery plan that was different than another kind of state agency or federal recovery plan. We basically facilitated co-creating it with a broad base of partners that there was a lot of buy-in, published it in 2020 shortly after the pandemic. And then I've continued to have a role in ongoing coordination and kind of keeping the plan alive so it's not just documentation that sits on a shelf, but is this thing that keeps that big partnership of kelp people engaged. And that's turned into legislative funding from the state for the last two bienniums as well to support us as well as partners to keep the kelp plan happening. So that's again, sort of this rambling. It all started with this volunteer saying, I feel like I've been seeing kelp decline in this area. And then it's kind of had the ability to spin up to a lot of things. And now one of my staffers is a full-time kelp person doing kelp monitoring support and kelp plan coordination where when I started it was just me.

**Interviewer:** Okay. Very cool. Okay. And one of the other ones I was really interested in was the forage fish research area.

**BD064:** So that one again predates when I joined. So my background knowledge is kind of oral history I've heard, but it has a similar individual volunteers and MRC members kind of asking questions about what we are Forage Fish are spawning with the fact that because MRCs are this known entity, and there's a lot of, I think, I don't know how unique this is to Puget Sound, but it feels like a lot of state agencies have a strong trust and value in going to MRCs for community local input. And I don't know if that's built up over time or if it's very much the feeling now. And so Department of Fish and Wildlife partnered with MRCs and then another nonprofit and said, that's a great question, let's develop a protocol. So MRCs helped actually fund getting another community science protocol developed for volunteers to go on the beach, essentially pick up gravel and sit through it to look for eggs from Sand Lance and sort Smelt and developed a protocol. And so that was very much again, at the onus of individual volunteers, sort of having those as curious questions and then us helping to support them in finding connections to partners. And it spun up into a protocol that's used across the state now, not just by our volunteers, but by their Washington conservation crews. And it's turned into, I think DFW calls it one of their longest standing complete data sets for any marine species. I think in terms of, and that's not a huge part of it is because of the volunteers that continue to engage with MRCs, at least in our region.

**Interviewer:** Yep. Interesting. Okay. Very cool. I was just looking back at the list as well from Rosa, and actually there's one other one I wanted to ask about too is the Olympia oyster restoration research or work.

**BD064:** So we have four MRCs that are working in some form or fashion on Olympia oyster restoration. The best example is right near you in Anacortes at Fidalgo Bay, and that was kind of the origin again. So we have a member who, he's been with the Skagit MRC since its inception. So he is been on the MRC for 24 years. Many other MRCs have term limits, but Skagit does not. So they all do their own thing. And so he partnered with Taylor Shellfish and a nonprofit, and they had noticed kind of a small remnant population of Olympia oysters, so native oyster species. And I think they started basically modifying putting out shells or to improve substrate for oysters to settle. And at the same time, so I don't know who led the kind of prioritization, but it became a state priority partnered with Puget Sound Restoration Fund to set this goal of restoring a hundred acres of native Olympia oyster by 2020. And so I don't think that was an MRC set goal, but then all the MRCs decided to kind of prioritize and participate. And so we coordinate with Peach Center Restoration Fund and Department of Fish and Wildlife to try and get input on methods and protocols. And so we have four MRCs that have different restoration sites that they both work on actively restoring, so in adding more substrate - cultch, seeded cultch and monitoring, but they all have, that one's a hard one to manage. Well, we don't really manage it. We mostly coordinate because they all have different restoration approaches, different partners and different monitoring protocols. So it's mostly we just try and get them to keep talking to the state agency partners to make sure that they're getting the guidance they need. But really a lot of it is that I think other MRCs saw what Skagit was doing and how well it worked. And so we have annual conferences and symposiums to make sure MRCs are highlighting to each other their different work as well as our monthly commission meetings and our newsletter. And so that's really how we work on supporting sparking ideas from each other. And I think that's how that started to happen in other counties, including in Whatcom. They're struggling, they've had a pilot project for the last seven years and can't quite figure it out. And they bring the specialist from Skagit MRC up to their site often to try and help share a lot of that knowledge.

**Interviewer:** Gotcha. Okay. Very cool. Okay, great. Thank you. That was super helpful. Are there any regional priorities or areas of concern that you all and the MRCs are working on that I missed or that aren't on the website that are important for us to know about?

**BD064:** And so when you say regional areas, you don't mean geography, you mean things really, Marine conservation?

**Interviewer:** Yeah, yeah, yeah, exactly. Yeah. Marine conservation priorities. Yeah,

**BD064:** I'd say something that's been emerging a lot and talked about is recreational boating pressures. So it's being spearheaded a lot by discussions or being spearheaded by San Juan MRC, which makes sense because that’s the biggest kind of hub for boating. And how that kind of trickles down into impacts for the marine environment, so eelgrass anchoring, but also impacts on southern resident killer whales. And water quality and so i’d say that's starting to be talked about in other counties too, and somewhat linked would be oil spill prevention and so big things that they talk about but aren’t really project scale. Separate from climate change which is always climate resiliency they always talk about what that means at the local level. I’d say that the idea of increases in shipping that might be happening because of the Roberts Bay terminal in DC, and potential implications for oil spills or things that come up. It's more of the advisory piece that aren't specific projects but they’re resource management issues that get talked about across MRC’s. And aren’t reflected in our project list.

**Interviewer:** I see, that’s really helpful. So I was going to share some more background on our project and then ask you more questions about biodiversity and biodiversity management specifically I was going to see if Lucas was going to join because I was looking at the clock and I was like, oh, it'd be perfect timing, but maybe I'll just jump in and then Yeah, we'll see him on

**BD064:** Yeah, we’ll see him on

**Interviewer:** Okay, cool. Yeah, so like I said in the email, so the really high level goal of this project is to understand what aspects of coastal and marine biodiversity are important for community members. What components of biodiversity do they value, care about, and rely on for different ecosystem services. And then to understand from resource managers and researchers what aspects of marine biodiversity they're thinking about when they make decisions or when they make their research plans. And understanding if those two things align, are our resource managers thinking about the same components of biodiversity that community members rely on and value. And then ultimately, we want to understand if and how marine biodiversity is currently directly or indirectly considered in management and policy and what approaches are needed in the future to better do so and to make sure that we're managing again those components, biodiversity that community members rely on. So those are very high level goals, but we're taking a case study approach to look at three different study systems. And so we have with three case studies, this is our third and final, so we've already completed one down in Mobile, Alabama for the Northern Gulf of Mexico, and then we just did one in the Chesapeake Bay by the Smithsonian where I am. And then Puget Sound is our third and final case study. And so to address those research questions, we're doing individual interviews and meetings with folks like you and other community members, and then we're convening community members, researchers and managers together in workshops to look at trade-offs of different management approaches for different stakeholders and different community members. And so one thing that we've heard time and time again in this project is that biodiversity means different things to different people. And so I'm wondering from your perspective and from your work, what you think about when you think about biodiversity and if it's something that comes up in your work and something that's considered in these regional priorities that we were talking about.

**BD064:** That's probably the first point or question I was going to make was could you define it and are you defining it for the group? I would say often like ocean acidification or climate resilience, biodiversity is probably a co-benefit, but not the target priority for the things we do or what the MRCs prioritize. It's also similar to cumulative effects, I'd say is something that everyone talks about more than biodiversity, but I lump them in the same category and it's just so broad and it's kind of a how do you break that down into small, local, approachable things. And so I think often, but then at the same time, you might feel siloed. So if we're focusing on people approach kelp and are looking at kelp diversity even within across different species, the approach is the focus is kelp and the priority is kelp with this understanding that the co-benefit of conserving and protecting diverse kelp populations will support biodiversity, but the goal wasn't biodiversity. That makes sense. So that's what I'd say is it's not forefront in most people's minds. I think it would be a hard thing to have them focus on as a let's approach a project specifically for the outcome of increasing biodiversity or conserving biodiversity. Did I answer your full question?

**Interviewer:** No, that was perfect. And that leads great into my next question because one thing, exactly how you were just describing it is there are so many different components within marine biodiversity. And so our team has come up with a framework for trying to conceptualize what those key components are. And I see interviewer 2's going to put them in the chat for me. Thank you, interviewer 2. And so those four, one of them is habitat forming species. When you just gave this great example of kelp as being a component of biodiversity. One is species of conservation concern, harmful organisms and key food web supporting species. So I think I probably already know this answer because when you were talking about the priorities, you're kind of going through a lot of these bins, but I'm wondering if this framework resonates with you and makes sense and aligns with the work that you're doing, and if there are any changes that you would make to it.

**BD064:** No, I think that, I mean, I guess I have to think, I'd have to sit with it a little bit longer to see if I felt like there were things that were missing. But I think reading all of those, they make sense to me and seem logical and I can think through all of the projects and that we have and things that our MRCs are doing and very much feel like I can fit them into different buckets.

**Interviewer:** Yep. Okay. Perfect. Yeah, I mean, I think the priorities on your website and what we just talked through fit really, really well within this framework. So I was excited when I was reading before this meeting, I was like, okay, I think we could basically put this framework on top of the research that you're doing. Okay. Very cool. And so then to kind of jump to the management side, and I know a lot of your research is more like community-based coordination and research, but from your perspective here in the Puget Sound, do you think that these components of biodiversity are currently considered in marine resource management here in the Puget Sound?

**BD064:** I think they are to a degree. And so what's coming to mind, and again, this is different. I feel like the priorities are a little different is a lot of it's habitat, physical habitat itself. So I know kelp and eel grass are good examples of habitat forming species, but often it's the water quality and shoreline piece, the physical processes that support biodiversity, I'd say is a much bigger priority that I feel like is what drives people more than the critters or the biodiversity itself.

**Interviewer:** Okay. So are there management approaches that you think are needed to better manage for biodiversity or for these specific components in that framework that we just talked through?

**BD064:** I mean, the biggest challenge that you probably hear everywhere is everything's siloed and disjointed. So there's not something that's looking at these different lenses, but I'm thinking through, well, who would be in charge of that piece versus this piece? And they're all in different rooms and different areas doing different things. And so that I'd say would be the biggest barrier.

**Interviewer:** okay. Yeah, we've heard that very consistently. So then you were just talking about, you just mentioned water quality, and I'm laughing because in my notes it just auto corrected to water equality, which would be a fun thing. What are the other core stressors that are impacting biodiversity and the other components of the Puget Sound ecosystem?

**BD064:** So water quality. When I say water quality, that would be inclusive of temperature as well as things like oxygen. That's a massive one and probably the hardest one to manage that we've found because it's just there's so much non-point source level things that are tricky. And I've been learning a lot about the management mechanisms through a lot of our kelp work separately. Again, the things that come up a lot is Washington has a really backwards way of managing shorelines and tideland ownership, and I don't think they can quite change from it, but there's a lot of private property and the need for -people's perceived need for protection by building hard armor. And so that's the other thing that I think has a lot of trickle down or cumulative impacts as well as, I mean, we talk a lot about, I would say this is not big, but it's big in terms of eelgrass and kelp in the areas that we work would be over water structures, particularly private property over water structures. Department of Fish and Wildlife specifically has a mandate to not look at cumulative impacts when they assess every single different permit that comes through, which I get it, it makes sense because this guy now down the street already has a dock. Why can't I have a dock through the same lens of permitting that he went through 50 years ago versus now? Stuff like that. So I'd say that's the biggest challenge is. I'm getting on a tangent. I'm trying to think. I need to think, I feel like I'm trying to pull myself out of the areas that I've spent so much time focusing on and think bigger picture. But I'd say those are the things we come across a lot is individual fragmented private property parcel management, and that includes then individual septic systems, which feeds back to water quality, but it comes down to the individual people that all own bits of land across Puget sound.

**Interviewer:** Yep. Okay. And that leads great into my last question, and also I meant to follow up before you were talking about, I don't remember if it was called an advisory board within the MRCs, but you were mentioning that they make sure to have representation from different stakeholders and areas of interest like industry and recreational representatives. And I was wondering if you could speak a little bit more to that. And the overarching question that we were curious about is who are the core stakeholders in the Puget Sound that are impacted by this biodiversity, and what are the ecosystem services that community members really value and rely on?

**BD064:** So it varies by MRC. That just falls out of my mouth every time I answer questions. So in general, it's the Marine Resources Committee. So each county's committee has these different delegated or designated seats or voices that they try and fill or most do. Some do not. So yeah, I feel like that's a big question. So I will answer only from those seats that I view these in. It's shellfish growers in terms of specific industry and ports are probably the biggest industry pieces. There's some commercial fishing that happens in Puget Sound, but I think it's a lot of it's outside more. They're not as strong of a voice outside of shellfish. Growing tribes are really key, but they aren't referred to as stakeholders, but they're really key voice. So in terms of, there's a lot of subsets of recreation that we've worked across between recreational boaters certainly, and there's all sorts of different subgroups within that. Diving communities often, diving in kind of, I guess, non-motorized water sports are another big recreational voice that we get a lot of thoughts and opinions from, and a lot of them overlap with the MRC members. And then are you, I'm trying to think through, you're saying residential community voices and not partners that work that paid roles where we come across people, right?

**Interviewer:** Yeah, I was asking more I would say about the residential community members.

**BD064:** Yeah, I'd say those aside. Then there's just a lot of, then the rest of it I'd say is people that there's a lot of strong sense of place varying from people. So people that have had multi-generational home, multi-generations living in one property and kind of the, there's a lot of just strong spots, conservation and Puget sound health and sense of place, I'd say in the area versus the transplants for newer people, it's definitely different.

**Interviewer:** Yeah. Okay. Cool. Okay, amazing. So those were all of the core questions that we want to go through with you, interviewer 2. What? Oh, wow. You got a lot going on there. Okay. Yeah. Do you want to share your screen, interviewer 2?

**Interviewer 2:** Great. Okay. So while you've been talking, I have put together a model of essentially how you view the system. I've tried to keep it as clean as possible with as few overlaps in the model, but it gets kind of crazy after a certain point. So basically, just to orient you, all of these concepts are like things you've said. So there's management plans here. There's specific species, there's the MRCs, which are kind of the hot topic of this conversation. And each of those things can impact other concepts in the system. So if there's a blue arrow pointing to something, it means, for example, MRCs increased or positively impacted long-term monitoring, and then going the other way. An orange arrow means that that concept has a negative impact or decreases something else. So recreational boating down here in the bottom has a negative impact on eelgrass. So I can talk through this a little more. I am showing you now to make sure that this kind of resonates with what you've been saying. And then with the extra time that we have, I have a couple of, I guess questions or some concepts at the bottom that we can try to loop in here. But before I ask anything, does this make sense? Do you want me to explain a little bit more in depth about some of this stuff?

**BD064:** That makes sense. It's just I'm amazed how many keywords you've picked up on. Well, seeded cultch, with a C, C-U-L-T-C-H. It's basically it's specific place specific oyster shell that then has seeded larvae on 'em of Olympia oysters that they can then put out. I'd also argue that water quality, the way I was talking, thinking about it, would also be a negative depending on the trend of the direction that temperature and oxygen and other things are going. But it could have, it paused. I guess I'm curious about things that I'm listing as both a stressor and a thing to improve. Right. Reflecting as either orange or Blue.

**Interviewer 2:** Right. So when you initially mentioned water quality, I perceive this as clarity, but then you mentioned later that it includes temperature and oxygen. So I can either flip it or we can separate that out and say sometimes the clarity is a good thing, but then increasing temperatures is bad.

**BD064:**I think we don't want to get in an exercise of splitting out the different components of water quality. I guess you could probably just phrase it as good water quality versus declining water quality is when if you wrote it as declining water quality, then it would be a negative. Right. Okay.

**Interviewer 2:** So where do we want to start here? Okay. So one of the last things I added was some of the most important groups like community members or stakeholders that are important and are affected by a lot of things in the system. And so down here those are the shellfish growers, diving or non-motorized water sports, tribal groups, and ports. Some of this might be kind of obvious, but where do these groups fit into this system? What are, are they affected by most?

**BD064:** I think ports is the only straightforward one with the shipping terminal development down at the bottom. Tribes are everything. Sorry. I think that just having positive biodiversity supports tribes in their recreational first foods and commercial fishing and the co-management they're entitled to in Washington diving and non-motorized sports. I think that, and probably shellfish growers also just positively benefit directly from good biodiversity. I wouldn't put them as a subset that one of the other various things I blurted out,

**Interviewer 2:** We kind of clean this up a little bit. And then we have this little kind of terminal development thread with ports and shipping and more development of these ports requires more oil spill prevention. But I am not sure how that fits in with everything else.

**BD064:** Yeah, it doesn't really, it's part of the biggest challenge like Chesapeake Bay, it's kind of a semi enclosed water body with an increasing population and economics happening. And really the challenge is it doesn't fit super well because the people management population piece isn't really in here besides that little subset. And there's certainly a lot more, but I think it's more of if you were trying to fill out having stressors all much more clearly outlined, that's probably where they'd all make connections to things. helps. Okay. But you are also welcome to just remove it because it is like an island. And I'd say overall, all the other things, it's not a huge priority, but

**Interviewer 2:** Okay. Do you want to just take it out? Yeah. Okay. Okay. It's gone.

**BD064:** Okay. I mean, that was really all the clarifying questions that I had. I don't know how closely you've looked at this. Do you see anything that we need to address?

**Interviewer 2:** No, no. I mean, I think this makes, looks great to me.

**BD064:** You don't view these as complete from our different perspectives. This is sort of like an initial rattled off brainstorm?

**Interviewer:** Yeah, I can give a little bit more back. So we have been doing these individual interviews, meetings and building these initial mental models is what we call this. It's like a mental model of how you see the system and work that you do. But then that's really the core focus of the project is to run these workshops where we use this tool collaboratively with managers, researchers, practitioners, and community members to develop more holistic perspective that encompasses all these different values and knowledge sources. And then, like I said before, the final core goal of the project is to help build some sort of decision support tool that looks at management interventions and approaches that are needed in the future. And so what we can do with this tool, which is really cool, is because we have these positive negative relationships between system components, we can look at trade-offs or potential consequences of different management interventions and see if we were to implement one approach, what would it impact in the system and who would it impact in the system? And so that's what we'll do in our workshop in October that I mentioned in the email. Cool. Okay. Awesome. Thank you Sarah. Okay, well in our last four minutes, I was just going to ask, with your knowledge of community members and the MRCs, definitely finding community members to engage with is probably the most challenging aspect for us. So I was wondering if you had any suggestions of specific people or areas to start to engage with some of these community members that we could meet with and talk with about some of these topics?

**BD064:** Yeah, I would say so, at least for the MRCs, the best way to, especially since you have some time before October, and you can do sort of a varied approach, but often presenting, asking the MRC staff and I can send you an email with all of their contacts. If you could have some time on the agenda to introduce yourselves and talk about the project. And then you could either flag the October workshop to see if there's any select individuals that would like to attend, or if they wanted to hold a smaller group meeting with you. Really that's the best way to go about the MRCs. And they would also, if you're on the agenda that again, they're open public meetings, so those would be notified to others. So that is the best way to work with MRCs, I would say. I can also, if you don't have time to go to all or many or any of their monthly meetings, if you have an email draft that you can send me, I can share it to all of the staffers and they would distribute it to all of their members. So that's also totally an option if you want to Share this to advertise the workshop. But if you're looking to target different individuals, I'd rather let them self select than try and target different individuals.

**Interviewer:** Yeah, that would be great. Are there meetings? They have calendars on their websites where we could see when the meetings are and if they happen to be while we're here?

**BD064:** They should be listed on their calendars. They all operate on a Whatcom’s first Thursday of every month from five to seven, and Snohomish is the third Wednesday. So they all have that. That's how they're reoccurring. I sent this email a number of times to people, I don't know if I normally specified what there is, but each MRC's website should, I'm just going to pull one up at random and make sure that they actually are doing this. They should be listed on their calendar for... Island MRC is not doing it. They're supposed to. I can always try and include a note sometimes probably. Sometimes they'll take one month off in the summer. All the field work communication's happening makes, and that might be why they don't have an August one listed or it's in about us. They're not in straightforward places. I will in my email, write up what they're in theory doing for their reoccurring time as well as the staff contact to ask. And again, the best way to approach them is ask if they.. a little bit about your project and ask if they would be willing to give 15 to 20 minutes of their agenda time.

**Interviewer:** Yep. Okay. Awesome. Thank you so much. I appreciate that. And then also, if you have availability and are interested, we would love to have you at the workshop as well if you'd like to come. I think I probably sent the email. It's October 28th and 29th, which is still a ways away, but we're kind of trying to get our participant list ready this summer if you're interested. And I can follow up with more details later on.

**BD064:** Yeah, more details will be good. I can flag it in my calendar now. I think knowing where it is would help.

**Interviewer:** It's going to be at UW in Seattle.

**BD064:** Okay. And then are both days required? I'm asking mostly from a childcare perspective.

**Interviewer:** No, definitely not. Whatever time you can provide is appreciated for sure. Yeah. Okay. Awesome. Well, thank you so much for your time. We super appreciate it. This was really helpful. So thank you again.