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BD035

**Interviewer 1:** Um, ok. So I know a bit about what you do from your lab website, but to start I was hoping you could tell me a little bit about your background and your area of expertise, and your current research projects.

**BD035:** Um, so our, my background is I got - Steven and I were in grad school together. So, I got my bachelors in Marine Bio and my grad degree is in Marine Science from South Alabama and Dauphin Island Sea Lab. And when I was in school, my focus was mostly on like wetland restoration and wetland ecology - coastal wetland in particular. And now, moving over into what our group does, I would say the majority of it is shoreline restoration and protection work, we do have some oyster reef restoration and conservation projects, and then we also have a decent amount of marine debris and litter work. And all of that involves applied research as well as education and outreach activities. Let me know if you need more detail than that, I could talk 3 hours about this stuff. I’ll spare you.

**Interviewer 1:** Yeah, that’s great. We can stop there, and then if you can expand as we go through the other questions, that would be great.

**BD035:** Ok.

**Interviewer 1:** Ok. So, one thing that we’ve learned from the project thus far is that the term biodiversity itself means different things to different people. And of course it can be measured in multiple different ways. And so, super broad question as a starting point - we’re wondering what you think about when you think about biodiversity? And what you see as the key aspects of it.

**BD035:** Uh, when we say the term biodiversity I’m just thinking about, well, from a manager’s perspective, it means increasing the number of species that are present in some area. That aren’t invasive. I mean, that’s generally what I think of when I think of diversity or biodiversity.

**Interviewer 1:** Ok, great. So, for part of the project we’re building a framework for marine biodiversity and so we’ve come up with 4 bins to help conceptualize that term, and so we’re wondering if you agree if those are the key components of biodiversity.

**BD035:** Could I ask you to define what you mean by marine biodiversity? Or are you talking about coastal, or near-shore, or off-shore, or what kind of context there?

**Interviewer 1:** Yeah, we’re including coastal - so yeah. Coastal and marine biodiversity. Including estuaries and coastal habitats for sure.

**BD035:** Ok. Perfect.

**Interviewer 2:** Ok. So, those terms are habitat forming species, species of conservation concern, key food-web supporting species, and harmful organisms. So we’re wondering if you agree that that conceptualized marine and coastal biodiversity or if there’s anything you would change about it.

**BD035:** Um, I don’t think so. The first one and third one seem like they overlap probably a good bit. But that would be it. I don’t disagree with them.

**Interviewer 1:** Ok, overlap. Ok. Ok, great. And do you consider, I can take a guess at this answer based on your area of expertise but, do you consider these four components of marine and coastal biodiversity in your own research and if so how?

**BD035:** Yeah, yeah I mean, particularly for the first one. What was that one, foundation species?

**Interviewer 1:** Habitat forming species, yeah.

**BD035:** Habitat forming, yeah. Particularly that one.

**Interviewer 1:** Ok.

**BD035:** But yeah, how we do it is through not only the applied research, but through the outreach work that we’re trying to work with property owners to make the best decisions possible when managing their shorelines. So, with wetland restoration, we haven’t done this much on that front, with the oyster reefs, but I see it coming once we’ve learned a little bit more about how to best design reefs.

**Interviewer 1:** Ok. Ok, great. Um, so yeah. You just started to answer, but a core part of the project is understanding if and how we manage marine and coastal biodiversity and US marine coastal management. So I’m wondering if you think that we do manage for biodiversity, in particular for these 4 components, and if so what do you do for that?

**BD035:** Um, with living shorelines sometimes, I don’t know if, like form the regulatory stance or the natural resource management stance, if it comes to the like the ‘well we need marsh, so here’s marsh’. As far as your other components, your 4 descriptors about biodiversity, I think Fish and Wildlife Service probably does the most of that through like species specific conservation work. Whether it be the beach mouse, although I guess that would - would something like a beach mouse fall into the category for this type of work? Or you would make it like in-water.

**Interviewer 1:** Um, no, I would include that at this stage.

**BD035:** Ok. So beach mouse, grains, that kind of stuff, that’s mostly managed by Fish and Wildlife Service work and that’s where they’re trying to make the conditions as good as possible for that one species. Which also has a lot of side benefits as well, for a lot of other species. So I would - like as far as thing about biodiversity, that’s some of the only things I could think of that are truly biodiversity based initiatives.

**Interviewer 1:** Yeah, ok. And are there approaches that you would like to see or that you would need to better manage coastal biodiversity?

**BD035:** Um, I mean I do think a lot of the research - I mean I’m a little biased, but I think a lot of the oyster reef research going on in our group and a lot of other groups, like helps particularly with the near-shore biodiversity in areas where it hasn't been easy to establish oyster reefs. So yeah, that would be it. Is trying to figure that out. And the studies in particular I’m talking about are trying to design reefs that are a little bit more resilient to predators, and also having a better understanding of the distribution of oyster reef predators that already exist.

**Interviewer 1:** Right, ok. Ok. Um, ok. So, thinking locally in your study system. Are there current stressors that are impacting biodiversity?

**BD035:** Development would be number one. Like the first thing that came into my mind was shoreline development. You know, big bulkheads and things like that. That’s a big one for any of the near-shore slash intertidal area. Once you get upland also, it’s also mostly development based as well. I think if you fast-forward four more years, ocean acidification will be a big one once it comes to ocean biodiversity. Particularly for shell-forming organisms, things like that. But that’s what came to mind.

**Interviewer 1:** Ok. Um, ok. And in your study system, what specific ecosystem services rely on, and stakeholders, rely on your biodiversity system.

**BD035:** Um, for the shoreline work it would be a lot of different things. But I would say predominantly nutrient removal, cleaning water quality, and providing habitat particularly for fisheries dependent or fisheries based organisms.

**Interviewer 1:** Ok. Will you, and I apologize if I’ve already said this. But will you - so I know you’re at Mississippi State, right. And Mississippi Sea Grant.

**BD035:** Yeah.

**Interviewer 1:** So is most of your work local to Mississippi, or what is your study area?

**BD035:** Um, most of it is Mississippi, Alabama, and Florida, so pretty much like, all of Mississippi all the way over to Panama City, Florida. That’s our routine area.

**Interviewer 1:** Ok. So I know you’re driving, are you calling in from a phone or can you see a screen? Or are you actively driving right now?

**BD035:** I’m actively driving but I can see your screen.

**Interviewer 1:** Ok. I don’t want to cause a car crash during…

**BD035:** If we hear we’re in a car crash, just say we’re in Texas somewhere.

**Interviewer 1:** I don’t want - I don’t need Steven calling me after this.

**BD035:** Yeah.

**Interviewer 1:** Ok.

**BD035:** It’s good, it’s pretty low traffic right now.

**Interviewer 1:** Ok, well. Sarah’s going to share her screen, but I’m going to encourage you not to look at it. I will look at it. To help facilitate the rest of the interview. For liability’s sake.

**BD035:** Good luck on this transcription.

**Interviewer 1:** Yeah, I’m thinking of the same thing. I’m like, oh, I don’t think the government would appreciate this. Ok, [Interviewer 2] do you want to talk through… ok, wait I’ll back up. [BD035] are you familiar with the tool Mental Modeling that Steven’s group uses a lot?

**BD035:** Yep.

**Interviewer 1:** Ok, great. So we’re using Mental Modeler in this project to try and build mental models of how experts like yourself thing about biodiversity. So while we’ve been chatting the last 15 minutes or so, [Interviewer 2]’s been building a concept list. To build a mental model. And then, for the remainder of this interview I’m hoping to build out any of the relationships you see between these components. Um, so [Interviewer 2] do you want to just like, talk through the concepts that are on the map right now?

**Interviewer 2:** Yeah, so the center concepts in gray are those bins that we’ve identified as the key aspects of biodiversity. Uh, the orange concept is what you, [BD035], think of when you’re thinking about marine biodiversity. The blue concepts on the bottom left are ways that we currently manage biodiversity or how we could incorporate that better into management, so mostly restoration. The pink are stressors, and then the yellow concepts in the top right are ecosystem services.

**Interviewer 1:** Do you want to actually read through the concepts [Interviewer 2]?

**BD035:** Sounds good.

**Interviewer 1:** Oh shoot. I was going to say -

**Interviewer 2:** [Interviewer 1] you were muted.

**Interviewer 1:** Sorry I was going to say, do you want to maybe - I feel like it might be helpful if you actually read the concepts out. Since he’s driving, in case you can’t actually read them.

**BD035:** Yeah, the text is pretty small.

**Interviewer 2:** Um, yeah. So the orange concept is number of native species present. The blue management concepts are habitat restoration, single species management slash conservation, and more resilient oyster reef development. The stressors that you mentioned are shoreline development and ocean acidification. And then the ecosystem services are nutrient removal, improving water quality, and improving habitat for fisheries species.

**Interviewer 1:** Ok so -

**BD035:** It sounds like our conversation so I think you captured it good.

**Interviewer 1:** Perfectly! Ok, great.

**Interviewer 2:** Sweet.

**Interviewer 1:** Love it. Um, ok. So, I’m going to do my best to talk through this, assuming that you can’t really see it. Um, so bear with me. Um, so what we’ll do - I mean it sounds like you already know about mental modeler so that’s great, but how I’m going to ask is if one concept was to increase, how would that impact the rest of the system as we have it drawn. Um, so I think a good one to start with is number of native species present, which is your biodiversity definition. So, essentially if biodiversity was to increase, would that impact the other things that we’ve talked about? Um, so maybe to start with, the other core components of biodiversity. So habitat forming species, key food-web supporting species, harmful organisms, or species of conservation concern.

**BD035:** Uh, I think that would increase all of those.

**Interviewer 1:** Ok. And so, as you probably know with mental modeler, we can assign relative weights to each relationship. If possible, just assessing the relationships are driving the system dynamics most, and so, if you can, and it’s ok if you can’t, assign a weight to those relationships. So, I’m just going to ask if a relationship has a low, medium, or high impact on the other component. So if we increase biodiversity, would that have a low medium or high impact on harmful organisms.

**BD035:** Ok, let me clarify - I want to clarify when I’m thinking about increasing the number of species, I probably should’ve said like that that meant the native founds that are here. Like when I think about going over the number threshold of number species, it’s probably due to things like climate change or invasions or introductions of species from somewhere else. So, it’s like a, I don’t know how I would word that, but probably increased number of native species, I guess, would be a better way to word it. But, yeah.

**Interviewer 1:** Ok, great.

**BD035:** That’s why I said, you know, increase all those other things. In my head I’m thinking if we increase a species through a natural, well, maybe it isn’t that. Through causes that aren’t a direct - well, I’m blanking here. But like climate change, range expansion of certain organisms, that can not be a good think. You know, that’s why I think it would lead to more species of concern to manage for and things like that. But yeah, we can go through and rank that, I just wanted to clarify and let y’all know kind of what was in my head before we went too far.

**Interviewer 1:** No, that makes a lot of sense. And we can add, like, range expansions if you think that’s key. We can add that as a concept too, or not. Whatever you think is best.

**BD035:** I think it’s probably captured with what’s here, I just don’t know if everybody else will think about it in the same way.

**Interviewer 1:** Ok, yeah we can just make a note of that then. Ok, so if we’re rephrasing our biodiversity as number of native species, if that was to increase, would that increase or decrease harmful organisms in the system?

**BD035:** I think that would decrease, if you frame it as native species.

**Interviewer 1:** Ok, great. So I think that rephrasing that helps capture that. Is that, do you think that’s good?

**BD035:** Are you asking me?

**Interviewer 1:** Yes, yeah. Does that capture what you’re saying?

**BD035:** Yeah, adding the native species really helps.

**Interviewer 1:** Ok. And then, do you think that you can assign weights to those four relationships of which have a low, medium, or high impact?

**BD035:** Ok, yeah, if you can just read them to me i’ll tell you low, medium, or high.

**Interviewer 1:** Yep. So if you increase the number of native species, would that have a low, medium, or high impact on increasing habitat forming species?

**BD035:** Uh, medium.

**Interviewer 1:** Medium, ok. And then what about on species of conservation concern. Increasing the native species to species of conservation concern.

**BD035:** Oh, actually I think that would decrease now. We reframed it for native species.

**Interviewer 2:** Ok.

**BD035:** Yeah, I would say they decrease. Probably medium as well.

**Interviewer 1:** Ok, and then what about on key food-web supporting species.

**BD035:** Mm, I think that one would be high increase.

**Interviewer 2:** And then, what about on harmful organisms.

**BD035:** Oh, low decrease.

**Interviewer 1:** Low decrease, ok. So then, if we increase the number of native species in the system, would that impact any of the stressors? So we had nutrient removal, improving water quality, and improving habitats of fishery species.

**Interviewer 2:** That’s ecosystem services.

**Interviewer 1:** Oh, I’m sorry. That’s what I meant, I’m sorry, yes. Thank you.

**BD035:** So you want me to do like, high or low, and assign weights to it as well?

**Interviewer 1:** Yeah, that would be great.

**BD035:** Alright, just name one and then I’ll give you an increase, high, medium, or low.

**Interviewer 1:** Alright. Nutrient removal.

**BD035:** Uh, increase high.

**Interviewer 1:** Ok. Improving water quality.

**BD035:** Increase medium.

**Interviewer 1:** And, habitat for fisheries species.

**BD035:** Increase high.

**Interviewer 1:** Um, ok. So now, onto the stressors. How would increasing number of native species impact ocean acidification?

**BD035:** Um, I - can you just do neutral, like not increase or decrease?

**Interviewer 1:** Mhm. Yeah, we can just -

**BD035:** Yeah, I think that one’s just neutral.

**Interviewer 1:** Ok. And then, what about on shoreline development?

**BD035:** Increasing native?

**Interviewer 1:** Yes.

**BD035:** Well, I’m thinking about what relationship I want it to be. Now we’re supposed to thinking about it like the stressors, is it the other way around?

**Interviewer 1:** Yeah, well I’m asking if you increase the number of native species, does that impact shoreline development? But we, relationships can be bidirectional and eventually we would get there, but it’s honestly faster if you think about it now, we can draw it now.

**BD035:** Yeah, yeah. I would say increase low.

**Interviewer 1:** Ok. From native species impacting shoreline development? Or shoreline development impacting native species?

**BD035:** The first way. If you flip it around the other way, I think it’s increase high.

**Interviewer 1:** Ok. And would that be a positive or negative? So if you increase shoreline development, would that have a positive or negative impact on the number of native species?

**BD035:** Positive.

**Interviewer 1:** Positive. Ok. So then, our management concepts. So we have habitat restoration, um, single species management, and more resilient oyster reef development. So if you increase the number of species, does that have an impact on any of the management approaches?

**BD035:** Yeah, list them off again.

**Interviewer 1:** Yeah. So we have habitat restoration first.

**BD035:** Uh, positively medium.

**Interviewer 1:** And then, um, would increasing the number of native species increase the single species management decisions?

**BD035:** Yeah, I think that would be positively leaning as well.

**Interviewer 1:** Ok. And then, would it impact more resilient oyster reef development?

**BD035:** I think that’s a neutral.

**Interviewer 1:** Ok. So then, now maybe let’s go to the other marine biodiversity concepts. So if you increased habitat forming species, would that impact the number of native species?

**BD035:** Yeah, I would say positively.

**Interviewer 1:** And then, would increasing habitat forming species impact species of conservation concern?

**BD035:** No, I think that would be negative low.

**Interviewer 1:** Ok. Um, key food-web supporting species?

**BD035:** Could you repeat that?

**Interviewer 1:** Yep, would increasing habitat forming species impact key food-web supporting species.

**BD035:** Yeah, positive impact.

**Interviewer 1:** Positive, right. And then, would increasing habitat forming species impact harmful organisms?

**BD035:** Uh, negative low.

**Interviewer 1:** Negative low, ok. Um, ok. And then back to the ecosystem services. So, do habitat forming species impact nutrient removal?

**BD035:** Habitat - yeah. So positive high.

**Interviewer 1:** And then to they impact water quality?

**BD035:** Positive mid.

**Interviewer 1:** Ok. And do they impact habitat for fishery species.

**BD035:** Positive high.

**Interviewer 1:** Do they impact either of our stressors? OA or shoreline development.

**BD035:** Um, no. I don’t think so.

**Interviewer 1:** Ok. And do they impact any of our management approaches. Habitat restoration.

**BD035:** Yes, I would say positive mid on that.

**Interviewer 1:** Ok. Do they impact single species management?

**BD035:** I would say positive low.

**Interviewer 1:** Ok. And, do they impact more resilient oyster reef development?

**BD035:** Positive low.

**Interviewer 1:** So then, key food-web supporting species. If we increase that - so i’m going to ask you if we increase key food-web supporting species and we’ll go through all the other concepts again. Um, number of native species.

**BD035:** Positive high.

**Interviewer 1:** Ok. Harmful organisms.

**BD035:** Negative low.

**Interviewer 1:** Habitat forming species.

**BD035:** Positive high.

**Interviewer 1:** Species of conservation concern.

**BD035:** Uh, positive mid.

**Interviewer 1:** Ok. Nutrient removal.

**BD035:** Uh, could you repeat that same one one more time? I just want to make sure I got it all.

**Interviewer 1:** Yep, so we’re still on - if we increase food-web supporting species, does it impact nutrient removal.

**BD035:** Ok. Uh, positive low.

**Interviewer 1:** Ok. Does it impact water quality.

**BD035:** Positive low.

**Interviewer 1:** And does it impact habitat for fisheries species.

**BD035:** Positive mid.

**Interviewer 1:** Does it impact either of our stressors? OA or shoreline development.

**BD035:** Um, I don’t think so.

**Interviewer 1:** Ok. And does it impact - does increasing food-web supporting species impact any of our management? So, first habitat restoration.

**BD035:** Yeah, I would say positive low.

**Interviewer 1:** And, single species management? Does it impact that?

**BD035:** Positive low.

**Interviewer 1:** And does it impact more resilient oyster reef development?

**BD035:** Positive low.

**Interviewer 1:** Ok. So now I’m going to move to species of conservation concern. So if we increased species of conservation concern, would that impact the number of native species?

**BD035:** Uh, positive mid.

**Interviewer 1:** Positive mid ok. Would increasing species of conservation concern impact harmful organisms?

**BD035:** Negative low.

**Interviewer 1:** Um, key food web supporting species?

**BD035:** Positive mid.

**Interviewer 1:** And habitat forming species?

**BD035:** Positive mid.

**Interviewer 1:** Ok. So then would increasing species of conservation concern impact any of our ecosystem services? So first nutrient removal.

**BD035:** Positive low.

**Interviewer 1:** Ok. Water quality?

**BD035:** Positive low.

**Interviewer 1:** And habitat for fisheries species?

**BD035:** Um, I’d say positive mid.

**Interviewer 1:** Um, so would increase species of conservation concern impact our stressors? OA or shoreline development.

**BD035:** I would say for shoreline development, I think it would reduce shoreline development or limit it a little bit, so I would say that's a positive impact. Low though.

**Interviewer 1:** Yeah, ok.

**BD035:** Any other one, not.

**Interviewer 1:** Ok. And then, does increasing species of conservation concern impact our management approaches? So habitat restoration.

**BD035:** Yeah, positive mid.

**Interviewer 1:** And single species management?

**BD035:** Positive high, I feel like those are almost the same thing.

**Interviewer 1:** And then more resilient oyster reef development.

**BD035:** Positive low.

**Interviewer 1:** Ok. Um, ok. So then, if we increase harmful organisms, would that impact the number of native species?

**BD035:** Yeah, negative high.

**Interviewer 1:** Negative high, ok. Would increasing harmful organisms impact key food-web supporting species?

**BD035:** Negative low.

**Interviewer 1:** Species of conservation concern?

**BD035:** Negative mid.

**Interviewer 1:** And habitat forming species.

**BD035:** Negative high.

**Interviewer 1:** High, ok. And then, would increasing harmful organisms impact any of our ecosystem services? So, nutrient removal.

**BD035:** Um, I’d say negative low.

**Interviewer 1:** Low. Ok. Would they impact water quality?

**BD035:** Negative low.

**Interviewer 1:** And would they impact habitat for fishery species?

**BD035:** Negative mid.

**Interviewer 1:** Would increasing the number of harmful organisms impact either of our stressors? OA or shoreline development.

**BD035:** No.

**Interviewer 1:** And would increasing harmful organisms impact any of our management. So, habitat restoration.

**BD035:** Uh, I don’t know how to answer that. It would increase the difficulty of habitat restoration, like so how would you - would you count that as positive or negative?

**Interviewer 1:** Um, probably negative. Because you’re saying the more harmful organisms you have, the more challenging it is to do habitat restoration and that could help decreasing restoration.

**BD035:** So I was saying, yeah, so I was saying negative high.

**Interviewer 1:** Ok. Would harmful organisms impact single species management?

**BD035:** Negative high.

**Interviewer 1:** Ok. And then, would it impact more resilient oyster reef development?

**BD035:** Negative low.

**Interviewer 1:** Ok. Ok, sorry this is a lot more tedious over the phone so I apologize, but we’re almost there. We appreciate your time. Thank you. Ok so then, I’ll go through the ecosystem services. So, if we increased nutrient removal, you that impact the number of native species?

**BD035:** Yeah, positive mid.

**Interviewer 1:** Ok. Would it impact key food-web supporting species?

**BD035:** Positive low.

**Interviewer 1:** Habitat forming species?

**BD035:** Positive high.

**Interviewer 1:** Harmful organisms?

**BD035:** Uh, negative low.

**Interviewer 1:** And, species of conservation concern.

**BD035:** Neutral.

**Interviewer 1:** Neutral, ok.

**BD035:** Those responses that I just gave would be the exact same for the water quality when you ask it.

**Interviewer 1:** Ok, yeah. [Interviewer 2], we can fill that in later if that’s easier. How about habitat for fisheries species, for… I can talk about it again.

**BD035:** Uh, habitat fisheries? Yeah. So habitat for fishery species impact on what?

**Interviewer 1:** Um, number of native species.

**BD035:** Um, positive mid.

**Interviewer 1:** And, key food-web supporting species?

**BD035:** Positive high.

**Interviewer 1:** Uh, habitat forming species.

**BD035:** Positive high.

**Interviewer 1:** Uh, harmful organisms.

**BD035:** Positive low.

**Interviewer 1:** And species of conservation concern.

**BD035:** Positive low.

**Interviewer 1:** Ok, so I’m going to go back to nutrient removal. So if we increase nutrient removal, would that impact either of our stressors; the OA and the shoreline development.

**BD035:** Um, no.

**Interviewer 1:** Ok, would improving water quality impact OA or development.

**BD035:** Well, let me back up. So like, so I would say that increasing nutrient removal or water quality, if that - if the cause of that was because of reduced shoreline development, how would you categorize that?

**Interviewer 1:** So then, I think that was the opposite relationship. So if we increased shoreline development, that would have a negative impact on those two stressors.

**BD035:** Yeah. So yeah, but I guess we need to keep looking at it that one way right?

**Interviewer 1:** Yeah. So - we’ll get there but we can just draw that now. So if you increase shoreline development you decrease nutrient removal right?

**BD035:** And water quality.

**Interviewer 1:** And water quality.

**BD035:** And I would say that’s a high.

**Interviewer 1:** Ok. For both of those?

**BD035:** Yeah.

**Interviewer 1:** Ok. Um, ok. Where was I. So then, I think I asked if you increased water quality - yeah, I asked that for both the stressors and you said there would be no impact, it’s the other way?

**BD035:** Correct.

**Interviewer 1:** Yeah. So then, if you increased habitat for fisheries species would that impact shoreline development or OA.

**BD035:** Yeah, positive impact.

**Interviewer 1:** Ok.

**BD035:** Oh no wait. Nevermind. I was thinking the reverse. Um, so, increase in habitat for fisheries… no I don’t think so.

**Interviewer 1:** Ok, yeah, you can delete that [Interviewer 2]. We can draw it after. Or, either works. Um, ok. So where was I. So if you increased nutrient removal, would that impact management? So would that impact habitat restoration?

**BD035:** Mmm, I think that… positive low.

**Interviewer 1:** Would increasing nutrient removal impact single species management?

**BD035:** Positive low.

**Interviewer 1:** And, would it impact resilient oyster reef development?

**BD035:** Positive mid.

**Interviewer 1:** Ok.

**BD035:** Actually, do positive - actually, positive high on that one.

**Interviewer 1:** And then, same questions but for improving water quality. So if we improve water quality, would it impact habitat restoration?

**BD035:** So all of my answers to that would be the same. My nutrient removal and water quality ones are going to be pretty much identical.

**Interviewer 1:** Ok, great. What about habitat for fisheries species, would increasing that impact habitat restoration?

**BD035:** Uh, it would be positive high.

**Interviewer 1:** And would it impact single species management?

**BD035:** Um, positive low.

**Interviewer 1:** Um, would increasing habitat for fisheries species impact oyster reef resiliency development?

**BD035:** Positive mid.

**Interviewer 1:** Ok. Um, so I’ll do the two stressors. If we increase OA, would that impact species of conservation concern?

**BD035:** Uh, negative high.

**Interviewer 1:** Ok. Would OA impact harmful organisms?

**BD035:** It would have a negative - well, the other one… so I feel like if you would have more OA, the less species of concern you would have to worry about. So could we count that as negatively impacting?

**Interviewer 1:** Yes, it would be decreasing based on what you just said.

**BD035:** Ok. Can you bring me the next one?

**Interviewer 1:** Yep, so if we increased OA, would that increase or decrease harmful organisms?

**BD035:** Decrease.

**Interviewer 1:** And would that also be high? Or low or medium?

**BD035:** Yeah, high.

**Interviewer 1:** Ok. And would OA impact habitat forming species?

**BD035:** Yeah, increase mid.

**Interviewer 1:** Ok, so sorry. I just want to clarify based on what you said before. So increasing OA would increase habitat forming species or decrease?

**BD035:** Increase.

**Interviewer 1:** Increase, ok. And an increase mid ok. And would increasing OA impact key food-web supporting species?

**BD035:** Yeah, increase high.

**Interviewer 1:** Ok. Um, would OA impact any of our ecosystem services, so nutrient removal?

**BD035:** Um, increase high.

**Interviewer 1:** Um, water quality?

**BD035:** Increase high.

**Interviewer 1:** And habitat for fisheries species?

**BD035:** Increase high.

**Interviewer 1:** And then -

**BD035:** Can you change my water quality one to increase mid?

**Interviewer 1:** Ok. Um, and then, would OA impact any of our management? So would OA impact habitat restoration?

**BD035:** Increase high.

**Interviewer 1:** Ok. Does OA impact single species management?

**BD035:** Increase low.

**Interviewer 1:** And more resilient oyster reef development?

**BD035:** Increase mid.

**Interviewer 1:** Ok. So then, I’m just going to run through shoreline development. So would increasing shoreline development impact the number of native species?

**BD035:** Uh, decrease high.

**Interviewer 1:** Would increasing shoreline development impact species of conservation concern?

**BD035:** Uh, it would increase mid.

**Interviewer 1:** Harmful organisms?

**BD035:** Increase low.

**Interviewer 1:** Habitat forming species?

**BD035:** Decrease high.

**Interviewer 1:** And key food-web supporting species.

**BD035:** Decrease high.

**Interviewer 1:** Ok. And would an increase in shoreline development impact OA?

**BD035:** Mm, I don’t think so.

**Interviewer 1:** And does shoreline development impact any of our management approaches? So habitat restoration.

**BD035:** Increase in shoreline development would have a negative impact on shoreline development. So decrease high.

**Interviewer 1:** Ok. Does it impact single species management?

**BD035:** Increase low.

**Interviewer 1:** Ok. And does it impact oyster reef development?

**BD035:** Decrease mid.

**Interviewer 1:** Ok. Did I ask if shoreline development impacts OA? Yes I did. Ok, just making sure.

**BD035:** Yeah, you did.

**Interviewer 1:** Ok. Then, I just realized - [Interviewer 2] I didn’t ask about connections between ecosystem services did I? I think I forgot to do that. Yeah, I forgot.

**Interviewer 2:** Yeah you have to do that.

**Interviewer 1:** Ok, so do you - ok sorry I’m going to go back a quick second. So if you increase nutrient removal, would that impact your other two ecosystem services? Which are improving water quality and habitat for fishery species.

**BD035:** Uh, positive high on both. I think it’s positive high for all of the relationships.

**Interviewer 1:** Ok. And in between the services you mean?

**BD035:** Yeah.

**Interviewer 1:** Ok, cool. Ok, so then our last chunk - so the three management approaches. So if we increase habitat restoration, does that impact the number of native species?

**BD035:** Uh, positive high.

**Interviewer 1:** Positive high, ok. How does single species management impact the number of native species?

**BD035:** Positive mid.

**Interviewer 1:** And then, does more resilient oyster reef development impact the number of native species?

**BD035:** Positive mid.

**Interviewer 1:** Ok. So then, same three for species of conservation concern. So, does habitat restoration impact species of conservation concern?

**BD035:** Mm, negative mid.

**Interviewer 1:** Um, single species management to species of conservation concern.

**BD035:** Positive low.

**Interviewer 1:** Ok.

**BD035:** Actually, positive mid.

**Interviewer 1:** And then, does increasing oyster reef development impact species of conservation concern?

**BD035:** Uh, positive low.

**Interviewer 1:** Positive low, ok. So then, how does management impact harmful organisms? So, habitat restoration?

**BD035:** Uh, negative mid.

**Interviewer 1:** Single species management?

**BD035:** Positive low.

**Interviewer 1:** And resilient oyster reef development.

**BD035:** Positive mid.

**Interviewer 1:** Ok, so, how does management impact habitat forming species? So, habitat restoration?

**BD035:** Um, can you repeat that?

**Interviewer 1:** Yep, so, how would an increase in habitat restoration impact habitat forming species?

**BD035:** Positive high.

**Interviewer 1:** Ok. Single species management - how does that impact habitat forming species?

**BD035:** Positive low.

**Interviewer 1:** And how does resilient oyster reef development impact habitat forming species?

**BD035:** Positive high.

**Interviewer 1:** So then, how do these management approaches impact key food-web supporting species. So, habitat restoration.

**BD035:** Um, can you repeat that?

**Interviewer 1:** Yep, so how would an increase in habitat restoration impact key food-web supporting species?

**BD035:** God, I’m sorry. My GPS was going crazy, I can’t hear you. Can you repeat that one more time?

**Interviewer 1:** No, no. Sorry. How would an increase in habitat restoration impact key food-web supporting species?

**BD035:** Uh, positive high.

**Interviewer 1:** And how would single species management impact key food-web supporting species?

**BD035:** Positive mid.

**Interviewer 1:** And then, what about more resilient oyster reef development to key food-web supporting species?

**BD035:** Positive high.

**Interviewer 1:** Ok. So then, how do these management approaches impact our ecosystem services. So, habitat restoration to nutrient removal.

**BD035:** Positive high.

**Interviewer 1:** And then habitat restoration to improving water quality?

**BD035:** Positive high.

**Interviewer 1:** And then habitat restoration to habitat for fisheries species.

**BD035:** Positive high.

**Interviewer 1:** Ok, so then single species management to nutrient removal.

**BD035:** Uh, positive low.

**Interviewer 1:** Single species management to improving water quality?

**BD035:** Positive low.

**Interviewer 1:** Single species management to habitat for fisheries species.

**BD035:** Positive high.

**Interviewer 1:** Ok. Then, last one, how would a more resilient reef development impact nutrient removal.

**BD035:** Um, positive high.

**Interviewer 1:** Improving water quality?

**BD035:** Positive high.

**Interviewer 1:** And habitat for fishery species.

**BD035:** Positive high.

**Interviewer 1:** Ok. Um, then - ok so then how would those management approaches impact our stressors? So how does habitat restoration impact OA.

**BD035:** Neutral.

**Interviewer 1:** Ok. And then would habitat restoration impact shoreline development?

**BD035:** No.

**Interviewer 1:** Ok. Um, does single species management impact OA?

**BD035:** I’d say neutral on all of them.

**Interviewer 1:** Ok, so all of the management approaches are neutral to shoreline development and OA?

**BD035:** Correct, yeah.

**Interviewer 1:** And then, do the management approaches impact one another? So does habitat restoration impact single species management or more resilient oyster reef development.

**BD035:** Uh, yeah I’d say those are positive high across the board, like for all the connections.

**Interviewer 1:** Within the management approaches?

**BD035:** Yep.

**Interviewer 1:** Ok. Correct me if I’m wrong [Interviewer 2], but I think we did it.

**Interviewer 2:** That’s everything, yeah.

**Interviewer 1:** I’m so sorry, when we’re like, I really wanted to be thorough because you were driving. I’m very self-conscious about you having to look at the screen so that’s why I was being so repetitive.

**BD035:** No, I appreciate that. I do think that I goofed on my responses on OA’s impact on everything, um, I think I got the relationships backwards. But, maybe you could just take a note of that, or you could just follow up in like an email in those, and I can chime in to make sure I had it right.

**Interviewer 1:** For sure, yeah we can send you like a screenshot of that and you can let us know if we need to change the relationships.

**BD035:** Ok. Perfect.

**Interviewer 1:** Well, I know we’ve been on the phone for an hour so I’ll let you go. But we really really appreciate it, thank you for your time, this was super helpful and we’re excited to hopefully see you on the 15th.

**BD035:** Sounds good, yeah, see you then.

**Interviewer 1:** Ok thank you.

**BD035:** Bye.