**BD041**: How many people are you interviewing?

**Interviewer** 1: I think… we’re in the forties now. We’ve done about forty.

**BD041**: Oh my gosh! You guys are pros at this by now.

**Interviewer** 1: I hope so.

**BD041**: And will the end result be like a compilation of this, will it be available to the people attending the meeting or?

**Interviewer** 1: Yeah, yeah, we’re putting together a comprehensive model from these interviews that we’ll show during the workshop, is that in a week and a half? And you’ll be coming to the workshop right, in a week and a half?

**BD041**: Oh my gosh the workshop’s in a week and a half!

**Interviewer** 1: Two weeks, two weeks.

**BD041**: Oh my gosh, I need to get my-- oh yeah that's right. I thought they said that they would help me with organizing my travel but I guess maybe I better follow up on that. I wasn’t sure if I arranged it myself or what, but. Yeah, I better look at that.

**Interviewer** 1: Yeah Sarah and I are… we hear what’s going on with the travel but we’re not the ones in charge of it.

**BD041**: Yeah, I’ll make a call after our call because yeah, that’s something important for me to get that travel squared away. Write myself a little note. Okay!

**Interviewer** 1: Alright. So, just to start, I was hoping that you could just tell us a bit about your area of expertise and your current work responsibilities or research.

**BD041**: Sure, so I started out with a degree in aquatic biology which is essentially marine biology because I went to school at UC Santa Barbara and everything we did was marine based so it was a lot of marine ecology, um, I would say very strong in marine ecology. Then I’ve got a Master’s degree in marine policy and I focused on fisheries, so, fisheries policy, salmon was big of course in the Pacific Northwest at University of Washington, so I did a lot of that and so then I worked in the field of oil spill damage assessment in Washington state for a few years and some generalized work on siting different facilities as part of work with the Army Corps of Engineers as well as consulting firms and when I moved to Florida I started working with the Nature Conservancy I think it was in 1995 and started, actually my initial work with them was all based on Everglades restoration and that whole very difficult challenge that still is going on, but I was able to then move into marine conservation, which is really my area of expertise - marine conservation, marine ecology, and that’s really what I’m most interested in. So my work with the Nature Conservancy now is focused on all kinds of marine conservation issues from restoring oyster reefs to looking at blue carbon content of some of our ecosystems, our coastal ecosystems, doing a variety of coastal ecosystem analyses from impacts of sea level rise to how well things like our mangrove forests and coral reefs help reduce the impacts of storm surge from tropical storms, you know, quantifying that using various models and things and also, the other thing I’m doing right now is helping really, so we have many projects in the - what we call our well Southern US division which goes from Virginia all the way down across Florida to Texas and we have many estuarine projects that focus on coastal resilience, ecosystem restoration, and probably some other things. So what I’m doing right now with that is getting a handle on what all those projects are, what their categories are, how they relate to each other, how they can support each other, and how we can make a bigger impact with this compilation of projects rather than just individual projects that are kind of operating separately. So, I guess I would say I have a pretty broad background and uh, in all kinds of marine conservation issues and I also use geospatial analysis quite a bit, so I do a lot of mapping - another project that we are just getting going on is a marine assessment for the Gulf of Mexico. I worked on previous marine assessments around Florida and the south Atlantic coast where my particular thing that I focused on the most was sea turtles and marine mammals, but, you know, certainly I was involved with some of the other species groups that we were trying to describe their distribution and quantifying their populations in these areas. So that’s kind of it in a nutshell.

**Interviewer** 1: Ok great. Awesome. Perfect. That’s, that’s great, thank you so much. That’s amazing. Okay so, I think probably you’ve heard a bit about our project through emails and talking to you at the workshop a little bit.

**BD041**: Yes.

**Interviewer** 1: Yeah okay so, yeah just the really high level overarching goal of the project is to understand the role of biodiversity in marine resource management and how we’re managing for biodiversity. And, so to start, one of the things that we’ve been hearing a lot in this project thus far and learning is that the term biodiversity means different things to different people and of course it can be measured in multiple different ways and so, 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 biodiversity.

**BD041**: So, in my work with the Conservancy, I think one of our main objectives is to protect and increase biodiversity and to do that we protect the ecosystems and ensure that those ecosystems are healthy and what we’ve noticed with some of our oyster reef restoration is you get it started and build it and they will come. Just the amount of biodiversity that was attracted to oyster reefs that had really been mostly eliminated from the system where we put it was pretty spectacular. And then you start noticing over time like other fish species coming in to utilize the crabs and other small invertebrates on the reef and, so to me, biodiversity, it really is at many different levels. It’s certainly organismal at the macro-animal level all the way down to bacterial and, you know, those microbial communities that really support that whole food chain so, and all the plants involved with it as well, so it for me is everything in that, those ecosystems, that existed in a natural state, it represents the biodiversity of those ecosystems.

**Interviewer** 1: Okay, great. So, some of the other previous work that our team has done has generalized marine biodiversity into four key components, and I think Sarah’s gonna put them in the chat or I can, but they are habitat forming species, species of conservation concern, key food web supporting species, and harmful organisms. And so we’re wondering if you agree that these are the core components of marine biodiversity and if not, how would you change this framework.

**BD041**: I would add, it seems like what might be missing here is the top predators that might come, they’re maybe not residents to a particular ecosystem place over time, but maybe they come in, or they could be resident, and I guess you could consider those food web supporting species, I’m not sure. They’re also food web taking species. I’m not so sure they’re supporting the food web as much as taking advantage of the food web that exists.

**Interviewer** 1: Gotcha. Okay perfect, great. Okay and so, like I said, the goal of this project is to understand if and how we’re managing for biodiversity. And so I’m wondering if you think that there are management approaches or policies currently that exist that explicitly manage for biodiversity and if so, what those are.

**BD041**: Yes, I don’t work so much on policies anymore. I did at one time, but certainly not recently and in this part of the world. But, I think that ecosystem protections, like broad ecosystem protections, broad ecosystem restoration approaches, are probably, you know, good approaches to use certainly if you want to increase that biodiversity. You may also have to remove some of those harmful organisms such as invasive species, invasive non-native species, in particular, things like lionfish and its, you know, it's practically impossible to remove them entirely from our system because they live at very, as well as shallow, they live very deep but you can maybe eliminate them from certain areas with a lot of management, with certain management, some level of management attention. Similarly, some types of invasive species, invasive non-native species that can very much disrupt our natural ecosystems would be a good policy to have and I guess some of the policies I am aware of are - I’m not so sure they - well they probably do come into play in marine and coastal ecosystems, but things like not allowing the importation or raising of these species because they invariably get out somehow or another into the ecosystems.

**Interviewer** 1: Okay, great. Are there approaches to managing biodiversity that you think are needed to do so?

**BD041**: Well, yes and I know its a very difficult thing to accomplish, but especially in marine and estuarine systems, we need more no taking areas for conservation because when things are -and we have these on land, it's not like an unusual concept on land but for some reason it's a very unusual and not well thought of concept in the water- when you’re taking so much off of these reefs or other types of ecosystems, you don’t even know what’s natural anymore and as someone who used to in particular do a lot of diving and being a marine biologist, you can see it like that like it’s denuded here, you know, you can really see the harm and when you do, when you are able to see areas that are protected or that have been pretty much untouched it's just miraculously different. Uh, what other types of, and you said other types of approaches or?

**Interviewer** 1: Yeah, management approaches or policies, really anything that you think is needed to better manage for biodiversity.

**BD041**: Yeah and we also in the estuaries work that I do, it's not just what you do in the water, it's the whole watershed and what’s coming into the water, so we’ve done a lot of things as the human race that is really bad for estuaries and marine environments, anything from putting in contaminants, excess nutrients, allowing sedimentation to occur, filling of wetlands and things along the coastlines and some of our estuaries, all of those things -and it could also go for coastlines- all of those things harm those systems and the biodiversity that are part of those systems. And then, you know, it’s, sometimes we don’t even know what the biodiversity of that system was in its natural state, and just as an example, the Everglades, southern Everglades, there’s so many non-native fish from Brazil, cichlids in particular, that we don't know what was there. We don’t even know what is gone, so having, you know, -and I’m sure if it's mostly done-, but having suitable levels of inventories for our natural systems so we know what’s there and we know if something is becoming impacted and, you know, so we would know maybe what to do about reducing that stress that’s impacting particular species or species groups.

**Interviewer** 1: Okay, great. I love natural inventory. I haven't heard that phrase before when talking about that. I really like that a lot.

**BD041**: Thank you.

**Interviewer** 1: Okay. So, I think Sarah, that's a good time to transition maybe if that’s okay with you.

**Interviewer** 2: Sure. Let me share my screen. Okay, so while you’ve been talking Laura, I have added some concepts to Mental Modeler. Well Kelsey, do you want to give an overview of what this is exactly?

**Interviewer** 1: Sure, yeah, yeah, well Laura have you used Mental Modeler before? Are you familiar with this tool?

**BD041**: No but this is really cool.

**Interviewer** 1: So this is a tool that we use during interviews to help conceptualize how an individual sees a system. And so while you and I have been talking, Sarah has been making a concept list from your responses and then drawing some connections between the concepts as she could, and our hope from the rest of the interview is that we will go through the concepts and talk about how you see all of them connecting to one another. And so we can say if one system was to increase, how would that impact the rest of the system as we have it? Would it cause other system components to increase or decrease, essentially.

**BD041**: Okay, sounds good. Well, I notice one item I’m missing on this upstream management and that was contaminants and I’m thinking like pollutant spills, I probably said them so fast you didn't have a chance. Wow! It’s amazing how fast you can build these models.

**Interviewer** 2: We’ve done like forty of them so we’re gonna get fast. Okay, so I’ll just go through these concepts and we can talk about if there’s anything else missing and start making connections. So, the gray boxes in the middle, those are the four key components of biodiversity that we identified and then I’ve added your aspect which is top predators. The orange boxes are kind of my summation of what you said when you think about biodiversity, so healthy ecosystem, and then kind of the native organism of abundance or species diversity. And then the blue boxes are current management or potential policies that could better incorporate biodiversity, so oyster reef restoration, just basic broad ecosystem protection, invasive species removal and importation bans, no take areas, our natural inventory of biodiversity data, upstream management, and then Kelsey didn’t ask about these specifically, but you starting talking about stressors that upstream management could improve, so those are those pink boxes that I have.

**BD041**: Okay. So yeah, you’ll have to lead me through what you want next.

**Interviewer** 1: Yeah for sure. Sarah, do you want me to go ahead or do you want to finish?

**Interviewer** 2: If you don’t mind, I am feeling a little hoarse so.

**Interviewer** 1: Of course, so yeah maybe let’s start with the orange boxes up in the top left. So, with healthy ecosystem for example, if a healthy ecosystem was to increase, so I guess in this case we would be thinking of it as the ecosystem would be becoming more healthy, would that impact any of these other components on the map?

**BD041**: Yes I think it would help to improve the key food web supporting species, the habitat forming species, the species of conservation concern, top predators, and maybe reduce, potentially reduce, harmful organisms, but it all depends on the organism and you know, sometimes human action is necessary to remove them physically but healthy ecosystem might be able to better repel or reduce their impact.

**Interviewer** 1: Okay. And so, yeah, so would the rest of the relationships that you described be positive, so as you have as the ecosystem becomes healthier, you would have a positive impact on the other components that you listed?

**BD041**: Yes.

**Interviewer** 1: Okay, perfect. Just wanted to make sure. Okay, great. Is there anything else that healthy ecosystem would impact? Any of the management components or the stressors?

**BD041**: And the management components are which ones?  
  
**Interviewer** 1: The blue ones.

**BD041**: The blue ones. It could help maybe reduce the need for some of them. Healthy ecosystem might be able to reduce the need, maybe the, maybe not the need for upstream management, but it may not have to have such a large footprint, you know. Healthy ecosystem may be able to reduce some of the management actions you take to achieve the upstream management cause perhaps the healthy ecosystem can accommodate some of these stressors better. It may also be able to reduce the amount of activities on invasive species removal because a healthy ecosystem may be able to repel some of that stress, or deal with that stress. It may not need ecosystem restoration such as oyster reef restoration if the whole ecosystem is healthy. If it’s healthy, they would already have these things in place. I think the other two though like bans on non-natives and no take areas, better baseline biodiversity, I think those need to -- I don’t think a healthy ecosystem would necessarily reduce their need.

**Interviewer** 1: Right, okay. Okay, great. And then would a healthy ecosystem impact any of the pink components, the stressors, to the right?

**BD041**: Yeah, healthy ecosystem can reduce the nutrient influx. It may be able to better accommodate some types of contaminant spills or pollutant spills, but it really depends on the type of pollutant. But the other things, you know like sedimentation’s coming from upstream, that just buries things and wetland filling just buries things so yeah, wouldn’t affect those.

**Interviewer** 1: Okay. And then, I think I missed, so would a healthy ecosystem impact species diversity?

**BD041**: Yes, yes. A healthy ecosystem and I think by definition it means that you have all of the ecosystem components present and in a healthy state.

**Interviewer** 1: Okay, great. So then basically I’m just gonna go through each concept and we’ll just do that. So then we can go to species diversity. So if we were to increase species diversity, would that impact anything else in the system?

**BD041**: I think it can help achieve a healthy, healthier, ecosystem. It may not, you know, operate alone, you know, there might be other things that need to happen, but it certainly will help and not hurt achieve a healthy ecosystem.

**Interviewer** 1: Would increasing species diversity impact any of our gray boxes, our other biodiversity components?

**BD041**: Yeah the increasing species diversity may help our species of conservation concern because maybe it provides more food source for those, but there could also be predators but perhaps its more in a natural balance. Species diversity could also help ameliorate some of the harmful organisms potentially. Species diversity may help feed the top predators better. And it should help this key food web supporting species as well. Did I leave any out? Maybe not.

**Interviewer** 1: I think, I don’t think you --It’s okay if you don’t see it-- but I don't think that you connected it to habitat forming species is the only one I think.

**BD041**: Ah, right. Well, you know, certainly, yeah, improving species diversity can certainly benefit habitat forming species as well cause you could be adding those back into the system.

**Interviewer** 1: Okay, great. Would increasing species diversity impact any of our blue management boxes?

**BD041**: Oh what was this broad ecosystem protection? Oh that was protection, that was a management function right?

**Interviewer** 1: Yes.

**BD041**: It might make broad ecosystem protection easier when you have a high species diversity. High species diversity, as long as its native species, could help reduce some of the invasive species. High species diversity… yeah, just those.

**Interviewer** 1: Okay. And then would species diversity impact any of our stressors in pink?

**BD041**: Yeah, higher species diversity could help with nutrient influx. They may, some of those species -- especially different types of bacteria -- could help or break down certain types of contaminants or pollutants over time. But just those.

**Interviewer** 1: Okay, great. Okay, I think, let’s go to the white boxes I guess. So, if species of conservation concern were to increase, how would that impact our other biodiversity concepts, our other white boxes?

**BD041**: It’s very species specific but I think in general, species of conservation concern could potentially reduce harmful organisms, maybe some of those harmful organisms are some of their food sources. They could help balance out the ecosystem better and help the habitat forming species have a, you know, better outcome so to speak. A lot of time, our species of conservation concern are top predators, not always, but a lot of times. If I think of something like, say, the urchins. Species of conservation concern, you know, maybe there’s things that eat the fish that eat the urchins, so yeah it could have a positive impact on those. Species of conservation concern with food web supporting species, yeah I think it can help if they have more of a natural balance of where they should be, then that can certainly help create a stronger food web, more natural food web that existed before we messed it all up.

Interviewer 1: Okay great. Would species of conservation concern impact either of our orange biodiversity boxes?

**BD041**: And our orange ones are just species diversity and healthy ecosystems or?

**Interviewer** 1: Yes, yep, yep.

**BD041**: Yea it should, species of conservation, if they are approved, can certainly help create that healthier ecosystem and species diversity as well, yeah.

**Interviewer** 1: And then would they impact any of the blue management boxes?

**BD041**: Well yes, if you bring in --oysters are species of conservation concern, oyster reef is so for bringing those back is kind of a synergistic thing, they can also help balance out that ecosystem I guess. And I’m sorry, the blue boxes are management actions?

**Interviewer** 1: Yes.

**BD041**: Okay. They could help reduce some of our invasive species by eating them, getting rid of them that way. Yeah and you know, eating some of those non-natives as well. Yep, that’s, those are the ones -- upstream management, no I don’t think so. I think those other last three are not affected necessarily by species of conservation concern.

**Interviewer** 1: Okay.

**BD041**: You mean if species of conservation would affect things like upstream management?

**Interviewer** 1: Yep, correct. Yeah they would, if they were to increase, would that impact, yeah, the other components.

**BD041**: I don’t think so, no.

**Interviewer** 1: Okay. And then any of the stressors in pink?

**BD041**: I don’t think so, I mean some of the anadromous fish can affect nutrient influx, but no I wouldn't put that down. I’m thinking -- nutrient influx to me I’m talking about it going into the estuaries. Species of conservation concern, yeah I think it’s kind of a far flung concept if they would affect nutrient influx.

**Interviewer** 1: Okay. Okay. Great, okay so then let’s go to harmful organisms. So if we were to increase harmful organisms, what would that impact in the system?

**BD041**: And tell me which color to focus on first. A little overwhelming!

**Interviewer** 1: Let’s do the other gray boxes to start.

**BD041**: The gray boxes. I’m sorry, if nutrient influx was to increase, you’re saying?

**Interviewer** 1: Oh I’m sorry, I was on harmful organisms.

**BD041**: Oh I’m sorry, harmful organisms. And we’re going to the blue boxes? I’ve lost track, I’m sorry. What did you say? The other gray boxes, the other gray boxes.

**Interviewer** 1: Yeah, yeah, whatever works for you, the other gray boxes maybe.

**BD041**: Yeah, harmful organisms can increase the species of conservation concern. They can harm our habitat forming species, I’m thinking coral reefs. Harmful organisms can eat our top predators when they’re young, like young fish, and they can also eat all of our key food web supporting species. Lionfish are very voracious.

**Interviewer** 1: Okay, great. Would harmful organisms impact either of the orange biodiversity boxes?

**BD041**: Yeah, they would make our healthy ecosystem less healthy and they would reduce species diversity.

**Interviewer** 1: Okay. Would harmful organisms impact any of our blue management boxes?

**BD041**: Well they could certainly reduce our oyster reefs if we had say an influx of things that eat oysters on reefs. They could sort of reduce the effectiveness of broad ecosystem protection, harmful organisms. They could reduce the effectiveness of our no-take areas. And they could reduce the effectiveness of our really good upstream management.

**Interviewer1**: Okay. Okay, sorry I’m just trying to think. Sometimes it’s tricky with Mental Modeler to make sure that the --especially with something like harmful organisms that we want to decrease-- so if we were to increase harmful organisms, would we decrease oyster reef restoration? Cause that’s how that relationship is represented right now. I think you said effectiveness, so I don’t know if we want to -- just trying to make sure we have that right.

**BD041**: Yeah, I think increase, like say there’s certain shellfish that eat oysters and say if a lot of those increased and they could just, you could restore oysters but it could be gone in a couple of months. So you're talking about if harmful organisms were to increase right?

**Interviewer** 1: Yup, exactly, yup, yup. Okay, yeah that’s great Sarah, okay. And same, I think same with, Sarah, with no-take areas too right. We’re thinking of it as the effectiveness of no-take areas there?

**BD041**: Yes.

**Interviewer** 1: Okay. And probably the same with upstream management too right? Like effectiveness of upstream management?

**BD041**: Yeah, but only in terms of this particular harmful organisms one because no-take areas was a management action right, so.

**Interviewer** 1: Okay, so, and okay so do you think that’s true for--?

**BD041**: It wouldn’t affect the action but it would affect the effectiveness of the action.

**Interviewer** 1: Right, right, right, right, right. Okay. Let’s, we can just leave it for now Sarah and we’ll just, we’ll make a note of that and come back to it for later. But, yeah just maybe take effectiveness out of the no-take areas and probably oyster restoration, sorry. Okay, okay. Okay, and then would harmful organisms impact any of the stressors?

**BD041**: No. The pink boxes, right?

**Interviewer** 1: Yep, yep, yep, yep. Okay. Okay, so let’s go to habitat forming species. If we were to increase habitat forming species, would that impact the other gray boxes?

**BD041**: If we were to, I’m sorry, increase?

**Interviewer** 1: Mhm.

**BD041**: Okay, increase… It could reduce species of conservation concern. They could reduce harmful organisms, I guess, potentially. They could help grow the population of top predators. They could support key food web supporting species. I think that’s it.

**Interviewer** 1: Okay.

**BD041**: One thing I’m noticing, you know, I said oyster reef restoration as a management action, but really it could be ecosystem restoration of any type of coastal ecosystem or --Are you guys, I can’t recall, is your focus in the water or is it also terrestrial?

**Interviewer** 1: It’s only in the water. Like marine and estuary.

**BD041**: Okay, perfect. Good fit then.

**Interviewer** 1: Okay great, then I think we were, if habitat forming species was to increase, would it impact either of the orange boxes?

**BD041**: Yeah, it can improve healthy ecosystems and it can improve species diversity.

**Interviewer** 1: And would increasing habitat forming species impact any of the blue management boxes?

**BD041**: Yes, it may reduce the level of invasive species removal necessary. It may reduce the need for habitat restoration, not entirely but it reduces maybe the level of ecosystem restoration needed. But I don’t think it affects the others.

**Interviewer** 1: Okay. And then, do habitat forming species impact any of the pink stressors?

**BD041**: They can help reduce nutrient influx, you know, adverse impacts of nutrient influx. That’s about it.

**Interviewer** 1: Okay. So then I think we’re up in the top right corner, so key food web supporting species. If we were to increase those species, would that impact any of the other gray boxes?

**BD041**: It should improve top predators. It should improve habitat forming species and species of conservation concern. It potentially, it could help reduce some of the harmful organisms. Doesn’t always happen though. Yeah, so that’s the only ones I have.

**Interviewer** 1: Okay. Do key food web supporting species impact any of the orange biodiversity boxes?

**BD041**: Yeah, certainly they can help improve the health of the ecosystem and improve species diversity.

**Interviewer** 1: Okay. And then do key food web supporting species impact any of the blue management boxes?

**BD041**: It helps accomplish ecosystem restoration, or improves ecosystem restoration. It can facilitate broad ecosystem protection or conservation. I think really only those two.

**Interviewer** 1: Okay, and then do they impact any of the pink stressors?

**BD041**: They could also help with nutrient influx. That would be the main one I would think.

**Interviewer** 1: Okay. Okay, so then top predators. If we were to increase top predators, would that impact any of the other gray boxes?

**BD041**: Yeah, they can certainly help support key food web supporting species, habitat forming species as well. I think it’s hard to say on species of conservation concern. It depends if they eat those or not, so it’s kind of a wash, so to speak. But, they could help remove harmful organisms, depending if that’s one of their food sources.

**Interviewer** 1: Okay. Do top predators impact either of the orange boxes?

**BD041**: Yeah, they can, getting their balance right can ensure we have a healthy ecosystem and they can actually help create and improving species diversity as well.

**Interviewer** 1: Okay, great. Do top predators impact any of the blue management boxes?

**BD041**: They could help with invasive species removal. They could help with ecosystem restoration. The others, I don’t think they actually help with those management actions.

**Interviewer** 1: Okay. So, sorry I want to pause for a second, cause I think, Sarah, we have, for all of the other concepts, like for species richness, we have a negative arrow to invasive species removal and I think your thought process, or right, is that there’s less need for invasive species removal as a management action the more species diversity we have. Is that correct?

**BD041**: I think so.

**Interviewer** 1: Okay. So then I think it would be the same direction, Sarah, for top predators there, right? Cause the more top predators you have, the less need there is for invasive species removal as a management approach.

**BD041**: Potentially, if they’re a food source or maybe they’re eating the things --top predators can help get the ecosystem in balance as it should be.

**Interviewer** 1: Okay, perfect. Okay, I just wanted to make sure. And was it the same for ecosystem restoration? Or am I…

**BD041**: Top predators?

**Interviewer** 1: Yeah, did we…? I’m now, the map, we’ve gotten to the point the map is so complex that now I, I’m, I can’t see the lines.

**BD041**: Can’t see the lines. So is it there? The line is there?

**Interviewer** 1: Yes okay there we go, yeah. So would, the more top predators we have, would that increase ecosystem restoration, decrease, or not have an effect?

**BD041**: It’s complicated because, you know, if you just added a bunch of the top predators without out… it all depends what ecosystem you’re talking about, what top predator or predators you’re talking about, what ecosystem. I think it does help with ecosystem restoration because they help get it back in balance. I mean, an unhealthy ecosystem is one that isn’t in the right balance and you need all the components really. You need those habitat forming species and the predators, top predators, and the, you know, food web, and the species of conservation concern that might be missing. What you don’t need are the harmful organisms and invasive species.

**Interviewer** 1: Right, right, right, right. Okay, okay. Alright, we can leave it at that then. Was there any other blue boxes that top predators connected to?

**BD041**: Can we look at that one alone? I can’t remember what it’s connected to. Blue boxes… Oh, I see. The blue --I’m sorry, so we do need to see it. We need to see the previous \_\_\_\_ with importation bans on non-natives. I don’t think it affects those actions because you need to have those importation bans, you need to have the no-take areas, you need better baseline. Top predators, I don’t think they’re going to necessarily affect upstream management either.

**Interviewer** 1: Okay, great, okay. And do top predators impact any of the pink stressors?

**BD041**: Possibly nutrient flux. Oh, no I’m sorry, I’m thinking the… I wasn’t thinking nutrient influx, I was just thinking nutrient flux. No I would say they don’t, because that was really specific to things coming down into the estuary, or into nearshore waters.

**Interviewer** 1: Okay. So then we’ll go to ecosystem restoration in our blue box, so if we increase ecosystem restoration, does that impact either of the orange boxes?

**BD041**: Yes, it will improve species diversity, native organism abundance, and healthy ecosystems.

**Interviewer** 1: Okay and would it impact any of our gray biodiversity boxes?

**BD041**: Certainly it can help with species of conservation concern and habitat forming species, key food web supporting species. It may provide food sources for top predators. I’m not sure it’s going to be able to… it could… I think the jury’s out on whether it would have an influence on harmful organisms. I mean, it could help them but it may not be able to. It just depends on the specifics.

**Interviewer** 1: Okay. So since we only have ten minutes left, I’m going to focus on getting your connections from the blue management boxes to the orange and white biodiversity boxes, since that’s the focus of our project.

**BD041**: Okay.

**Interviewer** 1: So, would an increase in broad ecosystem protection impact the orange boxes?

**BD041**: Yes. It would improve both orange boxes.

**Interviewer** 1: Okay. And would it impact any of the gray boxes?

**BD041**: Yes it could certainly help with species of conservation concern. If that protection includes measures like removing some of the harmful organisms it certainly could improve that. It certainly could help with habitat forming species and key food web supporting species and top predators.

**Interviewer** 1: Okay. So then same set of questions but for invasive species removal. So if we increase invasive species removal, does that impact any of those biodiversity concepts?

**BD041**: The two orange boxes?

**Interviewer** 1: Yep.

**BD041**: Yes it will improve those two things.

**Interviewer** 1: Okay. And then the gray boxes?

**B041**: Invasive species removal can certainly help depending on specifics with species of conservation concern. It can help with removing harmful organisms. It can help with improving habitat forming species. It can improve food web supporting species and top predators.

**Interviewer** 1: Okay. If we were to increase importation bans on non-natives, would that impact the orange boxes?

**BD041**: Yes, it would improve both those things.

**Interviewer** 1: Okay. And then would it impact any of the gray boxes?

**BD041**: It could certainly help improve species of conservation concern depending on specifics. It could reduce harmful organisms. It may help to support habitat forming species and key food web supporting species and top predators.

**Interviewer** 1: Okay. And then no-take areas, if we would increase no-take areas, would that impact -yeah-?

**BD041**: Those could, yeah, those could certainly help with both the orange boxes and could certainly help with species of conservation concern. It can help with habitat forming species. It can help with food web supporting species and top predators. I don’t think it’s necessarily going to affect the harmful organisms.

**Interviewer** 1: Okay. What about increasing better baseline biodiversity data?

**BD041**: Well, if you don’t know what you have, there’s no way you can assess species diversity so it doesn't necessarily increase it but you don't have a measurement unless you know what the baseline is, so I would say yes, it’s going to improve those things cause you’ll be able to measure them, and it will also improve healthy ecosystem. You can't measure that without having a baseline and as far as the gray boxes go, I think it helps with all of them because it gives you that baseline of what you have so you can assess what the changes on those other things.

**Interviewer** 1: Right, okay.

**BD041**: Even harmful organisms, I’m not sure about that one because we wouldn’t know whether they were there and to what extent.

**Interviewer** 1: Right, okay.

**BD041**: I mean it doesn’t grow the harmful organisms but yeah, we’ll need to know… we can’t measure what happened unless we know what that baseline is. It’s kind of a different one, you know?

**Interviewer** 1: Yeah, yeah, I see what you’re saying. Okay. But you’re saying it would be… it sounds like you’re saying we would need the baseline data to know what’s there to then remove the harmful organisms, is that right?

**BD041**: Well, to know whether they’re there, whether they’re growing, whether they’re decreasing, yeah.

**Interviewer** 1: Right. Okay, okay. I think how you have it, Sarah, works. Okay, and then upstream management… if we were to increase that?

**BD041**: That can certainly help with species diversity and healthy ecosystems. It can help with species of conservation concern. It could potentially help with getting rid of harmful organisms by rebalancing the ecosystem as it should be. It should help with habitat forming species and top predators, potentially because you have a better, cleaner ecosystems, and key food web supporting species.

**Interviewer** 1: Okay. Okay, I think I’ll stop there since we’re just about out of time. Is there anything else that you think is really important to add to the map or that we should know in this context before we hop off?

**BD041**: There’s a lot here and I can’t think of anything else off the top of my head. I’m just curious like how… with this program, you’re able to compile somehow all of the different responses you get? Wow, that’ll be really interesting to see.

**Interviewer** 1: Yeah, it’s, it’s both a qualitative and quantitative process so everyone brings in different series of concepts and so we do some qualitative aggregation and bin them and then we can combine the relationships to see what experts collectively think about when they think about biodiversity in marine resource management.

**BD041**: Yeah, great! Should be a very interesting meeting.

**Interviewer** 1: We hope so, we’re really excited and we’re excited to have all sorts of stakeholders there together, so hopefully it will be really fun and productive.

**BD041**: I’m sure it will be. Okay well I guess I’ll see you guys at the meeting. And I’ll make my arrangements.

**Interviewer** 1: Sounds great.

**BD041**: I’ll call the travel office and make sure that’s the acceptable approach.

**Interviewer** 1: Sounds great. Okay, thank you so much again, we really appreciate your time.

**BD041**: You too. Bye.

**Interviewer** 1: Bye.