2/8/2024

Transcript BD037

**Interviewer 1:** Um, so, just to start - and obviously both [Interviewer 2] and I know a lot about your work, but just for the purposes of our interview could you just give an overview of your area of expertise and your current research?

**BD037:** Sure. So, I’m a fisheries ecologist. I’m essentially studying fishery important species, and how and where they interact in the environment with respect to temperature, salinity, other environmental forcings, you know, tide, seasons, things like that. Essentially trying to understand why fish are where they are and when they are where they are, things like that. So I work on a variety of species; red snapper, red drum, amberjack, trip and tail, jackerval, this morning… lots of other things, but primarily, I guess the body of my work, most of my work, is focused on coastal sharks. So small coastal sharks, large coastal sharks, a little bit of pelagic shark work, but mostly coastal species. So, somewhat broad - I do a lot of life history work. So age, growth, reproduction, maturation, a fair bit of trophic ecology work. So dietary studies, stable isotopes, DNA barcoding, stomach contents, things like that. A fair bit of movement in migration work, so I’ve been using natural tracers, or we’re typically using telemetry. So acoustic telemetry, or satellite telemetry. And then with my position here at Mississippi State, I do a fair bit of extension work. So, sharing and or translating the results of, you know, the latest scientific findings to stakeholders as is applicable. So that’s it in a nutshell.

**Interviewer 1:** Wow. It’s a wide nutshell. Um, ok awesome, thank you. So, I think like [Interviewer 2]’s probably told you about the project. Um, the really high level overarching goal - the project is to understand how experts think about biodiversity and how we manage for biodiversity in US marine resource management. Um, and so, one of the first things that we learned during this project is that the term biodiversity means different things to different people, and obviously it can be measured in multiple different ways. Um, and so as a starting point today, we are hoping to hear what you see as the key aspects of biodiversity and what you think about when you think about biodiversity.

**BD037:** Sure. So, actually I think a bit about biodiversity with respect to the work which I do. Which, again, is primarily coastal shark work. So we run a shark monitoring program. Right, so just a fishery-independent, bottom long line work survey. That’s the sort of backbone of my lab’s work. I started that survey in May of 2006. Um, and so, like any survey, it’s just a census of the population that is selected to that gear type. In this case, again, bottom long line, big old 15 line circle hooks. So, whenever I’m showing that gear to a class, for example - I teach a sharks and rays class in the summer. Whenever I’m showing that gear type to them, it always occurs to me that we have a large species diversity here in the North Central Gulf of Mexico. So I’m always quick to point out, if these students were taking this class in New England, for example, or in the Pacific NorthWest, or areas like that, the species diversity would be much lower. So, I would say that’s kind of one of the central themes of the class, is understanding and appreciating the diversity of a lot of our banks sharks and rays, you know, it could be that within the course of their two week field course, they might see 13 to 15 different species of elasmobranchs. So, when I think about biodiversity, I tend to think about it from that perspective. Species diversity within elasmobranchs. Now, the counter to that, when I think about reef fish, because we do a fair bit of work with reef fish, I think about how the species diversity is so different here versus areas like South West Florida, and in exactly the opposite way. Right, so, if you go to South West Florida, you would expect the diversity of the reef fish assemblage there to be 4, 5, 6 times what it is here in the North Central reefs of the Gulf of Mexico where our assemblage is really culminated by a handful of snapper species. Um, so, kind of landing the plane on that thought, when I think of biodiversity, I tend to think about species level diversity with respect to our area, which for me North Central Gulf of Mexico, like, Louisiana, Mississippi, Alabama.

**Interviewer 1:** Ok, great. Um, so, some of our team’s previous work has generalized four key components of marine biodiversity as we’re attempting to conceptualize and define biodiversity. And so, I think [Interviewer 2]’s going to put those in the chat in case that’s easier for you to visualize them. But the four components are habitat forming species, species of conservation concern, harmful organisms, and key food-web supporting species. And so, we’re wondering if you agree with those key components of biodiversity, and if not, how you would change it.

**BD037:** Sure. So, looking at that list, and again understand that my lens, you know, the easiest lens for me to look through is with respect to sharks. So, sort of habitat forming species - I don’t tend to rank that very highly just because it doesn’t lend itself to the types of organisms I study. That said, species of conservation concern, that is always kind of front and center when I think about sharks, and increasingly for rays. Sort of the same thing, right, that’s a big issue of that taxon group. Um, harmful organisms, you know, a bit. You know, we tend to, with respect to sharks, we tend to think about human-wildlife interactions, and increasing there’s talks about human-wildlife conflict with respect to sharks and potential increases in their populations and how that adversely impacts, you know, beach goers and things like that. There was an article written, published in the Journal of Fish Biology a few weeks ago that talked about an area off the coast of New York and how they’re experiencing what the public perceives as an increase in shark populations and how that has natural down the stream effects with respect to how people interact with the beach and the environment. So yeah, um, I can certainly see that in that context. And then, the key food-web supporting species, you know, I think a lot of, I would say almost all of the sharks I study are considered meso-predators, so kind of squarely in the middle tier of a food-web. And so it’s interesting to think about this species from the concept of the removal or, you know, the increase of those species and how there’s the potential, you know, arguably hard to demonstrate, but the potential for cascade there in either direction with changes to populations of those types of animals.

**Interviewer 1:** Ok, awesome.

**BD037:** So yeah, I mean, my one sentence kind of answer to that would be, yeah. Number 2, 3 and 4, I think are pretty applicable to the types of animals I think about. Number 1, less so.

**Interviewer 1:** Ok. Perfect. Great, ok. So, I want to shift to talk about management a little bit. So, we’re wondering, like I said, how - we’re trying to assess if and how we manage for biodiversity in US management. And so to start, I’m wondering if you think that biodiversity is currently explicitly considered in management, and if so, with what approaches or policies.

**BD037:** So, my short answer would be no. And again, I approach that from a fisheries management standpoint, and that would apply to both fishes and to sharks. You know, of course managed by completely different entities. But no, I mean, the bulk of the assessments, or I guess, all of the assessments that I’ve ever been a part of, maybe 15 or so, all approach management of marine resources from a single species standpoint. And, really, if I’m thinking - I’d have to think about it for a minute but, you know, only rarely or only recently have we started taking broader considerations into context. So, SEDAR, you know the South Eastern Data Assessment Review, the stock assessment process essentially, SEDAR 77 - I’m a part of that process right now and that encompasses all hammerheads in the Atlantic Ocean. So, great hammerhead, scalloped hammerhead, and carolina hammerhead, and we have been filling out kind of report cards, essentially, that look at how those animals interact with other species and their potential vulnerabilities to changes in their populations. So that would be the first kind of attempt in my world, for the assessments that I’m familiar with, to really sort of consider that in a meaningful way. Yeah, I think, you know, that’s something that’s relatively new. Um, in my experience.

**Interviewer 1:** Ok, great. Are there approaches or policies that you would like to see to better manage for biodiversity?

**BD037:** You know, we talk a lot about the concepts of multi-species management and ecosystem approaches to fisheries, and ecosystem based fishery management. And, you know, understanding that those can be at times pretty nebulous, or at times difficult to define and operationalize. I think there is the opportunity through those types of platforms to encourage, uh, you know, multi-species management for example. And, you know, even when we think about how we set quotas for things like small coastal shark populations, historically - and when I say historically it’s only since 1993 that those have been managed at all. But at first those quotas were built for those animals around species complexes. So all coastal sharks managed in the same management plan, and even sometimes assessed through the same SEDAR. But I think about it, there’s been a push away from that. Um, as we learn more and more about the individual life histories of these individual species, and understand that they vary a lot more then we might have previously thought, there’s this move towards assessing them more specifically and more individually on a basin by basin, stock by stock basis. So, almost counterintuitively, you could argue that the approach has moved away from a multi-species or conglomerate approach to a more single species approach. But then, if you continue along that sort of trajectory, I see the potential to add things like sharks into more - at least simple ecosystem based management approaches and I think, you know, as complicated as that might be, I think there are inherent benefits for biodiversity if those plans can be implemented successfully.

**Interviewer 1:** Ok. Great. That is perfect, ok. So, I know that you are very familiar with mental modeler, for this project we’re using mental modeler to understand how management impacts biodiversity and other system components. So, [Interviewer 2]’s been building a concept list while you have been talking in the background. Do you want to just go ahead and share your screen [Interviewer 2]?

**Interviewer 2:** Yup. Ok.

**Interviewer 1:** Ok, great. So, do you want to just run through what we have here [Interviewer 2]?

**Interviewer 2:** Yeah. Um, so those gray boxes in the center are those bins that we’ve identified as the aspects of biodiversity. I pulled habitat forming species out because you don’t think about that in your work. The orange boxes are the ways that you personally think about biodiversity, so species diversity of sharks, and then kind of regional scale diversity. Which I believe is gamma. And then, the blue are either current management strategies or policies, so single species management and SEDAR 77, that are kind of considering biodiversity but not explicitly. And you’d be a fan of multi-species management that might more explicitly consider biodiversity if they were implemented.

**BD037:** Cool.

**Interviewer 1:** Ok, awesome. Um, should we make a note? So, if I understood correctly, within SEDAR 77, the component that might, or that’s starting to consider biodiversity was those report cards of species interactions? Is that right?

**BD037:** Yes. Um, and I’d have to go back and look. Because that was just - it wasn’t an afterthought, but it was towards the end of the entire process. Um, and it wasn’t yet - I mean it was a new concept. It was something I haven’t seen from the previous SEDARs.

**Interviewer 1:** Yeah, ok. Very cool. Um, ok great. Yeah, so our hope for the rest of the time is just to go through and talk about how each of these components are related to one another, as you know very well. Um, do you have - what time do you have? Until, to talk. Just want to make sure.

**BD037:** Oh, I’m not - I’ve got an hour. I have to lecture tonight but… so I would just need a minute or two to remind myself what I want to talk about. But, I’ve got at least an hour.

**Interviewer 1:** Ok. Great. Just want to make sure. Um, ok. So, maybe let’s start with species diversity of sharks. So, how would an increase in that impact the rest of these components?

**BD037:** An increase in the species diversity of sharks?

**Interviewer 1:** Yeah.

**BD037:** Ok. So that would increase, um, geographic scale diversity. It would increase key food-web supporting species. Harmful organisms to humans. Now for the blue - for the blue boxes. Why are those a different color?

**Interviewer 2:** I just used different colors to color code. In other interviews, we’ve also included stressors, stakeholders, different things like that. So that just kind of helps people separate the concepts. And it’s easier for me, personally.

**BD037:** Gotcha. So, is it logical for me to be making an increasing or decreasing relationship between species diversity of sharks and things like single-species management?

**Interviewer 1:** Yeah, however you see that relationship working. And of course it can be bidirectional, or just one way or the other. And however you think about this logically, we can go through and draw the relationships. So we can bounce around however you see fit.

**BD037:** Yeah, so an increase in species diversity of sharks would make single-species management of sharks more difficult. So, I guess that’s a negative relationship. Same with the SEDAR 77 report card, that’s a negative relationship as would the other two boxes honestly, EBFM and multi-species management. And the way that I think about that is they’re both just such data hungry approaches, that we’re really only somewhat able to manage at this stage for the suite of species that we have.

**Interviewer 1:** Yep. Ok.

**BD037:** And then, let’s see. Um… I think increasing the species diversity of sharks would in turn increase the potential for those species to be of conservation concern.

**Interviewer 1:** Ok. Ok, great. Um, so, if you can, we can also add the weights. For this project we’re just doing low, medium, or high impact on the relationships. But it’s not a big deal if we can add them. But do you see differences in the weights of these relationships, if we have them?

**BD037:** Yes, um. So, a high weight between species diversity of sharks and then gamma diversity. Um, medium weights between key food-web supporting species and harmful organisms. And, medium for - well, a low weight for species conservation concern. And I think with respect to the orange areas, like starting on the left hand side and moving down, I would say… a high level of difficulty, same with the SEDAR 77 report cards, and then medium, a medium strength relationship between the final two.

**Interviewer 1:** Ok. Perfect. So maybe let’s jump to gamma diversity, the geographic scale concept. So if that was to increase, how would that impact the rest of the system.

**BD037:** So I realized I set those relationships as being the same. So if gamma scale diversity would increase, you know, shark species diversity would increase as would key food-web supporting species, harmful organisms to humans, and species of conservation concern. And if we were applying weights I would say add the same weights to those.

**Interviewer 1:** Ok.

**BD037:** Let’s see. I feel the same way about the final four - the four boxes on the bottom. So the same, um, you know, negative relationships with the same strengths.

**Interviewer 1:** Ok. Ok, great. So, let’s go to key food-web supporting species. So, if those were to increase, how would that impact the rest of the system?

**BD037:** Ok. And that, that arrow though, between species diversity of sharks and key food-web supporting species, that could be bi-directional?

**Interviewer 1:** Yep.

**BD037:** Yeah, I mean, that’s how I would characterize that. So… ok. Same with geographic scale diversity. I don’t really - I see a weak relationship, I guess, between key food-web supporting species and harmful organisms. The same with species of conservation concern. Ok, so the arrow to multi-species management I see is positive with a medium weight, same with EBFM. And, um, a negative, but only slightly negative relationship between… yes, that, and the final two boxes.

**Interviewer 1:** Do you mind explaining the mechanisms behind those different relationships like you did for the diversity components to management? I thought that was really interesting, how you were saying it would make it more difficult.

**BD037:** Yeah, sure. So, if there’s an increase in key food-web supporting species, I think when it comes to multi-species management, that if that relationship is understood, I think that’s an easier thing to model or an easier thing to capture, in both the interspecies model for an ecosystem based fishery model. Because, you know, if those species are key food-web supporting species, I feel like there’s an inherently better understanding of their trophic ecology, so that makes that a bit, perhaps cleaner to examine in that framework, that multi-species framework. With respect to, you know, the more species, SEDAR 77 single species management, things like that, it’s kind of that same concept. Whereas, you know, with an increase in the number of species, you know, there’s an - almost an inherent difficulty in adequately assessing those because that process takes so long and is so clunky at times. SO that’s why I think there’s a wee bit of a negative relationship there.

**Interviewer 1:** Ok. Great, thank you. Ok, so I think we’re done with key food-webs supporting species, so if organisms harmful to humans were to increase, how would that impact the system?

**BD037:** So, I see weak relationships between increases in harmful organisms to humans and the top two boxes, so, um, yeah. That one and that one. And then for the gray boxes… is it for some of those boxes to just not have relationships?

**Interviewer 1:** Oh, absolutely. Yes.

**BD037:** Ok. So, I think to finish that box, for me the other relationships I see are with multi-species management and EBFM. And there’s a, um, gosh. It’s a weak relationship I think, in sort of a positive - well. So this is to say if there was increase in a shark that was dangerous to humans, I mean I think that could be well captured in something like a multi-species management plan or a fisheries-based management plan. But I don’t know if that relationship is inherently positive or negative.

**Interviewer 1:** I see what you’re saying. So we can also just draw an arrow and leave it - it’ll look like a question mark, but it’s just neutral, showing that there’s a linkage but we can’t assign a weight to it.

**BD037:** Ok.

**Interviewer 1:** Ok. Um, anything else for harmful organisms?

**BD037:** No.

**Interviewer 1:** Ok. So, if we were to increase species of conservation concern, how would that impact the system? And, I wanted to ask you for this concept, um, because we’ve had different interpretations of it. Would you say that your preferred state of species of conservation concern is increase or decrease? How are you think about that? How are you thinking about that as you’re building up this model?

**BD037:** So when I think about - I think about something like a sandbar shark for example. Um, you know, classified as overfished and experiencing overfishing, since the late 2000s. And under a harvest moratorium. But then that species starts to recover following periods of no harvest. Recreational or commercial harvest. So, you know, it - there’s a point after which it’s no longer considered a species of conservation concern. Now on the other hand I think about sawfish, and things like that. I mean, very clearly a species of conservation concern. So, as those populations start to recover - that’s the way I think about that. So, what’s the impact that has on these other components.

**Interviewer 1:** Ok. So you’re… I think, if i’m understanding what you just said, you would prefer for species of conservation concern, for those species, to increase. Like you would want a sawfish population to increase.

**BD037:** Yes. Yes. I’m saying those populations are depressed, then the objective would be to increase those populations of species of conservation concern.

**Interviewer:** Right. Ok, perfect. Ok. So, with that, if those were to increase, how would that impact the system?

**BD037:** Sure, so I think the first thing - I mean, white sharks were at some point a species of conservation concern. And as those populations increase, there’s a direct and a negative relationship between those population increases and harm to humans. And that’s - I think that’s a pretty strong negative relationship. Um, a lot of - and again for the species I think about, they tend to be at least mid to upper trophic level predators. So they, I mean, increases in those populations which is a good thing has the potential to have downstream cascading effects on key food-web supporting species. Um, but a very strong and positive relationship with gamma diversity and species diversity. And then for the four bottom boxes, that makes things like EBFM and multi-species management a bit more of a challenge, and I say that because a lot of these species of conservation concern, we just don’t know very much about their life history. Because they’ve been protected and sampling them is difficult. So, I think that relationship’s weak, but I think it’s there. And then, you know, I would say a slightly positive relationship to the SEDAR 77 box and the single species management. When we do see, you know, these hammerheads are a great example. Right, so, there’s the thought that these species are of considerable conservation concern. At least they are in our part of the work where they have population segments that are experiencing overfishing. And so that actually increases the impetus for their single species management. So in essence, they get bumped up on the priority list of things they can assess. Because everything’s a tradeoff, you know, we’d like to assess every single species every year, but of course we know that’s not possible. But, given, like it’s always the squeaky wheel that gets the grease kind of thing.

**Interviewer 1:** Right. Ok. Great. I wanted to just really quickly, before we go on… so you said if species of conservation concern were to increase, that would increase, in this example with sharks, organisms harmful to humans. Right? Ok. Yeah, so I think we need to change that sign. Just wanted to make sure. Ok. Um, ok great. Alright, so now, we’ll finish off with the management concepts. So, the, if we increased multi-species management approaches, how would that increase the system?

**BD037:** I think that’s a positive relationship with species of conservation concern. Positive relationship with harmful organisms to humans. Key food-web supporting species. And, both of the diversity boxes. There’s a, you know, a strong positive relationship between multiple species management and ecosystem-based fishery management, um, and really no relationship to the - well, let me think about that. I’d say a - basically, just a neutral relationship between that and the two remaining single species boxes.

**Interviewer 1:** Ok. Perfect, ok. So then, same question but EBFM.

**BD037:** So, I see those very similarly. So, you know, essentially a repeat of those same relationships. And so, I’m making sure that I interpret that correctly, what I intend for that is an increase in the prevalence of ecosystem based management would have a strong and positive effect on species of conservation concern. Is that appropriate?

**Interviewer 1:** Yeah, and it would hypothetically increase those species.

**BD037:** Yes.

**Interviewer 1:** Yep, exactly. Ok. Anything else for EBFM?

**BD037:** No.

**Interviewer 1:** Ok. So then, the SEDAR report cards, if we were to have more report cards and those approaches, how would that impact that system?

**BD037:** I think that’s good - you know, that increases in a positive way the whole EBFM and ecosystem-based fisheries management, same with species of conservation concern. Same with harmful organisms, and same with food-web supporting species. There’s really no relationship to the top two boxes in orange. And… a positive relationship to single species management.

**Interviewer 1:** Ok, great. And then, our last one is single species management.

**BD037:** So I’m moving from left to right, or clockwise I guess. Positive strong relationship to species diversity, geographic scale diversity, food-web supporting species, no relationship to harmful organisms. Well… yeah, no relationship. Increases in single species management positively increase species of conservation concern and, let’s see… positive relationships between the three other management options. In essence, the more in-depth information we have for single species assessments, the better that those then could be incorporated into more complex management options.

**Interviewer 1:** Ok. Is that everything you think?

**Interviewer 2:** Yeah, that’s all of it.

**Interviewer 1:** Ok. So, since we still have a few minutes, I wanted to ask if there are specific ecosystem services that are related to this system? Or stakeholders that are affected by the system. And it’s ok if we don’t have time to redraw all those relationships between all the different concepts. I would love to get your thoughts on that.

**BD037:** Yeah, um. Yeah, I think what I spend a lot of time thinking about recently is how increases in species of conservation concern have negative impacts, or potential for negative impacts on stakeholders. It’s interesting. And I think that human-wildlife conflict and, um, I can see that relationship pretty clearly.

**Interviewer 1:** Do you think it would be - I know we have harmful organisms to humans. But worthwhile to add in human-wildlife conflict as a separate concept, just conceptually? Or is that too redundant?

**BD037:** Um, no, I don’t think it’s too redundant. Well - yeah, I guess it actually, yeah I think it is.

**Interviewer 1:** Ok.

**BD037:** And so your, just to remind myself of the question, your question is how are other stakeholder groups are impacted by these boxes?

**Interviewer 1:** Yep, exactly. Within the context of your study system of course. As we’ve been talking about it.

**BD037:** Huh. Where was this guy when I needed it the other day.

**Interviewer 2:** Hey. I have a few choice words for him.

**BD037:** Lets see.

**Interviewer 1:** You can take that call if you need to.

**BD037:** Uh. I’d rather not.

**Interviewer 1:** I’d rather not, ok.

**Interviewer 2:** [Interviewer 1] I’ll fill you in after.

**Interviewer 1:** Great.

**BD037:** So I guess the other group I would think about, of stakeholders, you know, inherent in this system are resource managers, NOAA fisheries, stocks assessment scientists and things like that. But the question is then, how would something like - I don’t know how to quantify that sort of relationship, though.

**Interviewer 1:** Yeah, it’s ok if they don’t directly impact certain components, or if it’s indirect, or it’s, um… yeah. It’s however you see it.

**BD037:** I guess I should probably clarify, when I say fishing stakeholders, you know, I think there’s a pretty big difference between recreational fishing stakeholders, charter fishing stakeholders, and commercial fishermen. So I would probably separate those out in different groups. You know, I think diversity, however you think about it, is beneficial to all three of those groups in the same way. But I think, you know there’s a positive relationship as recreational - as species of conservation concern are increased, I think that there’s a positive relationship to recreational fishermen, but less so for charter-for-higher, and even less so for commercial. And actually, I think those are negative relationships between those final two - yeah. So weak negative relationships between charter-for-hire, and more strongly negative for commercial. It’s essentially this concept that, I mean, think about marine turtles. As their populations recover, you know, that creates additional frustration for commercial fishermen who interact with those animals. And it’s always, or it seems to me to always be the case that that increase is realized faster on the water then it is through the models or through management plans. So those stakeholders are sort of forced to deal through those scenarios before the fishermen managers are. Whereas for recreational fishermen, there’s really no downside for seeing more turtles, you know, if we’re talking about that. And the same applies for sharks, really.

**Interviewer 1:** Ok.

**Interviewer 2:** Yeah I was going to say, it’s the deprivation conversation we’ve been having.

**BD037:** It is, and I’m not trying to beat a dead horse, but it is where a lot of my thoughts go.

**Interviewer 1:** Ok. Is there anything else? Should we go back quickly to the, yeah, to the resource managers. Is there anything that those managers are connected to in this system? Either for the diversity or for the management boxes. Or for the stakeholders.

**BD037:** No, I’d probably just take that out. You know, the more that I think about it - I just don’t know how to think about those relationships.

**Interviewer 1:** Ok. Ok, that sounds good. Ok, maybe for the sake of time, because we have about five minutes left. I’ll stop there - unless there’s anything else that you see that you want to add.

**BD037:** No, I’m just wondering how, I mean, I just want to actually want to make sense of this.

**Interviewer 1:** It’s a great question. Um, yeah, so what we’re using these initial interviews for… so we’ve been interviewing folks like yourself, researchers, some practitioners, NOAA folks, and then some regional managers for our case studies. We have two other case studies along with the Northern Gulf of Mexico. One is Chesapeake Bay, and the other is Sailor’s Sea. Um, so we’re trying to distill down the results from these models and these interviews into a base model, which I think will end up being more of a conceptual model, to be honest. Unless it’s a quantitative FCM. To understand these issues, of how to frame biodiversity and how to conceptualize it, for a potential decision making framework. And then we’re going to use that framework in our workshop in a more localized use with specific species of interest, whether or not that’s a fisheries target species or oysters for aquaculture, or living shorelines. And see if that framework can be distilled down into a more specific context-dependent scenario in these case studies, and then use that as a feedback loop back up to refine the more generalizable framework for larger spatial scales. For bigger picture management decision-making frameworks.

**BD037:** Ok. Ok, that’s interesting.

**Interviewer 1:** So you’re, are you able to come to the workshop in a few weeks? Ok cool, alright.

**BD037:** Yep.

**Interviewer 1:** So you’ll see how it goes then.

**BD037:** Yeah, no I’m excited about that. That sounds really good.

**Interviewer 1:** Yeah I’m excited as well to have you there, I think that that will be really helpful. Are there, um, key issues in the Northern Gulf of Mexico that you think are relevant to this project and important for us to maybe hone-in on in this workshop?

**BD037:** I mean again, I spend so much time thinking about shark deprivation. And that really is the result of an increase in species abundance, but, you know, a - yeah, really more in species abundance. Is not as though the biodiversity has really changed that much. But, yeah, it’s a pretty, it’s a pretty topical issue among fishermen. So it depends on the audience that you’re around, but fishermen talk a lot about that. And I guess with respect to protected species as well, like with dolphins. I mean it’s the same sort of negative interactions that are sort of plaguing fishermen. And so it pits those two groups of stakeholders, you know, in sort of opposite corners. There’s people that desire to see those protected species continue to be protected, and the populations recover fully. But then, it’s almost as if the very true fishermen don’t have the desire to see that because it adversely impacts their experiences on the water. And you know, like anything the devils are in the details. But I think - not I think. It’s definitely a topical issue in the Northern Gulf.

**Interviewer 1:** Ok. Ok, yeah that’s great to know. Steven has said similar things. And that’s - we’re, uh, [Interviewer 2]’s doing some interviews with tourism operators as well, and so we’re hoping to have representation from the tourism industry and the fishing industry to talk about just that.

**BD037:** Good. That’s a good idea.

**Interviewer 1:** We’ll see how it goes. The cool thing about using mental modeler, as you know, is you can run those scenario simulations to look at tradoffs, so the goal is for the second day… we’ll build the model on day 1 and for the second day we’ll use the scenarios to look at how different management interventions would impact these different stakeholders in different ways.

**BD037:** Yeah. Yeah, no I had, you know, I had aspirations to try the same sort of things in a workshop we had a few years ago, I just don’t know enough about the program to really do that. But I can see the potential. I see the utility of it and I would really like to see it in action. That would be really good. Um, I think I mentioned this to [Interviewer 2], you know, these Australian guys that deal with the same issue have proposed and subsequently have funded this series of workshops to address deprivation in Australia and they’ve, you know, they’ve invited me to attend those workshops as someone who knows how to use mental modeler. And they’re sadly mistaken because I don’t. I mean, I’m familiar with it, but. So I’m hoping - I need to either brush up on my techniques or bring someone with me that can actually do all the things as the people they’re talking. So…

**Interviewer 1:** [Interviewer 1] I hear you have too much on your plate.

**Interviewer 2:** I do, but I’m not going to pass up a trip to Australia.

**BD037:** I know, right?

**Interviewer 1:** Alright. Well, I’ll let you go, but thank you so much for taking the time today, we really appreciate it. And we look forward to seeing you in a few weeks!

**BD037:** Yeah, likewise. See you, and so sorry about missing my time earlier.

**Interviewer 1:** Oh, no worries at all.

**BD037:** Alright, well. See you guys.

**Interviewer:** Thank you, bye.