Interviewer: Okay, great. So before I kind of dive into some of my specific questions, I was hoping that you would just tell me a little bit more about your area of expertise, your work responsibilities and research.

BD016: Sure. So I've been at the council for about 16 years. My primary responsibilities are coordinating the mackerel, squid, and butterfish fishery management plan, and our dogfish, spiny dogfish fishery management plan. So with mackerel, squid, butterfish, we get into some river herring issues. Cause there's bycatch of river herring in the mackerel and longfin squid fisheries. Those are my primary day in and day out. And then various projects from year to year where we've done some sturgeon bycatch reduction stuff this year. A little bit of tilefish. We've got some private reporting on tilefish catches. Track New England development - so, monkfish, groundfish, herring - I kind of track what's going on with New England stuff for us. I'm our kind of liaison to the MRIP program that estimates recreational catch. And also heavily involved in MREP, which is an educational program run through the Gulf of Maine for fishermen to kind of learn how to participate in the council process.

Interviewer: Great, okay. So I just want to make sure - so my next question is going to be what specific species or habitat do you manage or work with and I want to make sure I have them right. So mackerel, squid, butterfish, river herring, there was dogfish.

BD016: River herring we're more focused on bycatch issues.

Interviewer: Gotcha.

BD016: We don't get a ton into habitat stuff with the river herring. Yeah so spiny dogfish, Atlantic mackerel, butterfish, and then two species of squid - longfin and illex.

Interviewer: Okay. And are there specific policies or regulations that you work with when conducting this work? You know, thinking about bycatch and some of the other fishery management plans that you're talking about, like the specific regulations that fall within that?

BD016: Sure. So, Magnuson requires bycatch reduction to the extent practical - is kind of the wording in the Magnuson Act that drives bycatch issues. There are - so when we have endangered species issues, it's whatever kind of comes out of the biological opinions, kind of activates reasonable and prudent measures. So we have ESA stuff - mandates and stuff. We're starting a kind of a review of all of our EFH designations and also kind of fishing impacts on EFH, both our own EFH and EFH of other federally managed species. Jessica Cokley in our staff is kind of the lead on that EFH. And she'll be kind of coordinating with all of us, other planning coordinators in terms of, you know, there - are there habitat measures? We've closed a number of areas for habitat concerns, primarily some canyon areas for tilefish habitat, golden tilefish build like these mud, Pueblo, mound habitats that they kind of live in. And then we've closed a number of canyons and deep water areas for deep water coral purposes. Those are our main habitat related kind of area based measures that are on the books right now.

Interviewer: Gotcha, okay, cool. So what would you say - I think you probably answered this in the first question, but what would you say your current area of focus or top concern is right now is in your job?

BD016: I'd say, so mackerel - Atlantic Mackerel - are overfished - were in a rebuilding plan. We'll get an assessment update this summer to kind of see how things have gone the last two years since our last assessment. Canadian mackerel assessment was rather dismal so I'm not expecting happy news. Our assessment we - a lot of the data is overlapped. I think the mackerel and the squid are in pretty good shape. Butterfish is in pretty good shape but spiny dogfish - we just had a research track assessment that kind of changed I think our perspective on how productive that stock is and we'll have a management track assessment in the fall and I wouldn't be surprised if that comes back overfished. We won't know until September / October so that's likely to kick off our need to improve that population and almost no one likes to have more spiny dogfish in the water. The recreational folks - the commercial folks - kind of think we're crazy to increase spiny dogfish population, so that would be kind of a mix of both just kind of you know, kind of integrating the new science on dogfish, spiny dogfish - but also be a bit of a public relations trickiness there. So those - because the other thing is we have this ongoing River Herring and Shad conundrum. There's been, you know, there are some runs like up in Maine that are doing more or less fine, but a lot of the southern New England and Atlantic runs of Alewife and Blueback are, you know, continue to be operating at - I think what a lot of folks who are kind of more directly involved in River Herring management - we kind of consider like a remnant run and the Atlantic Herring, Atlantic Mackerel, and Longfin squid fisheries, probably among some others also, but they definitely bycatch the River Herring and we have a cap on River Herring and Shad bycatch in the Mackerel - and New England has similar caps for Atlantic Herring, but we don't have great observer coverage in those fisheries. The caps are based on historic amounts or ratios, not really directly tied to River Herring and Shad biology, so it's not clear if our caps are overly restrictive or not restrictive enough. They have some impact because sometimes they go to the fisheries, so they're having some benefit to River Herring and Shad, but the cap amounts aren't directly tied to river herring and shad biology. So that's kind of an ongoing thing. New England is revisiting kind of their approach to river herring and shad and I think in the medium term we're kind of, I think we'll be able to get a better handle on like what genetic stocks are most prevalent where and maybe try to have some adaptive management to avoid those some time areas that make sense but we're not - we don't have that quite pinned down and concern is if you just shut some area in some kind of static timeframe you just shift effort around and maybe you make the problem worse not better. When we look historically we can kind of see where bycatch has occurred but that's an intersection of effort and the presence of river herring and shad. So presumably the fishermen are going to where the target species are relatively prevalent. If we shuffle them somewhere else and they have to fish longer to catch the directed species you could do more harm than good. So anyway that river herring shad is still a conundrum. I still don't think we know exactly, is it more a habitat issue? Is it more a bycatch issue? What is the driver there? We still don't have a perfect sense of. So let's see, I think those are probably the core things. Again, we're also, we have an action for sturgeon bycatch reduction, focused on probably more on monkfish, but that's actually going to be talked about tomorrow, I think tomorrow at the council. So that, you know, so we have out of the last buy off have to reduce catch of sturgeon. It doesn't say by how much, just as some reduction in large mesh gill nets. They're also caught in smaller, in like what NMFS defines as smaller mesh gill nets, which would extend beyond the monkfish fishery down into the spiny dogfish fishery. So it's not - it's hard to know. Again, we have the same kind of issue with the river herring. We don't want to just reshuffle effort. So I think for a monkfish we have some measures, some cooperative research was done, some kind of gear strategies that should reduce bycatch for sturgeon to some degree, but kind of an ongoing action and trying to figure out you know what is you know for reasonable improvement measures - they are not supposed to like change the overall characteristic and kind of operation of the fishery, but you still want to reduce sturgeon and if you're reducing sturgeon catch you can have to change something about the behavior operation in the fisheries. So kind of weighing that of you know, what is kind of - what's a reasonable approach for sturgeon. So those - I don't have a ton of right whale issues in my fisheries. But if, you know, if some spiny dogfish gill net or monkfish had right whale interactions, that could spin that up quickly. There's some - NMFS is organizing some measures that will probably impact those fisheries to some degree in terms of reducing vertical lines in the water. But it's not a direct action out of us. It's more of a NMFS driven thing through the - I think that's run through the large whale take reduction team plan or something like that. So I think those are kind of as I look at my performance here kind of - kind of the most pressing issues this year anyway

Interviewer: Okay, great. So I think for - so I think like I said in the email the focus of our project is to understand the role of biodiversity and marine resource management - in your case fisheries management. Given that you work on such a wide range of issues, I think it probably would make sense to focus on one of the things that you just talked through rather than like going through all of them. So I don't know if there's one that you think would be like most interesting or prevalent to that topic, broadly biodiversity management. I think it sounds like maybe the River Herring and Shad bycatch issue might be a good one to focus the rest of the conversation on but I don't know if that makes sense to you.

BD016: Yeah, how are you defining biodiversity for the purpose of your project?

Interviewer: It's a great question. So that's part of our project, not to flip the question back on you, but part of the goal of the project is to understand how managers and researchers think about biodiversity, how they conceptualize it, and when they hear that term, what do they think about and what is important to them. So the next question I was gonna ask is what aspects of biodiversity do you think are important for your system or this area of focus? And I think like maybe picking one of those focus areas, but we can talk about that broadly as well.

BD016: I mean the handful is some degree, you know, still because the Magnuson Act focused on managing the individual stocks. And as I kind of googled biodiversity before our talk here, just to try to, my wife always says, "Oh, you're too wrapped up in the dictionary definition of words." But a variety of life in the world or a particular habitat or an ecosystem is what Oxford Dictionary kicked out here. And so kind of when I reflected on kind of the council, you know, I think it definitely informed our deep water coral closure areas. And you got a fairly sensitive ecosystem, some interesting, possibly endemic kind of species of flora and fauna out there. And so the council, this is maybe five or ten years ago roughly, closed a bunch of areas, canyons and just deeper shelf break areas. And I think even though I kind of did a word search through our strategic plan and biodiversity didn't pop up as a word in our strategic plan - that's a theme. But that's a vision - healthy marine ecosystems and thriving sustainable fisheries and fishing communities, blah, blah, blah. So I mean, I think the healthy marine ecosystems kind of brings in biodiversity by necessity, I think to some degree. So thinking, you know, the coral thing, I think that was even, you know, if biodiversity doesn't pop into our strategic plan, I think was a driving force there. I think our EFH redo that is kind of pending - I think we don't have a lot of direct impact on. So if we identify things as EFH, federal agencies have to consult with NOAA when they're, you know, permitting, doing permitting decisions or federal rulemaking. And they have to, you know, take those comments. And if they don't kind of do what NOAA suggests, they have to tell them why basically. So we don't have like a strong habitat hook other than kind of identifying these EFH areas and that drives consultations. But whether it's BOEM with wind farms or whatever, it's really just a consultation and there's not a strong hook there. But I think identifying the EFH is, you know, kind of gets into some of that biodiversity aspect. Then, you know, our ESA work is the other thing that kind of came up because, I mean, we definitely have interactions with turtles, sturgeon, not so much large whales, knock on wood, but it's possible because we have, I mean, vertical, we have pot and trap gear to fish black sea bass. So there's potential there. But all of our ESA related activities, I think, are - I mean that's kind of the crux of biodiversity for you. You lose species, you've lost it. And then I guess from kind of my day in, day out, probably the river herring is a good one. There have been, so there was a listing determination that it was not listed and a few years ago, there's been a good bit of genetics work kind of that's kind of chunked up some of the river herring populations into - I don't know if they're, since they're not listed, I don't know if it's technically like a distinct population segment - but there are these genetically different regional populations. I'll send you a paper that just came out that was then analyzing bycatch based on which of these kind of regional populations are being most impacted and so that - we're still kind of digesting I think that paper and you know how again…and it's still a bit of a snapshot of what happened in particular years. I don't think we're quite at the spot where we can say, "Okay, this area at this time of year has a lot of river herring from these Connecticut watersheds that are particularly low runs, so we should focus on some kind of management area, some management action that we know would have a good impact for that group of runs.” But I can see that it's - kind of - things are headed in that direction because we've been able to identify them a bit more and have a sense that there is bycatch in certain areas that, at least in some years, has disproportionate representation from some of these runs that are particularly low, low, low statuses. And so I don't know how it's going to play out, but I know we'll have one of our advisors, Pam Lyons-Grooman, who works for Wild Oceans. So she asked that paper to be kind of considered as we - every other year we kind of do like an informal River Herring and Shad update when we set the River Herring and Shad caps for the fishery. So that paper will be kind of in the mix. And generally the council sets priorities for any given year in the prior October and December. So I can imagine - like our discussion in August on River Herring when we're setting the River and Shad cap and kind of updating relevant information, could kind of lead into some discussion. And in October and December, does the council want to spin up some River Herring and Shad action and then it's kind of up to the council where its priorities are and how it wants to spend my time next year. Right. But yeah, I think it's like we know some runs are doing more poorly than others. We know there's disproportionate representation of some runs in some years in bycatch, but we haven't quite gotten to where we know how to redirect effort where we're going to have that positive impact. So I think we'll be digging into that over the next few years in some fashion. And again, New England is considering reprioritizing some of their 2023 work efforts for River Herring and kind of this issue. So I don't know exactly what the Mid Atlantic will do, but I am sure there'll be kind of continued discussion of the issue.

Interviewer: Okay, okay, great. That's really interesting. Um, you know, I don't hear a lot about genetic diversity as something people think about, so that's a really interesting perspective to hear. So when we're asking, you know, what we mean when we think about biodiversity, a previous project of our collaborators broke biodiversity down to these four bins of biodiversity and those are habitat forming species, species of conservation concern, key food web supporting species and harmful organisms. And I can put those four in the chat if that would be easier if you're a visual person like I am. But I'm wondering I guess one, if you agree that those are kind of the four key components when thinking about biodiversity and two, if those are things that you think about, you know, in all these, this discussion we've been having of like, do you think about these different types of bins when you're thinking about biodiversity in your work? I think you've already listed a few of them. You're talking about whales, you know, species of conservation, and you're talking about the deepwater corals for habitat forming species. But yeah, if you could elaborate on that.

BD016: Yeah, could you put those four into the chat?

Interviewer: Absolutely.

BD016: We don't have kind of in general, well - so we do have kind of a whole “ecosystem approach to fisheries management” guidance document. And I just want to see if it says anything in particular about biodiversity in this EBFM guidance document. So that does kind of talk a bit more about biodiversity directly as I kind of just do a word search in it.

Interviewer: Sorry, will you say again what document this is?

BD016: So I mean, I think we're still - fisheries management in general - still moving in the direction of more holistic ecosystem-based management on our website. If you go to - on the bars on the left, there's ecosystem and habitat. The first one, there's ecosystem approach fisheries management and there's a guidance document that the council came up with in the mid-teens, revised in 19, to try to come up with a framework for considering policy choices in an ecosystem context. And that has a little bit more discussion of biodiversity. But okay, so habit-forming species, again, the tilefish form a little bit of their own habitat. I'm sure other critters use it also. And I think that's why, again, I think it was more for their own EFH. In decision making, I don't know that we had a lot of information that there were other critters using it. These kind of burrows they form, but I'm sure that's some overlap there. Species have come - - so from the key food web supporting species, I think we'd say, you know, following the science on our kind of prey species, like squid, mackerel, butterfish, should contribute to that. We have a lot of, again, Pam would say that we don't, we may not robustly enough account for potential effects of harvest in the broader context, like in our last meeting. She was slagging me and - we have Atlantic mackerel and Atlantic herring are at quite low levels right now. So should that impact how we're managing squid and butterfish, other prey species? And she would say we haven't accounted for that enough in a sufficiently precautionary manner. I think from the basic council response would be, we have a, I would say a fairly precautionary risk policy that forces quota decisions to become more and more conservative if the species is below its target and gets more and more conservative as it gets lower and lower beneath its target. And so that should integrate, I think some, again, of this food web supporting species. And I don't think we get into harmful organisms too much. I know in our NEPA documents, there's like a little section that talks about introduced species and I think we have some like boiler plate that we don't anticipate or know if kind of our fisheries have caused transfer of harmful organisms or our fisheries like causing some blow up of a eutrophication over nutrient thing. So I'd say it's mostly the middle two there. And I'm looking at species of concern, whether it's the river herring or the whales. And then also, I think our general risk policy should address that food web thing. I know in the ecosystem approach to management, there's language. So we've got kind of two components. We have an unmanaged forage species part of management where, so basically for a long list of what we determined to be unmanaged forage species, we have an incidental limit, possession limit for them. So it'd be difficult. And then we also have at least once a year, I think I might be at this council meeting, let's see here. It's today at three o'clock. There's an unmanaged commercial landings report. That's a bit on like, is there some Southern species that's moving into our area? But I think also a bit like, could some new key food web supporting species fishery pop up that we're not aware of. And I think with our unmanaged forage amendment, basically will make that very difficult for that to occur. And it kind of came up with chub mackerel is another species that Julia Beatty in our office has lead for that within this FMP, but it really kind of was added because there was a sense that it was this new species, a species starting, we started to see some landings of it and then we kind of put in a pretty precautionary quota for it and so a fishery on it doesn't blow up until we have a good sense of what would be of, say, prior to allowing any new fisheries or expansion of existing fisheries for forage species, you kind of pretty have to have some decent information on it, basically. And then the ecosystem approach to fisheries management also has some language about trying to establish a forage species management policy that basically said so far that we don't have the science for models to kind of estimate optimal forage harvest levels and to really understand the trade-offs. So we don't have a forage species management policy right now. But if you look in that ecosystem approach fisheries management document, there are these considerations of maybe kind of maintaining forage species at higher biomass levels than you would kind of traditionally see under standard fisheries management.

Interviewer: Gotcha. Okay so that leads right into my next question which I'm just wondering and I think you already just went through a few but like are there actions that you think are needed to better manage for these different aspects of diversity that we're talking about?

BD016: I was just gonna look at our... I mean from a biodiversity perspective at large, lots of things right, but in terms of what the council has purview on, just kind of scrolling through some of our priorities this year. So we have some ongoing work on short-term forecasts of species distributions. And I mean, our species moving into new areas being that it’s new biodiversity in a particular area - anyway - so that gets to it a little bit, but really isn't. I think one, so we have this, there's this National Fishing Effects Database. Jessica is involved in that. And I think again, that gets into better understanding the effects of fishing on habitat. I think that is something still that we're working on to understand and will warrant continued engagement on. So this is another - so we've gotten some exempted fishing permit applications related to thread herring. And it's one of these kind of new species that we want to kind of tread carefully on until we have a good sense of what impacts from fishing might be. That's an ongoing work on marine mammal and ESA issues as they come up and are identified as our fisheries kind of potentially having impacts. I think one thing that will come up a bit, so again, Pam Gromen, so she could be an interesting one to talk to. She interacts in the council process a lot. She's kind of hoped to - the council - to include. So when we do our NEPA analyses, we include impacts on non-target species. And that goes into the NEPA analysis that almost no one reads except me, one person at GARFO, maybe one person at the science center looks at a few chunks and Pam, maybe. And so that - effects on non-target species tends to have a lot of bycatch information. And so Pam has kind of successfully requested that the council include some of that bycatch information upfront in the specifications process. And so like longfin squid has relatively high bycatch rates on our fisheries, I mean ballpark, it's about 33% bycatch, which means for every 100 pounds of longfin squid that go in the hold, 50 pounds of bycatch is going overboard. So I'm anticipating there'll be some additional discussion of the bycatch in at least some of our fisheries, like the illex squid, has almost no bycatch, but longfin squid has relatively higher amounts of bycatch. And so, what is practical? Reduced bycatch seems impractical. What exactly is practical? The list of species caught in the squid fishery is long, even though some of them may be low quantities. You know, what, you know, the impacts on lots of those species that aren't managed, you know, maybe is a source of uncertainty at the least. And I'm not, I don't think that, I don't see outside of ongoing ESA concerns that our bycatch and our fisheries would be likely to lead to kind of extinctions of different critters. It's still a long and varied list of organisms that are bycatch in that fishery. So I think, you know, trying to figure out, you know, what is, you know, when has bycatch been reduced to extent practical? It will be an ongoing discussion for a long time in some of our fisheries. Anyways.

Interviewer: Yeah, okay. Okay, great. Okay. And then, you know, obviously you're in fisheries, this answer might be pretty straightforward. But what stakeholders would you say rely on these organisms that we're discussing and how have they been affected by management in this system?

BD016: Our cumulative effects analysis always says, overall, the effects of management are beneficial to the nation at large. I mean, it's gonna, I think, vary, so. Can you repeat your question again?

Interviewer: Yep, so the first part, what stakeholders rely on these organisms that we've been discussing? And so what stakeholders in the system rely on this biodiversity that we're talking about? And then how are they affected by management in the system? Or are they affected?

BD016: Right, I mean, you have a wide range, right? Everywhere from my kids mucking around the Choptank River and seeing river herring come up in these tributaries to recreational interests that are looking at any of these fish as target species, as forage species, the commercial interests that are dependent on and for livelihood, plus the wide variety support industries, insurance, engine repair, etc. that goes in and exists in the communities where the commercial fishing takes place. You know, subsistence fishing still occurs to some degree in the mid-Atlantic area. Since some of our fisheries have bycatch issues, so lots of different species, anyone with any interest or connection to the ocean or any hazardous species is going to be impacted to some degree. And I think again, in our cumulative impacts analysis, in our NEPA documents, fishing effort is a lot lower now than it was when there were foreign fisheries active in the '70s. And I think through the overall control of fishing effort, I think there are less impacts, less negative impacts on biodiversity than there would have been had management not been there. I think that's probably true. But the species themselves are naturally fluctuating with changes in recruitment. We hopefully are smoothing out some of those ups and downs. But I mean, layer on climate change on top of it, and you know, teasing out the effects of our management on biodiversity are challenging. But again, I think through some of the ESA measures, you know, I think we will have and continue to be reducing impacts on some of those kinds of species of conservation concern. But again, what I, you know, quantify that impact is very challenging other than directionally, you know, we should have, you know, less negative impacts on these species of concern. But I think our populations of our key food web supporting species are going to be higher than if we weren't following the science trying to encourage research yada yada but quantifying those impacts is really hard.

Interviewer: Okay okay great um okay so I know we only have like 15 minutes left, but the last part of the interview, and we won't have time to do all of it, and that's fine, but just to maybe get a little bit. So we're using this tool called Mental Modeler. Have you heard of that before? Are you familiar with that?

BD016: I know what a mental model is, but not that tool.

Interviewer: Okay, well, yeah, it's just a visualization tool to build a mental model. Okay, so you're familiar with mental models?

BD016: I went to University of Delaware for grad school and took a few classes with Willett Kempton who is, yes, he's big into mental models.

Interviewer: Oh cool, okay. Okay great. So yeah, the hope for this project is to build mental models as conceptual models to understand the role of biodiversity in management. And so I, for this project, we're doing an open concept approach. So the hope would be to build a concept list around the answers to the questions I've been asking you and then to assess how those components are related to one another. We've talked about so many things and we have 15 minutes left. But I'm just trying to think through at least to make the concept list in the last 15 minutes of what the key system components are based on what we've talked about. So obviously we've been talking about river herring and Atlantic Mackerel and longfin and illex squid, correct? Those are just like the key species that you're focusing on, on management for. And butterfish was also.

BD016: Yeah. I mean, I think the squid and butterfish, it's not clear how much we're managing them versus them managing themselves. They're so heavily driven by environmental drivers that they're less clear. But mackerel, spiny dogfish, as managed species, I think we have a better sense that fishing mortality has been more negatively impacting them.

Interviewer: Gotcha, okay. And so when we were talking about biodiversity specifically, we were, you were talking about the genetic diversity of river herring being important. And so I wanted to capture that in there. Is there genetic diversity that you think is a key consideration for some of the other species that we've been talking about? Or is that not something that's considered at this point in time?

BD016: I mean with mackerel, we've looked at it because the European mackerel catches have been going like gangbusters. And so we're trying to, some work has been done, but it looks like it is two kinds of distinct and separate genetic stocks. There's been some genetic work with the squids that there was like this back and forth argument, academic argument about like, yes, the squid are likely kind of going back to native spawning grounds and have created genetic little distinct genetic groups. Or no - like the last one was no - but I don't think that argument has fully been settled because they’re going to go offshore in the winter and come - well, they're spawning year round, but they definitely…well, they're offshore in the winter, inshore in the summer. The aging information suggests they're kind of spawning year around with kind of pulses at certain times of the year. But there is some concern that there may be some kind of genetic groupings of the longfin squid and they should be managed as separate stocks. That's kind of an open question. Also other species - I mean, so, genetics of Blueline Tilefish - we sponsored a genetics project that more or less said that they're homogeneous along the shelf from Florida up to us, but we still kind of manage them as two groupings just because of how the fisheries operate on them. And even if they're being distributed through currents and eggs and have a homogeneous population, you know, you could still potentially diminish the population in a smaller area. So yeah, I mean, there are other species where we kind of get into genetic stuff, but I think the river herring issue is mostly where - and I think that's because you have stocks that are quite depressed from their historic levels - why that has kind of been I think an ongoing concern.

Interviewer: Okay, great. And then we were talking about essential fish habitat and deep water coral in particular. And then I think there was some tilefish habitat as well, potentially, or was it in that they make their own habitat - is what you're saying, right? Okay. And so that, correct me if I'm wrong, so that was the species I just went through. That was when we were talking about habitat forming species and species of conservation concern. You said that right whales aren't really an issue and you're in the mid-Atlantic right now, right? So that's not really a consideration.

BD016: Well, I mean, I think some of our gears don't seem to interact with right whales as much as others, but because of their critical status, I think NMFS will be implementing some measures that impact gears in our area. Carson Cisneros is our kind of protected species lead here. He should have a better sense of how exactly some of the right whale stuff coming down the pike from NMFS may impact our fisheries. I'm just aware that there are measures coming to try to reduce vertical lines, but I don't know all the details.

Interviewer: Okay, great. And then were there other species of conservation concern that I'm forgetting?

BD016: Sturgeon is one, I don't know if they're popular, probably, well, I don't think it's quite as critical of a concern as right whales, but again, we have this biological opinion and we have to reduce catch of sturgeon. We have ongoing, I mean, a number of our fisheries catch turtles and have a variety of requirements for turtle catch reduction. I think there’s likely more to come in the future. That I think, yeah, NMFS just did a workshop looking at, I don't know if it was turtle excluder devices, but there's like, I think for summer flounder fishery, there's like a certain north-south border where they have to use south of that. But I think NMFS is looking to increase that usage more off the middle end because we certainly have a number of turtle takes in our summer flounder and squid fisheries. I don't know if anything is like percolating immediately with that, but I mean, I think the turtle takes will be an ongoing issue that creates a management - it's not. We don't have - yeah, there aren't any actions ongoing, but I know, BOEM just was doing some gear research and looking at, I think it was turtles. So yeah, I mean, so turtles are still an issue, will be an ongoing issue. And turtles, right whales, sturgeon, those are the ones that kind of seem to impact fishery actions the most.

Interviewer: Okay, okay, great. And then you said that there aren't really harmful organisms. You said that maybe some range distribution shifts it seems, but like not really like invasive species concern or harmful organism concern right now.

BD016: I mean, I think there's concern of how invasive species may be altering the ecosystem. But I don't think there are a lot of concerns that the fishing we manage is gonna introduce new species. So it's more - we may suffer negative effects because of it, but I don't think there's a sense that we're the cause of it.

Interviewer: Okay, gotcha. Perfect. Okay, and then for the key food web supporting species, I just wanted to make sure I had that right because you were talking, I need to go back and look at my notes really quick, because I know you were saying at one point, and I think there was someone that you said I could talk to - I should reach out to who would be a good point of contact on this - that there are other prey species that maybe like, you know, since it's so single species focused right now in fisheries management that there are other prey species that maybe aren't being considered holistically as we manage other individual target species and that could be an important consideration when thinking about key food web supporting species as a component of biodiversity.

BD016: Yeah, if you go to our website - it is under ecosystem and habitat. There's an unmanaged forage link there. And so that's got Julia's contact information. She's the lead for that. And it'll give you kind of a quick overview of some of our unmanaged forage concerns.

Interviewer: Gotcha, okay, perfect. Okay, and then just the last thing. So in terms of management approaches that we were talking about, I know you were talking about area closures for some EFH deep water coral, talking about bycatch reduction regulations, river herring, fishing effort reduction or control. Are there other management approaches that I'm forgetting that we talked about or other things that I should make sure I have down for that part of the model?

BD016: So, okay, I mean, we have various regs that are driven by ESA, whether it's whales or hurdles for sturgeon. The coral thing, what else here? I mean, I think as I - and I'm just looking through the little ecosystem and habitat blurb on our website - and our kind of reassigning EFH and considering effects of our fisheries on habitat, the protected resource work, the coral stuff, the river herring and shad and the unmanaged forage. I mean I think those - kind of within that ecosystem and habitat grouping on our website there - I think that covers most of our critical stuff and what we're doing related to what you're looking at. And I think we've touched on it all at some point. We haven't - the council hasn't gotten too involved in aquaculture. I see we have an aquaculture policy approved in 2022. There has been some legal stuff with whether the councils can manage aquaculture or NOAA should manage aquaculture. I'm sure there's gonna be biodiversity concerns whether it's increasing kind of pest species on them or antibiotic use or if you're bringing in some other critter. So I think our aquaculture policy probably touches on some of those things, but whenever possible we use only native or naturalized species, blah, blah, blah. So I think we could have some concerns related to aquaculture if that offshore aquaculture develops but it really hasn't gotten very far off the Atlantic so far.

Interviewer: Okay. That's good to know. Yeah, if you have, on that note, I know you named a few other people, but if there are other people that you think would be helpful to talk to you haven't mentioned - if there is someone - since you said an aquaculture policy was just approved. Is there someone at the council who is an aquaculture specialist or are we not there yet because it just got approved.

BD016: I think that the lead for aquaculture is... Let's see. I think it's Jose Montanez is the staffer here who's dealt with some aquaculture stuff, I think primarily over the years. But again, we've barely touched the issue. Even though we have an aquaculture policy, I think we've barely touched it. Although I think there are some concerns and maybe there'll be an intersection of some of the wind farms because they provide maybe some natural - they provide some infrastructure potentially to anchor stuff too. I think there's been a little - just some discussion/concern. Looks like there is one, Manna Fish Farms is trying to get some permits to do some offshore aquaculture off New York, off Long Island. So anyway, on the aquaculture page you'll see a couple sources there and if you want to dig in, yeah I'd probably give Jose a call. Email him on that.

Interviewer: Well, I know we're at 2:01, so I don't want to take up any more of your time, but thank you so much. This was so informative. I really appreciate your time.

BD016: No problem. Have a good one. Good luck.

Interviewer: Thank you, you too. Bye.