

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

HABITAT PROTECTION AND ECOSYSTEM-BASED MANAGEMENT ADVISORY PANEL

**Florida Fish and Wildlife Research Institute
St. Petersburg, FL**

November 15-16, 2016

SUMMARY MINUTES

HABITAT ADVISORY PANEL

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Anne Deaton

David Bush Jr.

John Ellis

Dr. Clark Alexander

Dr. Laurent M. Cherubin

David L. Webb

Brian R. Hooker

Dr. Steve W. Ross

Pace Wilber

Lisa Havel

James Geiger

Bill Parker

Thomas D. Jones

Dr. John Galvez

Bill Kelly

Dr. Amber Whittle

Dr. George Sedberry

J. Carter Waterson

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Dr. Wilson Laney

STAFF MEMBERS

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The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council convened in the Florida Fish and Wildlife Research Institute, St. Petersburg, Florida, November 15, 2016, and was called to order at 9:00 o'clock a.m. by Chairman Pat Geer.

MR. GEER: My name is Pat Geer, and I'm Chairman of this committee, of the Habitat AP Committee. Welcome, everybody, to St. Petersburg. We've got a full room, and a very full agenda, and so please just mute your phones, so those don't go off during the meeting, and I think everybody knows that at this point. I guess I want to start with introductions, just real quickly. We have a few new faces in the room, and so I just want to go around the room and just introduce yourself and say your affiliation, and let's start with George.

DR. SEDBERRY: I'm George Sedberry, and I'm with NOAA's Office of National Marine Sanctuaries, Southeast Region.

DR. ALEXANDER: Clark Alexander, Executive Director, Skidaway Institute of Oceanography.

DR. ROSS: Steve Ross, and I'm a research professor at the University of North Carolina in Wilmington.

MR. BUSH: David Bush, fisheries biologist, North Carolina Fisheries Association.

MR. PARKER: Captain Bill Parker, Runaway Fishing Charters, Hilton Head Island, South Carolina.

MR. KELLY: Bill Kelly, and I'm the Executive Director of the Florida Keys Commercial Fishermen's Association, based in Marathon, Florida.

MR. ELLIS: John Ellis, U.S. Fish and Wildlife Service, Raleigh.

MS. HAVEL: Lisa Havel, Habitat Program Coordinator for the Atlantic States Marine Fisheries Commission.

MR. WILBER: Pace Wilber, NOAA Fisheries.

DR. GALVEZ: John Galvez, U.S. Fish and Wildlife Service for the peninsula of Florida.

MR. HOOKER: Brian Hooker, Bureau of Ocean Energy Management out of the D.C. area.

MR. GEIGER: Jamie Geiger, U.S. Fish and Wildlife Service, retired, Seabrook Island, South Carolina.

DR. CHERUBIN: Laurent Cherubin, Harbor Branch Oceanographic Institute in Florida.

MR. WEBB: Dave Webb, recreational angler, Islamorada, Florida.

MR. JONES: Tom Jones, recreational fisherman, Georgia.

MS. DEATON: Anne Deaton, North Carolina Marine Fisheries.

MR. WATTERSON: Carter Watterson, Navy.

DR. LANEY: Wilson Laney, U.S. Fish and Wildlife Service, from Raleigh, but here in my capacity as the Co-Chair of the corresponding council committee, the Habitat Protection and Ecosystem-Based Management Committee.

MR. BOSTON: Brett Boston, Group Solutions, and we're facilitating part of the process for Roger.

MR. PUGLIESE: Roger Pugliese with the South Atlantic Council staff, and I'm responsible for our ecosystem activities and habitat.

MS. UDOUJ: Tina Udouj, and I'm here with the Florida Fish and Wildlife Research Institute

MR. GEER: Okay, and I would like to just acknowledge the other folks that are around the room that aren't at the table, if you could introduce yourself, please.

DR. REICHERT: Marcel Reichert, South Carolina DNR, and I'm also the Chair of the South Atlantic SSC.

MS. CLARK: Lora Clark, Pew Charitable Trusts.

MS. O'DELL: I'm Julie.

MR. GEER: The most important person here. Otherwise, we wouldn't be having a meeting. All right. I am going to put on my old-man glasses, and I hope you don't mind. I look just like my father, unfortunately. I am looking like my father now, believe it or not. The first item on the agenda is to approve the minutes. Are there any additions or subtractions or changes to the minutes? Hearing none, the minutes are accepted.

Roger and I are supposed to give opening statements and introductions, and we've already done the introductions, but, as far as opening statements, Pace is already telling me to move on and go faster, and so you know me. I'm going to try to keep this as short as possible, but we have a pretty full agenda and a lot of things on climate change and ecosystem-based management. There's a lot of issues with that.

If you've read through some of the things coming out of NOAA, they have a very ambitious plan that they want to take forth, but they have no money for it, which is going to make it very interesting for a lot of us. With our new administration coming in, we've heard talk that some of the things that we were going to be talking about today may not be on the table anymore, and so it's going to be -- We go ahead and we do our jobs. We do what we're supposed to be doing and we move forward with that, and we worry about those other things later.

That is all that I really have to say, just please be productive. Please participate as much as possible. If you have a question, ask, and we're going to be going through some policy statements, and you all know how much I love going through those line-by-line, but we have a few of those.

Please read them. In doing some of them, read them in advance, so we can make some progress on those as well, and so that's all I've got to say. Roger, it's your turn.

MR. PUGLIESE: Again, just some perspective for the overall meeting. As Pat has indicated, we have a couple of significant tasks ahead of us for this meeting, and I think the further development and advancing of policy statements for the climate and fisheries and food web and connectivity are critical actions. I think we're going to have, at the end, an update on a path forward for the artificial reef policy statement that is still advancing. We're going to engage some additional expertise to move that along, and we will be wrapping that up, hopefully, at the next advisory panel, or a core of it in advance of the next advisory panel.

Another aspect of this meeting will also be looking at kind of the bigger picture on research activities, to support both what we're doing, but then also into that realm of ecosystem-based management, and so we're going to essentially have kind of a brainstorming session on bigger-picture needs that we're going to have to advance in our region to be able to move those forward.

I think those are some of the major tasks, keeping on the connection with our activities with the broader Landscape Conservation Cooperative and the blueprint and the Southeast Conservation Adaptation Strategy, something that we want to keep in the mix, and all of this is said because what we're doing is we have got this group, as I have reemphasized, is providing a lot of guidance on how the council moves forward on ecosystem-based management and the bigger picture of habitat and ecosystem conservation.

We have advanced the development of the sections for food web and connectivity and for climate and fisheries for the Fishery Ecosystem Plan II, and so that task of advancing Fishery Ecosystem Plan II is getting to a new stage of development, where the core components of it are coming together, with the idea that there is going to be then linkages to a lot of other information and ultimately an interactive capability of a very different type of a fishery ecosystem plan that will be interactive online and available, and that's ultimately where this effort goes.

The advisory panel is playing a major role in both policy and on advancing this newer effort or newer capability of this effort, versus kind of the old document that was put in and created and referenced when needed, and so those are the tasks at hand for a good core of this meeting, and hopefully everybody steps to -- Sometimes working on policies can be tough, but I think the other aspect of it is that you've got the core first number of different attachments that have been provided that constitute the early review, and a lot of the other materials are really support materials that you can draw from to add additional material to these policies.

There has been a lot of things that the council has responded to, for example the NMFS ecosystem roadmap, and a lot of those statements in there are actually not necessarily captured in the policy and are the position of the council and could be pulled in fairly simply. As we move that forward, and the other key is, from the beginning, we've been working very closely with Group Solution, both Brett Boston and Brittany, to advance this entire process, and we brought them back onboard to keep that connection in, and hopefully that's going to help us move forward in expanding and refining and advancing these statements and materials for support of that whole bigger process. I know I said a lot, but I think it put the whole kind of thing into context, hopefully, and, with that, I think we're going to move forward with the first matter at hand.

MR. GEER: Thanks, Roger. Who is going to start? Is it you or Brett?

MR. PUGLIESE: I'm just going to do a quick introduction of the issue and then bounce it to Brett, because what we really want to do is get at the weeds of looking at what is here and then beginning the discussion. The first agenda item is the Advancement of the South Atlantic Climate and Fisheries Policy Statement.

What we have done and the panel was provided information previously on advances of both the section development for this, with both the writing team providing the information and advancing that material, and we're getting into a next stage of they provided additional foundational policy considerations that the council, at the last meeting, reviewed and revised and provided specific recommendations, which has been now folded into essentially the beginning of the essential fish habitat policy statement that is the responsibility of the Habitat and Ecosystem Advisory Panel to advance.

That is where we're at with this statement, and it is capturing the core recommendations, as I said, with the council providing additional guidance, and so what we have is that first generation, and what we want to do is bounce this over to Brett, to be able to walk us through this. I will open up the document, and everybody has these documents.

We've gone to the totally online providing of materials, and so hopefully everybody was able to access it or can access it on the fly. I sent out the direct link as we went into the transition of the new website, and there may have been a little bump in between about being able to access it, but, with that direct link, you can go to all the materials now.

With that said, I think we will move to the first policy statement. What's included is the statement as well as the latest executive summary, again, with additional input from the council and revisions, et cetera, and so I will open that up and we will start there.

MR. GEER: Just to let you know, on the agenda, what we're talking about is Attachments 2, 3, and 7 and not 1, 2, and 7. Attachment 1 was the minutes. Brett, you've got the floor.

MR. BOSTON: I think our process would be we will do a couple of things. One is, rightly or wrongly, assume that we have actually looked at the documents. If not, try to stay a paragraph ahead of us, or a sentence. I mean, that's probably all you need. What I thought we would do is look at those documents and see -- Particularly the two in front of us, but try to go through them. Are there big misses that we missed out on? Are there things that are still there that are causing some heartburn? Any of those things that we can do to get some final kind of input and thoughts, and we'll be capturing those as we move along through them, and so just stay a paragraph or a sentence or two ahead, and you will look like you were prepared. Let's start with Attachment 2. Anything in the draft policy considerations, the climate variability, there that caused some heartburn or big misses? That's really what we're looking for.

MS. DEATON: One thing that I don't remember noticing when I read it is changes that could happen to the system, like as our barrier islands go under, and so, in North Carolina, Pamlico Sound may be more of a bay, and that's a huge change, with implications for nursery habitats and such, and so I don't recall seeing that.

MR. BOSTON: Okay. Good. So that barrier island breach or go under and suddenly it's a rapid change in habitat further inland.

MR. PUGLIESE: I think that's where we have a little crosswalk, in terms of the general policies, and I think we could just look at those to see if there are specific statements on the general policies, but then we've also included a table of essential habitats, and I think what we were trying to do was to make some specific linkages about those types of actions, something that happened with sea level rise, loss of estuarine habitat, and that's going to affect the snapper grouper species and that FMP.

That was an attempt to at least make some of those very specific linkages, so we can literally go through that one and populate a lot of those, to really highlight that direction connection, not only to the habitat but then even to the managed species that would be affected, and so I think, as we move through this, that crosswalk between both the policy considerations as well as the specific potentially habitat or species that may be impacted from various changes that may occur.

MR. BOSTON: That's the center column on Table 1, Anne, and Roger is saying, essentially there, as you look through the habitat types that we have, maybe making that kind of note in there might be the place to capture it. I don't know about your thoughts on that, but most of those are not filled in.

MR. GEER: I would assume, before we leave today, we would want to have most of those blocks filled in. There's a couple of these policy statements that seem like these tables have that item, and so I think that the crux of what we're going to talk about today is probably filling in and getting some statements as far as those.

MR. BUSH: I have nothing as awesome as what Anne had. In looking down the line, there's quite a few folks that are struggling to get into the network to pull their own notes down, and so I don't know if we can maybe offer some -- I just got in.

MR. BOSTON: Got it. So, thoughts on that, one of our options is to use the university network, and let's just do that real quick, because I think that will save us some time down the road.

MR. PUGLIESE: Why don't we take a minute and let -- If anybody is having problems, if you want to go ahead and go online with that. I have a quick point about the documents here. One of the attachments that was provided to you is Attachment 7, the EFH User Guide, and what that does is provide all the information on the managed species, essential fish habitat, and the habitat areas of particular concern designations and some very specific qualifiers relative to that, and so it's really trying to provide the detail about how those are supposed to be interpreted, and that is going to be essentially a reference document for the policies. We've been working on that for a while, and this is the final version that we'll be connected to and will be able to be accessed for detailed information, and so that's something else that we can look at.

If there are, for example, other habitats that we want to identify in the tabling and whatever for species, we can draw from that too, and so I don't know if Pace wants to make any comment about how we would do that, but that's what the intent of having that on kind of the frontend of the discussion, to connect the two here, and so making that bridge between the habitat and the species managed and the implications for climate and fisheries. A07 is the document.

MR. WILBER: Roger, just to fill the dead space, this policy statement, as well as the food web policy statement, really just point out a lot of issues. There is really no action plan in any of these, and are we going to be able to get to some sort of actions that you want to see for the various agencies represented here to begin implementing?

MR. PUGLIESE: Yes, and, I mean, that's an opportunity. They are integrated directly into the statement itself or we were discussing that earlier on. What I anticipate is, as we finalize these policies and finalize the core sections for food web and climate and habitats and then build the linkages to other species and fisheries information for the FEP, that there would be supplemental discussions on specifically additional policies relative to habitat and beyond, and so I think that may be another step. Someone said like an implementation or an action plan.

However that's stated, it doesn't preclude us from adding some of that type of specific recommendations, and I think that's definitely the opportunity we have. We've done that in other policy statement recommendations, so that, if those are specific, that we can include here, this is a time that we can do that also, and so I think it's a natural evolution of some of the next steps of the bigger picture of the whole fishery ecosystem plan, but we have the specific areas identified here, and they can be integrated right into this policy at this point.

As you mentioned, with the expertise now, we can add some of that into this document as we advance it, and so it's a combination of both, I think, and so how far we can get to add some of that now is fine, but I think it's not the end of it, because I think that, as we advance the bigger picture, the council is going to be having some of those discussions about how you go even further with some of these types of recommendations.

MR. BOSTON: We did ask the teams to make recommendations straight up, and many of the teams did that, Pace, and so we have a starting point, certainly, in the plans themselves, where a lot of the teams put forward some recommendations. It's kind of tricky. You don't want to be in the policy making thing when you're drafting, but I think a lot of the teams did that. They certainly took the time to recommend future research that might be needed or areas that needed to be explored, as well as some policy stuff, and so I think we'll see that in the habitat plans themselves, and so we've got some of that. Almost every team did that. Most people wanted to do even more, I think.

MR. PUGLIESE: With that stated, as I mentioned before, I think some agencies, say National Marine Fisheries Service specific, the recommendations for advancement are integrated in some of the additional documents or in the responses of the council to those different strategies or roadmaps or whatever, and so I think the ability to pull some of those into here is also there, but we have other expertise in other agencies and other organizations that potentially could provide additional support and guidance and whatever, and so this is the opportunity here, but, as I mentioned, this isn't the only one, because I think we're going to see this evolve even further as the FEP is finalized and once we get kind of the core down.

MR. GEIGER: I guess I would suggest that I think it would be nice, before this group leaves, is to put together, or at least make some recommendations -- I really like the idea of action items, or suggested action items, to go with what we think needs to be done, but I also think, looking at all

of these threats and assessments in a policy statement, it would be nice to have the opportunity to at least make a first cut on priority of threats and defined action items.

I say that because, again, I am looking at a new administration coming in. The agencies are going to have new leadership, and why wait six to twelve months for this group to come with some kind of solid action items for recommendation? The time is now to put those on the table, in my opinion. I would hate to waste the collective power of this group to not have an opportunity to do so. Thank you.

MR. GEER: Thanks, Jamie.

MR. BOSTON: So as I see it, Mr. Chairman, then we'll be looking for, where we have some real priorities in each of these, we will capture them. We should do that while we're here. We won't worry about the wordsmithing, if that's okay. Let's just get the bullet concept framed, so we can go back and write it, because writing as a group is a waste of time, and then perhaps any ideas that we have on that center column, because a lot of these -- As you said, Mr. Chairman, we've got that center column we can fill in to make that linkage between the managed species and the habitat itself, and so back to Anne's original comment.

Then I think where we can at least identify those priority threats, Jamie, and so those three things are all in play, and I think we're ready. If we can, let's start through A02. I am just going to use the first numbers, because they seem to be the easiest. Let's start through this document. Any of those points, actions that you would like to put in or priority threats or anything that you would like to point out that needs to be put into a column, we'll capture that in real time as we move through, and so we'll start with page 1. Is there anything there? I think we'll just do it page-by-page real fast through each document. That way, we can just kind of hang in there and try to stay a page ahead. I'm on page 1, which is just the introduction and the first part of the policy considerations.

MR. PUGLIESE: This pretty much opens up and introduces just at least the concept and the connection to existing policy and implemented actions that the council has taken and the broader connection of EFH policies from the beginning, which does begin and move directly into policy considerations.

MR. BOSTON: Right, and so you've got all that preamble. That takes you to the middle of page 3, and we start there, Jamie, with threats from climate variability.

MR. GEER: On page 2, at the very top, you have a reference, and you may want to add the references from John Hare and his group from the Northeast.

MR. BOSTON: That cooler waters, that Number 1?

MR. GEER: Yes, and you might want to have a 1 and a 2.

MR. BOSTON: Got it. Thanks. He will be Number 2, and we will just renumber. Good catch. Anything else on page 2?

MR. GEER: For the record, I am going to note the fact that the cannonball jellyfish were in here as far as being in Georgia, but they're a developing fishery. The only other thing is, under ocean acidification, crustacean larvae, commercially-important crustacean larvae, because that may have impacts with acidification.

MR. BOSTON: Got it. Crustacean larvae.

MR. GEER: Along with mollusks.

MR. BOSTON: All of that right there with the acidification piece, we will add that. Okay. That's just that last paragraph. A couple more commas is what you're suggesting. All right.

MR. WILBER: Just so I understand how this relates to the FEP, the FEP has a much bigger discussion, with more detail about the black sea bass and cobia examples, and it has some additional examples too besides black sea bass and cobia?

MR. BOSTON: Yes.

MR. WILBER: All right, and then my question is, are all of the examples in there all temperature related, because, right now, this is talking about climate change really only as a temperature thing.

MR. BOSTON: I will make a note to look at that as we get to it, but I see your point there. Can we move to 3, real quick?

DR. ALEXANDER: Can I follow-up on Pace's question? I haven't done my due diligence and gone through this, but certainly sea level rise as an implication of climate change and changing habitats and loss of marsh, in some instances, and expansion of marsh in other instances is going to be an important factor as well, and is that addressed in here?

MR. BOSTON: Yes, very much so.

MS. HAVEL: It's minor, but I don't know if you want to add the commissions into 1a under the General Policies.

MR. BOSTON: Under 1a, Roger, there's a suggestion to add the commissions there. Thanks, Lisa.

MR. WEBB: Threats to the EFH HAPCs and climate variability, does anybody on the South Atlantic Fishery Management Council believe that there is no impact from climate on those, because the word "potentially" alludes to the fact that it may or may not, and it may be to a lesser or greater degree, and it may be positive or negative, but I don't think anybody could argue that it doesn't have an impact.

MR. BOSTON: So delete "potentially"?

MR. WEBB: I move.

MR. BOSTON: Then we can strike "potentially", or that's what is the recommendation.

MR. GEER: I was just going to say that the word “variability” pretty much takes out the word “potential”, because, if you have fluctuating of anything, there is going to be an impact. Does that make sense?

MR. BOSTON: Right, and so drop “potentially” from that point. Thanks.

MR. PUGLIESE: Specific to some of that discussion, I think one of the biggest things that has come from a number of the different workshops over the years and follow-up with council member involvement is the fact that, in our region, a lot of the variability becomes the biggest issue, versus necessarily a direct line change, and so I think increased rainfall, a lot of other bigger-picture things that are changing and more frequency and different things are going to be some of the biggest impacts in our region, and so I think the variability captures that and dropping that is fine.

DR. CHERUBIN: Variability is a natural state of the system, and I think what we should maybe emphasize here is the amplitude of the variability that will change, and so, as we see more acute events, rather than the normal, but variability is a natural state of the system, and so maybe we should emphasize that.

MR. BOSTON: In that first sentence, finding a way to emphasize intensity of the variability. Got it. Thanks.

MR. BUSH: I don’t mean to be dragging you back, but page 2 there, the second-to-the-last paragraph, the very last sentence, highlighting the need for a precautionary approach, we all have been to the council and commission meetings, and you see what happens at the public comment, and nobody is ever happy with what’s happening, but, over time, I don’t think any of us can question that climate has invariably changed before we arrived here.

Whatever is on the planet, which, when we talk about food webs, I would think that the human population should be included, but we fed on whatever was out there, and, if we couldn’t find them, that didn’t mean they weren’t there, but it just meant that they weren’t as plentiful to find and easy to find. We fed upon what was available and what was plentiful, and we will always do that. My concern is some of the wording in here. While it’s not guidance or regulation, we’re already shaping this to be a document to go ultraconservative on everything, and I certainly don’t want to go cowboy on everything either, but --

MR. BOSTON: Right, but you want to thread the needle.

MR. BUSH: Yes, sort of. I want to make sure that maybe we follow an educated approach, because a precautionary approach means that we need to ask for funding to do research, which takes years, and, by the time we get the information, the fishery has already come and gone and we lost that peak, and we’re already looking at the next peak we need to fund.

MR. BOSTON: A thought for you, David. If you put the period after “habitats”, are you happy with that?

MR. BUSH: That would be fine, but please don’t mistake my comment for saying that we don’t need to do something.

MR. BOSTON: No, but I just wanted to ask, if we put the period there, which would take out those last seven words, highlighting the need for.

MR. BUSH: Certainly. Thank you.

MR. BOSTON: Okay. Thank you. It's basically saying to just end it after "fish species and habitats." Thanks, David. We finished up on 3 and made some changes up in the discussions on the threats piece. We also had 1a, where we added the commissions, and can we move to 4? If we need to, let's back up. Let's go to look at 4. I will give you a second to glance through there.

MR. BUSH: Under 1, continuing there somewhere where the folks that need to be working, the organizations, fishing industries, communities, other interested civil stakeholders, I believe that, at some point, we need to address the other organizations, like the federal entities and state entities, that have some sort of control of different areas, state EPA organizations and whatnot.

We have no teeth in other arenas. What we do have teeth in is reducing harvest for this or that. If nothing else, maybe suggesting that we -- I don't know whether we put together a panel or a committee or suggest that one is made that is sort of a bridge with those other folks. Like we have a representative from BOEM here. It's important that we discuss it, and they may not have a clue what affects us and they're just doing what they think is right.

MR. BOSTON: Thoughts on that, David, your suggestion, would it be to add a 7 or a 1d, because 1c kind of gets at that, but it's not quite as pointed as you're saying, to reach out to other organizations that have some kind of regulatory or other impact that directly impacts a fishery, but we're not managed by and build those bridges, and so is that a 1d or maybe another numeric?

MR. BUSH: I think 1 would definitely be the paragraph for it. You might spell it out in 1c, not necessarily specifically, but other affected regulatory bodies or something to that effect.

MR. BOSTON: Got it. Maybe we will just put that as 1d, because it almost starts to talk about a broader action of reaching out to other, as you said, regulatory bodies that impact or affect the fishery. We will make that 1d. Thank you.

MR. HOOKER: 1d is fine, but I did kind of assume, in looking at it, that multi-organizational partnerships would encompass other federal partners as well, but that's on the science aspect. We have a management side and a science side, and so either one would probably work fine.

MR. BOSTON: Yes, and it's just the clarity of it would be the thing, I think. We policy guys kind of get that right away, but we're always trying to -- Our battle, David, is always reducing the number of commas as we start to list organizations, and so we just say "organizations", right? Otherwise, we have these five-paragraph things of commas, but I think, in this case, pointing it out is not a bad thing.

MR. PUGLIESE: Just a point to that specifically, and I think you both have significant comments on that, because what we've tried to do is engage groups like the Landscape Conservation Cooperative and other ones that have other partners that are not traditional that can expand the understanding of say the impacts on essential fish habitat and council-managed species, et cetera,

and so I think we do cross-walk, and that's why you've got that multi-organizational partnerships represented that way, and then you have state agencies and then other federal agencies, but being clearer that it includes even a greater scope is probably not -- I mean that's probably good, to make sure that that's included.

MR. BOSTON: Well, certainly at the frontend of the document.

MR. WILBER: So we're moving on to 2?

MR. BOSTON: Yes.

MR. WILBER: All right. There has been indicator workshops for twenty years, and so it is the position of the author of this policy that those indicators are not suitable for looking at climate change and new climate change indicators are necessary? Then the other question I had is the council requests annual summaries of these indicators, and who is it requesting those summaries from?

MR. BOSTON: You've got two parts to Number 2, Pace. The part let's go to, which is, yes, there's indicators all over, but which indicators? That's maybe the process of developing that or whatever, and so, Roger, what's your thinking on that?

MR. PUGLIESE: Some of this is tied directly to the ongoing discussion about how you actually implement this into habitat and council species management, and so it's drawing on the actions that have started through say the Climate Science Strategy and some of the other actions that have been ongoing with developing species indicators, and so I think the intent here was to try to draw on those recommendations.

If we need to be more specific on what actually should advance, I think we can look to those recommendations on where to go, because there is a number of different aspects of that that are recommended, and species-specific indicators were developed for other regions, but we don't have those done yet. We have kind of begun looking at some of those, but the actual -- Say, for example, in the Northeast, they are receiving ecosystem reports that provide kind of status reports. We don't get those either, and so I think this was at least opening the door for whatever can be developed through our partnership with National Marine Fisheries Service and other partners, whether it be through there or even other actions, but this provides the foundation for those to advance. I know a number of proposals are being submitted to specifically build some of these types of things.

MR. BOSTON: Roger, I think the first sentence though, to the case that we're making here, and, Pace, I think this is -- Look, we've been building indicators forever and ever. It's really about we don't need to build a new list, but we need to start refining or -- It's a selection process of work that's already been done. We don't need to spend another three years inventing another set of indicators, and I've heard this as I've been working with the migratory bird program, and it's the same thing. What species should we be selecting and what are our priority migratory birds? It's the same thing.

We have been doing this forever, and let's don't start a whole new research project to create indicators where there might already be some, and so I think some -- I am putting words here, but

something that really says, look, indicators are there, and let's quickly select some and get started with that, as opposed to, oh my god, another research project, right?

MS. DEATON: Could those climate indicators be included in the new FEP and then this would be reworded that the indicators in the FEP will be evaluated at some frequency by somebody?

MR. BOSTON: So, in 2, it would be that the list of climate indicators will be indicated in the FEP and those indicators will be reviewed and made sure that they're appropriate, blah, blah, some wording there to that effect, Anne, which gets you to the point where we're actually putting it in the working document. I like that. Pace, would that address that first concern you had?

MR. WILBER: Well, I mean, if that's the status, that's the status. At times, this comes across more as a plan for a policy as opposed to an actual policy statement, and so I'm trying to nudge it as close to an actual policy statement as we can do feasibly.

MR. BOSTON: Thank you, and then the second part of that, you were saying who is they, and the council requests -- You had two concerns within that.

MR. WILBER: Well, it's just who are they asking to produce these summaries?

MR. BOSTON: Produce it, exactly. That's what I'm saying, is who is they?

MR. PUGLIESE: I think, it's, to some degree, left general, because, right now, some of those that are indicated that would be provided are being provided by National Marine Fisheries Service to other regions. As I mentioned, there are proposals that some of these be developed through other partners in our regions, and so the question is, if we want to connect it kind of to the climate science strategy, we could specifically indicate that National Marine Fisheries Service provide these types of annual summaries.

MR. WILBER: But why doesn't it say the council will produce annual summaries?

MR. PUGLIESE: Because the council is looking to get those provided to us. I'm a little confused about why you would say that, because the technical expertise is not coming out of the council itself to provide that. It's going to be coming from a partner to provide that, and so I think it's very different. It's like saying the council is going to produce a stock assessment fishery evaluation report, where the real responsibility is actually in National Marine Fisheries Service or other partners to provide that information. I think we are looking, and we are saying these need to be done to advance this process.

MR. BOSTON: Yes, but this is a governance issue, and it's really built in there. Your point is sort of you are vaguely suggesting that these are magically going to appear, and who is they, and I read that, and I think that strengthening that request of whom, I think that some work needs to be done, because this is truly a governance statement, and it's not very tight, and it's not very clear.

AP MEMBER: Pace, in regards to the National Climate Strategy, aren't the regions developing their own implementation plans for the regional science centers? I thought there was some effort to implement those in there, and so is this going to feed them or is that going to come out at the

same time as this is coming out? I am trying to reconcile that and why that isn't necessarily directly referenced.

If the Southeast Fisheries Science Center is coming up with a climate science strategy for the Southeast Region, then you would think that that would be the Southeast Fisheries Science Center will provide these indicators. I would assume that some of that information would be in that Climate Science Strategy for the Southeast Region.

MR. PUGLIESE: Yes, and, actually, the draft Gulf Regional Action Plan is one of your briefing materials, and the early matrix of the South Atlantic Regional Action Plan is included as one of the documents, and so, yes, that actually was added so that if we want to pull from that or reference it that we can do that here, and so that was why I added those into briefing materials for this now. They are in development, and, as mentioned earlier on, a lot of it is laying out a strategy to do this with specific tasks to accomplish some of these types of efforts, but, as indicated earlier, there aren't necessarily resources to advance these, but that shouldn't preclude us from either referencing it directly or adding in some specifics from those developing documents.

MR. BOSTON: I believe that, Roger, just in 2, Number 2, I just think a little more clarity, certainly on that second sentence about just referencing the broad array of where these indicators would come from and there could be -- Even if you put it as a note on the bottom, to kind of frame it out, using the Climate Science Centers or the LLC or whatever other places you would be looking to to grab those from. That's what that would be, and so I think we can either make a footnote on that that, look, there's a lot of work being done, and reference the Climate Science Centers or the LCC or whoever you want to that's already working on biotic and abiotic indicators and move from there, and I think that will give more clarity to that second sentence and Number 2.

MR. PUGLIESE: I think, very specific to that point, I think this would be an appropriate place to specifically say as indicated in the regional action plan, so we can, within that regional action plan, specifically identify what the avenue to develop climate indicators, what those are so that can be provided as that develops, and so it's a cross-walk between this policy and how that ultimately gets finalized for the South Atlantic region.

MR. BOSTON: Okay, and so beefing up Number 2. We're on that. We've got good notes on it. Let's keep moving.

MR. BUSH: Number 4 seems like it's missing a word in there somewhere. Also, that sort of gets back to your shaping of the document.

MR. BOSTON: Yes, and that's almost identical to the comment that we edited earlier, and so let's look at that. This is that same edit almost we had up above, isn't it? Given the variability of climate impacts. Now, to your point, David, if we change "uncertainty" to "variability", that's a start, right? How about after the impacts and then the comma? You're concerned, again, at the precautionary principle again.

MR. BUSH: Should be invoked as possible for future management decisions on issues, and that is just --

MR. BOSTON: Yes, I'm with you.

MR. BUSH: Should it be “as much as possible”?

MR. BOSTON: How about “where appropriate”? We can always do that kind of stuff.

MR. BUSH: My second item there was -- I’m not sure what would be the best way to word this, but I think maybe you obviously don’t want to let super fisheries start before you have a chance to determine what they are, and I get that, and maybe there should be some sort of a framework put together between stakeholders to understand whether or not they’ve reached that trigger point.

What I mean by that is, for example, our glass eels, or something in our area where we don’t harvest enough of them to warrant a stock assessment, but somebody who wants to go out and harvest them gets an opportunity to do aquaculture, and if he does well, we’ll have to do a stock assessment on them, which we don’t do enough harvesting, and so it’s a vicious cycle. We’re basically telling somebody that we’re going to put you in that little cycle and you will never actually get a stock assessment, but anyway, maybe something in there that’s worded to where we’ll work to address that with the appropriate, whoever that might be, to develop that fishery, as appropriate.

MR. BOSTON: Got it, and so, back to 4, we need to tweak that like we did back up on page 2, and we’ll come back to that. Then, on 5, I hear your concern, and it’s let’s make sure we change the process, or intervene a little bit differently in the process, or we get into that spin cycle that you were referencing there, and so a little bit of work on 5, to get out in front of it.

MR. BUSH: I guess one avenue to avoid -- To have controlled removal of species that have no limits is to include them in an aggregate bag limit, and I think that’s an option.

MR. BOSTON: An option.

MR. BUSH: Does that work for everybody? Is that bad for the species, maybe? We don’t know, but, if a fishery appears to be developing or it’s getting large enough to be addressed, I don’t know the best way to do this. I’m the new guy here, and so work with me, but maybe something needs to be put into place to where you pull in the appropriate individuals, the three fishermen from that state who are actually catching them, the two biologists four states up who have experience with them, and so it’s like, what are the ramifications? Do we even need to worry about this? It may be simply that these guys are never going to do it and nobody else wants to catch them and leave them alone.

MR. BOSTON: It’s almost a stop-gap kind of -- Is there an intermediate step that we could take that says let’s pull together the affected parties and the people that have the science and see if we actually even need to do anything here.

MR. GEER: I would suggest taking out the -- Instead of having the specific management action, which is an aggregate limit, make that more generalized, because you used the example of cannonball jellyfish earlier, and there’s no such thing as an aggregate bag limit in jellyfish. You catch jellyfish and nothing else, and so, if you look back at that, it would make sense, and so maybe rephrasing that to say something like accepted fisheries management practices or something like

that, because it could be a suite of things that you don't want to name here, but certainly you went very specific with that one.

MR. PUGLIESE: Let me comment specifically about it, because that was added because it was a council member, and it was really -- I think it was trying to balance that discussion about the precautionary approach by saying an example of an action that can be taken is applying the bag limit, and so that would be an avenue, versus some kind of more dramatic type of effect.

This is one of the tools that is available, and so it was kind of cross-walk of how to integrate that in here, and I think that it stands out, because it's so specific, but the intent was to provide that type of other avenue to address this, and that would be one way to do it without necessarily going down other ways, and so I think that's what that was trying to capture, but if there is a more generic way to do it and then identify it, but that was the intent, and it was very specific from a council recommendation to highlight that.

MR. BOSTON: At a minimum, it would be as one example that would be in there, but we haven't done any examples anywhere else, but I understand how you got there.

DR. ROSS: Considering that then, it seems like you could roll Number 5 into Number 4 and say, for example, fisheries can develop and then make the management response more generic. It seems like you're almost talking about the same thing there.

MR. BOSTON: It was the reaction to 4 that got us to 5, and you're right, and so maybe merging those things and redoing the wording, but I think we've got the feedback that that's -- You see how we got there though, and so that always helps.

MR. BUSH: Certainly I appreciate that. I guess the only thing that I was looking for is that, if I'm a fisherman and I've decided that the weather is really bad and I'm going to open this document and read it, how am I going to get from this new X fish that I decided to catch to a fishery or is something going to prevent me or what are the steps here? It doesn't need to spelled out specifically, but what am I looking forward to? Should I go approach the appropriate council and ask to get on their new species committee? Oh, there isn't one.

MR. BOSTON: I am with you. I think you're looking for a process.

MR. BUSH: A general process.

MR. BOSTON: Yes, a general process to be put together.

MR. GEER: Each state has a different manner of doing it within state waters. Our cannonball jellyfish started as a -- We had no avenue for it. It's exactly what you said, and so we gave them an experimental fishing permit, and, in South Carolina, when they tried to do cannonball jellyfish, they followed our lead, and so I think each state has an avenue for the development of a new fishery on a limited basis, but it's, like you said, that next step, when you're going from you have this small fishery to, well, when does it become bonified? When does it become an official fishery? That varies from state to state.

In our state, it was just that we happened to be doing an overhaul of our legislative regulations, and so we said let's just make it official now. It's been there for twelve years, and it's been successful, and let's go ahead and do that, and so there are processes to handle that, at least in state waters.

MR. PUGLIESE: Just as a follow-up, that is the same with federal waters. You have the ability to request experimental permits to the Regional Administrator. I would point to Number 6 on this, because it does kind of get to that issue of looking at scientific and management evaluation as it develops, because this actually got crafted away from where there was some direct wording saying that everything was going to be done in advance of any type of -- There was very specific pushback by the council on that. It really has to be something that evolves, because many times they're developed before any of this, and so throwing a whole bunch of things into, where have limited resources, into a lot of things in advance may be not the way to go, and that was trying to walk, again, a cross-walk between that, so that, as things develop, you begin that process.

Then, as Pat said, both in state, and then, as I've stated, in federal, there are some of those. We could actually explicitly say that, to tie it to the experimental permit process or whatever, if you want it within the policy, but those do exist to advance this. They do force you to get into more of an evaluation mode.

DR. ROSS: I have changed my mind now. I wonder if the -- Maybe it would be better to blend 5 and 6 together, with the first sentence being that new fisheries can develop, and the second sentence being the first one that's now in 6. Does that follow better, because we're talking about new fisheries in both of those.

MR. BOSTON: Essentially, you're saying take 6 and make it the second sentence in Number 5?

DR. ROSS: Yes, make Number 5 -- Keep the first sentence as it is and make the first sentence in Number 6 the second sentence in Number 5, and then I'm not sure whether we need the --

MR. BOSTON: Yes, we don't need the example. We could probably just strike that, and so we end up with 5 and merge 6 in and strike sentence number two from 5.

DR. ROSS: Correct.

MR. BOSTON: That would be un-editing your merge of 4 and 5 there. You saw the light there. The coffee is kicking in.

MR. BUSH: Thank you. I don't want to belabor this anymore, but I just appreciate you understanding where I'm coming from.

MR. BOSTON: Absolutely. That's why we're here. Anything else on that piece? Let's jump down to research needs. Go ahead, Pace.

MR. WILBER: I just wanted to point out that, in the General Policies, there is nothing habitat in there. Are we okay with that?

MR. BOSTON: No, we're not.

MR. PUGLIESE: A lot of these came directly from the core of the section, and so I think this is the opportunity to add in some of those very specific -- I think the idea of having the lists and the species and all of that is one way to elaborate on it, but what it really needs to do is, if there's opportunities to integrate specific policy recommendations within here, this is where you can add to this and bolster what those recommendations are specific to habitat.

MR. BOSTON: We have an opportunity then for some recommendations to slide in here, and, like you said, we have nothing on habitat even mentioned, and so certainly a 6 and 7 that start to address either habitat or some of those other implications, and so are there thoughts on that?

DR. ROSS: That's a good point. Number 2, where it says species likely to be influenced, you could say species and habitats, and it may be that an additional bullet is also needed, but there may be several places that the word "habitat" could be added.

MR. BOSTON: Where we have references to species, let's add "and habitat" and that will do part of it, but we may still need another bullet is what I heard there. Did that get at it? I think you're right, Pace, that it's a big mess. Jamie is nodding. Okay. Then we'll make sure that we have a 6 that really specifically says something, Roger, on habitat.

MS. DEATON: Would you want a policy about habitat resilience, increasing habitat resilience, as a mechanism to minimize adverse impacts from climate change, and so restoration geared towards increasing habitat resilience?

MR. BOSTON: Good. That's a great one. Certainly there's one, and that may be getting us to a 7 too, Anne. Thanks, Anne. Are there others? Then how about the research needs, and we can always jump back.

MR. WEBB: Number 2, climate impacts should also be a focus of the new proposed stock assessment. These are policy recommendations, and isn't that correct?

MR. BOSTON: Yes.

MR. WEBB: Okay, and so maybe that word should be "should". That's all we're talking about in the whole document.

MR. BOSTON: Should and shall. It shall be. On 2, just changing "should" to "shall"?

MR. WEBB: "Could" to "should". In the second sentence in Number 2, climate impacts should also be a focus.

MR. BOSTON: I see. It's not the "could". I've got you. Thanks. We will make that a "should". We're on to the 2 in research.

MR. WEBB: Number 5 and Number 6, "clearer" instead of "greater" in the first word of both sentences. We've got a lot of information, but we don't understand a lot of it.

MR. BOSTON: Yes, you're right. So 5 and 6 under research should be "clearer understanding". Got it. It's about the communication. It's not about the collection.

MR. PUGLIESE: Truthfully, I think 6 is essentially a -- I think, originally, these may have been separated as economic and social and we created socioeconomic impacts, and so you may not need 6. That may be just my edit, in terms of trying to capture it.

MR. BOSTON: It looks like a cut-and-paste error to me there. Yes, social impacts and socioeconomic, and so let's merge those into one coherent thought and make it "clearer understanding".

DR. ALEXANDER: I have a question about these research priorities. Are these in numeric order of importance?

MR. BOSTON: No.

DR. ALEXANDER: Because one comment I would like to make is that every time there is a new issue that we want to bring up, we always say, well, we need to learn all about this new issue, and then we tag on to the end that we need to figure out where the habitat is. I mean, if that's important, and it always comes up, it should be highlighted and we should be speaking more forcefully that we need to find out where our habitat is before we think about all of these other things.

MR. BOSTON: So, for you, Number 1 would be -- You would have a new Number 1.

MR. PUGLIESE: Right now, these are not prioritized, and I think, again, this is a cross-walk between policy and other discussions, because tomorrow's session, the beginning, is actually going to be research for ecosystem, and I think that's going to be really important, to very much pin down that type of frontend need as one of the -- That is definitely an opportunity to do it. However, this is kind of a short list that came out of core areas out of the -- Again, the core of it was coming from our partners that built some of the recommendations from the section. However, we have the entire climate strategy that has major category areas that are supposed to be addressed by not only National Marine Fisheries Service, but other areas, and so the bottom line is this is not prioritized, and I think you do bring a point up that -- That is kind of the most significant one that should be addressed.

DR. ALEXANDER: Then I would like to strike the word "prioritize" from Research Number 1, which says that we need to prioritize research and collection of further understanding of impacts from climate change, because, right there, we're saying this is the most important thing, unless it's a general statement, and then everything else should actually be a bullet underneath it, because this whole document is about climate change impacts.

MR. BOSTON: Exactly, and so you make that -- One option then is for one to almost be a preamble. It's sort of the introductory paragraph, with then Number 2 being the Number 1. I think you're on to something there. Otherwise, like you said, it just sort of -- It is a priority. We're going to make 1 kind of introductory to that, and then, while we're here, quickly, is there -- Clark, you mentioned -- Do we want to try to prioritize these today or just leave them and do that later or what are your thoughts?

DR. ALEXANDER: I think this is a good point that Roger has, that we do have a broader discussion tomorrow, where that can be done.

MR. BOSTON: So you're okay, just as long as we make 1 an introductory statement that addresses it?

DR. ALEXANDER: Sure, or you could even add that these are not in priority order.

MR. BOSTON: All right. So 1 will become our introduction, and we will have some statement that these are not prioritized, though we could prioritize them after tomorrow's discussion. We can come back to that. Let's go to page 5, if we might. I think we did some merging of 5 and 6, with "clearer understanding", and was there anything else that we need here in terms of research things, that were big misses? We're going to get a lot more depth, as we said, tomorrow. Can we go to 6?

MR. WILBER: I have a question. For Number 7, why are diadromous fish singled out?

MR. PUGLIESE: I will call directly on Wilson to add in to -- This was brought in, and I was going to ask him about the cross-walk between 7 and the previous one, but Wilson, I think, can address that.

DR. LANEY: The short answer is I don't know, but the longer answer is I may have been responsible for getting that added in here somewhere, and I think it, from my perspective, Pace, the reason I would like to see them highlighted is because they are, to me, the integrators of marine and freshwater habitats. They are the species that have probably, and I guess that could be debated, but certainly some of the most complex life cycles of the species with which we deal, because of their need for both freshwater and marine habitats.

The reason we stuck in specifically the characterization of the offshore ocean habitats is because there is so little information on that. I think Marcel would probably agree with me that their encounter rate in SEAMAP with diadromous species is fairly low. We have some information from the winter tagging cruise that our graduate student, Jillian Osborne, at East Carolina is currently compiling, and so we will be hopefully getting her to finish up her master's pretty soon, and then we will get that information published in the not-too-distant future, but the spatiotemporal window that we investigate during the wintertime off the coast of North Carolina and Virginia is very small. The information is just very limited, and Marcel may want to add something here.

DR. REICHERT: Thank you. I just wanted to mention the -- It's an effort by multiple states of the acoustic tagging studies that are now creating and increasing volume of data and information relative to, in particular relative to, those species. I think we're on the way to getting a lot more information, but I am not entirely sure how that information is synthesized to the degree that it could be useful right now.

DR. LANEY: Pace, one thing that comes to mind too is that this particular group of species, as a guild, if you want to look at them that way, contains two federally-listed ones already, both sturgeon species, and it contains three additional species that have been through status review twice, in the case of the American eel, and once, in the case of the river herring. I think there is a good case for highlighting that group.

Now, is that to say we shouldn't be highlighting other groups? No, it isn't, and I think we look to the AP here for if there are other groups of species that are particularly important, from an ecological, economic, or cultural perspective. Then maybe we should modify Number 7, which is pretty specific for offshore ocean habitats and diadromous species, to include other guilds or groups and particular habitats of concern to the AP that would certainly be of concern to the council as well.

MR. BOSTON: That would be, Wilson, expanding 7 and really saying look at those emerging or important guilds, similar to diadromous, that should be included in there, and so you can broaden it and generalize it a little bit.

DR. LANEY: Sure, and I think Bill would agree that reef fish is -- Any reef-based fishery or reef fishes, in particular, we know they have very complicated life cycles as well. They use acoustic cues to determine appropriate habitats for settling, and so the noise environment is very important for that whole group. I mean, there's a bunch of different things we could put here, and so maybe one way to approach it would be to have a more general statement, and, instead of saying characterization of offshore ocean habitats, just say, as I think Clark already pointed out, characterization of habitats, period, is one big, important thing. Then we can have maybe a list of bulleted guilds and/or habitats under that that are of particular interest to the council and/or the AP.

MR. WATTERSON: I just had a quick question about Wilson's statement. You mentioned three species, the two sturgeons and the American eel, and so none of those are managed by the South Atlantic Fishery Management Council. Is this documented limited to those species that are managed by the council, or are we trying to open it up to other species as well?

DR. LANEY: The answer is, and, Roger, help me out here, but, way back when, there is this catch-22 in the Magnuson Act, which says that the council shall address any impacts to anadromous, and I think it says anadromous instead of diadromous, species that may arise in its jurisdiction, basically, and that jurisdiction includes offshore, but it's also the reach of the council sort of oozes inshore, where species do reside in state waters and where EFH has been defined in state waters.

Now, for the diadromous species, no EFH has been designated, because there are no federal plans for those species, unless you consider a recovery plan for sturgeon a federal plan, I suppose, but what we elected to do, and this goes all the way back to 1998, when the council prepared its first habitat plan, was to go ahead and document, to the extent we could, what would constitute EFH for all the diadromous species if there were federal plans for those species, and so we put that into the document.

I think that our intent here, still moving in the direction of ecosystem-based management, is to acknowledge the fact that while all of those species, with the exception of the two sturgeons, are all managed by ASMFC, most of them are significant forage species for species that are either managed by the council or managed by Highly Migratory Species, like bluefin tuna comes to mind, or some other management institution, but the council has a role to play in that.

If I remember correctly, and, again, Roger, I'm looking to you to correct anything that I misstate, but I believe that NOAA General Counsel did determine that the diadromous species are definitely

under the jurisdiction of the council when they're in oceanic waters, and so I think we're on solid ground here in jumping into diadromous management and trying to address diadromous habitat needs, because of the ecosystem interplay.

MR. BOSTON: Roger, do you want to pick that up before I go to Jamie?

MR. PUGLIESE: Yes, and let me just address that quickly. I think you're on target with the history of where we started with this and where we are now, because I think the biggest thing is that it all goes back to connections with habitat, and it all goes back to connections with species and managed species, and so I mean those linkages -- Right from the beginning, we had identified the habitat plan, and then, subsequently, the fishery ecosystem plan as capturing the entire South Atlantic ecosystem, and without highlighting those connections with other managed species outside of the council jurisdiction, that would be a shortfall of advancing our understanding of how these connect, especially when you're talking about, as you mentioned, prey of managed species.

I think that's such a significant part of this discussion, that that, in and of itself, warranted us including that detailed information in the original plan and the FEP and would be referencing the latest information from ASMFC in other actions in the future, and so the latitude there is, I think, pretty much what we had -- That's the road we went down, and it's part of the bigger system.

MR. BOSTON: The key though here is, for 7, thus far, it's completely adequate to express the ideas that just emerged in that conversation, in terms of the breadth of what we were trying to get after, and I think some strong reworking of that is what we're indicating here.

MR. GEIGER: Again, I think the discussion is very, very good, but I think it needs to be encapsulated in a separate paragraph. I don't think it belongs in research needs addressing climate variability and change. They should be either stand-alone or incorporated in some of the previous paragraphs, but don't lose sight of that. Wilson brings up some very important things, and I think you're going to look for people connecting the dots, and you've got to start doing that now. We're still in various pigeon holes that we're thinking, rather than thinking of the bigger picture, and I think that's -- It's extremely important now to start connecting the dots, sooner than later.

MR. PUGLIESE: Just, quickly, one last thing connecting that is one of the reasons I think that it does show up under the research side is because of some of the least information of use of habitats of those most critical species is what we really need to know. It is there for a very specific reason. We really need to get that information to really understand how that fits into there, because when we're talking about modeling and we're talking about actions on those things, without knowing that food -- Some of the previous ecosystem modeling activities, some of the key food and forage bases were really not well represented, because we don't have the detailed information on those species and the distribution of those species as it relates to the managed species.

MR. BOSTON: But we need it in both places is the point that Jamie is making, and so you can talk about it as a research gap, but you also need to make the broader case that we made earlier.

DR. LANEY: Yes, and I would just say that I think it gets back to the point that Clark made earlier. You can't assess what changes climate change or what impact climate change is going to have on a species unless you understand its life cycle and the habitats that it uses in the first place, and so, yes, I would agree with Jamie, to that extent, that we need to address it earlier, perhaps,

and I still think it would be useful for us, to the extent that we can do so, to highlight the habitat information that we really, really lack that we think should be priorities or could be priorities for research.

Then, in response to Pace's earlier question and Carter's comment as well, I would just note that the other two councils to the north of us, both the Mid-Atlantic and New England, have jumped on diadromous species, perhaps, more specifically, the Alosinae species, to try and address fishing impacts to those species offshore, and to the extent that we can glean information on what offshore habitats the Alosinae are using, from fishing records, I think there is a whole large body of information there and data that can help us map out habitat use for those species, certainly off of the Mid-Atlantic and New England, but, again, I will look to Marcel.

I think for the South Atlantic, because we don't have the sorts of large-scale industrial fisheries off the South Atlantic that are encountering especially the Alosinae species, we don't have the same kind of body of information, I think, and so that's where we're dependent on a lot of the work that George laid the foundation for at Gray's Reef, putting those acoustic receivers out there and discovering, quite serendipitously, I think, that Atlantic sturgeon that Duane Fox was tagging in the Delaware Bay, or off the Mid-Atlantic, were spending time down at Gray's Reef, maybe eating brachiopods, and we don't know, but we speculate there some reason they're going down there.

That's the kind of data I think that need to be compiled, and I think the current Atlantic sturgeon stock assessment process is going to wind up compiling a lot of those data for Atlantic sturgeon, and hopefully maybe other species will follow.

AP MEMBER: I'm just trying to cross-walk a little bit with the Gulf of Mexico RAP that you provided in the briefing material. They call out vulnerability. They're going to be doing vulnerability assessments, and so I'm wondering if we should just link off of vulnerability, vulnerable stocks, and leave it at that. Obviously there is going to be a vulnerability assessment, I assume, for the South Atlantic as well as the Gulf of Mexico, and so maybe trying to use some of the same terminology that's going to be in the RAP and then linking it, perhaps, to vulnerable species that have a very integral habitat, that perhaps have a physical habitat dependency that deserves more specific attention might be the way to go here.

MR. BOSTON: Got it. Good points. We are rapidly making this a better document, and so it took us to get to the very end, at the research section here, to really start getting that piece going, but that's good.

MS. DEATON: Just a question. To me, when I read 7, I thought you were trying to get at species that cover multiple habitats, that whole system, and so you picked diadromous sort of as a model, but I mean, if that's the point, it might just need tweaking, like just to say characterization of offshore ocean habitats used by estuarine-dependent species, and so those are going to traverse, particularly diadromous species.

MR. BOSTON: Yes, and I think the word "particular" is the right word there in that example, but you're right. I think we decided, for 7, coming back to that, just to wrap it up, is it's more of an example, and then Wilson is saying, just on the specific point of the kind of -- "Indicator" is the wrong word, but the species, that maybe we have a little bit of fleshing out of a couple of bullets

or something that make that a little broader. However, there were issues that we needed to shove up earlier on in the introduction that also came out in that discussion, and so, going around, any other thoughts, research or otherwise, on this topic? I want to make sure that we wrap it before we move to page 6.

MR. BUSH: Not necessarily a correction, but I guess maybe I want to understand a little bit better the philosophy of what we're working toward, and I hate to think at this point that I don't know, but I feel like we're really more trying to be an observer as to what's going on and to allow people to make better management decisions, and I'm assuming that that's sort of what we're trying to weave into the underlying, I guess, gist of this document, and am I incorrect in that?

Are we looking for a little more -- I mean, we can sort of see what things are happening. You can see the lobsters are moving further up north, and they're going to continue. They didn't just start when we were here. We may have just started noticing it, but my point is that we can't stop them from moving. As Anne mentioned, there are some things that we can probably do to decrease the impacts, or maybe stop certain things, but this is all really just us trying to observe and provide better information to make better management decisions, and does that sum it up, sort of?

MR. GEER: I think lobster is great example, and I really like showing that, because it's so visual. It's what has happened to that species. It's gone deeper and further north. We, in a lot of regards, the Southeast has not undertaken those exercises to the same level yet. We're starting to. We're seeing some of them, but their vulnerability index in their report they put out, and I think it's twenty or twenty-five species that they can show that same kind of influence that they see with lobsters and see what the vulnerability index is going to be for them. Ultimately, I think that's where we want to be.

Having that information, you're right that there's nothing you can do about it, but it's like, as far as this habitat committee, it's putting forth what needs to be done, what needs to be looked at. There's a lot of information that we have, and can we go ahead and do something similar to what they did in the Northeast and provide that kind of information, because, like I said, I haven't seen as much come out of the Southeast as has come out in New England states on the issue.

Then, if that information is available, and you've sat at the commission meetings. You see what is happening there. They take this information, and they know there's been a shift in populations. Well, it's not going to shift back, and so how are they going to change the fishing allocations as a result? That's not us that are dealing with it. When you and I go to that meeting, fortunately neither of us -- Well, you sit on the Lobster Board, probably.

MR. BUSH: Sorry, but I try to avoid that.

MR. GEER: Georgia does too, and so we don't have to worry about that, but they're dealing with those kinds of things from the management end, from the information that they were able to gather from habitat groups like this, and does that somewhat answer your question?

MR. BUSH: It does. I guess the reason why I made those other points I made earlier and why they're a little more important to me is because folks like me will sit out there in public comment and beat those folks up like you on the councils that, hey, this is your document providing your guidance and you're not following it. Rather than wait until public comment to address some of

these things, that's why I'm trying to get away from shaping this document one way or the other before we get there, and so if it's suggesting an action that needs to take place or something, and, again, lobster is a great example. It's very visual.

If we start wording this that we need to be conservative with it, do we tell these guys that have been fishing on it for the past hundred or 200 years or whatever that you can fish on it while it's in your area. Then, when it starts to leave, you can't, but these things have been moving for a while. They're vulnerable everywhere they go, because they will eventually move from there as well, and so we're developing very, very subtle hints as to what the council should do when we word these documents, and that's the reason why it concerned me. Thank you.

MR. BOSTON: The key is looking at Table 1, back to your point, and so what? That's really -- Filling in that central column is sort of the so-what that starts to provide what are those climate impacts and what potential variability are we going to see, and I think it's really talking almost species-by-species to that, and that's the big miss here right now, is not having that central column kind of filled in with some of those ideas. I think, as Pace, I think, was bringing up earlier, shame on us if we don't take advantage of some of the intellectual capital in the room to at least address a few of those things.

MR. GEER: Are we ready to move on to Table 1?

DR. LANEY: I don't know exactly where this fits in Table 1, because I don't think that I see a category in the left-hand column where it fits exactly, but maybe we can figure that out. I just got a message, actually this morning, from our GIS and IT guy in the Raleigh office providing a link to an article on Gulf Stream destabilization points and the fact that it's moving west, and so that's something that is of obviously of importance, not only to habitats and species that occupy the habitats, but to those who pursue the species occupying those habitats. I guess that fits in the central column as an impact of climate variability, but I am not exactly sure where we put it. Maybe in the one that says --

MR. PUGLIESE: I was looking to see if we had the Gulf Stream, because these are EFH HAPC, and you don't really have the --

DR. LANEY: We don't have one that captures the Gulf Stream itself.

MR. PUGLIESE: Exactly.

DR. LANEY: We do have sargassum in here.

MR. BOSTON: Yes, there's a few broad ones, but we've missed some big ones.

DR. LANEY: Is that where that would fit, under pelagic and benthic sargassum, the Gulf Stream shifting westward?

MR. BOSTON: No, why can't you add a row called the Gulf Stream?

MR. PUGLIESE: These are specific designations. All we need to do is go to -- In order to do that, we can go to the EFH guide and find out where that is identified, and it should be EFH HAPC for dolphin. I've got to look back, but --

AP MEMBER: The Gulf Stream is actually EFH designation for several species. I think it is for juvenile larvae lobster and --

MR. BOSTON: Yes, and either some introductory to the table itself, Roger, might lend itself to something like Gulf Stream or put a row in.

MR. PUGLIESE: Also, this is HAPC specifically.

MR. PACE: If the Gulf Stream is important enough to be in the table, just add it as a row and put a little asterisk there saying this is not an HAPC, but it is EFH.

MR. BOSTON: To me, it seems like the easiest way around, instead of trying to go through and note it in a million places. Is there a reason that we couldn't do that, Roger?

MR. PUGLIESE: No.

MR. BOSTON: So add Gulf Stream as a row, and, as you said, we'll just make the asterisk and a note.

DR. LANEY: Roger, I think I sent that link to you. Could you send it around to the whole AP, because I didn't have everybody's addresses in my hard drive.

MR. BOSTON: Okay. So we've added a row of Gulf Stream, and we can certainly put that towards the top, Roger, with an asterisk and just cover it in one place, instead of trying to piecemeal it all the way throughout.

MR. PUGLIESE: Then we can just identify it as EFH and then identify the species and the FMP. This was just a springboard to do this, and so I think you bring up a very critical need, to be able to pull other ones into here other than just the HAPC designation.

MR. BOSTON: Right. Other big misses like that, we have two options here. We're going to take a break in about fifteen minutes, and so if we can dig in. Kind of our goal would be, one, big misses like the Gulf Stream, obviously, but we do have sargassum, and then any ideas or just some basic bullets on what we might put into that central column. Those are the things we're looking for now.

MS. DEATON: I just have a question. In the new FEP, there's going to be a chapter on climate change, correct? Would this table -- That's already been drafted?

MR. BOSTON: Yes.

MS. DEATON: So this table ought to be in there, and so it doesn't exist yet?

MR. PUGLIESE: No, that discussion isn't species-specific. That was the whole review of climate as it relates to the South Atlantic region, and this is an attempt to specifically make the connection to managed species and habitats, and so while there may be different pieces of it that get highlighted in the discussion, this is very specific to trying to see which specific issues may affect either species or habitat, et cetera, that are essential to those managed species.

MS. DEATON: Well, I mean, I see why this would be a great table to have in this policy, but I think it would probably be lifted -- I think it should be in the climate change chapter, because you need to be tying every chapter into the species, the habitat and the species, the change, and so I don't know. Then you would have references, and so, to me, every impact we put here almost needs a reference to go with it, and so how are you going to do that in a tiny little table?

MR. BOSTON: Right, and so the thinking there, Anne, just to summarize, is, in Table 1, we don't need to make this per se the research piece, but if in fact we picked the table up and copied it and moved it over to the actual section, we could go a little bit deeper on that central column, providing reference and background as well. Did I sum that up correctly?

MS. DEATON: Yes, but it would be easier if we did it the other way.

MR. BOSTON: I know. So I went both, and you're saying that, no, just one, but we're doing an and instead of an or. I've got you.

DR. LANEY: Just to jump in there, keep in mind that I think one of the things we're trying to do in the policy is to put the information that is species-specific in there to enable those of you who are engaged in regulatory review to be able to pull that out and put it in your comment letters, and so that applies to the NMFS Habitat Conservation Program and the Fish and Wildlife Service Ecological Services and all the management institutions and all the state regulatory review folks as well, and so any comments like Anne just made I think are useful.

I agree that it probably would be beneficial to have it in both places, but certainly in the policy. We are trying, I think, to be responsive to Pace's past admonitions to the Habitat AP and the council that the AP try and produce policies for the council that are going to be immediately applicable for use in the regulatory review arena, and so I would encourage you to speak up and tell us how we can do that.

DR. SEDBERRY: I have a question. I am trying to relate Column 1, the column on the left, to the column on the right. Are the management units that are listed in the column on the right -- The habitats that are in the column on the left, are they HAPC for those management units and not just EFH?

MR. PUGLIESE: Yes, those are HAPCs for those species, yes, and I think what we're seeing is an attempt to make this linkage here. If we had a full-blown climate variability analysis for the Atlantic, for the species, we would have all of that with the specific key references, et cetera. That is yet to be done. There are beginnings of that type of work that we did in some of the previous climate workshops, where we were trying to look at -- Some of them were like these obvious ones, the change in bottom temperatures and habitats or upwelling events and species, making some of those kinds of generic, but we have not had the same process they went through in the Northeast, where they did a -- It was an informed review, is essentially what they did.

They brought the experts on species and looked at which ones may be potentially vulnerable for various aspects of climate and then created levels of vulnerability, and that has not been done for our region. It's planned as part of the regional action plan for the Southeast Region. That's at least what the intent is, is that that be done, and so I think we're kind of in between that entire process.

However, I think you are right about making that connection between sections and discussions and habitats and species, and we are in that next stage of the FEP development right now, to be able to do that cross-walk between habitats and species and those big core sections on climate and food webs, but this was trying to -- As I think has been identified, it was an attempt to begin to populate this, so that it could be integrated in a policy early and then refined as new information gets developed and refined information is provided and the research to really support how this advances, but this was beginning to at least make some of what are probably more of the obvious connections on what some of the implications of these different changes are and have it right frontend loaded on the policy.

MR. BOSTON: So why not a mental health break for about ten minutes? We'll take about ten minutes.

MR. GEER: We're going to break a little bit earlier.

MR. BOSTON: It will give everybody a chance to catch up and mark their boxes in, so maybe we can get some ideas in here.

MR. GEER: Come back at 10:50.

(Whereupon, a recess was taken.)

MR. GEER: All right. We're going to get started back up again. We had a slight problem with the catered lunch today, and so we're going to have the catered lunch tomorrow, and so we will have to go out for lunch today.

MR. PUGLIESE: We will be doing the webinar first.

MR. GEER: Yes, and so we're going to do the webinar at about 12:15 or so, and then we will break for lunch at 1:00, and is that okay? Is everybody okay with that? Everyone can survive on cookies for an extra forty-five minutes or an hour. Let's move on then, and we're going to go until about twelve, and then the webinar will be at 12:15 or so.

I can start this off with shrimp, because, as a crustacean ecologist, that's about all I can provide on this. Temperature-wise, it's going to affect spawning. Increased precipitation can affect recruitment. We had a recruitment failure in 2013 as a result of excessive rain that we had over the summertime. Those are just two things that can be impacting it. You might have earlier spawning. If that spawning does not coincide with their larval food supply, there are issues with that as well.

There are some things in the literature about temperature. Winter temperature, that's been pretty well documented, and I think that's in some of the documents we have about the council and how they manage shrimp with winter water temperatures, and so that's already in there. I am trying to think what else we might have. We might have some shifts of populations further to the north as well, as temperatures continue to increase, but that's what I can relate to for shrimp and for spawning sites as well.

MR. BOSTON: Thanks. So we've got some notes on shrimp.

DR. LANEY: The question I was going to ask, Pat, I guess, is are the impacts of climate variability in the center column there supposed to be on the coastal inlets or on the shrimp and snapper grouper or all of the above? Because we're talking about coastal inlets, which are designated EFH HAPC for shrimp and snapper grouper. The reason those inlets are so important is because they're migratory pathways into the nursery areas and then again back offshore for the mature animals coming out, and so one impact that we might want to capture here is more frequent storms that have an impact on inlet geomorphology.

MR. BOSTON: To make the notes, just for our editors, we have a general comment on the shrimp that we can capture in multiple places, everywhere we have shrimp listed, and then this is specific on that one.

DR. ALEXANDER: Obviously climate change and sea level rise, which increases the tidal prism, which probably either expands the inlets or will cause greater velocity flows in and out, as you have greater volumes of water to move. I am not sure which will occur, or maybe it depends on the situation.

MR. BOSTON: I've got it. Are there others?

MR. GEER: One that I forgot to mention is there is a PhD student at UGA right now who is looking at the vulnerabilities with shrimp and red drum. That's what they're looking at, and they're saying that there is actually going to be an increase in habitat with sea level rise, but that habitat is going to be of poorer quality, and so it's like a 57 percent increase in habitat, in available habitat, but most of the habitat is poor quality. The good quality habitat they have now will be declining, but there will be more of it.

DR. ROSS: I just had a follow-on to what Clark said. It's not just talking about the existing inlets, but the inlets may change location, and there may be increasing numbers or decreasing numbers.

MR. BOSTON: Got it. How about we move to spawning sites? Some of what you just said was spawning sites and potentially increasing habitat for some species, but poorer quality, and that was the point there. Is there anything else on spawning sites? This is shrimp and snapper grouper.

DR. LANEY: Well, again, some of the literature that I've read suggested in the Southeast here that there may not be as much of a shift in any sort of distribution, because the temperatures are already so warm, but I am thinking that, for species that are adapted to sites where temperature is a driver, then those could shift again as the species preferences -- I am thinking maybe not so much spawning sites.

Here, the example that always comes to mind is striped bass and habitat squeeze, because of their temperature and DO preferences, and so, to the extent that temperature and DO are also defining spawning sites, along with structure, maybe the structure is not going to change, but the temperature and DO attributes of particular spawning sites could certainly change, and so those could move. They could shift from areas that have been traditional spawning sites, I suppose, under a climate change regime. Again, it's going to depend on how much that temperature varies and changes.

DR. SEDBERRY: I think that there are temperature thresholds for spawning for some of these fishes, and so, as the water is warm in the spring and the water temperature hits twenty degrees, for example, for gag, they spawn. If those temperatures come earlier and earlier in the year, the day length may not be long enough to increase primary productivity, and the early life history stages of these species may have survival problems there.

MR. GEER: That was one of the issues that I had with the penaeid shrimp as well, their food supply. If they're spawning earlier, there may be a disconnect with their food supply.

MR. BOSTON: Day length was another point you brought in there.

DR. ROSS: I was just going to follow up on what George said, that there could be expansion or contraction, but the mismatch between productivity, that's a good point.

MR. BUSH: A question I was going to ask, and that really sort of leads into it, is there a potential or do you all think maybe we should consider maybe a -- I hate to say it, but a fourth column where you might have secondary or indirect impacts, where species are moving into ranges where they now have a new prey source or a new predator that predated on them that could have a substantial impact on them?

MR. BOSTON: That potential suggestion there, Roger, might be just brainstorming, and that would be like a food web or other secondary impacts column. I hear the sawdust burning.

MR. PUGLIESE: I am thinking. I am just trying to think about it, because what we've got right now is kind of a limited connection between the habitat and what the impact -- The variable climate change may affect that habitat and then the species -- I know where you're going, and I'm trying to figure out if it could be integrated within the actual impacts, talking about prey availability shifts within that discussion. You could highlight it with that change in distribution, and that is actually one of the upcoming intentions.

MR. GEER: It could be prey/predator.

MR. PUGLIESE: Prey/predator shifts, and so that could actually fall into there. It's not necessarily a secondary.

MR. BOSTON: It's a primary, and so the prey/predator shifts could, in fact, in your mind, be in that category. A follow-up to that one, before I got to a new one, and is it on this same topic?

DR. CHERUBIN: When we talk about spawning habitat, we know that we have different types of spawning habitats. We have pelagic spawning habitats or shelf-edge spawning habitats, but we

also have shelf habitat. If we think about shrimp in Florida Bay, for instance, and you think about water management or climate, the latest predictions have shown some drought in southeast Florida that will decrease the discharge of freshwater from the Everglades into Florida Bay, which means increasing the salinity, but also changing the local circulation.

You know that shrimp use that what is called the tidal stream transport to move from their spawning grounds in the Dry Tortugas to their nursery habitat near the coast. When you change the salinity, you change the circulation, which means the effect of freshwater on the geotropic transport, which means that the shrimp may not be able to go back to the habitat because of that change.

Now, when we talk about semi-pelagic habitats, and so shelf-edge habitats, the edge of the Gulf Stream, we could imagine some changes in the Gulf Stream, in terms of the generation of eddies or localized upwellings that create those blooms that some of these species that spawn there use for their larvae to find their food. Hence, what I mean is like maybe we should refine the definition of spawning sites, because there could be a huge variety of them with different characteristics, and so different inferences on climate change on those characteristics.

MR. BOSTON: Thank you. Are there others?

DR. SEDBERRY: As we all know, the council is going to special management zones for spawning locations of reef fish, and it's possible, with climate change, that those spawning locations will change in the special management zones, and the management plan for those SMZs needs to take that into account. I don't know whether that fits in here or not.

MR. PUGLIESE: I think it does, because it affects not only those deepwater MPAs, but a number of different managed areas that have spawning aspects or need to be considered.

MR. BOSTON: Where would we note that? Would it still be the central column?

MR. PUGLIESE: It would be within here, yes. The SMZs and potential impacts on SMZs and MPAs.

MR. BOSTON: So we would add that as sort of one of those other categories within that central column. Good point out, George.

MR. GEIGER: I am sort of intrigued by what George said. You have mismatches between primary and secondary productivity, and that's going to affect a whole variety of different species. How do we capture that as this, because it's going to impact a variety of different habitat types. It's going to impact a variety of species, and what hits me between the eyes is we saw that with red knot and horseshoe crab spawning. I mean, if you get a mismatch there, it's a disaster for the birds, and it's happy news for the horseshoe crabs, and how do we capture that? Again, I think it's a very important thing that we need to have somewhere in this that crosses all habitats and all species.

MR. BOSTON: Yes, and the -- It's almost this kind of super issue kinds of things that are really cross-cutting, and so, while you can note them species-by-species, they're going to cut across so many that it's almost worth perhaps an introductory piece to the table itself, Jamie. Maybe a place

that highlights these big prey/predator things and some of these big comments that you can make, the missed timing that George is bringing up, and so perhaps we just need a better introduction to the table, as opposed to trying to note it every single place. We can define it upfront, and maybe we can then capture it easier with a bullet. I am just throwing that out there. Roger, will that work?

MR. PUGLIESE: I think upfront or wherever we can, because that ultimately could be something where you could very specifically talk about cross-cutting effects, and then it gets outside of the realm of what is necessarily EFH. It crosses all managed species, regardless, and I think that might be, in and of itself, a way to address it, whether it be frontend loaded or you go through the managed species detailed discussion and then say these cross all of them, whereas it potentially could have significant impacts across those as well as other managed species.

MR. BUSH: Just to throw another monkey-wrench in there, also, if we're going to do that opening paragraph which describes some of the macro issues, would it be appropriate to address the timeline that we're trying to address here, because obviously I think you could make an argument that over the long term, no matter what changes occur, there is going to be adaptation. It may be an extraordinarily long term, and they may not survive long enough to do that, but I think, if we're going to change that opening paragraph, it would be worth addressing that as well.

MR. BOSTON: There is no real planning horizon that frames out the length of this discussion, and there are -- It's tough to do that, but I get your point. It's sort of frame the time perspective that we're talking about here. Thanks, Dave.

DR. LANEY: Kind of a follow-up, I guess, is we were talking earlier this morning about prioritization, and it occurs to me that, if you look at the suite of spawning sites that we have for each of our council-managed species, some of them are going to be more subject to impacts from climate variability than others are, and so the ones that -- George, correct me if I misspeak, but maybe the species that are currently in offshore deeper-water habitats, where environmental conditions tend to be very stable anyway, will be less subject, probably, to climate change impacts than those species that are in shallower water, maybe, where the temperature extremes could go greater.

I don't know, and so perhaps, and maybe not necessarily in the table, but maybe in the accompany text somewhere, we might want to just sort of list those out and say, okay, as far as the hierarchy of spawning habitats go and the different sites that are used for spawning, here is kind of a priority of the ones that we think are going to be more likely to be impacted versus those that are less likely to be impacted, but I don't know. It might be worth saying that, and it also might reduce the amount of work that ultimately has to be done if we could identify a suite and say, okay, these guys are -- It goes back to what Pace made the point earlier about the vulnerability assessments that are being done.

In the overall suite of things, if you're doing a vulnerability assessment on a given species, if its site is already in a habitat that's very stable, where conditions are very stable and long-term and are not likely to be influenced, we don't need to worry about those as much as we do others, perhaps.

MR. WILBER: I just wanted to expand on Dave's point about timeline. These policy statements, historically, have a five to ten-year shelf life before they get redone, and so to be talking about things that are thirty or fifty more years down the line, it's perhaps not that useful as us talking about what we need to do in the next five to ten years, before the next iteration of the policy is cranked.

MR. BOSTON: Yes, and that was it, just framing out -- It also helps frame out the kinds of recommendations and things you can put in there. You are speaking with a much more immediacy if it's five to ten versus 2060.

MR. WILBER: Well, I think we need to do both, but we need to have like a short-term action plan and a longer-term action plan. Right now, I think we've mostly just been talking about longer-term stuff.

DR. ROSS: To address Wilson's comment, I think we've got to be careful about what we call stable. It's in a relative sense, but, anytime we go out there and monitor with very intense data recovery, like daily or hourly, we find a lot more variability than we thought was there, and, if you're anywhere near the Gulf Stream, temperatures can change several degrees in a matter of hours, and we don't always measure that, and so we've got to be pretty careful about that, and the Gulf Stream changes will have a big impact on outer shelf variability.

DR. SEDBERRY: I agree with what Steve said, but I just also wanted to add that, in areas where there is great stability, the species there have a tendency to respond to very tiny changes, and so it's all relative.

DR. BOSTON: So ignore that outburst is what they're saying. Sorry about that, but good try.

DR. LANEY: But I did hear the word "relative", so it's all relative, every bit of it, and so I think that we all would agree that those species in shallow-water habitats, which are much more variable than those deeper-water habitats, even though the -- The degree of change may be greater there, and so who knows? They may have a greater tolerance just because they experience greater variability on a day-to-day basis. I don't know. It's complicated, as they say.

If there is some way we could say there is a group of species that we're less worried about and a group that we're more worried about, in terms of their spawning sites being impacted by climate variability, I think we should say that, if we can say it.

DR. ROSS: Just to follow up on that, I would be worried about saying that, because I think the point that George made is a really important one. There is variability everywhere, and the scale and magnitude is different, and the responses are geared to that. If you change that window anywhere, it could have a big impact.

DR. BOSTON: Again, ignore that outburst. Moving down through there, are there any -- We're getting very good generalized comments, and that's kind of where we are. Is there anything specific species wise? The Chairman started us off with shrimp and some very specific, broad things around shrimp, reactions, and are there other species that folks can weigh in on that would be helpful by the particular ecosystem to that species? That's kind of that map. We've got some

broad things, but are there some other things that we can fill in as you look through Table 1, the center column?

MR. PUGLIESE: Just to follow up on what George said, I think, when you look at the -- That's going to be the most stable, but the implications of something that has such a specific habitat and specific parameters may be seriously threatened by shifts in the Gulf Stream or something that ultimately changes the entire habitat distribution for that species.

DR. SEDBERRY: Right, and you're reminding me of Steve's point, that these places aren't as stable as you might think. They can change six or eight degrees in a matter of hours or in a day or two. They may seem stable, because they're deep, but there's a very dynamic system that we're dealing with.

MR. BOSTON: Got it. Looking through here, are there any -- Again, we've gotten great generalized comments, and the Chairman started off with some specifics, and are there any species comments, as you look down there, that you would make by the habitat?

DR. ROSS: I have one question and then maybe a comment. Is the word "manganese" a requirement of that definition? Could it be hard ground, or does it have to be manganese?

MR. PUGLIESE: That is a specific -- It's one of the HAPC designations. I think there is a multiple number of these that capture hard bottom and other ones, and the most generic is the first one.

DR. ROSS: Right, because ocean acidification may not have an impact on manganese, but it will on coral, and so it's an impact directly to the habitat that's of great concern in the Atlantic.

MR. PUGLIESE: Yes, and I think, to that, one of the things in the HAPC designations is we do have all the coral. All the coral HAPCs are EFH HAPCs now too, and so being able to capture that, I think we can do that by making that linkage on how that could shift and change the entire deepwater coral ecosystem.

DR. ALEXANDER: I think that making it just manganese, I think it's being too exclusionary, because those are not just manganese pavements. They are phosphorhite pavements and they're a number of other mineralogies, and so I think that hard bottom pavement or manganese phosphorhite or whatever, but, the more specific you are, the more the chance is that it comes back to bite you later on, I think. We need to be more inclusive.

MR. PUGLIESE: Right now, what we're working on is actual terminology that's used for those designations, but I think the intent was to capture the type of habitat here describing it very specifically, and so I think that making that clear is going to be important.

MR. BOSTON: For that one, the manganese piece, while that is the specific way it's currently identified, perhaps finding a way to broaden that a bit is what the team is saying, Roger, and are you okay with that?

MR. PUGLIESE: Yes, and I think, to some degree, that's what some of the user guide was trying to capture in the past, is interpretations of some of these terminologies for other aspects, such as

nursery areas and other aspects of that. I think there is an opportunity to maybe add in some of that terminology within, just to clarify what the intent is.

MS. HAVEL: I was just moving down the list, if we're ready to, and I'm not sure if spiny lobster use salinity as a settlement cue the way that like blue crabs do, but, if they do, I think a lot of the issues that Pat mentioned with the shrimp could also apply to Florida Bay and Biscayne Bay for spiny lobster as well.

MR. BOSTON: So similar in those shallow-water areas?

MS. HAVEL: Yes, either increased precipitation or if there's drought in southeast Florida. It could be lack of precipitation. Both of them could affect settlement.

MR. BOSTON: Thanks. Are there others?

MS. DEATON: If we're jumping, any of the hard-bottom categories -- I would think acidification should be a big one on there, and just put it in all of them, because of potential loss of the crumbling of the habitat or whatever it's going to do and not just the coral, but any calcareous invertebrates that are on that.

MR. BOSTON: So just generally across hard bottom, make that comment on acidification? Got it. Are there others?

MR. GEIGER: I'm sort of struggling on this middle column, and I guess, unless you have some real hard, solid data on all these individual essential fish habitat HAPC issues, it seems to me that I would -- Again, the will of the group, but I would eliminate this impact of climate variability in this middle column. I would capture all of this. That does the more broad brush, and the one or two introductory paragraphs in front of the table, unless you have specific information related to that habitat type and that particular species. I think we're struggling, and why present an incomplete or relatively irrelevant table, but rather identify some of the more appropriate broad-brush issues. Thank you.

MR. BOSTON: Just returning us to earlier, when we -- Anne brought this up, and she said, shouldn't this actually be in the climate change section itself, and the answer is yes. Probably there, you would be able to make those linkages much better, and we're kind of struggling here, because we don't have necessarily all the scientists in the room that would help us with that.

I think your point is a good one. We certainly need to cross-walk it, and we need to see if there is in fact information in there. If you can't really fill these in, your point is then cover it with some introductory stuff and drop the table and make that more for the section area, and so that gives us an option of how to proceed there. Thanks, Jamie.

MS. DEATON: I have more impacts. If you bump down to wetlands, shrimp is listed there, but there is science out there that shows that wetlands will not be able to keep up with the rising water rates, and so wetland loss is expected, and so that would be a big impact to shrimp. Also, it could cause increasing erosion rates, which attributes to that.

MR. BOSTON: Increasing erosion rates, and you're saying that wetland recreation is not going to keep up with the rise levels, and it's not going to be able to -- Okay. Clark is going to explain that.

DR. ALEXANDER: No, I'm not going to explain it, unless you've got a while, but, basically, it really is a -- It depends on the rate of sea level rise, and it depends on the amount of sediment you have in your system, and so, North Carolina, you guys are screwed. Down in Georgia, we've got plenty of mud, and we've got plenty of marsh.

MR. BOSTON: You can go back a way, yes.

DR. ALEXANDER: Yes, and so I don't know how you want to approach this for the South Atlantic fisheries, other than -- I mean, you want to acknowledge it, but my major problem with this table is that it's kind of like we list every little area that we know something about as important, and is there an argument to be made that we should be describing general habitat types and then listing as sub-areas, that these are the areas that are like this, and then talk about the impacts in those kinds of areas?

MR. BOSTON: You would say there is almost like a super category to the left that says -- Describe that in general, and then you can go to these specific EFH HAPC areas.

DR. ALEXANDER: As an example, there is a couple of things. There was the lake plateau manganese platforms, and then there is the rock overhangs, magnate phosphate rock slab formations, and it's the same thing. It's just in a different place, and certainly it will impact different fishery species based on water depth and all those sorts of things, or at least that's how I understand it as a geologist, but I think that you could address all that in a more composite way, but it just seems like you're slicing it just based on we happen to have had a survey here and let's talk about it here and somewhere else.

MR. BOSTON: Got it.

MR. PUGLIESE: One of the things you've got to remember is this is specifically the HAPC designations, which are subsets of the EFH designations, and so some of the broader categories are actually captured in the broader EFH of like all hard bottom and coral and that bigger picture, and a lot of that descriptive information that started in the habitat plan was updated in the fishery ecosystem plan, and this is just an attempt to kind of walk through linkages on what some of the implications may be, but I understand what you're saying.

DR. ALEXANDER: Yes, and I guess I just don't see that linkage to that other document. It's not explicit, and it could be explicit.

MR. BOSTON: Yes, it's not as strong, and so, if you said -- Just to kind of follow on that, if you just said hard bottom, and then you had just a general these are the kinds of impacts across that broader category, and then maybe that next column over would be the manganese, and you could break it down that way. You would see that as a stronger linkage? I don't want to put words in your mouth, but --

DR. ALEXANDER: Sure.

DR. SEDBERRY: Also, to Clark's point, I think, is that, under Atlantic coast estuaries, we have coastal migratory pelagics as a management unit, but we don't have that under coastal inlets. How can you have -- How can that be important in estuaries, but not be important in inlets? I just don't understand. We need some kind of broader classification or some broader way to look at this than the way the table is looking at it.

MR. BOSTON: Got it. So we need the parent. We're almost like starting out with the children here.

MR. WILBER: Specifically to that point, coastal inlets are essential fish habitat under the Coastal Migratory Pelagic Fishery Management Plan. They are not a habitat area of particular concern under that particular fishery management plan, but I mean I think my take on the last fifteen or twenty minutes is that I think folks would rather talk about this at a generic habitat level rather than skipping the EFH stuff and going right into the HAPCs, because it seems like a lot of stuff has been kind of omitted. My question to the folks who have drafted this policy is do we really need to limit the discussion to HAPCs, or can we get more generic and essentially ditch this table?

MR. PUGLIESE: The answer to that is this was an attempt to bring in that cross-walk, which was done in other policies, and, if it's the desire of this group to deal with it on a more generic level, that's fine, too. This was just an attempt to do exactly what we're doing, talking about some of the specifics or broader brushes of what potential impacts may be to the habitats or the species that are affected as essential fish habitat, and so I think it's what you all feel is going to relay this message.

It's just drawing on past ways we've looked at this and try to bring this into light and have -- I mean even you had said, Pace, before, is it's something to be able to focus on and what the implications may be for a specific managed species and making that cross-walk to that is what this was, is just an attempt to take those first steps, and there's a lot of good discussion on specifics as well as broad brush and how we make that be the most useful tool is what we're --

MR. BOSTON: It might be that there's really two tables here. It's the broader table with broader implications, and if, in fact, there is a map here, I think the group is saying, yes, make it, but we can see the map being made at a higher level.

MR. PARKER: I have always understood and told people to tell people on my charters that -- They ask about the marshes, but I believe that three-quarters or so of the fish in the ocean depend on healthy marshes for some stage of their life. Also, highly migratory species would depend on food fish for foraging, and they come from the marshes, and so you talk about a broad stroke, and that's a big one right there. Whatever happens to those marshes is going to be mighty important to what happens to all of that three-quarters of fish.

MR. GEIGER: Whenever I see a table like this, and listening to the past fifteen minutes of discussion, I come back and say, who is the intended audience for this discussion? If the intended audience is for managers, I am certainly more compliant to lump it rather than split it. If the intended audience is much broader than that and we have specific examples, then let's split it and put those examples out, but, whenever you go with some kind of a hybrid document, you're going to fail.

I guess I would ask, let's reassure ourselves who the intended audience is for this document and what we really need to move this forward, this policy process forward, in a clearly understandable, realistic and useable form. It's simple. Thank you.

MR. BOSTON: Good, and, right now, we may be at -- We can address both, and we may not have enough depth, is what I am hearing also, to actually get there on these very, very specific things. There might not be the research behind it, to where you could even make these statements, other than in a more general, broader sense, and so I think this is going to play out as the team starts to take this table on, Jamie.

MR. BUSH: I think I kind of agree with what you're saying with having maybe two tables, one with a few specifics with your HAPCs and whatever, but also maybe the thirty-thousand-foot view, because the managers are looking at different things. I mean, temperature can have multiple effects. It may not drive -- Like southern flounder, it may not drive them out of the area, but two degrees Celsius can shift their spawning from a 50/50 male-to-female ratio to a 75-to-25 ratio and have phenomenal impacts up and down the food webs, and so maybe a generic or general table would be helpful.

MR. BOSTON: Good. I think we got that one. Certainly generalize the table, and then, if we can later, be specific by EFH HAPC, and we'll get there, but generic seems to be kind of the tenor we're getting there. Anything else on that topic or this table? I think we've beaten it pretty much into submission, but there may be some beating that we still want to do. It is still breathing, maybe, but I don't know.

MR. PUGLIESE: Just as a point, one of the ways to make a linkage back to kind of the broader designations is we do have the user guides, and so, if we craft it right, we can make a reference back into what those specific species designations are for EFH or HAPCs within the user guide as a supplement to the policy, and that's one of the avenues to do this.

Again, this is -- The discussion about the use of the policy, the intent is to be able to highlight where, especially in more recent activities, non-fishing activities may be impacting the council's managed species or habitats. In this case, it would be broader scopes of other partners that have authority over those habitats or, in the EFH consultation process, the ability to use some of these types of references to get down to at least alluding to potential species-related impacts, and so that's kind of the cross-walk, and I think everybody is struggling with the -- If we had the full-blown vulnerability analysis in front of us, we could be populating this thing with no problem. That's part of the problem, and I think that's why, number one, you have it in some of the research recommendations, but we're trying to get as far as we can with some of this discussion.

I think what we can do is that this also will lead to, where possible, quantifying some of those connections on what the real vulnerability of these species are, at least some of the ones that we have now, as this proceeds, as the FEP II proceeds.

MR. BOSTON: Pace brought it up earlier, but a table is probably not the best way to capture these interactions. Modeling and some other things are tools that we don't have.

MR. WILBER: I appreciate being singled out for this entire row of folks, but --

MR. BOSTON: This genius row in the back here. I can see you. Jamie is hiding, and so I couldn't get to him, but I think trying to do this in a table is pretty awkward anyway, but I think that's the state of the -- It says more about the state of the data and the forms that we have it in. We don't have those interactive forms like we should, clearly, or need.

MR. WATTERSON: I was just curious. We're putting this policy statement together, and how do you envision this playing out, in terms of being incorporated into say an EFH consultation?

MR. WILBER: If there was a magic wand and I could wave it, I would like this policy statement to somehow identify the coastal habitats that are the most vulnerable to climate change and discuss briefly how and why they're vulnerable to climate change in a way that we can develop avoidance minimization measures and best management practices and compensatory mitigation measures, to either make those habitats more resilient on a local basis or to somehow replace those habitats in other areas within the estuarine watershed or something like that, where they can still provide their function.

We go through this often enough, but the thousand EFH consultations we do each year, less than one handful are out inside federal waters, and three of those five are going to be somebody laying a communications cable, and so only two of them really involve any kind of significant bottom-disturbing kind of activity. If it doesn't really focus on inshore stuff and identify where we should be spending most of our time on inshore stuff, the policy statement is not going to be that useful in the EFH consultation arena.

Now, EFH consultations are not the only arena where this policy plays out. I mean, it has a huge role in how the council develops its fishery management plans and any regulations it puts on fishing impacts and stuff like that, and so I mean I think my voice is important in this context, but it's not the litmus test as to whether or not the policy statement is valuable.

MR. BOSTON: Certainly to have management impact, and this is back to that earlier discussion about these other groups that we could potentially be impacting, and that would be a clear benefit of having a policy that could help, certainly in an EFH consultation period, and so some portion of that would be useful, and it certainly would have impact on these thousand things a year that you're looking at. Carter, was that helpful there?

MR. WATTERSON: I mean, it was. I guess the question is, does this policy really get at something that would be beneficial, in terms of playing out for the EFH consultation? Does it give National Marine Fisheries Service the information and the backing it needs to be able to substantiate the information required to go into that assessment or that consultation?

MR. BOSTON: I know many of the teams that worked on the various habitats, they really looked at that, to say, look, if we can make this section, whatever that habitat section was, we can make this section useful by managers and others that were looking for a quick shorthand, to say, well, look, this group of people has recommended this. Then, even within the teams, Carter, the teams said, if stuff already exists that looks like it's a benchmark, let's make sure we're cross-referencing it, so that we start to tie all of the research and implications together, and I think the teams are very cognizant of that. As we look through those individual sections, I think you will see that they did

a pretty good job of that. The question is, are we capturing enough of that in this policy to make it valuable?

MR. WATTERSON: I think there is definitely potential to do that, but there are lots of little decisions that need to be made. For example, saltmarsh is not an HAPC, but, to address Captain Parker's comment, we should be clearly talking about the impacts of climate change on saltmarshes, in order to have any kind of meaningful discussion that's going to affect my side of the regulatory arena. There is a whole lot of little decisions like that I think need to be kind of visited and made in such a way to kind of end up having this document target whoever ultimately the audience is going to be.

MR. BOSTON: So you can see, from the amount of time we allocated in the agenda for the document, and yet, the importance of the document -- I think we've clearly said it's not going to meet our needs and there's a lot of things we need to do with it to make it better, and I think that's important, because, ultimately, this is a guidance document that can in fact affect decision making in a very positive way.

Each of the teams that I worked with struggled with what are they going to do with our work, and so I think that these internal connections between the sections, these internal connections between the policies and the chapters, the sections on these habitats, making those linkages better and better, is what needs to happen now, because, as we tighten these up, you suddenly have a cumulative impact within the document. We are feeding and supporting each of these kinds of decision processes better, and so this is tough to summarize all of these things and come up with something in a policy statement that is actually a summary. The table was a good start, but I think we've seen that we probably need to do some other stuff there.

MR. HOOKER: This last part of the discussion, Carter and I are on the receiving end of EFH consultations as well, and that's where I've been struggling on this, is how this will benefit Pace and his group in those EFH consultations. Let's take the saltmarsh example, and shoreline hardening isn't affecting global climate change, but the issue is that there's less area for sea level rise to -- You're trying to look at such a large thing, global climate change, and the actual impacts are something much more discreet and have implications in global climate change, but you're not going to say you're going to increase CO2 and affect global climate change, and so I have this conservation recommendation for you. Well, there may be one case where that can occur.

I think that's where a lot of us are struggling on this. It's so broad, and it's not clear on what we're trying to do, and so maybe that does bring us back to just having some broad policy statement and saying that this is a cross-cutting issue and kind of leave it at that.

MR. BOSTON: Yes, and I think the linkages from this policy into the places where we do have detailed recommendations within these sections themselves, that could be helpful too, because I don't know that you can squeeze all of those hundreds of pages into a ten-pager.

MR. HOOKER: I would almost advocate reducing this one.

MR. BOSTON: Yes.

MR. GEIGER: Again, I think we answered at least one intended audience question. Is there several others that we need to identify that will drive this discussion? In my mind, it sounds like we are honing in on who are the real users of this policy, and for what purposes, and let's go ahead and identify those and move forward. Again, the last thing I want to do is put such a broad-based policy on the table that's going to be put on a shelf and ignored. We're not doing anybody any service to do that.

MR. BOSTON: Every team said the same thing. If we can make it shorter and more usable and simple that a manager can go there it is, boom, and here's the science behind it and here's the team recommendation -- The faster they can get to that, the more usable and the more likely we are to be part of decision making. Like you said, if you can't find it, if it's just too broad, it's platitudes. Usability of the document is an important function that we need to certainly consider, the eyeballs of the customers of this.

MR. GEER: Somebody brought up a question, and, Jamie, I think it was you, about the timeline of this document, five to ten years versus long-term. Pace, this a question for you though. Your permits, what is the lifespan of a given permit, of the structure of whatever that permit is for?

MR. WILBER: It's a really a Corps of Engineers question, but Corps permits typically have a five-year lifespan. They can go up to I have seen -- We did one recently that had a forty-two-year lifespan. Why it was forty-two and not forty or fifty or forty-five was beyond me, but a lot of the five-year permits that deal with maintenance dredging can be extended kind of automatically for another five years to ten, and I don't think the Corps can make a maintenance dredging permit last longer than ten years.

MR. GEER: Okay. I guess I was thinking more along the activity itself, the activity that's being permitted. Is it something that is going to be done over five years and will have an influence over a hundred-year period or is it -- That's what I was trying to get at.

MR. WILBER: I think you can probably find examples that fit every scenario you can think of, but I would guess that the mode would be eighteen to twenty-four months of activity that has essentially a permanent impact on the landscape.

MR. BOSTON: So we have a couple of different time horizons that you're working with there. Any other comments?

MR. GEIGER: I will take it from a different perspective. If I was writing a budget right now, it would be a three-year budget cycle. I want to have the document right now, so I can incorporate it into the next three-year budget right now. I can take it from a political or economic point of view, or I can take it from a biological point of view, or I can take it from a regular point of view. Again, what is the intention of the document and who are we trying to influence or direct or drive for improved habitat restoration and protection?

Those are the critical questions that we need to ask, and, again, I would rather do something sooner than later. I would rather have something more dramatic and generalized that I can make some talking points to make those points to influence direction, wherever it may go, at the local, state, federal, and international level. I may be thinking way too broadly here, but I think that's going to make a very effective document. Thank you.

MR. PUGLIESE: To that specifically, I think you made some significant points about the timeliness and utility. I think it's going to be really important that we advance -- This is one of future discussions that is going to happen beyond here, and so I think it's important to -- It's a first attempt to bring this to the forefront, because, in our region, for the broader scope of fisheries, these things have not been integrated, or are just at the beginning stages, and so I think this is the springboard to advance this discussion further.

It has a focus on the essential fish habitat component, because the council still views habitat conservation as the foundation of the move towards ecosystem-based management, and so I think, very specifically, that this is a driver that can advance things, but the implications for working with our partners and advancing this, getting the appropriate research, getting our partners to provide the more detailed information to make more informed decisions to affect assessments and to really guide how we understand what some of the implications are has to start somewhere, and I think this is what we're trying to do, is to start here and get it to a point that we can advance it further, and I would anticipate having further discussions on implementation or action planning that goes kind of beyond what this is in future discussions of the advisory panel as we see the FEP evolve further, but that's my two-cents.

MR. GEER: Are you ready to move on?

MR. BOSTON: I think we've got pretty good input on that, and I think this document, what I'm hearing, it is really important. It could be very important if we could tighten it up and make it impactful, and so I think it's very, very important to get this one right, if we're going to use any of the other things, because it's the springboard to all of these other sections. It needs a major rework. We've got a lot of feedback on the tables themselves, and they could be very useful, if they were broader, but who is our audience? If we want to impact the decisions that managers are making relative to habitat, we've got to really tighten this up and make it a much stronger, more impactful document, and so I got that feedback loud and clear.

We got a lot of great feedback on the frontend, of how to make it better, and so I think this is just in need of a good rewrite and a refocusing and get it back, and sooner rather than later would be good, because this is an important piece, and everything else is going to be playing into this from these other sections, Roger. Mr. Chairman.

MR. GEER: Jamie, you brought up the timeliness of this and trying to get something out sooner rather than later. The plan is to take this policy statement to the Full Council at the December 5 meeting, and so that's not too far away. If we want to do that, but it's the will of this AP to say, no, it's not ready and we want to hold off, but I agree with Jamie's statement. I mean, now is the time to do something, but, if it's not ready or we can't have it ready in time, that's going to be the bigger issue. We've got to decide that.

MR. BUSH: I think it's very important that these things do get addressed, but it's probably maybe not well spelled out, but this document also will never be static. It will be continuously evolving and getting on the board with something, something correct, and something that at least is on the right track is important as well, and I don't think we would be wrong with that, but I'm just making sure that all intended users understand that this isn't, or probably never will be, a final product.

MR. GEER: Jamie is nodding his head.

MR. GEIGER: Again, I think trying to seek perfection in this is a losing cause. I would rather go with something imperfect, but timely and reasonable and appropriate and get it in front of decision makers quickly. Again, I think habitat is -- You could tie so many economic benefits into habitat improvement that is going to -- You look at all the agencies, and they're all going to be divvying up and then spill down to the state who gets what. If you can show economic impacts of what you're doing and the benefits of those economic impacts and, if you do this, you are going to generate X amount of direct and indirect economic benefit as a result of this action, you're going to be on the winning side of the ledger. Those that don't are not, and I think this document can go a long way to help assist in that process.

MR. BOSTON: Okay.

MR. GEER: All right. Do you want us to move forward in taking this to the full Habitat Committee in December? I heard a definite yes, except it will never be perfect. That gives us twenty-one days.

MR. PUGLIESE: Then you've got to remember that the council is going to -- It's not as if it's just going to rubber-stamp it. They're going to have their own input on this, and there is a possibility that they may want more work done, and so it could always come back for additional refinement in April.

As I said, there is this balancing act of what goes in this policy versus maybe a broader discussion on additional implementation or actions into the future that may go beyond this, and so there is a number of different things that happen, but what really we were trying to do is to advance this another step. We've had some input on considerations. We can advance this to another step to get those detailed types of discussions and inputs to refine the product and allow the -- It's going to go first to the Habitat and Ecosystem Committee to refine that, and then the council consideration, and so that's what we're in right now.

MR. BOSTON: Roger, it sounds like there is -- Just to see if we can summarize it, it sounds like let's move forward. Let's get something in front of them on the 5th. Let's put all the caveats that we need to in there, knowing that it's probably going to come back for some revision, but let's clean this up a little bit with probably some broader strokes in here and fewer details. We can talk about the big implications, and tee it up to be a quality frontend document for the process is what I'm hearing from the group, but go ahead and get that in gear and in motion. That's kind of what I heard. Make it better and put it in front of them and know that we're probably going to get some edits, but at least it's in motion.

MR. BUSH: Since you're going to have a captive audience, you could already go ahead and plant the seeds with them now, and saying, look, we're going to be bringing something to you, and be prepared to tell us what you want out of it, what you can use and what's beneficial.

MR. BOSTON: Got it.

MR. WILBER: I just have a process question. Does it go to the committee before it goes to the council?

MR. PUGLIESE: Yes, the Habitat and Ecosystem Committee is the counterpart to this, of which Wilson is the co-chair. That really helps, having Wilson here, so he can relay all of these caveats and take it wherever it needs to go from there, and so that's the core group that really does the review. Then it goes to the Full Council for any other consideration as it moves forward, but the work is going to be done at the Habitat and Ecosystem Committee meeting.

MR. WILBER: Okay, but, right now, when we say going to the council, what we really mean is it's going to the committee, and the committee will talk and decide whether or not to send it to the council or whether to send it back to this AP.

MR. GEER: It has to be approved by the committee before it can go to the council, the Full Council.

DR. LANEY: Just to clarify, and I think most people sitting around the table are aware of this, but, at the South Atlantic Council, when we say the committee, it really is the Full Council, because every single council member is around the table for every committee meeting, pretty much. The only difference is that the members of the committee are the ones who get to formally vote on whatever motions or proposals are put forward with regard to the policy itself.

Then, at the end of that week in December, the policy, as revised by the committee, if they have recommended any revisions to it, then goes to the Full Council. At that point, it's wide open again, basically, because anybody who sits on the council can bring up any other issues that they wish to bring up, which they may or may not have brought up during the committee meeting earlier in the week.

The other thing that I would suggest is that all of you sitting around this table are residing in some state, and you are represented on the council by three individuals or, more broadly, by the Regional Administrator of the National Marine Fisheries Service and those of us who are non-voting members, ASMFC, Fish and Wildlife Service, the Coast Guard, and the State Department, who rarely attends a council meeting.

One of the things that I always encourage people to do is to pull up that list of who your council members are, and, if you have an opinion that you want to express to a council member, feel free to do that. Send them an email, or pick up the phone and call them. I think far too often that many of us sit out there and don't make an effort to communicate directly with council or commission members, and they are supposed to be representing us as stakeholders in the public trust resources, and so take advantage of it and do it.

MR. GEER: Okay. We have to tie this up, so we can get our presenter ready for the webinar. What we're going to ask everybody is to give us your comments no later than Monday the 21st, and so that's next Monday. Sooner is better than later, because, given it's a short workweek next week and then one full week of work and then the council meeting, and so it's a pretty tight schedule to get that done, and so please get any comments you have, as soon as possible, to Roger or myself.

MR. BOSTON: Or any big-time summary thoughts that you want to make sure are emphasized, and so send us the bullet points or the details, your choice.

MR. GEER: We are getting ready for the webinar now. Do you need us to take a break or anything?

MR. PUGLIESE: Why don't you take a couple of minutes, and we'll start at 12:15.

(Whereupon, a recess was taken.)

MR. GEER: We are getting ready to start. Kenric, welcome to the Habitat Committee. Kenric Osgood is the Chief of the Marine Ecosystem Division for NMFS Office of Science and Technology, and he's going to give us a presentation. Kenric, I just want to let you know that you're standing between us and lunch.

DR. OSGOOD: Hello, everybody. This is Kenric Osgood. I will go ahead and start. I can't hear anything, and so I don't believe that I will be able to take questions, but I want to thank you for the opportunity to provide an update on the NOAA Fisheries Ecosystem-Based Fisheries Management Policy Roadmap.

I want to start with just a couple of take-home points, first of all. The first point is that NOAA Fisheries needs to and is committed to doing ecosystem-based fisheries management. Making ecosystem-based fisheries management operational is a key challenge, but is one that we are up for, and let me also say that we are already doing many parts of it, along with our partners. Building from that, I also want to mention, on the last bullet there, that we cannot do this without strong partnerships with the fishery management councils, the state commissions, and our other partners.

What I want to do today is I want to give a little bit of background about EBFM and then, after I finish doing that, then I want to talk briefly about just an update of the ecosystem-based fisheries management policy and the ecosystem-based fisheries management roadmap.

As far as background, I want to just remind you, of course, that NOAA Fisheries Service is a mandate-driven science agency. Its mission is to follow a variety of legislative drivers, including the Magnuson-Stevens Act, but also the Marine Mammal Protection Act, the Endangered Species Act, the National Environmental Policy Act, and many others. There are clear requirements to generate a new prioritization to sustain fisheries and recover protected species and conserve the habitats that these resources use.

At NMFS, our work needs to support management choices for hundreds of taxa over 5 percent of the world's ocean area. Going up to the slide there, along the arrow there, we do this through observations and data collection, through the research and modeling that we conduct, and through synthesis and assessment of our data for both individual living marine resources and also of ecosystems. Then we translate this into management advice for our partners, such as our regional offices within Fisheries, but also the fishery management councils and others.

As you can see up on the right-hand side of the slide there, for over 450 fisheries species nationwide, 200 protected species, whether it be marine mammals or Endangered Species Act species. We also have 2,000-plus habitat actions that we're involved with each year, 200-plus aquaculture actions, and over a hundred NEPA, National Environmental Policy Act, actions each year, all around the entire country.

As we continue to deal with a changing ocean, there are commonalities and efficiencies that we can gain from adopting a more coordinated ecosystem approach that addresses issues across species and mandates, and so just a review. I'm sure most of you are very familiar with these various different types of fisheries management, and probably even this graphic as well.

Just very briefly, starting off at the bottom here, and I also I want to mention that the lines there are just to signify the boundaries between these various different levels, but they're not totally distinct, because there is much overlap between these different levels.

Down near the bottom, once again, we have stock assessments for single species fisheries management. We are not including any environmental or broader ecosystem information. The one step up there is the EAFM, the ecosystem approaches to fisheries management. This is where you're still doing single species fisheries management, but you are incorporating some sort of ecological or environmental data into that management process, whether it's climate information, temperature information, habitat information, predation rates, et cetera, any of those sorts of things.

If we step up one level to the ecosystem-based fisheries management, which is what I'm going to be talking about today, that's where we not only consider other factors of a given stock, like we do in ecosystem approaches to fisheries management, but we add other parts of the ecosystem. It's very easy to think of fisheries species, for example, where we not only need to be thinking about the use of that fisheries species as a fishery, but also its importance as potentially a prey item for other species that are fisheries that we're interested in, but also the importance as prey items in different parts of the ecosystems for other things, such as protected species, and so we're making the tradeoff in doing that multispecies type of approach.

We'll move on now to talking about the ecosystem-based fisheries management policy and roadmap. Why did we want to do this, first of all? Well, at the top there, with the policy, what we wanted to do is clarify the agency's commitment to integrating its management programs for living marine resources.

The second bullet there, we also recognize and plan to address challenges under changing environmental and ecological conditions. In many places, there have been changes in climate, oceanographic, and ecological conditions. There are many examples of this. For example, there are species distribution shifts, changes in productivity, invasive species, and coral bleaching.

We want to facilitate tradeoffs between priorities, balancing social and ecological needs. For example, there are tradeoffs between different taxa that are used by fishermen and species that are targeted by different fleets or different sectors, and also different types of species, whether it be marine mammals or seabirds, et cetera. The other thing I want to say here with regards to tradeoffs is that tradeoffs do not go away if we ignore them. It's just that we're making those tradeoff decisions explicitly instead of making them implicitly. Then, finally, down at the bottom there, we want to reap the many benefits from a more systematic approach, which ecosystem-based fisheries management is. With more information, we should have fewer surprises and fewer mistakes.

I have a couple of examples of how ecosystem-based fisheries management types of information that you can incorporate through that process that could be useful within the South Atlantic region.

Obviously, the lionfish populations are well established in the Caribbean and up into the Southeast United States. Through ecosystem-based fisheries management, we can help determine and account for the effects of lionfish on food webs and also the effects of lionfish on the production of resident stocks. We should be able to identify risk and mitigation options through management strategy evaluations.

An example is a change in environmental forcing is, as the Gulf Stream changes its position off the coast, this alters the habitat for species in the South Atlantic, the United States South Atlantic Bight, and this particularly may have impacts to habitat and impacts to recruitment successes of various species that utilize that.

Why an ecosystem-based fisheries management policy within NOAA Fisheries? First of all, we want to clarify, solidify, and document our commitment to ecosystem-based fisheries management. The second bullet down there, we want to establish a framework to enhance and accelerate the implementation of ecosystem-based fisheries management within NOAA Fisheries. That's an important thing there for me to reiterate, is that ecosystem-based fisheries management policy and the roadmap are internal documents to NOAA Fisheries, and they don't put anybody else on the hook for doing anything in these overall frameworks. They are a policy and a framework for us to do things, and they are saying, within NMFS, what we think we ought to be doing.

Some key issues, going down to the bottom bullets there, are we wanted to relate EBFM to our existing legal authorities and the requirements for living marine resource management. We also want to identify the elements of ecosystem-based fisheries management, which is a systematic approach.

The policy statement, which is in the NOAA Fisheries EBFM policy, is given on this slide here. The emphasis, the underlines, are mine and not in the policy, but I just didn't want to read through the whole slide here. If we just focus on what I underlined here, we can see that NOAA Fisheries strongly supports the implementation of EBFM to better inform and enable better decisions regarding tradeoffs that will help maintain resilient and productive ecosystems, even as they respond to various environmental changes.

Of course, within the EBFM, we had to have a definition, or within the EBFM policy we had to have a definition for EBFM. We either had to use one that was existing or we had to make up one of our own, and so we did that, but it's very close to many other definitions of EBFM that are out there. Once again, I don't want to read through this definition of EBFM, but just draw your attention to the middle there, where it says the economic and social interactions are a key component of EBFM, as we view it.

Within the policy, we have set out six guiding principles, and those are shown in this blocked pyramid on the screen now. We can see that, starting off, down at the bottom, the first step with our guiding principles is implementing ecosystem-level planning. What are our objectives? We have to know what we're trying to accomplish and what our objectives are with regard to ecosystem-level planning to know where we're going to. That's where things such as fishery ecosystem plans are very important.

If we move up to the second tier in that pyramid, what is the foundational science that we need? We need to advance our understanding of ecosystem processes or particular things that are of importance to us, based upon what our objectives are in the ecosystem with relation to fisheries. Going up to a step beyond that, what are our priorities? That's Guiding Principle Number 3. We need to prioritize the vulnerabilities and the risks of both ecosystems and their components, and so this is where we do such things as vulnerability assessments for individual species, individual fisheries species or other species of interest, but we also can do risk assessments for ecosystems.

Moving on up to Step Number 4 there, or Guiding Principle Number 4, what are our options? That's where we explore and address tradeoffs within an ecosystem, or we can do this through ecosystem modeling and management strategy evaluations. With management strategy evaluations, what we're doing is evaluating various different management options to project how we believe those actions, what would be the result of those actions, and then select the action that we feel would result in the best outcomes that are we are most interested in in that ecosystem.

Then that transfers up to the next step, Guiding Principle Number 5, where we have the ecosystem considerations that we incorporate into the management advice. Finally, up at the top there, the Guiding Principle Number 6, the final outcome being maintaining resilient ecosystems, and so that's the goal, if you will, and I want to stress that maintaining resilient ecosystems is not just focused on in-water ecosystems, but a component of that is the fishery-dependent communities.

The final policy was released in late May of this year. It incorporated issues we heard during the public comment period, when we had this open. It did not incorporate all of the comments that we heard, because many of the comments that we received were more detailed than what we felt were pertinent for the ecosystem-based fisheries management policy and more pertinent for the roadmap that we are presently developing. Many of the comments that we received during the comment period on the policy, we actually incorporated those into the roadmap. With that, what I want to do is talk for a few slides about the roadmap itself.

First of all, why did we want to develop an ecosystem-based fisheries management roadmap? It guides the implementation of the NMFS ecosystem-based fisheries management policy. It addresses the key questions, including what does successful ecosystem-based fisheries management look like? What do we need for successful implementation of ecosystem-based fisheries management? Then, down at the bottom, the last bullet on the slide there is how do we measure progress of ecosystem-based fisheries management? These are the types of things that we wanted to address in the ecosystem-based fisheries management roadmap.

We took the six guiding principles from the policy, which I just talked about in the blocked pyramid there, and so those six guiding principles are expanded into two to three core components for each one. Each one of these core components has an enlarged goal with multiple action items in it. Each one of those also has an approximate timeframe with it, and so the EBFM roadmap is a menu of options. It's not a prescription of must-dos, but a menu of possibilities.

It describes operational EBFM from a national perspective while allowing for flexibility in regional applications. In articulation of priorities, the agency will continue to review, revise, and build upon these. In fact, we plan to update the EBFM approximately every five years upon its release.

To expand out a little bit more and show you what I'm talking about, these six guiding principles with the core components are all listed on this one slide here. I am not going to go through all those core components of the guiding principles. First of all, it would take me quite a long time, and I believe I'm between you all and lunch right now, and so I don't want to take all the time to go through that. You probably wouldn't listen to half of what I said anyhow if I did go through these in detail, and so I would be wasting your and my time. Finally, the core components, you had a draft to see those in the draft EBFM roadmap that you commented on, and also the roadmap will be finalized and be made available very soon.

The next steps for the roadmap here is we have finished the informal council comment period. We have also finished with an informal public review that we did, where we had it open for sixty days for any comments, and that closed on October 15. We have incorporated the comments that we received from both of those reviews, and we are finalizing the EBFM roadmap this fall. In fact, we plan to roll it out on Thursday of this week. That's why I said this will be out very soon, the final version of it.

One thing I did want to say is just to give you a list of some of the ongoing ecosystem-related efforts, both within Fisheries and external to NOAA Fisheries. I am not going to read through all of these, but suffice it to say that there is a lot ongoing in fisheries related to ecosystem-based fisheries management, and our EBFM efforts, and particularly our roadmap, they aim to tie much of this together. We also recognize that there is a lot ongoing at the fishery management councils, and we very much appreciate and applaud your efforts, and so we want to continue to support your efforts as best that we can.

One thing that I did want to point is the fourth arrow down there, the Lenfest Fishery Ecosystem Task Force. We have been working on a report. That should be of interest to most of the fishery management councils across the country. That Lenfest Task Force is releasing the results of their work, the results and the recommendations, this afternoon at a presentation they are giving at Pew in downtown Washington, D.C. today, and so I am planning on being down there and listening to that. They are also having a panel of folks to discuss the results of this task force, and included in that panel will be Michelle Duval, who, of course, is with the South Atlantic Fishery Management Council.

Just to wrap up here, in summary, ecosystem-based fisheries management is needed. NMFS is committed to it. These efforts will help us meet our mission more effectively. These efforts are a start to codify what operational EBFM looks like, and we and our partners are already doing 20 to 30 percent, or about a quarter, of the elements that we have outlined. Finally, we want to maintain a continued dialogue. That's it for my presentation, and I'm sorry that I can't hear you. I keep getting a lot of feedback on the phone, and all I hear is this feedback sound, and so I guess, if you have any questions, people could write them into the chat on the webinar or email them.

MR. GEER: Questions are going to be pretty difficult to do, and so I would just go ahead and thank him. If you have any questions, get them to Roger, and we will get them to him. Just, real briefly, Attachment 9 is the council's response that Michelle Duval sent, and I'm sure Roger had a lot to do with writing it. That's the response to this.

They are moving forward with this, and the response to it has got a lot of good information in there about like, hey, is money being redirected, and a lot of the issues are there is no new funding for

this. This is something NMFS wants to move forward with, and it's like, well, okay, how is that going to happen? I kind of mentioned that very briefly this morning. Some of the things could probably be done with existing money, if someone is excited to do it, and they can go ahead and look at it, but a lot of these things are going to require new monies, new monies and new staff, and that doesn't exist.

It's going to cost some serious money to implement some of these things, and it's not there right now, but take a look at the letter that Michelle signed off on. It's pretty much to the point. I thought it was well written. It says, okay, this is all great. These are wonderful things to do, but - - I can't remember the phrase. I didn't highlight the phrase in here, but it was like motherhood and something else, but, without money, I'm not sure how a lot of this is going to get done.

MR. PUGLIESE: I think another thing that Marcel will touch on tomorrow is one of the real concerns too is that, with this new directive, what we don't want to do is see any rollback of existing programs that are collecting important information.

If anything, those need to be shored up, to really get the detailed information to really advance ecosystem-based management and understanding broader impacts on species and habitats, et cetera, and so that hopefully is continually taken into consideration, because you sure don't want to gut one, but we're already seeing some of that in the programs now, because of the money shifting, and so hopefully that's going to be an issue that can be addressed in the bigger scope as we move forward. With that, if you do have any specific questions on the roadmap or input, I will forward those on to Kenric. Really, we have to thank Jason Link, who is one of the primary authors. He was the one that we were trying to get, but I think he's literally at the Lenfest rollout today too, and so we'll follow up. With that, what we can do is go ahead and break.

MR. GEER: Okay. It is now almost 1:00, and let's plan on being back no later than 2:30, and we'll spend the rest of the afternoon talking about the food webs policy. We're a little bit behind schedule.

(Whereupon, a recess was taken.)

MR. GEER: We're going to get started again. Thank you very much for getting back way ahead of schedule. Let's go ahead and start on the next item on our agenda, and we're going to look at the food web connectivity policy, the statement, and I guess Roger is going to basically give us some preface to it and then Brett is going to lead us again, as he did before. We will basically say that table that's in there that's similar to the last one, we are just looking for some guidelines. We're not going to go through it like we did last time. The suggestions you gave on how to approach that, we're going to do the same thing.

MR. PUGLIESE: Just a quick opening, very similar to the comments I made on the food web policy discussions, is the foundation for this, of course, comes from the development of the food web and connectivity section of the fishery ecosystem plan and subsequent follow-up and input from our writing team to provide some foundation information to feed to the council for a discussion and then ultimately into this iteration of a policy statement for consideration by the advisory panel.

The core information is, again, the policy, one of the executive summaries, which actually I have provided a more recent update to that, based on council input, as well as the supplemental information I think that was provided, including the roadmap, which we had the presentation on, and I think it was a good segue for this discussion, the National Marine Fisheries Service ecosystem-based fisheries management roadmap, as well as a number of other publications that are responses to that that also have some information or specifics that could actually be integrated within this policy. That sets the stage for the discussion we're going to have. It's a little more tricky, especially when you get into trying to connect the habitat with the species on this, and so I wanted to open it up and build on what we have as a foundational document for the policy.

MR. GEER: Okay. I will turn it over to Brett at this point. I think the first paragraph is identical to the last policy statement.

MR. BOSTON: Yes, and so the same drill. Let's not -- I mean, general guidelines on the table and high-level feedback on big things that might be missing, things you would like to see tweaked that concern you, and then we won't drill into the table, other than to get some of the high-level feedback of how you would like to see it modified or utilized, if that's okay. It will just save us some time, I think. As you look through this, the same drill. Let's just kind of take it from page 1. Anything there?

MR. PUGLIESE: Just a footnote. An amount of this introduction information is literally pulled directly from the section or the condensation of the section as presented in the executive summaries that were also provided.

MR. BOSTON: Nothing on 1? What about 2? Halfway down on 2, you start getting into some policy stuff there. That's where it gets excited.

MR. GEIGER: A general question on the policies, the general policies. Are these in some kind of priority order or random order?

MR. PUGLIESE: No, they're not in priority. These are just provided as the area was addressed.

MR. GEIGER: I guess my suggestion would be I see two sort of things that are different. I see the invasive species and the contaminants grouped maybe towards the end of those and then put the connectivity and energy pathways. Everything else seems to be flowed together, and then you have the contaminants and invasive species. My sense is put those two towards the bottom, and, again, if it's not priority order, that's fine. If it's in priority order, then I would have a different comment.

MR. BOSTON: Contaminants at 6 and then you would say well maybe move invasive species -- They're not in priority order, but down to maybe 7, and then the energy pathways might be 5, 6, and 7, or something like that.

MR. GEIGER: Just move invasive species and contaminants on 6 and 7. If you put them that way, everything else seems to be somewhat interrelated, and it sort of flows nicely, from a logic point of view. Thank you.

MR. BOSTON: So food web indicators need to move up, clearly. Okay, got it. What else on that? Thanks, Jamie.

MR. WILBER: For Number 3, on food web connectivity, I assume the species that are the primary links between the inshore and the offshore areas have been identified in all the food web models that the council has done, and so I would actually identify those species here, rather than just talk about this in a very generic way.

MR. BOSTON: You would do that like bullets or --

MR. WILBER: Parentheses and then such as blank, blank, blank.

MR. BOSTON: Got it. We can add "such as" and then just list them. Thanks.

MR. PUGLIESE: Some of those will be based on previous work, because we're literally in the middle of doing ecosystem modeling right now, and so some of the development of the groupings, et cetera, are developing now, and so, to the degree that we can integrate that in here, and there is a food web that's been identified from past activities, past model work.

MR. BOSTON: In that section, there is a pretty decent graphic too of a physical web that's -- Is that bothering you, Pace?

MR. WILBER: I looked at that to try and identify which two or three or five species are the primary connectors between the inshore and the offshore areas, and I can't figure it out, from looking at that.

MR. BOSTON: So there is some feedback there, too. Okay. The actual physical model itself, you would like to see an indication of primary species.

MR. WILBER: Well, the policy statement says these primary species exist, and so why not identify them?

MR. BOSTON: Yes, where are they, and let's flag them. Okay. Thank you. Are there others?

DR. CHERUBIN: Actually, for 4, if we change the name of the energy to something else, but, at the beginning, I thought that they were talking about fuels.

MR. BOSTON: Got it.

MR. GEER: Mismatch issues? Productivity mismatch issues, like George had mentioned earlier? Is that what we're talking about there?

MR. BOSTON: No, it's where is the productivity in the system coming from, the food energy, if you will. This is the bioenergy and not fossil energy.

AP MEMBER: Use the word "trophic".

MR. BOSTON: Trophic, trophic pathways? Okay. Trophic pathways. Thank you. Yes, I can see that confusion. Thanks.

DR. ROSS: The Mid-Atlantic Council just recently made recommendations concerning forage fish, and so I am not clear how what we're doing here -- Are these things connected in any kind of way, what they're recommending and what we're doing here? Are we going down two separate pathways? Roger, I think maybe that's probably directed toward you.

MR. PUGLIESE: The Mid-Atlantic Council is the Mid-Atlantic Council, and what they did -- It's going to be up to the South Atlantic Council, in response to everything that's being developed, on if they're going to follow up with any other additional actions to specifically address issues that come through the fishery ecosystem plan or policies, et cetera, and so they're not necessarily going to go down the same pathway.

DR. ROSS: I know that. I'm on the committee that was working on that, but I just don't remember exactly how our recommendations ended up, but I know that we took new fisheries for forage fish essentially off the table, or that was the recommendation, and so, different fisheries and policies aside, should there be some comparability between council activities? That is I guess what I'm asking, and how would we make our actions more comparable, because there is some transport across the two areas.

MR. BOSTON: On Number 1, Steve, your recommendation would be to see what our neighbors to the north have done and see if we can at least mirror that within the forage fish statement?

DR. ROSS: At least consider it. I just don't have all the details in front of me, even though I worked on that with the Mid-Atlantic Council. I think we ought to not do this work on our trophic part without considering that.

MR. BOSTON: Got it. That's a fair statement.

MR. GEER: I would agree with that, and another question I had about that first one was forage species. There is probably a lot of information on the forage species out there, and how much of it has been collated to this point -- Do we have any indices for forage species, similar to like what they have on the west coast?

There's a lot of ways you can do it. You can do a total energy or caloric value of those species combined, or I think the way they did it on the west coast, in Washington, is they had indices for each species, and that was in their management plan and what they presented. There is a number of different ways to do that.

If it's possible, I think doing it caloric, because the value of a fifteen-inch menhaden is probably much higher than a bay anchovy, for instance, and so, even comparably-sized species, some species are going to have a higher caloric value, and I think some of that information is out there, where you can look at a species and get its length-caloric value relationship on some of these species. It would take some work, but, at the very least, looking at these datasets and determining what species are going to be used -- What defines a forage species? All the sciaenids, the spot croaker and weakfish and age-zero red drum, they are all eaten by something else, but they all grow into adults and they eat something else.

DR. ROSS: The interesting thing, to me, about what the Mid-Atlantic did is that species list was over a hundred species, I think, and so they didn't draw any -- Including mid-water deep species like myctophids. It was a wide-ranging list of forage species, and the idea was to be inclusive, and so that presents a lot of problems though when you're trying to present that as a management option, and that only related to species that did not fall under a management plan.

MR. GEER: The sciaenids would not be on that, for the most part, then.

DR. ROSS: That's correct, but it did include anchovies and sardines and lizardfish and tonguefish and a whole variety of things. It was an amazing list of fish and invertebrates. It actually included everything.

MR. GEER: I would think that -- It did include invertebrates? In the Southeast, I would think that may be a little different, because, for instance, shrimp. It's a managed species, but everything eats them, and so it would have to be on a forage species list as well.

DR. ROSS: I guess it could be. There is no reason why it couldn't be, except that I guess the feeling in the Mid-Atlantic was that they are handled sort of in another way. Their populations are controlled in another way, and we were looking at the animals that create a large part of the trophic web that are not managed in any kind of way, and so it was a way to bring them under some kind of management ruling. In a sense, it was to prevent fisheries from developing by surprise. There was talk of some fairly strange fisheries, like for euphausiids.

MR. GEER: Yes, I guess I can see that, in some way, taking the species that aren't managed and only using those as your forage. That limits it. It's still a lot of species, but --

DR. ROSS: It's a tremendous number of species, and I don't know whether we would want to go down that pathway or not, but what I'm saying is that we should consider it and understand what they're doing there, and we may want to be comparable or not, but it would look odd, I think, for the two councils to head down two different pathways without even talking to each other.

MR. BOSTON: Back to that, I think the guidance here is let's see how close we can get, if that makes sense.

MR. GEER: The only thing I had is I had some minor wordage changes, but I can get with you on some suggested wordage change on this whole paragraph on managed forage species.

MR. BOSTON: All right.

MR. HOOKER: I was just going to second those last comments about this Number 1, managing forage fisheries. I think you should at least make note of that difference in between the managed and unmanaged stocks, because, the way the rest of it reads, it sounds like you are talking about unmanaged stocks, because it's the managers must invest in essential scientific research, and you're assuming, for managed species, that should already be there. You should already know some of those food dynamics for managed stocks, I would hope. It seems to be written like towards the unmanaged side, but, if we want to include managed, I think it probably needs to make that clear.

MR. GEER: Can I have a clarifying point? Managed by the councils or managed by the commission? Take menhaden, for instance. Menhaden is managed coast-wide, but it's not managed at all by the council, and so I guess as long as it's managed.

DR. ROSS: Now I'm confused. Is this Number 1, are we only talking about -- We're talking about forage fisheries, and what is a forage fishery? Do we even have such a thing? That's a fishery for menhaden, and it's not a forage fishery. I don't even know what that term means.

MR. PUGLIESE: I think that's what the writers of the section were getting at, is the fisheries for forage species. One thing I think is --

DR. ROSS: So we're only talking about the ones that are managed then here and not what constitutes a large part of the food base.

MR. PUGLIESE: Actually, no. Again, this is trying to condense down probably extensive discussion within the section of the FEP, as well as the consideration, because there have been -- The last iteration of the Ecopath model that was worked on had a focus on forage fish. Now, there were significant -- It did partition it out to pretty significant areas, and we're going to draw significantly for the forage information, in terms of the most recent updates on that type of information. However, the shortfalls on that are a lot of our managed species, the information on the prey for those species, is still very limited in terms of really understanding the distribution, et cetera, and so that's part of hopefully what is going to be investigated even further in the next iteration of the ecosystem models that we're trying to move forward, so we look at everything.

When you're looking at forage, it's really your prey/predator interactions, and so you're covering not only the core feeding species, but also juveniles of other species, and so, depending on how complex we can make the next iteration of Ecopath and Ecosim and other related models, we will hopefully provide some foundation for understanding the more detail of what the full diets are of all the managed species.

MR. HOOKER: I guess I was -- I read it a fourth time, and it does seem to be written like it's for managed stocks. This is clearly talking about managed stocks, because it talks about setting catch limits for them and sound harvest strategies for them. When I was reading that research one, it sounded to me like it was trying to reach towards unmanaged, but, when I did reread it, it's the other way, and so sorry if I confused things.

MR. GEIGER: Do we have a definition of what is a forage fishery, because I am still confused. Based upon the conversation, I am confused about whether we're looking at strictly managed versus unmanaged or unidentified or unknown or vertebrates or invertebrates. I am a little -- Where are we going here?

AP MEMBER: It should be defined in the policy.

MR. GEIGER: Yes, and I thought we had a definition of what a forage fishery is.

MR. GEER: We definitely need a definition of that, because I could see this working on, like what Steve said, the Mid-Atlantic, for species that are not managed, which is literally a totally different

list than taking your -- In the Southeast, for instance, the key forage species are going to be a lot of species that are already managed, juvenile spot croaker, weakfish, red drum, shrimp, and a bunch of other ones, and so we have to decide how we want to approach that.

DR. ROSS: It's worth considering those other species as well though, because it doesn't do much good to manage a few species when massive trophic impacts could occur from some of the smaller, even more sensitive species, which is why the Mid-Atlantic took up that cause and basically took all the unmanaged forage species off the table for fisheries.

DR. LANEY: We just heard Kenric's presentation before lunch about ecosystem-based fishery management, and we say, on the top of page 2 here, or actually in the middle of page 2, under SAFMC policies addressing South Atlantic food webs and connectivity, that we are establishing the following policies to address just that, South Atlantic food webs and connectivity. We don't say anything about managed forage fisheries, and I'm not sure. I guess the Atlantic menhaden fishery does exist in at least part of the South Atlantic Fishery Council's jurisdiction.

I can't think of another fishery, unless maybe it's the ballyhoo fishery, that would be a forage fishery. That one is prosecuted primarily for -- I'm not even sure that occurs in U.S. waters, does it? Maybe a lot of it goes on in the Bahamas, and it's primarily a bait fishery, but I think we've had some discussion about managed versus non-managed, but that text that we have in the middle of the page there makes it sound like we're talking about the whole ecosystem, which is what I think we are talking about, and so I agree with Anne and everybody else that said I think we need to define what constitutes a forage fish and a forage fishery and then identify any of those that occur in the South Atlantic, and so maybe we're back to -- Maybe the document does that. Do we have those lists in the FEP itself?

MR. PUGLIESE: We can look to the discussions in the executive summary and in the section itself. However, I think your point about what the intent here was being captured in the ecosystem is really what -- I think I didn't do a good job of doing that, but I think that was the intent of the next iterations of trying to do modeling, was to look at the entire suite of species that are being consumed, the whole prey and predator components, and so it would include both unmanaged species as well as the components that are managed, so you understand what the dynamics are and the implications are for those.

However, specifically talking about research, it's getting to understand more about what those other species life histories are and how they're connected and how they're being consumed by managed species, and so there is a connection back to the managed species, the components of managed species, what their prey are and whether it be unmanaged or managed components at this stage, because it says managing, but it doesn't say that they are actually in management at this time, and so I think your point about covering it all is really what the intent is here. I think the issue of using the word "forage" has been a problem, I think, for a long time.

DR. LANEY: I know some people don't even like the term "forage fish" or "forage fishery", because, generally speaking, as the point has already been made, at some life stage, everything gets eaten by something else, pretty much, and so everything could be considered a forage species at some point in its life cycle, and so I think we definitely need to spend some time defining terms.

Then I would concur with everything Dr. Ross said too about at least looking at what the Mid-Atlantic Council is doing, and I would add New England to that, and Roger has heard me on the record already with regard to a particular species known as blueline tilefish, and I advocate for consistency between councils. I have gotten the look several times from our council chairman, Dr. Duval, when I point out that I think, under the Federal Paperwork Reduction Act and under NMFS's ecosystem-based management mandate, councils shouldn't be going off on independent pathways. They should be talking to each other, especially when they share species across artificial ecoregional boundaries that we have imposed on the ocean.

I certainly agree with everything that Steve said about that, and I think the councils need to collaborate and build on each other's policies. To some extent, the Mid-Atlantic is actually responsible for, if you go back and look at the history of it, for generating the ASMFC's habitat program, historically, and then the Mid-Atlantic sort of got out of the habitat business for a while, and now they've jumped back into it again, and I think, in some respects, they are looking to the work that the South Atlantic Council has already done, and they're beginning to emulate some of that work, and so there's been some collaboration and exchange, and perhaps not as overtly and directly as it should have been, and so I would certainly encourage us to do that.

Also, I would encourage us to collaborate very closely with ASMFC, who is the management entity for what is probably, if we're going to characterize anything as a forage fishery, I guess certainly Atlantic menhaden would fall into that category, but I think other folks would say, well, squid and mackerel and butterfish also probably fall into that category as well in the Mid-Atlantic, because certainly squid and butterfish are forage for a lot of things, and so, yes, I agree that we need to define terms, and we need to clearly say what it is we're about.

MR. WEBB: Working with this document, as we have it now, in an attempt to move forward, would it help, under 1, to remove the word "managing" and just say forage fisheries? Then, in the last line, after "understanding the role" and put "of both managed and unmanaged forage fish"?

DR. ROSS: I think something along those lines has got to be done, because, if we're just going to talk about -- I don't see the justification for only managing what we would call forage fisheries, even if that's anecdotally menhaden, and that may be the only one, but I don't see the point to that, because we're not managing then most of the food web. We're completely ignoring it, and that, I don't think, helps our cause. There was a lot less pushback on that forage fish amendment in the Mid-Atlantic than I would have thought there was, and so it's worth considering that further.

MR. GEER: Did anyone else have their hand raised?

MR. BOSTON: Mr. Chairman, so it's a definition for what we mean by this forage fishery thing, because it is complex, and the wording is kind of awkward. Within that, we've heard the recommendation that we talk about both managed and unmanaged species.

MR. GEER: I would think we need a definition of a forage species, a definition of a forage fishery, because they could be -- I would suggest maybe taking the word "managing" out, because I don't think we know at this point what we're going to include. If we say "managed species", we're painting ourselves into that corner of what species we're going to look at. By leaving that out and leaving it open, it allows us to look at the Mid-Atlantic and look at New England states and say we may have 200 species, but we may decide we're only going to take the top ten, because,

abundance-wise, they're the most important or whatever, but it doesn't paint us into the corner to a few select species. Does that make sense? I see a lot of nodding, and I see Anne and Roger with their hands up.

MR. PUGLIESE: Quickly, I think this discussion of forage, the word there is I think really what we're wrapped up in. If in here it can be crafted to really get to the issue of prey/predator interactions and understanding that, both managed and unmanaged, because I think that's really - - You're looking at the entire ecosystem, and if we get away from that word terminology, maybe that would be something that we capture, the entire ecosystem.

We could capture what we really need to know for all those different species and how those would ultimately be integrated into policy and cover both managed and unmanaged species. That would be, I think, a pathway to get out of this box, because I think that term is really wrapping everything up.

MS. DEATON: I was just going to say that I agree that you should probably take into account both, all forage species that are a fishery or not, but that doesn't exclude you having a policy that addresses a fishery that currently exists on the forage species, if there is concerns about that, if there is a need for something about existing fisheries that you think could be having an effect on the overall ecosystem, because of the pathway, and so you might want one more general and one more specific to existing fisheries. That's just a thought.

MR. BOSTON: All right. Thanks, Anne.

DR. GALVEZ: Instead of calling the forage fisheries, but why don't we just call it -- It is supposed to be just prey, and so we're talking about the predators for the prey, managing the prey, or the prey species. In Florida, we also have the mullet. It's a prey species that is used by both commercial and recreational fisheries.

MR. BOSTON: We were looking at the definition, but I was looking at -- Brittany was bringing up the fact that the folks that dealt with food web, they have the definitions of a -- They didn't say forage fishery, but they said forage fish. They have some strong definitions about managed and not managed, and so a lot of that is in the policy, and I think we can bring it forward and reflect it more in our definitions and the terms we have here for Number 1. We may have some mischaracterization of what that was, and so thanks.

MR. GEER: The forage species list is going to be substantial. Forage fisheries is going to be much, much smaller, maybe as little as one or maybe two species. Those are some things we're going to come up with, a definition for those two, and I agree with Anne about basically looking at what maybe some of these forage fisheries, what the impacts may be on those, and, like I said, I think, right now, the only one that I know for certain is menhaden. Can anyone think of any others right now?

AP MEMBER: Shad maybe or mullet?

MS. DEATON: What about shrimp?

MR. GEER: Yes, I guess so. I think yes. Personally, I would say yes, because they're eaten by everything. I would say that, if you look at the magnitude of how important they are to the ecosystem. Like I said, we can make a list that's forever, but some of those species -- If you look an inshore lizardfish, and I give that as an example because you mentioned it, but how much is that being preyed on? For instance, we may end up looking at all of them, or we may look at ten or fifteen of them.

MR. BUSH: A question I have for you is, when you're talking about considering the forage fish stock abundance, for something like river herring or menhaden or whatever, there is actually an assessment, something to go off of, but, when it gets down to the bottom, it's understanding the role of the fish in the ecosystem, and while we understand its role was to be digested, that doesn't really tell us how many of them are out there.

We're going to be making management decisions on a fishery or a population of fish with little or no abundance information, and that may be something we might want to -- Like what you brought out, one, to determine what they are, and, two, what exactly is it that they should expect from bodies to produce information-wise to allow them to make those decisions?

MR. GEER: David, there is a number of fishery-independent surveys done in the Southeast, and I will put Marcel on the spot on this for the SEAMAP coastal survey. I'm guessing they catch 240 species a year?

DR. REICHERT: (Dr. Reichert's comment is not audible on the recording.)

MR. GEER: I think, a lot of those species, their numbers would be able to be representative, and they've been doing it for a long time, and so, very quickly, I think you can take a survey like that, that's from Hatteras to Canaveral, and use that as a proxy for abundance of many of the species we are talking about that they have probably never looked at. They collect the data, and that's the value of his survey and some of the other surveys on the coast. All of my surveys, we do the same thing. We collect the anchovy information. We don't do anything with it, but it's there if we need it, and so I think a lot of those species that we're looking at that we'll be able to come up with numbers for.

MS. HAVEL: I've been trying to find the definition of forage species as this conversation was happening, and I think, from what I'm finding, the difference between prey and forage species is that a forage species contributes significantly to either other fish or sea mammals or birds or something, whereas a prey could be anything at any given time, and so I think we might want to keep that in mind when we're listing every single species that might be out there, that any point in their life stage could be what is actually a prey and not necessarily a forage species.

DR. LANEY: Lisa and David both already made part of the points that I was going to make, and that is specifically I think what the council is going to be interested in hearing, relative to the policy, is what does that AP think are the forage species, as Lisa just defined them, in the South Atlantic, and my guess is, Lisa, that those definitions of forage versus prey are probably based on some sort of a study of who eats what, diet studies, and the ones that I am most familiar with are striped bass. We know, for striped bass, that Atlantic menhaden and bay anchovies are very important components of their diet, and so they would be considered forage species.

I would say, to the extent we can identify what those forage species are in the South Atlantic ecosystem, versus everything else, which we know is probably prey at some point in its life cycle, that would be something the council would be interested in. Then we can go one step further and say, okay, here's the list of what we think are probably the forage species in the South Atlantic, and here are the ones that we know form the basis of human forage fisheries, those being Atlantic menhaden and mullet and river herring and ballyhoo and whatever else people are fishing for out there, and so that would be kind of a second tier.

For those, as David already pointed out, for some of them, we have stock assessment information available, but the fishery independent surveys, like SEAMAP and NEMAP, give us a lot of additional information for both forage species and a lot of the prey species as well, and certainly I think shrimp falls into that category where it's prey and forage. I guess you could call it a forage fishery, because, to the extent that we allow escapement to occur, then those animals largely become prey, except for the ones that survive to form the spawning stock biomass to produce next year's crop.

Once again, we're dealing with something that is very complicated that we've been mandated by the National Marine Fisheries Service to move in a direction of trying to understand and learning more about, and so I think, for this policy, it would be very beneficial, to summarize what I just said, if we can identify the group of species that we think are forage, the ones that are subject to forage fisheries, and then everything else falls into the prey category, I guess.

MR. BOSTON: I will say that, when you read the section, Wilson, I think they've done a pretty good job. You can determine that there, but there is definition of those points that you have made, and there are some species identified that they think are those species, and so I think, when we get into the actual document itself, in that section, you will see some of that.

DR. ROSS: To add to what Wilson said and others, we can keep picking away at the definition. One of the major definitions is that forage species are a bridge between the lowest trophic levels and the highest trophic levels, and that generally refers to pelagic species, and so I think what I would recommend is that we not make that definition here, because there needs to be some reading and some thinking and some clarification, but that we charge somebody to come up with a coherent definition, and I think it's a very good idea to then attempt to list those species that constitute forage species in the South Atlantic, and, in doing so, can identify which ones are managed and which ones are not. Then we also then, at the same time, are coming along with what the Mid-Atlantic Council did, in a similar way. Whether we act the same way or not, we at least have the same information on the table.

MR. BOSTON: We have gone full circle and answered Pace's question as well of what are those important species, and so good job, Steve. Can we leave 1? In fact, I recommend that we leave 1. I think we have determined that it needs some work on Number 1, and we have restructured the list a little bit. We talked about changing energy pathways and trophic pathways, and is there anything else with that general policies area, either missing or concerned or confusing or wrong? Let's sneak down to research. It's the bottom of page 3 and the top of 4, before we get to the table.

DR. LANEY: One that I think is not so much a research need as it is more of an analysis need is we talked a short while ago about all of the fishery-independent datasets that the states and federal entities have sitting out there, and maybe we could somehow capture that in a need here. I mean,

there is a huge mine of data out there that needs to be analyzed, and I think, if we do that, it will increase our understanding and maybe obviate the need for some additional research. Not all, certainly, but I don't know that we have that captured here. We could perhaps add that as another bullet, under research needs.

MR. BOSTON: Yes, you could state it as in order to take better advantage of the research that's already been done in this area. To me, on Number 4, it's almost an anti-research. It's more of a take advantage of the investment we have and the existing research and datasets and give Marcel more money to do this.

MR. GEER: Wilson, I agree wholeheartedly with you. I think that we need to do -- I know they're not in priority list, but that needs to be done first, before anything. We need to know what -- I was thinking, while we were sitting here, and I was going to ask Marcel if he could go on to the SEAMAP data extraction site and look for like the coastal survey for the last five years and print out all the species that were caught and their total abundance, so you can kind of see, at a glance, what was caught and where they fell, and that's just one survey.

I think Marcel's surveys would probably be, because of their range and where they cover, would be probably some of the primary datasets, if not the only dataset, but including maybe the striped bass one in the wintertime. I think that's the first thing to do, so we can have an abundance estimate on some of these species and look at them over time, to see what they're -- It's not a difficult task.

It's just somebody has to sit down and do it. Literally, I could probably do it in an afternoon, if somebody told me what species they wanted to look at, quite frankly, if Marcel gave me permission to use his data.

DR. REICHERT: I am not a member of your committee, but those data are actually available online. We are currently going through a process of maintenance of the database, but, once it's up and running again, anyone can actually query the data of the trawl survey, as well as the reef fish survey and the North Carolina survey and the red drum survey, and so that data is available if anyone would like to just explore what we have, and there is a lot of data in there.

I also wanted to say that you said earlier that we are collecting data and it's in the database. Happily, or fortunately, especially recently, a lot more use -- The data has seen a lot more use, and I forgot the website, but, relative to the climate change, there is a website that used our data. It's actually interactive, so that you can take a look at it and see what happens with species distributions. Fortunately, a lot more data is actually used currently than in the past. It's been used for stock assessments, et cetera.

MR. GEER: Marcel, I'm sorry if I jumped the gun on saying that it's available.

DR. REICHERT: No, and I have some data -- Tomorrow, at the presentation, I have some data that may clarify what I just mentioned.

MR. GEER: Also, each state has -- The trawl surveys seem to be the best for generalized abundance and catching a lot of species. That's what they're good at, and each state has some form of a trawl survey that that information could be used to gather information on the coastal waters and the inshore waters as well, and so those are just some of the datasets that are available.

There's a lot, and so I think priority should be like getting that information in there and basically coming up with some kind of forage index for the species. It's not a difficult task if you just want to come up with a CPUE per trawl from his survey. It should be pretty straightforward, and we can take a look at that and define what species we want to use from there.

MR. BOSTON: We could either put that at the top or the bottom and just say, you know, let's get the baseline in place from the existing research, and that was your point from the get-go. Anything else on those?

MR. BUSH: This is I guess maybe to add to the food web side of it in the South Atlantic, sort of the charter vessel here for the citizen science. Having the independent data is great, but, as far as things like food webs, you need to cover a lot of ground, and you need to cover it quick, and you have no funding. There is a lot of ways that we could incentivize the gathering of a lot of this data. It doesn't all have to be under specific rigorous scientific conditions. Simply give us a weight and a length and a bottle full of stomach contents, and you pull it out of a freezer and you take twenty or thirty out of each tow or something like that or whatever it might be, but I would definitely find a way to try to encourage the continuing of that or pushing it forward.

MR. BOSTON: Got it, and so it would be a new approach to research that you're saying. Well, not a new approach, but a new item. Then it's really about taking advantage of folks that are already on the water that could give you some datasets to fill in and kind of taking advantage of the citizen science, if you will, of the fleet that's already out there. Okay. Got it. Anything else on this one?

Are there generic comments on the table? You may have seen a table like this before, and I'm assuming the same basic stuff we said in the first thing, if you will, but is there anything specific on this one though that you would like to see?

DR. LANEY: I guess one of the things we could get specific about is the lionfish issue, because we do have specific data on which species lionfish are preying upon, and so, to the extent that we have that kind of information, we could certainly plug it in here in the appropriate EFH HAPC.

MR. BOSTON: For invasive, in this case?

DR. LANEY: Yes, for an invasive, right.

MR. BOSTON: Okay, and so plugging in impacts of lionfish, where we have that. We know the fish they are --

DR. LANEY: Yes, and one other one that occurs to me, off the top of my head, and Bill could certainly address this and others, but the resurgence of the goliath grouper population certainly is causing a change in the South Atlantic food web, and so, to the extent that we humans manage for a particular species, either purposefully managing it to a high level of abundance, as we have done with striped bass, or providing it some level of protection, as we have done with goliath grouper and other species, then changes occur in the food webs as a result of those management actions, and so we could note that in the table.

MR. HOOKER: Thanks, Wilson, and I guess I'm still struggling, like I did with the last one, in where that habitat linkage is with that, with what you just described. If in fact what we're trying to do is give something for Pace's staff to consult on with impacting some type of EFH HAPC that's listed here, he needs to know, is that going to impact some kind of food web connectivity for coastal migratory pelagics? I guess that's what I am struggling with. What's the linkage of what -- Yes, lionfish is an invasive species, and it predated on things that disrupts the food web, but what impact to the EFH are we getting at in that scenario?

DR. LANEY: To that point, I think we noted earlier that we didn't have saltmarsh designated as EFH, but certainly loss of saltmarsh, through erosional impacts or filling and development impacts, whatever change in saltmarsh is resulting, if it causes a reduction, then it's going to have an impact on the food web, because penaeid shrimp are so dependent on that particular habitat type, and so that's one species for which we actually have a habitat area production relationship in the literature that we can pull out, and so, to the extent that you reduce the intertidal acreage of saltmarsh, you reduce the numbers of penaeid shrimp, and you have an impact on the food web, and is that more the kind of thing that you're talking about?

MR. HOOKER: Yes, that's exactly it. Obviously, when you disturb eel grass beds or saltmarsh, you want to bring that in, the food web aspect of it, rather than just the acres disturbed, but I think that's would be most helpful.

MR. BOSTON: So just many more practical -- "Examples" is the wrong word, but it's that kind of connectivity, clear and easy and you can grab it and you can build your case very quickly with the kind of information that Wilson just stated.

MR. HOOKER: That's my personal interpretation, and I don't know if everybody else around the table feels that way.

MR. KELLY: To Wilson's point, we can be very successful at our management of various species of fish. With regard to lionfish, we can only hope that, in the immediate near future, that fish populations, like goliath grouper or cobia or something that have the right mouth morphology, would require an appetite for lionfish.

Just, in looking at Statement Number 2, it says invasive species, most notably lionfish, may be having negative effects on ecologically and economically important reef fish species, and I would change that language to invasive species, most notably lionfish, are known to have negative effects. I mean, we see that, and it's been very well documented in the Bahamas. We see in the Turks & Caicos and Bermuda and Jamaica, and we need additional study on lionfish in the Florida Keys, which I think would very well document that as well.

For some of you here on the group, just to give you an indication of the size of this invasion, we routinely get lionfish as bycatch in our spiny lobster traps, and one of our fishermen, Gary Nichols, that fishes in deeper water, meaning greater than 120 feet, out to about 300, in 2009, his first encounter with lionfish as bycatch was forty-nine pounds of those animals that were about a third-of-a-pound apiece. In 2013, he had over 10,000 pounds of lionfish, and they were up close to two-and-a-half pounds. He is now catching fish to three pounds, and he routinely catches over 7,000 pounds a year, strictly as bycatch.

Currently, we have a trap-testing program that is under review right now, and we're hoping for final approval in the very near future. It's been approved by both the Gulf and South Atlantic Councils, and the Protected Resources Division, we've just got a few more questions to answer there, and we expect final approval, where we would test a hundred traps in four different locations of Ormond Beach, the Florida Keys, Murrells Inlet, South Carolina, and off the Tampa/St. Pete region here.

It's not to develop a new commercial fishery, but to use modified trap funnels and so forth and proven baiting techniques to work with the states on developing mitigation teams that would address known populations of lionfish through a very tightly-regulated program. That's the status of things there.

MR. BOSTON: Thank you.

MR. HOOKER: While we're on Number 2 there, it probably should also reference the 2014 invasive species policy. I thought I had remembered seeing that before, and there is already an existing policy on invasive species.

MR. BOSTON: Good, and so we'll include that in there and make sure we're referencing it. Anybody else? Any other final kind of guidance on the table itself? Clearly usability, in terms of the examples, et cetera.

MR. PUGLIESE: I think it's building on the type of comment that Brian made previously on specific interactions. One of the things that I go back to, and it's in other policies, is, for example, when you look at the table for near-shore hard bottoms and the discussions and a lot of the foundation for the renourishment policies, beach renourishment and interactions, was founded on the fact that you had those near-shore hard bottoms or EFH HAPCs for specifically snapper grouper, but primarily snapper and grunts.

That is like the bottleneck area, is that potentially that if you lose those that you could have a significant impact on a population, and so they were making that food web -- That ability to impact those areas as being a significant potential loss on the connection within a life cycle of managed species. Those types of things, I think, are the same types of areas I think that Brian was trying to highlight before, or at least making that connection on essential fish habitat needs.

MR. WATTERSON: I just had a quick question. Was there any desire to address EFH and HAPC designations by other councils in the South Atlantic? For instance, seagrass is designated as an HAPC for summer flounder all the way down through Florida.

MR. PUGLIESE: In past policy statements, we actually have, when it's been a clear, direct link between species and management, and I go back and think about some of the lists we've had, and we've had not only the South Atlantic Council, but we've identified other council's habitats that were impacted or potentially impacted by actions, and so that's been something that has been highlighted. The ecosystem plan presents all those managed species. While the EFH designations, in most cases, are regionally-specific, there are some that do overlap into other areas, and we did try to capture those in some previous policy statements, and so that has been done in the past.

MR. BOSTON: Can we move to Document 5, A5? This is the actual food web. It starts out with the introduction. I think you'll see -- I believe we should be looking for the definitions and the clarity that we were bringing out in the piece itself there in this overview piece. I am hoping some of that is in there, and so let's make this one stronger, too. This is the introduction to the executive summary.

MR. GEER: Let's tie this up first.

MR. BOSTON: Sorry. Did you not?

MR. GEER: I think we did, but I just want to --

MR. PUGLIESE: I think what you're referencing now is just the executive summary for the section, and are you going to try to pull -- Is what you're saying reference that to pull other material into the policy?

MR. BOSTON: I just want to look and see if it's in there and just give it a quick view. If it's already written, we can say grab this and grab that and grab this.

MR. PUGLIESE: That's why it was provided, some of those, because some of the original introduction was --

MR. BOSTON: Right, and so let's look in here to see if there's anything of value, is what I'm saying, if we already have some written stuff. This is the introduction piece for the executive summary. I just figured we could save some --

MR. GEER: Okay. Go ahead.

MR. PUGLIESE: As you go through some of this discussion, one of the points I think that's made, when you were talking before about pulling some of that detail, is, for example, is, right in the beginning, is talking about the forage information. There is information that's presented in that graph that came from the last iteration of the Ecopath model, in the enumeration of core components of the base, the prey base, and so there is some of those types of things that we can pull directly from that.

MR. BOSTON: I just put that out there because we were talking about a lot of these issues, and this will give you an idea of what the team working on food webs was thinking about, kind of some of the depth that they're going to go into in their section.

MR. GEER: Can I ask a real general question? How does the marine food web in the North Pacific compare to this, complexity-wise or in the Northeast?

MR. PUGLIESE: For the Southeast, I think this is one of the most complex, because of the estuarine dependency and the Gulf Stream and, in many of those areas, the numbers of species managed or combined in there are a handful relative to the double digits for even the reef fish species we have in the Southeast, and so I think some of the complexity is -- You've got everything also, from tropical systems to temperate systems, all in one package and interconnected, to a great degree.

MR. GEER: Not my question, but it's a comment more, is the complexity here is immense. What we're trying to do here, there's a lot of moving parts and a lot of -- A similar graph of the Northwest is not as -- You don't see that. It's not as difficult. Having that shown side-by-side, if you're showing this to somebody on an upper level, and we hear this all the time, that we're going to have an ecosystem-based management plan. Right. Not tomorrow. It's coming, but it's complex, and we hear it from commissioners all the time.

Anybody doing the work realizes how complex it is, but a lot of managers go, oh, it's coming and we don't have to worry about this, but, if you took something this and put it alongside a more simplistic model that may be in the Northwest -- I understand the Northwest one is a little bit simpler. You could kind of show the managers that, look, this is what we're dealing with in trying to do this and it's like -- Whether or not it be in the document or in a presentation, but just so people could be aware of how much work is going to go into this.

MR. BOSTON: So perhaps an equivalent graphic that shows comparative complexity between, like you said, the Northeast or some other system. By the way, I just pointed out this introductory piece to show that I think the team was digging deep in their thinking on this, and it's not necessarily reflected in the piece that we were reading, but we had some good minds work on this, and so the definitions, I believe, are in there. A lot of the specific species were listed in this section, and it's pretty robust, from what I saw. I am not a fisheries biologist, but I did sleep at a really cool inn last night.

I put that up just to say, does it look like the chapter -- You didn't have a chance to look at it, but does it look like the chapter is moving in the right direction, from the kind of discussion we had earlier on? I wasn't trying to edit this, per se. Are we okay with that?

DR. LANEY: I think it's good, Brett, but I still don't see the species names in there, and I think that's one of the things the council members are going to be --

MR. GEER: They're in that chart.

DR. LANEY: Yes, they are, in very tiny print, but that's a good point. They are all in the figure.

MR. BOSTON: If you look down under the summary and recommendations, they're listed there, and the forage species are listed. Some are listed there, but, inside of the chapter itself, it's deeper, and the key is can we highlight them more? I think that's the point we were trying to make in the last section, is highlight those specific species and kind of define them better, and so I think you're there.

Then, as Brian was saying, make sure you say the so what? Okay, here's the species, but how is that somehow or other impacted by an impact on the ecosystem that we're talking about, that essential habitat. Again, I was pointing this out just to show you like kind of that introductory piece where the food web team has been working.

MR. WILBER: I am not a food web person, but, honestly, when I read the first two pages of this, this describes what food web models can do. It doesn't describe what the food web model of the South Atlantic Bight actually tells us about how to manage the South Atlantic Bight.

MR. BOSTON: We don't have a food web model yet.

MR. WILBER: But, as far as like finding something really specific that can be turned into an action, I don't see that in the summary. Now, it might be in the full blown chapter, or it might be in the paper that's referenced, but, right now, I don't see a whole lot.

MR. BOSTON: Got it.

DR. LANEY: We do have a piece of one though, right, Roger? You and Tom Okey have done the forage model.

MR. PUGLIESE: Yes, and I think I've tried to highlight the fact that we're in the middle of the next generation, because what you see here is the iteration that included and was the foundation for the last forage model. However, that model was also based on the previous South Atlantic Bight model, which was very limited in terms of how far it went. This shored up some of the forage information, but, with regard to, as I stated earlier on, with regard to primarily our reef fish species, that fell way short of really some of the detail that we really need to do it.

Yes, I think we can get the major categories and pull those and highlight those in an iteration subsequent to this and include some of that more detailed information. However, we're in that next stage of elaborating a more extensive system, because what you also want to do in the other levels is identify different life stages so that you can make some connections between prey and predator at different levels other than just the forage components of these things, and I think that's an important aspect that's going to happen into the future, but we do have the beginnings of information that can be integrated, and it's integrated into the existing section of the fishery ecosystem plan.

MR. WILBER: You guys said earlier that there is a handful-ish of species that have been identified as the conduits of energy from inshore to offshore areas, and so do you expect us to be able to look at that diagram and identify what those species are?

MR. BOSTON: No, and we took your point earlier. We need to highlight those and list them very clearly, and that's a great point. We shouldn't have to dig for that. That should be right in your face, and I think you made that point earlier, and so that's an important edit to have in the previous document that's got to be there. Thanks, Pace.

MR. BUSH: The New England folks, having been up at Sandy Hook, have a phenomenally extensive information database to pull from in creating their food webs, but, if you were to overlay throughout the decades of data that they have, one of the things you will notice is certain prey and the circles become bigger and smaller over time, and you may almost need some sort of a dichotomous key to figure out which food web you're going to have to actually use to manage something like that. It may not be that huge, but proving anchovies, and you know how they slip around during El Nino and the Atlantic multidecadal oscillation changes certain species from the dominant to the less dominant species there.

Fishing pressure on certain predators that we've had will change their diet. We've caused some of these shifts, and we've just seen some of these shifts, and I guess the big thing for me is to look

at it and to say, if we were to take all of those decades of data that we have and put them all on one, it wouldn't give us an actual picture of what their food web really is. We would need to see what it is in sort of keying that into what our current situation is, because they can't be eating 100 percent on this species and 200 percent on this species. They can't be doing that, but, anyway, I don't quite know where to go with it, but I think it needs to be addressed.

MR. BOSTON: Ultimately, when you have a model, the model should be dynamic, almost like a time series piece, where you could see, at any given time, have we shifted prey? Has the food web moved over time, and where might it be going and not trying to manage with a static food web, is your point, I think.

MR. BUSH: Certainly. Yes, when you have certain prey at certain levels, they will tend to feed on this, or vice versa, just so that you can maybe use one that's customized more towards your situation.

MR. BOSTON: Got it. Thanks. Great point. Are we good with that? Anything else? Again, I really wanted to just show you that introductory piece. I know those folks worked pretty hard on that, and the food web section itself is pretty rich, but we need to move some of that good information into a better summary is what we need to do.

DR. LANEY: I think David just made an excellent point. To that point, for Figure 1.1, we give the citations for the model. Do those papers, Roger, indicate what timeframe that web was constructed for, i.e., to David's point, and what years are the data from that enable us to create that web? I think he made a very excellent point about does the AP have any sort of recommendations as to what sort of intervals food webs need to be reexamined?

David made the point about the Atlantic multidecadal oscillation, and that's like a twenty to twenty-five-year cycle, and so that could be one particular recommendation that we might want to make, to the extent that work is out there that shows that that AMO cycle is affecting abundance of something that we have already identified as a key forage species in the South Atlantic, and there may be other factors like that, that we can say, okay, we know these things result in food web changes and affect our management decisions, and that's a good point.

MR. BOSTON: Okay. Anything else on that before we just kind of close it? I just, again, wanted to point out that we had a pretty deep piece on that.

MR. GEER: A lot of what we do with these things are arbitrary in the timeframes. Like the FEP is every five years, and some FMPs are updated annually and some are done not until there's an issue, but five years seems to be like a magic number for a lot of these things. I think it's convenience more than anything else, instead of having to do a report every year on some of these things, and I don't know what the right answer is for this.

I don't know whether it should be five or ten years. I guess it also depends on how much work is involved in producing it. If it's something where it's turnkey, where you can push a button and be done each year, then yes, but I'm looking at this, and, in listening to what Brett had to say, they've put a lot of work into this already, and so I would say probably a five to ten-year update would probably be realistic or every time we do the FEP.

MR. BUSH: To that point real briefly, I believe Anne brought up the idea about shrimp, which is an annual crop. If you have a bad shrimp year, which is a phenomenal amount of biomass, within ten years, you're going to be more than feeling the effects of it, and that's just a thought.

MR. PUGLIESE: I think that gets to the importance of some of the statements that I made before about some of the efforts and modeling, because what you're trying to do is -- Hopefully we'll be able to integrate the longer-term time series, and, even in the first iterations, we used the SEAMAP for lower trophic levels over time. We tried to do that. However, it was limited, in terms of how that could function.

The intent here is to be able to integrate, to the best you can, any of that information over time, for a longer period of time, because what's represented in say this food web here is a very tight timeframe to generate that model within less than a ten-year timeframe of data, and so, the longer period you can have, you can capture some of those fluctuations in not only the managed species, but the prey.

That's the whole benefit of understanding that. Then you can see the fluctuations and whether it makes some of the what-if scenarios or the connections to what may be driving why you saw those species drop or identify the environmental variable that affected that species that affected potentially production of another species, and so that ability to do it is going to be better as you're able to really document those seasonal or time periods over -- Long enough time periods to capture some of these changes.

MR. BOSTON: Are we good?

MR. GEER: Let's take five, everybody. It's 3:37. Let's get back here by 3:50.

(Whereupon, a recess was taken.)

MR. GEER: Let's get back. We don't have a whole lot more to cover today, because, in talking, most of the things we have left, we're either not ready or the people are not here to present, and so I just want to go over what we just talked about real quickly and what we're going to need from each of you on the food webs and connectivity and the essential fish habitat policy we just talked about.

We are going to have to come up with -- We're looking to define forage species and define forage fisheries. We want to look at potential impacts we may be having on forage fisheries themselves. We mentioned menhaden as an example. We are going to define what are the forage species in the South Atlantic.

We can do that pretty quickly, and I will talk to Marcel later to see if I can get him to send me the data, to send me something that we can get a list from that survey, and it's a good start, is what I think, and I will talk to him later about that, maybe coming up with that, and we can just check off species that we think fit the bill for it.

Also, any comments that you have, any additional comments, please send them to Roger no later than -- It's the same as the other one, by Monday. This one is trying to move forward to the Habitat Committee as well on the 5th of December, and so anything you can provide. I think we should

have, in that, a list of Southeast forage species, so they can see it, in the policy itself, and so that's probably like a one-pager in there. I am trying to think what else we have that we need to take care of, but, basically, any of your comments that you may have that you didn't already say that you want to get down in writing, please get them to Roger or I or Brett as soon as possible.

I will leave that up to you, Roger. If we can come up with something similar to Figure 1.1.1 for one or the other, that would be great, to be able to put that -- If we don't have it in, if we could show it to the council in contrasting and saying this is what we're dealing with, the complexity we have in the Southeast, versus some of the other regions of the country. Is there anything else that I'm missing? In talking with the Mid-Atlantic and getting their -- We already know their species lists. It's everything that is not managed.

MR. BOSTON: Then one other thing that is kind of a thread through here today, and Roger and I were talking about this this morning, and kind of the place that we're headed with all of the work that's being done by the respective teams is what's the ultimate toolkit? What is a useable set of tools for the actual managers that might in fact want to utilize the work that these folks have put in, and how do I find and utilize this when I'm taking a position and opinion in permitting or otherwise, and so I think that, from day one, we've talked a great deal about having some kind of digitally-enhanced toolset with a lot of hyperlinks and an easy way to move through that.

With the managed species, the FWRI team has put together a fabulous toolkit that is helping in that, and so we've got a system that starts to work through that, and Marcel is chairing that group, and that has gone pretty well, and that's well along the way, but the key is how do we have easy access tools for people to be able to get at the data very quickly? I don't need 800 pages. I need something like I can pull very quickly, a summary, something for a presentation that I'm doing or in response to some kind of permit request or whatever that we've been asked to comment on.

I think, ultimately, getting a quality tool that can speed that up -- It's hard to do, and it takes good user design. You can't get it perfect the first time, but putting something in play I think is the ultimate endgame that we've talked about being able to have. As the models start to come online and we have good data models, which we don't now. We have tables where we're trying to put stuff in, as opposed to iterative modeling, but, as that stuff starts to come online, I think in the next couple of years, we should start to have real tools that the council ultimately can use that are way beyond just population modeling that we're currently basing stuff on, the food webs and all of the connectivity pieces.

I think the commitment, ultimately, is how do we take that next step? Truthfully, had there been dollars in investment, we probably could have been a little bit closer to it, but I think great strides have been made with a lot of volunteer labor of very, very busy people putting a lot of time into this project, and I think, when you see the forty-nine pages on food webs, most of the things we're asking for, they're there, the lists and the tables and the connectivity. Those things are in there. Now, how do we make that useful?

We don't need it to be forty-nine pages. We need it to be real quick and easy and well-linked, so that people can actually use it to make decisions with, ultimately, and so where do those decision support tools -- What do they look like and where are they going? That's kind of the next horizon, and I see us that taking that beast on the first of next year, where you just really start to sit down

and do some decision support and user design of what would that look like and how could it be helpful.

One of the commitments we made at the council meeting was to spend time with the council members themselves, to ask them what would be a good toolset to help you make good decisions with, and I think that's ultimately where some of the design features have to go. We'll have the data, the linkages. We will have the research citations, and we will have the priority research lists in all of these essential fish habitat areas. We will start to have some ecosystem modeling components. We will have this fabulous fishery management tool that FWRI has.

There is a lot of things coming online, and now how do we link them together so that they're useful by decision makers, and I think that's the next frontier. We are way behind others. In some ways though, our stuff, hopefully, will be even richer and we can learn from some of the great work that they're done, and so do it even better the first time out, so that we're a generation or two ahead of where we would have started, and so that's kind of the commitment I think we've made over time to the council.

I just wanted to throw that in, because, ultimately, all of this has to end up in a decision support package for it to be useful for the people in the room that need these things. It's one thing to sit here and edit the documents, and it's another thing to have iterative, easy to edit and easy to access and utilize documents, and I think that's got to be the endgame. That's certainly the endgame that I think Roger has made a commitment to get out there, and so we're not editing the documents for the purpose of having a good-looking document. We've got to get to a decision support system eventually. Anyway, I wanted to put that in there, and we talked about it this morning.

MR. GEER: Roger, do you have anything else on this?

MR. PUGLIESE: No, and let's go ahead and move on. That was important. I think the bottom line is that we are really going to go down a very different road than many other regions, in terms of trying to make this an operational, online, interactive capability that can be used and integrated into a lot broader of a scope of conservation and management that I think was hopefully -- We're in a unique situation to do it, with the partnerships that we've been building over many, many, many years, and I think that's the only reason we're even contemplating this kind of effort.

MR. GEER: All right. I am going to use my authority as Chairman and, in the words of the great Mel Brooks, it's great to be king, and I am going to move the agenda around a little bit. I know some people want to get out early tomorrow, and so my goal is to always get everybody home as quickly and safely as possible.

If Lisa has no objections, I am going to basically -- You and I will just briefly talk about the artificial reef policy. She's looking at me like -- We don't have a whole lot to talk about, and we weren't really prepared to do it today, but we can get this out of the way. We've got thirty minutes in the rest of the day, and we'll just talk about where we're going with that and what we're up to.

In your package is Attachment 6, which is the artificial reef section of the ecosystem plan. You can look that over and get a summary of what the states are doing. The policy, we haven't made a lot of progress on it, for a number of reasons. We've had personnel changes and hurricanes and a few other things that have popped up, but, to let you know, the commission does have an

Artificial Reef Committee. It's a full committee on the commission, and they have been meeting on a regular basis. There have been a few workshops. I think there was one in the Gulf recently.

MS. HAVEL: Yes, and, every year, we meet jointly with the Gulf States Commission's Artificial Reef Committee, and, this year, we met in San Antonio in March. The Gulf States hosted it. Next year, we will be in Florida, and the Atlantic States will be hosting it.

MR. GEER: What we had done previously with this policy is we identified folks in the states to help write that policy. That should be a good policy. It's a good thing. It's not like doing the energy one, but it's a matter of getting those folks that have the time to do it. At this point, I know who my person is, and so if the state leads can give me their updated name, if there's a new name, because I know there have been some changes in some of the states with the personnel, and I think that's why this is kind of falling through the cracks.

If you can get us the name of those folks, we can start resurrecting that and getting that up. I am more than willing to help. If it's a matter of me going to the reef committee meeting and sitting in a room with them during a break or something or an extra half day to work through the policy statement, we can go ahead and do that.

MR. PUGLIESE: In addition to the state representatives, I think we've pushed Brian to be involved in this. There are some definite implications for activities they're involved in.

MR. HOOKER: In the Gulf of Mexico, we have a Rigs to Reef Program, or we've been attempting to do a Rigs to Reef Program, and so it's always something. Even the Navy is trying to work on decommissioning some towers right now.

MR. GEER: That's what we're working on in Georgia, trying to get them decommissioned. There's not a whole lot more on that. We gave presentations to all the states. I think in Charleston maybe last year is when we did the presentations, and Florida did one here last year, and so we've seen all the presentations, and we have to wipe the dust off of those and send them out to the group, so they can see them, but it's just a matter of getting that policy statement up and running again.

MR. PUGLIESE: One of the first steps we did to enhance the next step was we invited Lisa directly and Pat to the Basecamp setup that does have all those presentations. It has not only that, but a lot of more recent information on probably the whole -- There was a recent large artificial reef conference, where a lot of information, really updated and even management-oriented information, was provided, and so a lot of that has already been uploaded in there, and so there is a vehicle with the Basecamp and the document to coordinate whoever else needs to be a participant in that group to facilitate the next steps, and so we do have that, and we can work with Brett and Brittany to help make sure that we advance that further, so we have a tool and a mechanism and a vehicle to go further. That's pretty much what I just wanted to say. There is some trajectories that we can move fast, and there's a lot of information available to really draw on and come up with a very useful and, as you said, a very positive type of a document.

MR. BOSTON: Yes, and we were moving along really well on the artificial reefs team early on, and then there was a lot of personnel change in that particular team, and so reinvigorating that shouldn't -- It hopefully won't be hard, if we can get the list of names, because there is some baseline work that's been done there, but we just don't have all the connections.

MS. HAVEL: I shared this with the committee back in January or February, I think, and some people did respond with edits. Since then, I just didn't hear anything.

MR. GEER: Okay. If the states, the four states, can get us the names again. We might have them, but, if it's somebody new is going to be participating, just give us those names, so we can -- I know January Murray is going to be my person.

MS. HAVEL: I have January from Georgia and Jason Peters from North Carolina. It's Bob Martore from South Carolina and Brad Ennis from Florida on the Atlantic side. Then Keith Mille is the representative for the Gulf side, but, if any of those have changed, please let me know.

MR. BOSTON: That's the last list I saw.

MR. GEER: Amber, does that sound correct?

DR. WHITTLE: That sounds correct.

MR. GEER: Anne, that's right for you as well?

MS. DEATON: Yes.

MR. GEER: That's the list then, because we've confirmed it. Okay. We know the list, and we'll get back with them. I will get with you to get the emails and stuff.

MR. BOSTON: We can get this one going pretty quickly.

MR. GEER: When is the Artificial Reef Committee meeting again?

MS. HAVEL: It will be in February.

MR. GEER: In February? They meet once a year, usually in February?

MS. HAVEL: Right, once a year, and we have not started planning it, and so, if you want to put anything on the agenda, we can do that.

MR. GEER: Okay. The folks on -- With the exception of January, those people are not on the Habitat Committee?

MS. HAVEL: Correct.

MR. GEER: Okay. I was just going to say that we might be able to kill two birds with one stone if I'm going to be in the same building when they're there. All right. The only other thing I want to add about artificial reefs is, just in our state, the issue we're having is trying to come up with a way to look at usage.

A lot of ours are ten to twenty miles offshore, and so how to determine usage without sending out an email and hope that you get it back. Grays Reef is having that issue too, and we've talked about

this with Grays Reef. Grays Reef, I am chairman of the Resource Protection Committee, and one of the issues we came up with there was using the -- They wanted to try to come up with the best ways to use their resources.

One of the things with enforcement is, if you don't know when people are going to be there, other than a fishing tournament -- A lot of times they're going out there and they don't have a lot of interactions, but is there a better way to find out who is using their resource and how can we do that? With the technology nowadays, drones are one way, but satellite photographs might be another way, and it's just trying to use newer technologies to try to determine it.

I know, in our inshore reefs, January Murray, who has worked for me, she will call up a Google Map to look at our inshore reefs, and there is three boats right in the footprint, and you know they're not there waterskiing. You know they're there to go fishing, and so it gives you an indication of what's using it, but trying to see if we can tie into some kind of satellite program to get that information. It's an effective way to get it without -- You don't want to send a boat out there to go talk to people or interact with people if they're not going to be there. It's trying to maximize -- Even if you wanted to do a creel survey on those areas, you want to make sure people are out there.

MR. BUSH: Just a suggestion, and I don't know if we're going to follow through with it as well, but we've had a lot of discussion about there is so many things you want to know, but, if you've got those one or two questions from each of the different facets of the fisheries, everybody renews their license every year, and an educated question leading up to it, and not to give away your honey-hole, but we're looking at sites to maintain, if there's enough usage at this site. Try not to give the question bias, but maybe to get a little input, just as a brief survey when they redo their license, and that's just a thought.

MR. GEER: David, I agree with you that it's a great way to get information. However, I don't know about the other states, but, in our state, I have struggled with trying to get a single question added to the licensing thing. They won't let us. Either our licensing folks won't let us add it or the company won't let us add it, and it's kind of like we've struggled with it, because, in our state, we wanted to ask if you recreationally shrimp or do you recreationally crab or do you use our artificial reefs.

If you say yes to any of those questions, it comes down to another pull-down menu, and you can ignore it and just move on and get your license, but it's frustrating, because we've tried and tried and tried to get that on ours. I will say this on the record, because it ticked me off so much. Because of some legislator, somebody that died spearfishing offshore, there is a question of do you spearfish off of Georgia's waters? I think the person drowned. I mean, it's like, how many people go off spearfishing in our waters? It's not very high, because the visibility isn't that great. It's like that question got added, because somebody had enough clout to do it.

MR. BOSTON: It's a memorial question.

MR. GEER: Yes, but we can't add questions to do our general work, but it's a perfect avenue, I think, but we just can't get it done.

DR. ALEXANDER: In terms of recreational, you might be able to add it to the MRFSS survey questions when they do random calls.

MR. GEER: Cathy Knowlton works for me, and she said no. We have tried to do that as well, and it's -- I think these are all avenues, and I think they're solvable, in my opinion, but it's just that it's trying to get -- You're asking, especially like a creel clerk, where you're asking them to ask these questions and then they're asking additional questions. This year, they're doing a socioeconomic study, which is a monumental headache for them, because, after they're done asking questions on fish, they have a two-page thing they're asking about how much money you make, and you can see how the tone of a fisherman changes when that happens, but I agree.

These are all avenues. We can do a Survey Monkey, and this is all after the fact. We've talked about it would be really nice to have aerial surveys on a regular basis with satellite imagery. You could look down and zoom in one of the artificial reefs, or Grays Reef, and you could tell how many boats are out there at that given point on that day. If there was a way that could be done on some kind of regularity, a regular basis, we could stratify by weekend and during the weekdays, but that is going to cost money, and nobody is going to reposition a satellite for you just for that.

Drones are another way, too. We almost had an opportunity a few years ago to get a drone to fly over Grays Reef and our artificial reefs in Georgia, but, at the last minute, the drone went to Virginia to look at the menhaden fleet, which that's all right. That's a big issue too, but does any state know of a way that they're collecting that information on use of these artificial reefs? We are putting things out there. We're constantly doing more work, and it's like what we said today. It's like, what's the benefit and who is using that? Are people using these areas?

MR. WATTERSON: I just wanted to say that a big thing to canvass too, in addition to your fishermen, is the dive shops, the local dive shops, because I know, in North Carolina, probably the dive shops are one of the largest users of a lot of the artificial reefs.

MR. PARKER: Georgia has a charter logbook program, right?

MR. GEER: Yes.

MR. PARKER: Of course, South Carolina's is pretty extensive and accurate, I think. It's been around for a long time, but you might just ask for volunteer recreational fishermen, and I think you would get some. That way, you could find out how often they are using the artificial reefs, because our charter logbook has a space for which artificial reef did you fish.

AP MEMBER: (The comment is not audible on the recording.)

DR. LANEY: I think we would be interested in hearing, we the council, would be interested in hearing from the AP their opinions with regard -- Roger, remind me, but what have we done with artificial reefs and HAPC, or Pace can weigh in on that, but did we say --

MR. PUGLIESE: Artificial reefs are EFH, and SMZs are EFH HAPCs.

DR. LANEY: Right, and so we have done that, and so I guess that definitely should be addressed in the policy statement. There has been some discussion at the council level with regard to the

possibility of artificial reefs constructed as MPAs, and I think South Carolina has taken that approach and actually constructed several that are basically de facto MPAs, because they created them without any public information about where those were located.

I know some anglers at some of our public hearings have advocated that artificial reefs could be established in lieu of MPAs. In other words, that that's a possible solution. You take a designated area of habitat that may be currently unproductive or less productive and you make it more productive by establishing an artificial reef in an area where maybe people don't fish already, and so there may be some policy considerations given to ways you could use an artificial reef to mitigate some of the cultural and economic impacts of designating an MPA, for example.

I think those are the sorts of things maybe that we can think about, or that the AP could think about, addressing in any policy that they prepare on artificial reefs, and then obviously things like sighting, what areas do you know want to put an artificial reef in, certainly should be part of a policy, and I think there are existing policies in that regard, as well as materials that are inappropriate for artificial reef construction, and I think about all the tires that wash up on North Carolina beaches that were historically used for artificial reef, and they may be not necessarily in appropriate, as long as you use a proper methodology for immobilizing the tires, so they don't move around, but I will defer to Lisa, and I know we have an artificial reef guide, I think, or construction guide, and didn't we work on that, in collaboration with the Gulf? I think maybe there is an update of that planned or something along those lines, but she can correct me on that, or elaborate.

MS. HAVEL: Not since I took over a year ago.

DR. WHITTLE: Wilson, I sent one to you guys. It was in Florida, off of southeast Florida, and there's a really comprehensive one.

DR. LANEY: Anyway, those are my thoughts on things that you might want to recommend to the council be addressed in the policy.

MR. KELLY: Wilson touched on a very good point there. In fact, Florida has had some pretty robust discussions about using them as MPAs, including the Spiegel Grove. That's a 510-footer that is sunk off of Key Largo. The wreck itself, or these strategically-placed artificial reefs, provide essential fish habitat, but they also provide enormous protections for corals, and the interactions that we see in our special preservation areas, or sanctuary preservation areas in the Keys, eighteen of them, they're actually getting loved to death. Studies in 2010 and 2013 showed an average of eighteen interactions per diver per dive, in spite of pre-dive briefings, with corals.

If we can get some of that attention away from natural coral formations and move it to strategically-placed reefs and make them MPAs, where you have all the benefits, but not the problems of the interactions with the corals, you benefit everybody.

We have suggested to the dive industry down there that they go to a volunteer logbook program, so we could get some sense of the numbers of visits that are taking place with the natural coral formations and the artificial sites, to get a better handle on what's going on there, and I think it would be great to see them move in that direction. Even a wreck of the magnitude of the Spiegel

Grove, at 510 feet, it is placed so strategically that it's actually -- You can snorkel that wreck as well as dive it.

MR. BUSH: I think Wilson has brought up too many good points today, but one of them that I will go back to is he mentioned earlier about how we should build on each other's successes, and what I see when I'm in here is that we're going to be working on certain aspects of what we're putting together in all the different areas.

The Mid-Atlantic is going to work on a portion, and New England is going to work on a portion, and we're going to pull from the work that they do, and they're going to pull from the work that we do. Ultimately, we're setting the pattern for the states to pull from this as well, because you guys can do all the work and all we'll do is plug in the species later, what pertains to us inside of three miles.

It's important for me to get these things right, but one of the other things that Wilson brought up that I thought was very crucial was, with the way things are in the world today, everything is adversarial when it comes to fisheries, and artificial reef in lieu of an MPA is a phenomenal idea. We have some of our fishermen that are very interested in creating their own, and I don't know what the exact terminology is, but basically like for protected species, and it's a bank where you make sure that this is left alone. That way, your interactions out here doesn't impact them. There is a term for that, and I apologize that I don't know, but different things that we can do like that, as long as we can make clear the benefit to the participants. Buying into it and taking ownership of it will get you a whole lot further, and I think that's a great way to go.

MR. HOOKER: We have the FEP chapter all done, and so I'm just trying to figure out what would the next steps -- The next steps are still there's going to be a team that's going to start drafting the policy statement that's based upon the FEP, and that what is the -- I think I had raised my hand back in May. I remember this was this Basecamp thing, and you had set it all up, and then I don't think that I heard anything after that. I think it kind of --

MR. BOSTON: You got on about the time we had the --

MS. HAVEL: I wasn't here in May.

MR. HOOKER: I am actually going through the May minutes and making sure that I didn't raise my hand in the May minutes. I don't think that I'm on the record in there, but -- Anyway, that's where we are, and so when is the policy -- Are we going to have it back in May? Is that where we are?

MR. PUGLIESE: I think the idea is that we have set up the structure with Basecamp, and we have a lot more material that's been provided in there and additional guidance documents, I think, that have been updated from both the state as well as other participants.

MR. BOSTON: The county documents from southeast Florida are in there. We've loaded it up with a lot of stuff.

MR. PUGLIESE: The intent is that this be initiated again fairly quickly. Some of the core people there have that at their fingertips, and build a foundation, with the intent that potentially raise this

and coordinate directly with the next meeting of the ASMFC's Artificial Reef Committee, so that this could advance as the core of a policy that, at the next AP meeting, we could then take pretty much an advanced version and review and refine and move that forward. That, I think, is the realistic timeframe to accomplish that.

MR. GEER: Wilson, I am going to give the last word of the day.

DR. LANEY: Thank you. I just wanted to say to David that not everything in fisheries management is contentious. There is one area of, I think, total agreement by all sectors, and that is that, without habitat, and that is quality habitat, then you don't have sustainable fisheries to argue about, and so I think that's an area that we can explore more.

In the past, your organization, the North Carolina Fisheries Association, has collaborated with NGOs and management institutions, for example on a rather notable environmental project, and that was the removal of the Quaker Neck Dam from the Neuse River, and so I think there are opportunities for consensus among all commercial sectors and all recreational sectors, from a habitat standpoint.

I think Bill just mentioned another example of one of those, and so those opportunities are there, and those are the kinds of things that I think, when we collaborate on, builds trust and respect among all the different sectors and maybe, and emphasis on the maybe, smooths the pathway when we have to start dealing with difficult allocation decisions. Again, it's maybe. It's not a definite will improve dealing with allocation issues, because, generally speaking, somebody is going to win and somebody is going to lose, and so allocation is always the hardest part.

What I have always said, as a staff person in an agency whose mission is primarily for the fishes, in this case, my goal is to have populations that are robust and sustainable enough to enable you guys to argue about allocation from now until the end of never. We have a sustainable harvest, and the SSC and Marcel will tell us here is how much you can safely harvest, and then everybody can email council members until the cows come home and advocate for how much they would like to have of the allocation.

We wind up spending way -- Well, a lot of our time, probably most of our time, is either spent figuring out how to stretch the allocation out and maintain a stable economic and cultural aspect of the fishery or figuring out how to equitably divide it up among the different sectors and the non-fishing public, and so let's just keep that in mind. To the extent we can find habitat issues, and that's what this AP is all about, but, where we can find habitat issues on which we can collaborate and reach a consensus on, then, by gosh, I still think that's a good way to help build trust and move the fishery forward.

MR. GEER: All right. I am ready for my closing statement. The only thing I want to add to that is we are selling -- We finally, through our Georgia CCA, we finally got a license plate for our coastal waters, and the monies that are coming from that are supposed to go to our habitat program, artificial reefs and oyster restoration.

One of the logos they are using on that is no habitat equals no fish. It's pretty basic and pretty simple, and I think my experience is that, with oyster restoration -- Oyster restoration, everybody wants to do that, everybody in the world, because you can go out and it's something somebody

can do from the shoreline and help. Artificial reefs, we have Tom's group with the CCA and some of our sport fishermen who are always coming to us and asking us how can they help, how can they provide information.

It's doing these artificial reefs and doing these restoration projects, and it's a positive thing for just about everybody. I can't think of anybody it's not, unless you put one right over a major shrimp trawling area, which we try to avoid doing, and so this policy statement is going to be, hopefully, a pleasant one to review and work on, because it's not going to be the shall and the should. It's going to be like, hey, these are things we should -- We are doing these things, and these things have been successful in the past, and we're going to continue to do these, and it's important habitat, and we should continue to support these programs, as much as possible. That's all I've got to say. Have you got anything to say?

MR. PUGLIESE: Just be prepared tomorrow. We have a number of sessions that are going to be somewhat wide open in the beginning, some good, open statements with Marcel on advancing research and what we need to know, what we know that we need to know, and where we go. Then we'll really think about what are going to be the most significant future research needs for advancing ecosystem.

There is a number of different things in a lot of the support documents that kind of allude to key components, but I think a lot of us have already stated some of the most important, and so that will advance. I think we've got a lot of time to be able to advance that. We also are looking at the bigger picture tomorrow, with the presentation on the connection with the blueprint and the South Atlantic Landscape Conservation Cooperative and the adaptation strategy, and so really looking at how this is fitting in bigger and advancing mapping and mapping prioritization efforts that Tina is going to get into.

I think all of those will kind of be a big, broad step forward, and so be ready to advance. We have bumped some things together, and I think we're going to probably -- I've got to talk to Louise, and maybe do that during lunch, so that we can keep ahead of the curve, and we'll try to wrap things up a little bit earlier tomorrow, because I think a number of you all have early flights out, and we want to make sure that everybody has full participation and can advance and contribute.

MR. GEER: The hope tomorrow is start at nine. Then, if possible, we're going to have lunch in here, and so twelve o'clock. We will have Louise give her presentation from 12:30 to 1:30. Then, from 1:30 to 2:30, Tina and Roger will talk about the GIS support, and we should be done. I would say we would be out of here no later than 3:00 tomorrow. Does that please the panel? If I do nothing else, I like to keep everybody happy. Amber, thank you very much for bringing the coffee and the snacks. All right. We're adjourned, and we'll see everybody in the morning. Thanks.

(Whereupon, the meeting recessed on November 15, 2016.)

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NOVEMBER 16, 2016

WEDNESDAY MORNING SESSION

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The Habitat Protection and Ecosystem-Based Management Advisory Panel of the South Atlantic Fishery Management Council reconvened in the Florida Fish and Wildlife Research Institute, St. Petersburg, Florida, November 16, 2016, and was called to order at 9:00 o'clock a.m. by Chairman Pat Geer.

MR. GEER: Let's get started. This is day two of the Habitat AP meeting. My name is Pat Geer, and I'm the Chairman. I guess I have to say that for the record. I told you guys about -- I mentioned some changes in the agenda for today. We're going to start off with the Review of the Regional Research Programs by Marcel, and then we're going to break out into state groups and identify priority research and data needs, and so we're going to break into individual groups in the room or wherever we can meet and do that. Then we'll have a break, and we're going to continue with that.

During lunch, I want to welcome Louise Vaughn from the South Atlantic Landscape Conservation Cooperative. I am going to get that right one of these days, and she is going to be giving -- She was kind enough to change the time of her presentation today, and she's going to do that during lunch. Lunch will be coming in, and so, at twelve, we'll break for lunch and bring it back in here, and Louise will give her presentation. We'll all eat and have questions and move along with that. After that, we have the GIS to Support Developing South Atlantic Mapping Strategic with Roger and Tina, and so we'll get through that, and so hopefully we'll be out of here by 2:30 or 3:00, at the very latest. That's the goal. At this point, I will turn it over to Marcel, but I want to say one other thing.

One other thing is I made a mistake yesterday. We had a discussion yesterday afternoon about artificial reefs, and someone asked if Georgia has logbooks for charter captains, and I guess I misunderstood the question. I said yes, and my MRIP person back home sent me three emails and two voicemails last night to tell me that we do not have that, and so people are actually listening to us. It wasn't her who heard it, but it was a charter captain who called her and told her, and so, for the record, I want to say that Georgia does not have a logbook system as of yet for charter captains. With that, I will turn it over to Marcel. Marcel, the floor is yours.

DR. REICHERT: Thank you, Mr. Chairman. What I would like to do in the next twenty minutes or half-an-hour is give you an update of the regional fishery independent surveys, and I will highlight some of the activities relative to ecosystem-based fisheries management and bottom mapping.

Several of you have seen parts of this presentation before. I added some videos, since we are using a lot of underwater videos nowadays. If you need to turn off the lights in the back to see those videos, let me know. Also, if you have any questions, don't hesitate to interrupt me during my presentation. Otherwise, I can address them at the end of my presentation.

I want to remind you that what I am going to talk about is mostly the regional reef fish survey and the coastal trawl survey. These operate between just south of Cape Hatteras to just south of Cape Canaveral, and they are NOAA-funded programs, and the main goal of those programs is long-term monitoring of fish stocks, but also, with fish, it also means crustaceans and other important species, and provide that information and analyses on abundance and life history and diets and

anything that's needed for management and for regional stock assessments, and so that's the main goals of these regional surveys.

I know that there are various other surveys, either conducted by the states, and there is a NOAA longline survey in the region, and universities conduct surveys, short-term or long-term. Those are generally more localized, either in smaller parts of the region or off of specific states, and so I won't discuss these. I am going to concentrate on the larger-scale regional surveys.

The reef fish survey, as many of you know, started with MARMAP, the Marine Resource Monitoring, Assessment, and Prediction program that was established in 1972, and so we are indeed a long-term monitoring program. Since 1978, we started focusing on reef fish sampling, and we are using the chevron trap, which you may or may not be familiar with, since 1988.

We also use a variety of other gears, and I will talk a little bit about the bottom longlines and rod and reel, et cetera, later. In 2009, SEAMAP provided additional funding to the reef fish survey. The SEAMAP was established in 1986, predominantly as a trawl survey. Then, in particular, in response to the issues with the red snapper fishery in the region, the Southeast Fisheries Science Center established the Southeast Fishery Independent Survey in 2010. That added a video component and a bottom mapping component to the survey, and we are currently using four vessels.

The Research Vessel Palmetto is owned by South Carolina DNR, and we use about thirty to fifty-five sea days a year for this survey, and the R/V Lady Lisa, which is a trawler, also owned by South Carolina DNR, and we use that vessel for our longline survey between ten and twenty days a year.

SEFIS, the Southeast Fisheries Science Center uses the R/V Savannah, owned by Skidaway. They use that vessel for forty-five to sixty days a year, and they also use the NOAA Vessel Pisces for twenty to thirty days, and the bottom mapping activities is mostly done off the NOAA Vessel Pisces. In previous meetings, I always stressed the fact that both the Lady Lisa and the Palmetto were aging vessels, and so I am happy to report that South Carolina DNR invested close to a million dollars in a major renovation of the R/V Palmetto.

We got new engines and new shafts and new props and new generators. The plating was checked and replaced, where needed, and a variety of other replacements were done, and so hopefully we can have this vessel at our disposal for an extended amount of time, but, as you can imagine, that was a significant investment that South Carolina DNR made in the vessel. By doing that, by making that investment in the vessel, they made that investment to the regional surveys, because the reef fish survey is one of the main users of that vessel.

Since 2009 and 2010, with some additional funding to SEAMAP and with SEFIS, the combined MARMAP, SEAMAP, and SEFIS surveys are now called the Southeast Reef Fish Survey, or SERFS. That resulted in a doubling of the sampling effort, and, as I mentioned earlier, the introduction of trap cameras and bottom mapping. On the map on the left-hand side, the red dots are currently the universe of our sampling sites. The blue dot is our traps, and the blue X's are the sampling sites of our bottom longline and our short bottom longline.

As you see, in particular relative to the chevron trap, we are covering the region pretty well, and we are focusing on live bottom habitat in this sampling. This is the 2014 sampling universe, I believe. We have added a couple of new sites to the universe since then. Our sampling is generally from May to September. We generally start in mid-April and sampling through mid-October. We deploy between 1,200 and 1,500 gears per year, and we identify, weigh, and measure between 20,000 and 30,000 fish, finfish, representing sixty to seventy species each year.

Of those individuals, we keep about 10,000 for life history studies, and I will talk a little bit more about that later. They represent about forty to forty-five species, and so we are covering the vast majority of the economically and -- For the recreational and commercial fisheries, we cover a great deal of those species.

This is a picture of the live-bottom habitat. Based on the information that we gathered from reconnaissance traps and the fishing industry, recreational fishermen, et cetera, we selected our sampling sites focusing on live-bottom habitat, because that's where our focus species, mostly the species in the snapper grouper fisheries management complex, that's what our focus species are. This is the type of video that we gain from the videos on our traps.

This is the video that I showed you earlier, when we were waiting. We have used the chevron trap, which is our primary sampling gear, since 1988. It's deployed off the back of the boats. It is tethered to the surface and linked to a buoy. We deploy it into depths to about 120 meters, and the soak time is ninety minutes, and they are baited with menhaden. Here, you see a trap going through the water column. When the bubbles disappear, you can see here the menhaden and the cameras on the trap. There is a camera facing away from the opening, and here is a camera on the tip of the trap.

You immediately see that fish are attracted to the traps, and I will show this little clip later, to show you some important observations that we make from the trap videos. This is a gag grouper that's coming into the trap, and, in a little bit, you will see a red snapper coming into the trap. As I mentioned, we have used these video cameras since 2010, and it has provided a wealth of information. Here's a tomtate, and this is another little clip from a red snapper trying to get into the trap and snag another tomtate, and you can see some other species here, black sea bass and a variety of other species. At the end of the soak time, the traps are hauled back over the side, and the fish are collected, measured, weighed, and further processed.

We started using these videos, and is that same video clip, to verify bottom habitats. In the past, we kind of knew that we put our traps on a particular live-bottom habitat, and we can actually verify that now. It gives us an opportunity to describe the live-bottom habitat, because there is a high variability in the types of live-bottom habitat.

We can also look at trap behavior. With that, I mean whether the traps are actually moving in the water column, whether they are dragged along the bottom, because that affects the catchability and the selectivity of the traps, and so that's important for our analyses. Also, by identifying and counting fish in the videos, we were able to develop indices of abundance for fish that we normally don't catch in the traps or catch in the traps in low numbers. We can also compare the catches in the traps with the densities around the traps, and that provides important information for stock assessments.

We can look at community studies of what fish are seen in the videos together, and we can look at fish behavior outside, but also inside the trap. This is a spawning clam, and these sponges are actually sitting on top of that clam, and you can see the gametes actually being released, and it's not just this one here, but it's a variety of other patches of -- It looks like the sponges were moving, but it's actually clams under the sponge.

This is some behavior or some observations from the video cameras that have absolutely nothing to do with our fish survey, but it provides a lot of information that we normally would not have, and that may be important for ecosystem-based fisheries management. At what areas, at what times of the year, do you see this behavior? That's some of the additional information outside the trap.

This is the same clip that you saw earlier, and the GoPro cameras that we are using actually have microphones in them, and so we are now also able to record sound underwater, and this gag is going after tomtates, which is a grunt, and the sound you hear is actually the sound of the grunt inside the mouth of the gag.

We are now working with a couple of university researchers who are interested in sound that we are recording. We currently are not analyzing any of the sound signals. We deploy about 1,500 traps, and there is at least two cameras on each trap, and so that's 3,000 one-hour videos, and we also have videos, as you see here, inside the traps, and, as you saw earlier, on some traps, we have cameras above the traps, and so you can imagine that we collect information of probably between 3,000 and 3,500 one-hour videos a year, and that's a lot of information, and so I think we've only scratched the surface in terms of the utility of these videos for a variety of research and monitoring purposes.

I mentioned the other gear that we are using, the short bottom longline. When the bottom relief gets very steep, it's very difficult to deploy traps, and so we are using a short bottom longline, which is about thirty meters in length. It has twenty hooks, and we drag that over vertical relief areas, generally in depths beyond ninety meters. We currently have 300 stations, and we sample about 100 to 150 each year, and the species we generally catch on this gear are snowy grouper, blueline tilefish, and speckled hind, but also red porgy and jacks and a variety of other species.

Unfortunately, due to a significant reduction in funding, MARMAP celebrated its fortieth anniversary with a 40 percent budget reduction. We had to halt that survey in 2012. We slowly are starting to redeploy the gear again, and this year actually was the first time that we felt that we were kind of back to where we were before we halted this survey. However, it also halted the collection of species that have now become very important regionally, in terms of stock assessments, for, for instance, blueline tilefish.

We also deployed a long bottom longline. We have seventeen general areas for the golden tilefish, and it's muddy bottom and relatively flat, at about 200 meters, and it's primarily focused to monitor golden tilefish. Also, that survey was halted in 2012, and, if you are familiar with the current developments in fisheries management, golden tilefish is an important species right now, and, again, this year, for the first time since we halted it, we resumed the golden tilefish survey.

Funding affects what we do, in terms of what surveys we are conducting and also what we are doing within our surveys, and I will come back to that in a little bit. In addition, we do some rod-

and-reel collections, mostly to collect additional information on life history and diets, because our traps are baited. When fish are getting into the traps, they gorge on the bait, and so we use hook-and-line to get a better feel for some diet studies, and, throughout the summer, throughout the sampling area, we collect a variety of oceanographic data, like temperature and salinity and oxygen and light penetration, et cetera.

That was the reef fish survey. The SEAMAP South Atlantic, the Southeast Area Monitoring Assessment Program South Atlantic, as I mentioned earlier, was started in 1986 as the coastal trawl survey, and I mentioned earlier that some additional funding became available, and it's now also funding the reef fish survey, but also part of the red drum and coastal shark survey, both in North Carolina and South Carolina and in Georgia.

It provides a little bit of funding for the Southeast Regional Taxonomic Center that plays an important role in our diet studies, but what is also important is it provides funding for data management, and we now have our SEAMAP database online, and I mentioned that yesterday, that all of the surveys funded by SEAMAP, plus a couple of other surveys, are now available for query online by anyone who would like to query the data. I mentioned that, currently, we are working on some issues, in terms of maintenance, but hopefully very soon that full database will be online again, and that's at seamap.org, and we are very proud that we now can actually serve that data out for whoever wants to explore that.

The coastal survey is the only long-term regional trawl survey in the Southeast. It's conducted off the Lady Lisa, the South-Carolina-owned research vessel. It's a shallow-water survey. We generally trawl in fifteen to thirty feet of depth, and we sample about 112 stations each, but, due to funding, we had to lower that number of stations.

We collect information of close to a million individual fish and crustaceans each year, and they represent about 250 species. I sent a list to Pat yesterday with the -- Those were the species in the previous five-year cycle that ended in 2011, and so just to give you an overview of what we collect. The tows are twenty minutes, and so they're relatively short, and we do not use a turtle excluder device, and that allows us to collect information on a variety of sea turtles, in particular loggerhead and Kemp's ridley, and also some green turtles are caught regularly.

We have three seasonal cruises. The reef fish survey is an ongoing survey from May through September. The trawl survey is conducted in the spring, the summer, and the fall, and my staff is at sea between fifty-five and sixty days each year. Again, as a result of stagnating or declining funding, we are now forced to probably delete one of the cruises, and we are investigating -- We are analyzing our data to see deleting what season may have the least impact on our long-term data, but, as you can imagine, the summer is important for different species than our spring cruise, and our spring cruise may see different species than our fall cruise, and so it's kind of a catch-22, and we're trying to see what information the data has, and so it's a very difficult decision. That's why that little yellow asterisk is behind there.

These are some of the priority species. We are looking at species that like more structure, such as spadefish and some others, and we look at flounder, spot, croaker, Spanish and king mackerel, which are important for the South Atlantic Fishery Management Council, because they're managed by the council.

We look at a variety of shrimp species and blue crab, and we also catch sharks and rays. We monitor horseshoe crabs, and so there is a variety of species that we catch and monitor, and we also look, for instance, at black gill occurrence in shrimp, and so it's not just the size and the number of species, but we look at reproductive information, and we look at age and growth, because, as with the reef fish survey, we keep a set of the species we catch for life history studies.

AP MEMBER: (The comment is not audible on the recording.)

DR. REICHERT: I am not sure if we are actively sharing that information, but that information is certainly available, and we are aware of that survey, and I may be wrong, but I think we may actually have provided samples, and there are some folks at South Carolina DNR that are also looking at black gill, and so I believe they are in communication.

MR. GEER: I can clarify that a little bit. We are in the process, with the grants that Mark has in South Carolina DNR and Georgia DNR, we are in the process of trying to collate all of our data into one useable format that we can use to look at black gill, and so the data will be available.

DR. REICHERT: The combined survey, as I said, we collect close to a million fish, representing probably closer to 250 species, and we take life history samples from between 10,000 and 20,000 fish and other taxonomic groups each year. The data, what we provide is data on species diversity, relative abundance, length and age compositions, weights, and we age the fish by looking at otoliths and spines.

We look at reproductive information, and we provide diet information. We provide DNA to investigate stock structure. We use oceanographic parameters to look at links between temperature and salinity and occurrence of species and physiological processes, and we are looking at bottom habitat, both in terms of the surveying bottom habitat as well as using our cameras to identify bottom habitat.

These are some of the examples that we present on a regular basis. We provide the council annually with an overview of the relative abundance of key species. This is just an example of red snapper, and the blue line is the nominal index. Then the black line is the standardized index, and that takes into account variability and temperature, sampling intensity, sampling location, et cetera.

As I mentioned, we use otoliths and spines, and we also do validation studies. We just finished two age validation studies using bomb radio carbon on wreckfish and on blueline tilefish. Length at age information is very important, because that provides graphs like the one on the right-hand side, the growth curves, which are important information for stock assessments, and we also provide age composition. Age information is also very important relative to reproductive information.

We look at sex, and we look at maturity. We look at the differences in sex ratios, and we look at the difference in growth between sexes. We look at egg production and fecundity. That's a very active field right now. As you may know, a lot of the economically-important species, such as grouper and black sea bass, are protogynous hermaphrodites, which means that they start their life as a female and then transition into male, and the age and size at which that occurs is important information for stock assessments. For many species in the Southeast Region, our lab is the only

lab that provides reproductive information, and so, in that respect, that aspect of what we are doing in the lab is very important for stock assessments and for management.

I mentioned the mapping, and SEFIS is mostly responsible for the mapping. The multibeam is mostly done off the NOAA ship Pisces, and the primary goal is to map areas that haven't been mapped for the purpose of increasing the spatial coverage of the trap video survey, but also to provide information about habitats in the Southeast region in general, and, as you can imagine, anyone who has ever worked with bottom mapping, that is a very arduous process, a very slow process, and I would argue it's very easy to collect the data, but then the analysis can be extremely time consuming. Over time, I hope that, especially in collaboration with other folks, that we get a much better idea of the bottom of the Southeast Region.

Then Todd Kellison's group at the Southeast Fisheries Science Center is also working on modeling efforts. For instance, this is a graph that I stole from his presentation on predictive mapping of hard-bottom habitats in the region. Then our trap videos and the bottom mapping may be verification of these modeling efforts, of this predictive mapping.

A very important component of what we're doing is diet composition of the reef fish. Not just the reef fish, but also we did that for the species, a lot of species, from the trawl survey, and this is just an example of some of the recent findings for black sea bass, white grunt, squirrelfish, and blueline tilefish. We have also looked at diets for red porgy and a variety of grouper and other species, and diet information from bluefish from the trawl survey was provided to a recent stock assessment.

Unfortunately, again, due to funding, the trawl survey had to completely halt its diet studies and, in the reef fish survey, we are struggling to continue this, because, given the current single species stock assessment and single species management in the region, that's the focus of our data collection, and it's kind of an interesting catch-22, because, as we heard yesterday, there is a real push to move towards ecosystem-based fisheries management, and this type of information is vital for not only the management, but for the modeling and the implication of that concept. However, currently, under the single species stock assessment and management, that's where our focus is going.

For us, it's a real struggle, because we know this information is important. However, right now, abundance and ages and length of particular species have a very high priority, a higher priority than the diet studies, and so that's a struggle that we are facing. As I just said, it's important, but it's, unfortunately, reduced due to funding.

Then, of course, it gives our surveys, the combined trawl survey and reef fish survey, especially if you combine it with other surveys in the region, whether they are more localized or more broad -- They provide information on community composition, community dynamics, and trophic interactions, and this is just a slide that I stole from a thesis of one of our graduate students, and she looked at the deepwater habitat. I don't want you to read all of that, but that's just an overview of the type of information that we collect and we can compile using the information we collect. It's a combination of species composition in the traps in the videos and the diet information.

Who is using our data primarily? As I mentioned earlier, currently, stock assessments, in particular single species stock assessments conducted through the SEDAR process, but also through the

states. The Atlantic States Marine Fisheries Commission, we provide data to their stock assessments on a regular basis.

Then the information is used for fisheries management, both at the state level, at the commission level, and at the council level, and we provide a lot of information to state and federal agencies and colleagues at universities. As I said, our data is available, but also, since we are out with four vessels throughout the summer, anyone who needs specimens, who needs information, if at all possible, we will provide those specimens or that information, whether it be DNA or entire specimens. We do that on a regular basis.

What we also do, we involve a lot of graduate students in our research, and the reef fish survey -- Our cruises are up to twelve days, and, on every cruise, we have at least one volunteer, and that can be -- We have had council members and teachers and colleagues from federal labs and colleagues from universities and students and also citizens who are just interested in what we are doing. They volunteer on the cruises, and they are part of the crew. We work six hours on and six hours off twenty-four hours a day.

I remember, in the beginning, when I moved to the states and I was talking about my cruises -- I grew up in Holland, and I was talking about my cruises to my family and friends back in Holland, and I had to explain that, no, these were not lawn chairs on the sundeck with umbrella drinks type of cruises, but we do involve volunteers in our cruises, and so this is just an overview. There's no need to read through this list, but this is just an overview of some of the stock assessments that we have provided vital information for in the Southeast Region.

With that, of course, these are surveys that involve a lot of people, and so I always want to mention that we cannot do this work without the staff and the students and the research vessel crews, both in the past and in the present. These are long-term programs, and we can't do it without them. I hope I have given kind of a brief overview of the regional research, and I am more than happy to answer any questions that you may have.

MR. GEIGER: Thank you, Marcel. That was a very, very interesting presentation, and I have two questions. I noticed you indicated issues with funding, and I think the short line and longline trawl had to be discontinued or reduced, because of lack of funding. At the same time, I heard you say you're collecting a variety of video and sound information that it might be nice data to have, but it may not necessarily be essential. My question is how do you all make the funding decisions on the highest-priority data collection programs? How does that factor in?

For example, I can see some of the video would be nice, maybe five or ten years down the road, but, on the other hand, some of the short line and longline data, and some of the single species stuff, may be even more important as we make the transition into ecosystem-based management, and how are those decisions made, collectively?

DR. REICHERT: Since this is currently a partnership with the Southeast Fisheries Science Center, a lot of the decisions are made in collaboration with the Science Center, and I think, currently, there is more steering from the Science Center, in terms of what decisions are made, than there was in the past, obviously.

For instance, although I largely agreed, it was a Science Center decision, for instance, to focus on the chevron trap survey when we got this huge funding reduction, and a lot of that is also given -- It's guided by what currently are the important issues in the region. We all recognize that it would be nice to come up with a comprehensive, consistent plan. The reality is, for instance, when red snapper became a huge issue in the region, it was vital to collect information on that species. Since the commercial and recreational fishery is shut down, you have no -- At that point, you have very little information, other than fishery-independent surveys, to see how the population was doing. I would argue there is a combination of that.

Of course, internally, we are weighing, or we are trying to weigh, what information is important right now in stock assessments and what is coming up in the next couple of years. Then, at the same time, we also like to keep our eyes open. For instance, the diet studies, we have really resisted reducing that, but, at some point, you have to make the hard decisions. I am not sure if that really answers your question, but it's a combination, but it's mostly given by what issues are currently important in the region.

DR. LANEY: Marcel, I was just going to weigh in too and say there is a SEAMAP committee, Jamie, and it's split up into SEAMAP Caribbean and SEAMAP Gulf of Mexico and SEAMAP South Atlantic. Anytime we get reductions, the committee is convened and weighs in as to how we want to take the cuts that we have been facing, as opposed to any increases.

DR. REICHERT: Thanks for that clarification. I failed to mention that, and MARMAP has a committee that consists of South Carolina DNR staff involved in the surveys and Southeast Fisheries Science Center involved in the surveys, and they come up with recommendations to the Science Center, in terms of what we should focus our attention to.

MR. GEIGER: Thank you, Marcel. That was very, very helpful. My second question is my concern about obviously some of the concerns about reduction in data analysis, in terms of diet studies and everything else, and, to your knowledge, is anybody using this information to look at endocrine disrupter compounds or the frequency of endocrine disrupter compound effects on either feminization or masculinization of single or various fish species or assemblages? Is there any of that kind of work going on, based upon your survey and sampling, to the best of your knowledge? Thank you.

DR. REICHERT: No, to my knowledge, there is not, but, as I said, I would love to look into that, and it's very important, but we just don't have the means to do that. Having said that, as I said earlier, we are out there all summer long, and so, if there is anyone, for instance within a university or another agency, who is interested in looking at that, I know our reproductive biologists would be thrilled to collaborate with them, but, currently, I don't believe our samples are used for that.

DR. SEDBERRY: You're right that the samples are not used for that, but that phenomenon does occasionally show up, and so, in non-hermaphroditic species, you might occasionally see both sexes in a gonad sample, and those are noted when you come across them, but there hasn't been any effort to quantify it, I guess.

DR. REICHERT: Yes, you're absolutely right, and so that's basically morphological notes that we make. Of course, we've got to be careful, because, in the whole process, from sampling the fish to reading the slide, you need to make sure that there is not some contamination occurring that

may explain that, but, if that consistently occurs, that's being noted. I believe golden tilefish is an example where that sometimes occurs. Then there is the question of whether that means that there is some hermaphroditic process going on or whether that's caused by some disruption or another.

MR. GEER: That's an interesting question. Any other questions for Marcel?

DR. LANEY: Marcel, there is obviously -- This is another case that we touched on yesterday, where you have a tremendous database, you have a huge mine of data, and would you talk just a little bit about who may be looking at those data and analyzing them and then trying to get information out in the peer-reviewed literature? I mean, you mentioned the bottom mapping, which is certainly of interest, and one of the things we talk a lot about at the council is a desire to have some idea of what the relationship is between areas required by certain species or communities and what the productivity is of those, and it would seem to me that the work that you all have done certainly begins to lay a foundation for being able to do that. Is anybody currently trying to take a look at the data from that perspective and hopefully get some things out in the peer-reviewed literature?

DR. REICHERT: I am not sure. Because the data is now available online, people may be extracting our data and doing that type of study without us knowing it, although we urge people to let us know what's going on, so we can kind of keep track of who is using the data. We are doing a lot of analyses. The Southeast Fisheries Science Center analyzes a lot of the data and publishes that in the peer-reviewed literature.

We have provided our data to the Rutgers group that looks at changes in distribution relative to climate change, and we provided our data to the Nature Conservancy. We provide the data to a lot of organizations that analyze the data and publish them, and then we have a -- As I said, we have a lot of graduate students who look at the dataset and analyze data in a way that we don't have time for. Currently, most of our focus is on collecting the information and providing the data and the analysis for stock assessments, and that, by itself, is published in SEDAR working documents and sometimes in the peer-reviewed literature, and so we do that and the Science Center does that, and then provide a lot of data and information to others who publish that information, or hopefully publish that information eventually.

DR. LANEY: The follow-up is, is there any place where I could go to see or to find, gathered in one location, all of the publications that have arisen from the SEAMAP database through the years?

DR. REICHERT: We are working on that. The annual reports, and particularly the -- We are working in five-year grants. At the end of each five years, we produce a final report. In the most recent five-year reports that I was responsible for, and, George, remind me, and that may have happened in previous reports also, but there is a list of publications, by year, that resulted from the surveys. It's not just a list of publications, but a list of reports and a list of presentations is also in that report, and so that information is available.

Currently, we're trying to compile that into one database that people could potentially query, but we are not there yet. That's one of the aspects of these projects that generally gets a low priority, but it is very important, and so hopefully we can get that done in the near future. George, do you know if that was done in previous years, those lists of publications?

DR. SEDBERRY: It was, and it included theses and dissertations that came out of the projects.

DR. REICHERT: Thank you. Yes, that's also included. Then, of course, there are a number of publications that -- If people query the data and never tell us and publish that information, then obviously we don't know about it, which is a caveat of making the data available. We say don't use data that you queried more than a year ago in any publications, because we constantly go through quality control steps. When there is a stock assessment, we review the entire dataset of a particular species, and sometimes we make changes.

Most of the time, those changes are very minor, but sometimes we correct the database, and that's why it's important that we have this one centralized database, so, if we make significant changes, we don't have to track and see who we provided the data to over the last decade to make sure that they correct their database, and that's a conundrum of not just our database, but other databases also.

MR. GEIGER: I guess I'm looking at the -- I will come back to the funding issue and the sampling effort and everything else, and, again, I'm going to make a general comment. Assessment, monitoring, and evaluation always seems to take it in the shorts when budgets get tight and things really get really compressed. I guess, when we see assessment, monitoring, and evaluation results, it is a hell of a lot of output, but I am looking for the outcomes.

If I was in a budget situation, making decisions on funding, the first thing I would be wanting to see is a very succinct statement of how much money is invested and then what are the outcomes. When I look at outcomes, I look at biological, economic, and social outcomes. Is there a way that the South Atlantic Fishery Management Council can put a succinct statement on paper that summarizes, within some spatial timeframe, four years or eight years, but tie it to either congressional terms or a budget cycle, on what are these biological, social, and economic outcomes resulting from these sampling efforts that are very clear and very precise that can be presented to a new, incoming administration.

My continuing sense is, and my concern is, that assessment, monitoring, and evaluation continues to get hammered, because it's the low-lying fruit, and it usually gets axed, and that's the last thing we need, given all the concerns about status of stocks and communities as we make the shift into ecosystem-based management. That's just a comment for consideration. Thank you.

MR. GEER: Do you want to respond to that?

DR. REICHERT: I agree, and that has -- I am wearing different hats in different groups, but that is one of the consistent concerns that I expressed, that, if you look at the documentation, the data is always key, and so I agree with that. The data providers are always key, and that has been one of my concerns, because, when I was listening to the presentation yesterday about ecosystem-based fisheries management, the amount of data that is required to do that is mind-boggling, and so, yes, I agree.

DR. ROSS: Marcel, just a quick question. On the multibeam mapping, you're mapping opportunistically-selected hard-bottom targets only, and is that correct?

DR. REICHERT: Yes, and this is actually more a question for Todd Kellison's group, but I believe that that is correct, and I think, currently, we are focusing on areas that we are sampling that we don't have bottom mapping information, but I believe there are also areas -- I'm not sure if Todd's group did that. For instance, the deepwater MPA, I think that was mapped. There is a combination of priorities by the council by the National Marine Fisheries survey and by our surveys, and I think that combination determines where bottom mapping is occurring.

DR. ROSS: Just as a follow-up, for the record, Pat, I wanted to just also say that I think this committee ought to be very interested in any bottom-mapping activities and have some better idea of what is being prioritized and who is doing it.

MR. WATTERSON: I was just going to follow up on that. I talked to Nate Bacheler and Todd Kellison about it. They've asked us for data before, and they try to collect data on potential hard-bottom habitats within the South Atlantic. Typically, when they identify areas they want to try, they will go out and they will run the multibeam first and try to take a look at the multibeam data while they're out there and try to pick targets for dropping the traps on likely areas that look like hard bottom.

DR. REICHERT: Thank you, and, yes, you're absolutely right. I think, currently, we are at a -- That was particularly important when we were expanding the sampling area and we were looking at live-bottom habitat in areas that were under sampled historically. Currently, I think we came to the consensus that, if you look at that map, that we have pretty good regional coverage, and so I think that focus recently moved to areas that we know we have sampled in the past, but we don't have bottom mapping, that we don't have a detailed bottom mapping for, but thanks for that clarification.

MR. WILBER: Marcel, I maybe missed this, but are the bottom trawl data in the SEAMAP dataset that's available online?

DR. REICHERT: Yes, they are. That was actually the impetus for developing this database. That was the first database that was in there, and that's the database we are currently -- That's the part of the database that is currently under maintenance, and so that's why I am hesitant to say that you can actually look at them right now. They may very well be available, but I think they're working on updating that.

MR. GEER: I think the SEAMAP database in general is -- You submit a request and you get a log-in and then you get access to the data. Pretty much all they're asking you to do is to identify SEAMAP as the source. Like Marcel said, if your dataset is older than a year, come back and get the newer data. Marcel and I and Roger all sit on the SEAMAP database working group, and so it was a long process. It's a very useful tool, in my opinion. Once you get set up, you go and you can get the data really quickly, and you can do a lot with it.

MR. PUGLIESE: Just related, as a connection to the entire SEAMAP data system, we have a -- We'll be discussing it a little bit later on, but Tina will get into the online SA fisheries system that is presenting not only all the habitat information, but also a lot of the connected information and worked-up information from the fishery-independent surveys, so the trawl survey and the reef fish survey. Some of that spatial representation is beginning to be translated from just the raw data information to spatial representations within that, and we'll touch on that when we get into the

bottom-mapping discussion and how we're trying to connect some of these different information capabilities in a spatial way.

DR. REICHERT: Yes, and we're continuing to develop the database. Last year, or the year before, we added three zooplankton databases from Rutgers, the Southeast Fisheries Science Center, and the Baruch Institute. We have been working on potentially adding some data from the winter tagging cruise and some other databases that are not directly funded currently by SEAMAP, but that are conducted in collaboration with SEAMAP. Part of this was also because of the public access to research results requirements, where federally-funded research, I think within a year or two, the results need to be publicly available. In our case, that information is available usually within a year, for most of our surveys.

DR. ALEXANDER: I was curious. The Pisces project, whenever the Pisces is around, it's really being driven by NOAA and where they want to go to work on their predictive model? That's what I hear you saying.

DR. REICHERT: No, that's part of what they are doing. Where the Pisces is sampling is decided in collaboration prior to the sampling season, and that is given by availability of other vessels, and it's driven by areas where we need bottom mapping, and so the predictive modeling is more a modeling effort that is using the data that's collected and trying to come up with that model, but I am almost certain that that project doesn't drive the Pisces activities. Currently, the Pisces is part of the three vessels that are monitoring reef fish. In addition to that, they also have the capability of bottom mapping, which the other vessels have much less, to a degree.

DR. ALEXANDER: So who is deciding then what the Pisces is going to map? I guess that's the question. Are they decisions that are being driven by your needs in your program, or are they -- Who is deciding that?

DR. REICHERT: I would say that's largely the Southeast Fisheries Science Center.

MR. PUGLIESE: Also, some aspects of the monitoring of the MPAs. The Pisces, I think, is directly doing sampling and some of the filling in of mapping within some of those specific areas, and the only other comment I will make about that is I think the predictive modeling is actually being -- It's kind of flipped around. The predictive modeling was done so that, in that phase where they were expanding or looking at other areas to sample, it was used to at least provide a focus to maybe begin to pick up some of those other types of -- It was not a directed effort. From our aspect, the sampling within the MPAs, or outside the MPAs, and the mapping is part of what the Pisces done, but, again, that has a bigger picture from the Southeast Science Center.

MR. WATTERSON: In terms of the mapping of the MPAs and the monitoring of those, I think it's Andy David and Stacy Hartman out of the Panama City Lab for NOAA that are doing a lot of that work, but, in addition to the bottom-mapping efforts by Pisces, a lot of the NOAA ships, particularly the newer ones, they run their multibeam whenever they are just transiting, and so they will try to collect multibeam data just going -- Regardless of what project they are working on, they will run their multibeam while they're transiting from site to site and collect data that way.

DR. ALEXANDER: I had another comment on that, actually. Marcel, you had mentioned that it's easy to get the data, but it's hard to do anything rigorous with it, to get it into a good format,

and I think that's a reflection of the fact that there hasn't been a focus on collecting, in a deliberative way, bottom-mapping data and putting resources to doing the processing, and so the processing always kind of comes in on an ad hoc basis, and it isn't necessarily done by people that that's what they do for a living.

DR. REICHERT: I think, at the Southeast Science Center, I don't necessarily believe that that is strictly the case. What I was trying to convey is that, when we are out there, the collection of the data sometimes is the least time-consuming part of that whole process, and that goes back to a remark earlier. We have all the videos. We extract the information that's needed, that's immediately needed. There is so much other information there that just would be very time-consuming to extract. The sound, we haven't looked at any of the sound recordings. That is information that's out there, and, again, it only takes ninety minutes to record the video, and then it takes a multiple of that to actually do the full analysis, and so that's what I was trying to convey.

MR. GEER: Any other questions for Marcel? All right. Marcel, thank you very much. We really appreciate that. What I want to do now I want to turn this over to Brett and Roger and have them -- We're going to break out into state groups, but I want them to tell us what they expect us to achieve and accomplish. What are our goals during these breakout groups? I will let them do that, and then basically what we will do is, as we break out into groups, we'll take a break and get into our groups.

I am going to turn it over to Brett and Roger right now and let them tell us what they want to try to get out of that discussion that we're going to have for approximately probably about an hour, or an hour-and-a-half, maybe. They will be walking around and facilitating that as we go as well, and so I'm going to turn it over to Brett and Roger at this point.

MR. PUGLIESE: What we wanted to do is, and I appreciate Marcel taking the time to be able to present and set the stage for the active ongoing research activities in the region and how important those are for the advancing towards ecosystem-based management. I think that we wanted to do is I have provided a number of other associated documents, one of which I think is really relevant to some of these specifically research discussions and the council's response to the ecosystem-based management roadmap.

In there, I think the segue was very specific. In the introduction, it talks about the inability to move toward ecosystem-based management without fully supporting the ongoing surveys. When we were talking about some of the key information needs that are being collected and future needs for diet and for species composition, for utilization of even more detailed information of characterization of the habitat and species information, those surveys have the capability, if they're fully funded, to be able to provide a lot of the foundational information for moving toward ecosystem-based management.

Some of those points, I think, are made within that statement and beyond, and so what we wanted to do was to take the opportunity to have the breakouts and really look at what the priorities are going to be in our region to be able to advance what we really need to get, the information, because I think, where we are, there is a lot of the types of information that has not been collected or needs to be expanded to be able to support the broader scope that either provides input into individual stock assessments or the ecosystem models or into understanding the impacts, habitat impacts, on

the species and the connectivity, the broad scope, as well as the communities, the social, that whole cross-section of different activities.

There is that document that I mentioned, and we have the climate strategy matrix from the South Atlantic, and that is something that can be looked at and see -- We can really kind of pick what really should be some of the priorities that should be focused. This is the effort, and I will pass it to Brett to kind of capture a bigger picture, because he also has been looking at these broader-scope directives, too.

MR. BOSTON: Thanks, Roger. I think the thing to think about is, from a state perspective -- You can wear a regional hat if you want, but, from a state perspective, what are those priority research and data needs, as you see them, state-wise, because you're going to have a perspective of what's currently happening in your state and projecting that forward to the region. There is a lot, a lot, of research priorities, and there are a lot of just overall data priorities that the section teams, in the process of writing, have identified, and so there's a good starting point there.

I want to point to that Document A17, which is that climate variability and fisheries piece. If you scroll down to page 3, you can see there, from an example, if you will, from the recent workshop, kind of some research and monitoring and observing and some partnering needs, and I think that's a good format. There is also, I think, a really good bucket there, the fourth one, which is opportunities to leverage.

If we used kind of that format to capture things from a state perspective of research, the monitoring and observing, partnering, and then I think opportunities to leverage is a good word. It just says, hey, there is -- When you talk about SECOORA or some of those other folks that are out there, are there things that we can do to better integrate?

In an age of budget cuts, we have to be -- I just see the opportunities to finally stop duplication and start to work together, and they just happen, unfortunately, automatically, or fortunately, and so it's a great time to think about partnering, because there's a lot of people collecting a lot of data, and is it getting integrated and utilized? Those are four buckets, if we can, to look at, and then, if you can give us some sense, once you get that list built, of those kind of things, and you might not have something in every category, but if you can give us a sense then of the top couple of things that you think are the priorities, from the perspective of the state perspective here for us to look at, in terms of either priority research or data needs, I think that will be important.

That will give Roger a good starting point and us a good starting point to think about, and we'll be able to cross-walk these with the work that our section groups have done, because the section groups have done this as well, the teams that are doing the writing on the respective ecosystems, and so I think that's a good start, right?

MR. HOOKER: We have a question in the back. Which document are you looking at?

MR. BOSTON: I'm sorry. It's A17, and it's climate variability and fisheries.

MR. PUGLIESE: What that is, is there was a climate variability research workshop for the Gulf and South Atlantic and Caribbean regions, and what Brett has focused on is probably more of the structure, because this is very specific to climate.

MR. BOSTON: Yes, the structure.

MR. PUGLIESE: I think what this did is we had council members and we had regional experts and we had kind of a real cross-walk of individuals to be able to come up with some prioritizations of core research activities, but I think what he was trying to do was basically use this format that came out to bin the discussions.

What you've got is you've got these categories, as he mentioned, of the research and monitoring, et cetera, and I will put it on the board. Those can be used as categories. I think what would be good is to -- The other one that we've got highlighted in here is our response on the ecosystem roadmap, because it gets into really specifically some of the needs to support integrated ecosystem assessments or some of these other different types of tool capabilities, but the researcher information needs to do that I think is what is going to be important, too.

MR. HOOKER: Part of the reason that I asked is because, while we were talking, I was remembering our workshop from March, back in Charleston, and, for the life of me, I can't find a final report on that. That had all the prioritized mapping needs for the Southeast, and I didn't know if that was something that ever got a final report that ever got produced. I don't seem to have it in my inbox. Do you know what I'm talking about? It was with Mark Finkbeiner and Chris Taylor.

MR. PUGLIESE: Actually, I don't have that final report, because I wasn't at that meeting. We never did receive a final report on anything to that. I know that it was discussed. It started the process, and we will get into some of the discussions about the mapping needs and priorities and where we're going with the strategies here, and so I need to find out if there is any other additional follow-up to that.

MR. HOOKER: Pace, do you remember if we got a final report on that?

MR. WILBER: I don't.

MR. BOSTON: I was referring to that A17, that report, not for the dataset, but more for that structure, as Roger said, and then the other report, the letter, if you will, from Michelle Duval, which is A09, that was the council's response to NOAA, and that was another one, and it kind of highlights a couple of data needs there, from the council perspective. Those were two, and we're just using them more as reference. We're just using those four categories as maybe catch-all's. If they don't work, that's fine, and we're looking at trying to get your ideas down, and if you can just really say these are the top couple of things from each group.

That's always the hard part, is to get it down to, if you could do one or two, what would it be? That's the hard part. If we can just get going on that, I will walk around and help out, and we will pick up the notes, and there will be a report, Brian, from this meeting. I'm sure there was one from the other, but we just don't have that available just yet, but Pace is going to find it.

DR. WHITTLE: Roger, can you just email that to us, for the state leads, so that we can just fill it in?

MR. PUGLIESE: Those are the attachments, or the highlighted ones?

DR. WHITTLE: The highlighted one.

MR. PUGLIESE: I will email the highlighted version, because what I did is I walked through and kind of teased out some of those.

MR. GEER: Is everybody clear what we're going to do? All right. What I'm going to suggest now is let's take a ten-minute break. We will take a ten-minute break and get into our groups, and that will take us back to about 10:25, and we'll give you an hour. We'll discuss for about an hour, and then we'll get back together at 11:30 and report out. Let's take about a ten-minute break.

(Whereupon, a recess was taken.)

(The group went into Panel Member Breakout Sessions to Identify Priority Research and Data Needs)

DR. WHITTLE: For research, we have habitat mapping, artificial reef interaction with native habitat, incorporate all of this into fisheries models, and then also identify appropriate areas for habitat restoration. Incorporate environmental factors, including episodic and climate variables. Then, finally, land use/coastal ocean interaction, with an emphasis on manmade issues. An example is chemical markers in fertilizer, so you can track the cause and effect. I think you guys all know that Lake Okeechobee discharges, both to the east and west, cause major problems for our coast. Then also looking at -- Another example would be, at FPL, they have hot saline water that they discharge.

For monitoring and observing, we wanted to do some monitoring based on species function, and so the example would be forage fisheries, which we talked about yesterday, and also sediment bioturbation. We wanted to put an emphasis on fisheries-dependent monitoring information for recreational fisheries. I know that Florida has a huge emphasis on that right now, because that is a big hole in our models, our stock assessments.

We want to monitor for invasive species and how they affect the fisheries models and assume that invasive species have a negative impact, until proven otherwise. An emphasis on long-term water quality monitoring and offshore observing systems, extend SEAMAP to all of Florida, and require dive logbooks for dive operators.

For partnering, anyone who has funding, private foundations. We were talking about getting elected officials to do ride-alongs, so that they can become much more knowledgeable about what we do, and Captain Kelly said that they like having ride-alongs, and so he was volunteering for that. A lot of our actions will really depend on elected officials. Then, also, maybe implement a recreational diver fee for the sanctuary, like they have in pretty much every other country that I've been diving in.

Opportunities to leverage, we just had one, which is a greater emphasis on cooperative research, like NOAA cooperative grants, but also fishermen will take ride-alongs, and so, if you have graduate students or state people who want to do research, but it gets a lot to get out on the boats, to go along with the fishermen, and specifically the commercial fishermen. That's us. Any questions?

MR. GEER: Under research, we had forage species, coming up with an indices of abundance from existing surveys, doing more bottom mapping, looking at areas other than hard bottom, primarily golden tilefish habitat, and also validating hard bottom based on the models that are existing, the NOAA model off of Georgia, and mapping Grays Reef, which has been done, but maybe also mapping our artificial reefs, getting detailed maps of our artificial reefs.

We're not doing any gut content studies in our state waters, and so that would be interesting to have, and vulnerability indicators as well, coming up with those. Under monitoring, continuing doing acoustic tagging studies. Presently, we have a partnership with South Carolina to look at sturgeon under Section 6, and we would like to expand that to some of our artificial reefs and start tagging some of the species out there and see their interactions and migrations. Are they going from reef to reef, or are they hanging out on just one structure?

We talked about trying to incorporate video monitoring as a way of increasing our ability to assess what's out there. George had mentioned maybe attaching it to a buoy and looking at the pelagics and the bait species that are near the surface and looking at that. A buoy monitoring system. Right now, the state only has one off of our coast, and it's at Grays Reef, and maybe increasing the buoy monitoring systems.

Along with that, under leveraging, we had basically having -- If we are going to have buoy monitor monitoring systems, increase them, maybe have those buoys placed in association with artificial reefs or existing MPAs, so they're in those areas. Under leveraging, we talked about BOEM and their hurricane recovery work that they just recently completed, which has bathymetry and side-scan data from Florida to Maine.

Passive data collection, and there is a lot of vessels going a lot of places that they can collect bathymetry data for us very easily. It's easy to collect it. It's a matter of getting it off of those vessels, but I think that's a real simple way to get a lot of information, and Clark was saying the research vessels all have that and there's a depository for it, but our research vessels go everywhere in our state, and so do the other states as well, and so getting that information into a consistent database that everyone can have access to.

This is a really novel idea for leveraging. This is leveraging money. The Mid-Atlantic had, and they discontinued it for a while, but it was called a research set-aside. Species that had a quota, a certain percentage would be set aside, and it would be auctioned off. The money that was made from that auction could be used for research, and the premise behind it is what you were buying was, after the quota is caught, there's an additional 10 percent that's sitting there that you're buying and you can still fish, with the likelihood that the price would be higher then.

It worked for a number of years, and it's been discontinued, because they've had some problems with it, but NEMAP was funded for a number of years off of it, and so the idea behind that is to leverage some research dollars from some of these things, and they've had some problems there, and we've talked about what were those problems, but it's a novel way to potentially -- We talked mostly commercial, but could it be done recreationally as well? Basically, you're buying an extra fish. If the quota is 100,000 fish and they set aside 10,000 fish for this program, an individual would be buying the right to catch more fish and after the season closes.

It's a little controversial, but it funded some major work in the Mid-Atlantic, and so it may be worth looking at, as a way to leverage money, because we're not going to be getting any new money from NOAA or the states or anybody else. As far as partnerships, again, as Amber said, getting money, and we have to look for new places to get that money. One of the places may be fishing clubs. A lot of our fishing clubs in our state donate money for artificial reefs, and we talked about citizen science and trying to get them incorporated as partners, and the military, in our state, would be Kings Bay, the Navy base down in Kings Bay. Any questions? Okay. Thanks.

MS. DEATON: For North Carolina, under research, and we spent most of our time on that topic, and we have assess prevalence of endocrine-disrupting chemicals on managed species, do some toxic screening in selected species at various trophic levels, to assess how significant that may be affecting things.

Maintain biological sampling in the SEAMAP and MARMAP programs, cruise intensity and sampling, and we need dedicated staff to analyze data collected in long-term monitoring datasets such as those and others. DMF has a juvenile trawl survey, but we don't have -- We haven't taken staff time to do a lot of analysis on that, so that you can summarize the findings and report that back.

Inventory historical studies and repeat those to evaluate changes. If there was a study that was done a long time ago, then you could maybe pick it back up and just compare. Understanding specific habitat use and basic ecology and stock dynamics and abundance indices of the different species, especially forage species. There is a lot of gaps on that, and that's needed if you're going to really do the modeling on the food web.

Look at the effect of artificial reefs on fish populations. Does colonization matter? Effects of the geophysical seismic testing on reef fish and pelagics. I understand, in our discussions, there has been some research, but it's not out yet, and there is probably a need for me, especially like how it would affect behavior changes, and not just mortality, but those sub-lethal stress factors. Evaluate ecosystem effects on climate change. We talked about that yesterday a bit. Determine if habitat is limited for certain species. For example, for snowy grouper, it might be limited where they aggregate a lot, and that's a sign that there's not enough of that deepwater coral habitat for them. Then recruitment information is a black hole, where we could get more information that could help us to assess the health of the populations.

We kind of created a new category called data needs, which it could be monitoring, in some ways, or it could be research, but we just had a few of those, but some big ones. We need, as it was already said, I think, basic bathymetric maps of the entire EEZ, but for us in North Carolina, because we're the North Carolina group, with that multibeam side-scan data in the ocean, but we also have, in our estuaries -- The biggest mapping gap is with sub-tidal oyster reefs in Pamlico Sound, but I feel like, in our state, most of our habitats have been mapped fairly well.

Inventory and compile the various sources of that bathymetric data and coordinate future mapping efforts, and so, if there are all these entities out there getting little pieces of bathymetric data, we need to get that all in one central spot that can be put together accessible, and then we would see what was missing and sort of coordinate that, so efforts aren't wasted on doing areas that have already been done. That's it for data needs.

Monitoring, just long-term monitoring for environmental datasets, to help us look at the climate variability over time and a lot of things that affect fish populations. I had a note that, in particular, there is a gap in winter trawl surveys, and hint-hint to Wilson, and there is a need for long-term, continuous water quality monitoring, especially the datasets in the estuaries and the ocean that are really lacking, and we need a person to help pull that data together and calibrate it and make it accurate.

Partnering, we were using this framework that we were provided, which has pretty much all the agencies we could think of, although we added BOEM and USGS, and to reestablish a bottom-mapping committee that used to exist. Use already collected species from existing sampling programs to get your other information, like those toxic screenings, and cooperative research institutes, and we really didn't add anything to leveraging.

MR. GEIGER: First of all, I would like to acknowledge that Bill and I had the able assistance of Lora and Marcel and Roger in this exercise. We greatly appreciate that. Again, in the effort to not reinvent the wheel, we wanted to reemphasize the council comments on the roadmap climate comments and the workshop. Again, we had significant stakeholder input into that. We wanted to maximize and make sure we didn't lose that. In terms of research and monitoring, prioritize and fund existing fishery-independent data collection programs that we identified and that are critical to moving ahead with ecosystem-based fisheries management. Again, that's very, very important, to make sure that we're looking at that. I think the key words are "prioritize" and "fund". There is going to be some kind of process needed to do that.

Ongoing collection of biological, economic, and social data, including adequate basic data on landings, discards, et cetera, et cetera, and you all can read that. I think it's very, very important, and we need to continue that. Consistent data collection on a regional scale, I think we're trying to look at new forms of electronic data, but keep consistent data collection across the council area. We certainly had good examples that Bill brought up of inconsistent data collection related to some issues with red snapper. Bill, did you want to take the next one?

MR. PARKER: Actually, I was going to comment on consistent data collection. I know it sounds crazy, but there are vast differences between South Carolina's ongoing charter boat log system and North Carolina and Georgia and, in Florida, where most of the charter boat snapper grouper permits are issued, they are not required to submit charter boat log data.

The headboats do, but charter boats do not. I have been with the commissioner, Roy, many times to speak about that, and, of course, electronic data collection will supposedly help out in that, but it hasn't been done yet, and I've been going back and forth for about five years with it, but that will provide consistent data collection throughout the council's jurisdiction, and that is mainly what I was referring to with consistency. It will help around the whole -- It's very basic. When you start dealing with computer models and everything, you've got to have that basic information before you take off on different routes, and that's about it.

MR. GEIGER: We also talked about utilizing the existing survey platforms to evaluate and use new technologies, through various partnerships with federal, state, and private entities. Again, it's to promote and generate new biological and habitat data efficiently. Again, you have already invested in these resource platforms. You've got the personality and you've got the scheduling and you've got everything else, and why not utilize them for some of this new technology that is

basically almost labor independent and utilize that through partnerships? I think it's an excellent opportunity to stretch scarce dollars a little bit further.

Outreach training and education on the development and application and use of the various models, again, as models become more complex, it's contingent upon us to make sure that these are easily translatable and easily understood and easily appreciated by stakeholders. Once you lose credibility in a process or a model, it's hard to regain that credibility and understanding, and I think that's extremely important, especially now, as these systems become much more complex.

Ensure that existing models and technology can be easily translatable and defined. Again, that's a similar kind of thought, trying to, again, make sure that, as science and models become more complex, we are easily able to translate the outcomes of that that are easily understood and supported by the various stakeholders engaged, and I think we've heard this through various other groups as well. That's basically it from us. Thank you.

MR. GEER: Thanks for doing that. We appreciate it. I don't know how you guys -- If you like being in the big group or the small group, but I think, when you get into the small groups, there's a lot more interaction, and it's a lot more -- This group was very loud over here, but it was a very big group, but I thought that was very productive. Thank you very much for that. Let's get Louise set up. When the food gets here, we will go get it and come back in.

(Whereupon, a recess was taken.)

MR. GEER: Louise, you're from the South Atlantic Landscape Conservation Cooperative. I will get that sometime. Maybe I'm better off just saying the letters, but Louise is going to talk to us about the blueprint. Louise, you have the floor.

MS. VAUGHN: Hello, everyone. Welcome to your lunchtime matinee. I am happy to be here. I am going to be talking today a little bit about the South Atlantic LCC. I presented to the South Atlantic Council last spring, but I am just to going over, for those of you who are new, what is the LCC and what is the process that we follow. I'm going to talk specifically about our products, of which there are three, the indicators, our State of the South Atlantic, and our conservation blueprint. Then I am also going to talk about the Southeast Conservation Adaption Strategy, or SECAS, and what's been going on with that and an update about that.

The South Atlantic LCC is a forum. It's a place for really diverse partners to come together and develop a shared vision of landscape sustainability. It is a place for us to cooperate about implementation, meaning what is the best roles for each of us to take on, according to our organizational missions, and how can we collaborate in its refinement? By collaborate in its refinement, I mean that our plan is not a static map or a static plan. It's something that will change over time according to the opportunities and challenges as they occur, and so we need to be able to be agile to meet those opportunities and challenges and collaborate in our refinement over time.

LCCs form a network across North America. There are about twenty-two LCCs that cover the Pacific Islands and the Caribbean, as well as the areas that you see here. We are that beautiful light purple, and you will notice that we are one of the few LCCs that also consider the marine planning within our region. We go 200 miles out to the EEZ zone.

We are a large regional group. We are considering a specific ecosystem, and we work with other regional groups, such as the Climate Science Centers, NOAA's Regional Integrated Science and Assessment Programs, and USDA Climate Hubs. We are very lucky that the South Atlantic LCC staff is located in Raleigh, North Carolina, and so we get together regularly with people from the Climate Science Center, who are located about a mile away from us. Our science coordinator has regular meetings with folks from the USDA Climate Hub, and so it's a great place to be to collaborate with other groups.

We are governed by a very diverse steering committee. All these logos are representative of we have one person from each of these organizations serving on our steering committee. They are responsible for our strategic mission and where we're going. Roger Pugliese is one of our steering committee members, maybe the best, and I don't know if I can say that, but he's pretty good. Each steering committee member has an equal seat at the table, and so we're not the Longleaf Alliance's LCC or the U.S. Forest Service's LCC. We're all of these people's LCC, and each one of them has an equal seat and an equal say at the table.

We have a full-time staff of about seven, and our staff is really reflective of our cooperative nature. We get our funding from four different sources. The North Carolina Wildlife Resources Commission gives us office space, of which we're very thankful. The National Parks Service has funded one full-time staff member for us. The U.S. Department of Interior funds other people, and we recently have a new addition, Simeon Yurek, who is a USGS postdoc that's looking at coastal marine interactions for us over the next two-and-a-half years.

What do we do? Our mission is to facilitate conservation actions that sustain natural and cultural resources, as guided by a shared, adaptive blueprint. Our blueprint, which you see here, is a living spatial plan that identifies the best places for shared conservation actions across the landscape and seascape. The Conservation Blueprint 2.1, which is our current blueprint, is based on ecological and cultural resource indicators.

I am going to talk a little bit about the ways that the blueprint is being used. I think this is a really good way to understand what it is that we do and how our product can be used, and one way that the blueprint is being used is to amplify existing efforts already occurring on the ground. By this, I mean that, if LCCs did not exist, there would still be good and important conservation work happening, but, when we have a shared plan, we can actually say here is good work happening in very important areas. We need to bring in more money to support this work and demonstrate the impact of this work to the larger region.

One way that we've done this is we went after national funding from the Wildland Fire Resilient Landscapes Funding Program. They were looking at existing partnerships on the ground that were going to be able to do management to build resiliency and integrity within Longleaf Pine forest systems, and so we went after that funding source, and, to date, we've brought in \$2 million, and this money has been spent on the ground, on public, private, federal, and state lands that have been doing prescribed burning and important conservation work on the ground. I do want to point out that we're the only organization that managed to get this funding in the east. Everything else went out west, and so we were also very proud of that, to bring that funding source here.

The blueprint is also being used to anticipate and plan for change. While we know that there will be another major disaster, we just don't know when and where, but, sometime in the next couple

of years, there will be some sort of event that happens, and so how can we be best prepared to deal with that when it does?

One way to illustrate this point is that the National Fish and Wildlife Foundation, in the wake of Hurricane Sandy, was looking to do a prioritization along the Southeast Coast, so that, in the wake of another disaster, when funding sources became available, they would be able to act quickly. We started talking with them.

They were particularly interested in working in the Cape Fear Watershed, and so we were able to say, hey, we have a lot of people within our cooperative who are working in this area and you should connect with them, specifically the Cape Fear Partnership. You should be talking with them, and you should be thinking about the work that they're already doing on the ground and connect with them, and that's exactly what they did. Then they also used data from Nature Serve and the National Heritage Program to do a prioritization within that particular watershed, and they used our blueprint to do the rapid prioritization for the rest of the South Atlantic coast.

The blueprint is also being used to help people adapt to change to conservation actions, and the example I have for this is that we had a cooperative member who had an opportunity to do dam removal projects. He was working in western North Carolina, and that's the area that he was most familiar with. He knew, or he thought he knew, where he wanted to do a specific action, but, then, in looking at the conservation blueprint and looking at other plans in place, he actually decided to change where his project was, because he thought that he would have a larger conservation impact in areas that he was less familiar with, but the plans were saying might have a better outcome for what he was interested in.

I also want to talk a little bit about how we do what we do at the South Atlantic LCC, because it's kind of unique and interesting. At the South Atlantic LCC, we have made a conscientious effort to practice something called the Lean Startup Method. This was an approach to product development developed by tech companies. It was used by Toyota in the early 1990s as their approach for auto manufacturing, and the idea behind the Lean Startup Method is that you spend a minimal amount of time in your product development cycle and you spend the majority of your time in your revision cycle.

We have adapted this, and we feel like it's very similar to the adaptive management cycle. We actually call it adaptive management fast and furious, and, basically, it's great. It means we're always in some sort of revision cycle. We're always revising, and, yes, we do put out imperfect products. We know they're imperfect, and we try to tackle those problems and get as much feedback as we can and revise, revise, revise.

One of the ways that we've really worked to make the Lean Startup Cycle our own is that we engage our cooperative members, all 800-plus of them, in everything. You might see one person here in this room that is up on the screen right now, and so we're only a staff of seven, and we have a lot of things we need to do, and so we really reach out to our cooperative community in all parts of our cycle, and we rely on our cooperative community for everything. They're our idea generators, and they're our product testers. They are our reviewers, and they're our source of experts, and they're always involved and they're always engaged. Because we are in a constant cycle of revision, we are always reaching out to them in new ways.

Just to give you a sense of our Lean Startup and what that really means, I wanted to go back in time and show you our first conservation blueprint. This is Conservation Blueprint 1.0, and this is an expert-driven plan that was prioritizing sub-watersheds, and this was released about three years ago. We hosted a bunch of workshops, and we gathered feedback from these workshops. People identified areas that they thought should be high priority, and we integrated existing conservation plans, and this is what gave us Blueprint 1.0. This was not where we wanted to go, but this was our starting point.

The next year, we released Conservation Blueprint 2.0. This is a data-driven plan and our first attempt at using spatial data indicators to drive this plan. This past summer, we released Blueprint 2.1. This was refining some of the indicators from 2.0, and this is our current blueprint. This next year, we will be releasing 2.2, and, again, we're updating some of our indicators. I just wanted to show you where we started three years ago and where we're at today.

That leads us into what exactly do we offer and what are our products, of which there are three. We have our indicators, our State of the South Atlantic, and our conservation blueprint itself. At the foundation of everything we do, we have our indicators, and they are meant to represent ecosystem integrity and intact cultural landscapes. We have approximately thirty indicators. They are reviewed and tested regularly. They are reviewed by members of our cooperative.

We use our indicators to inform our State of the South Atlantic. This is a report card. This is actually a magazine. I passed this out at the last meeting, and I'm sorry I don't have more to share now, but this is a report-card-style assessment of our ecosystem as a whole, and so what you're seeing right now is, in general, the South Atlantic region, according to our indicators, scored an overall score of a C. We also go and we break this down by ecosystem and provide grades for each ecosystem according to our indicators, and, if you're interested, I will show you how to get to this digital copy of this, and I will be happy to share the one copy that I did bring too, whichever lucky member gets it.

Then, finally, we have Blueprint 2.1. and, again, this is informed by our indicators, and I just wanted to talk a little bit, very quickly, about how we develop our blueprint. The first thing we do is we break up our landscape into ecosystems, and you will notice that there is three ecosystem types at the bottom that aren't really so much ecosystems, but they are habitat aggregates, and these drape over the entire system and are meant to count for interconnectivity.

For each ecosystem, we come up with about three indicators. Indicators are meant to represent different characteristics of an ecosystem's ecological integrity, and so one indicator is not an endpoint of ecological integrity in and of itself, but, taken together as a whole, they're accounting for ecological integrity and cultural resources.

Each indicator is spatially modeled based on existing data. We don't want to replicate the good work of others. We want to use what is readily available, and so we try to use whatever existing data we can, and we process that at the 200-meter-by-200-meter scale, and each indicator is reviewed by our cooperative on voluntary indicator review teams. I think there's some people here who have served on those teams, and this is our chance that, once we put forth an indicator, we actually have our experts, people in our cooperative, review it and say, hey, this looks right or, hey, you need to continue working on this.

How we put it all together is we take our indicators that are representative of each ecosystem, and so imagine we have an ecosystem, such as upland hardwoods, and then we also take our ecosystems from those habitat aggregates, and so for landscapes, waterscapes, freshwater aquatic, and we run them through a conservation planning software called Zonation.

Zonation operates off the assumption that protecting everything would be the best for conservation. Then what it does is that it iteratively removes pixels with the least amount of value that will cause the least amount of loss, and remember our pixel value is derived from our indicators. What it does is that it assigns a pixel for each part of the landscape and says which pixel can I take away that will result in the least amount of loss overall, and it goes through that, and the output of this is a prioritization for our entire landscape and seascape.

We then use Linkage Mapper, which is an ArcGIS package that is able to come up with corridors between large hubs of high-integrity land and large protected areas, least a least cost path analysis. Again, we use the indicator outputs from Zonation to kind of inform that least cost path analysis, and so it's looking at, hey, I need to connect this large hub with this large hub and how do I do that, what is the best route, and we put this together to create 2.1 and 2.2 and 2.0. This is how we've created these past couple of blueprints.

What we're ultimately doing is we're prioritizing 50 percent of our landscape. We take 10 percent of our landscape in the best condition, and this is what is our highest priority. We look at the next 15 percent of our landscape in the next best condition and still we're looking at the highest score, based on Zonation, and we're calling that high priority. We're taking 20 percent of area that is above average, that's medium priority, and then corridors account for 5 percent of our total area, and that is how we get the blueprint. This is just, again, to show you what that looks like. It looks like this. The gray is the corridors, and that's 5 percent of our landscape. That dark purple is our highest priority.

Improvements to marine indicators from Blueprint 2.0 to 2.1 are, in 2.0, we had three indicators of potential hard bottom condition, primary productivity, and marine turtles and mammals. We found that primary productivity was not performing as we had hoped it would. It was identifying really good areas as well as really poor areas, and, in Blueprint 2.1. we revised our indicators. We kept potential hard bottom condition and marine mammals. Marine mammals is actually a new indicator. It's coming from the Duke Marine Labs, and it is looking at seasonal distribution of dolphins and whales across the South Atlantic. Duke Marine Lab continues to do great work, and we hope, within the next year or two, to be able to incorporate more of their work into our marine environment.

Again, we're working to improve the connections between coastal actions and marine impacts of the conservation blueprint. One of the other tools we're working on right now is what we call action indicator models, meaning, if I take a specific action, how will that be reflected within the indicators for a specific environment. We are working on a collaborative project with coastal marine models. For more information, you should talk to Roger Pugliese about this project and endeavor, but we're trying to work as hard as we can to think about what happens when we do specific actions along the coast and how does that impact the marine environment.

We also have recently brought on a new staff member serving as a postdoc, Simeon Yurek, and he is working to improve spatial planning of the coastal habitats and their ability to provide resiliency

against severe weather events, such as tropical storms and flooding. He's using a combination of hydrodynamic and ecological modeling, including interactions with the fisheries management and harvest, and his ultimate goal is to quantify the value of those habitats, both in terms of economics and coastal protection. He just started a couple of months ago, and he's trying to reach out to as many people as he can to start his project, and we hope to be able to see results of some of his research in the next year-and-a-half.

Now that I've showed you all these data products, you might be wondering, well, how can I find them, and we offer two ways for you to access our indicators, our blueprint, threats that we consider, and those two ways are through our conservation planning atlas. I call the conservation planning atlas kind of like an every man's GIS. It's an online viewer. You don't have to sign up for anything, and you can quickly go and explore our conservation blueprint, all of our indicators.

It has metadata and great descriptions attached to it. You can explore it on an online viewer, and, a lot of times, you can download the data. If you do choose to sign in, you can download all of the data offered, and it's not just our products that are on there, but it's also datasets from the Nature Conservancy, their protected areas dataset, and there's urbanization across the Southeast. There's lots of great regional datasets on there.

We also have the simple viewer, and the simple viewer is our easy, intuitive way to kind of explore the conservation blueprint a little bit different and peel back some of the layers to understand it. Just to give you a quick demonstration, you can just google "South Atlantic LCC", and this will take you to our homepage, and you can learn about some of the projects we're funding, what we're doing, how we do it. If you just click on the conservation blueprint, it will take you to our blueprint homepage. You can see who has been using the blueprint and you can explore the blueprint in our simple viewer and access the data in the conservation planning atlas.

We spent a lot of time trying to make it as easy as possible for people to access our products. You can go online to our conservation planning atlas, and you can learn more about our ecosystem indicators, our threats, and, again, we just try to make this as easy as possible, and so let's look at marine mammals and find out a little bit more about that.

You have a description of what this indicator is, the reason it was selected, the input data, what was used to actually generate this dataset, and you can open it up and explore it on your own within this online viewer. You can also download this for your own ArcGIS desktop. Once you open up the map, and I won't do that right now, you can quickly make a PowerPoint that will have credits and it will have the legend and everything already done for you, and so if you're ever in a rush and you need to make a map really quickly, and maybe you don't want to go through the trouble of opening up ArcGIS on your own desktop, or maybe your GIS analyst is just out of the office, this is why I call it the quick and easy every man's GIS. It's just an easy, easy tool.

You can also explore the blueprint in our simple viewer, and our simple viewer is really great. It's often the first place I go to check out certain areas. Basically, with the simple viewer, you can click "inland" on a sub-watershed, a HUC 12 watershed, or you can go out to the marine environment and click on a lease block. You can click on something and see how much blueprint occurs within that area or sub-watershed here. You can learn more about what it means to be highest priority and high priority.

My favorite is probably that you can look and see which ecosystems occur within there and which indicator is occurring in there and how well that indicator is doing. You can learn a little bit more about, for example, coastal condition and what is that indicator exactly, and, within this particular watershed, we see that 100 percent of this indicator is in the highest value greater than four, and that's a good condition for index water quality, sediment quality, and benthic community condition. If you still wanted to learn more about coastal condition, you could just click on the name, and it would take you back to the conservation planning atlas, and, again, you could look at the description, where the input data came from and more.

These are our online tools that we hope are helpful. Just like we're revising everything, we're always revising our tools to make them better. We will be working, over the course of the next year, to try to improve our simple viewer, in particular.

If you want to learn more about what kind of projects that the blueprint has been used for, you can actually look for this icon as well on our conservation blueprint homepage, and you can see actual stories, and the people themselves have their names, and you can contact them yourself to see how they've used the blueprint and how it's helpful. So far, the blueprint has been used to help with National Wildlife Refuge planning and coastal wetlands protection for grants and climate-smart wildlife management. It's been used for riparian forest and coastal wetlands protection. There's a lot of case studies we have about people using the blueprint.

My role at the South Atlantic LCC is user support, and I'm one of two fulltime staff members that my entire job is to help you use the blueprint. If you would like to go after a funding source, a grant or something, we will help you integrate the blueprint into that proposal and help craft language around the blueprint to make your proposal as competitive as possible. We will do analysis. We will make maps for you. We will ask you for your feedback, as much as possible, of how we can improve the blueprint. User support is pretty great, and please contact me. I have cards, and my email will be at the end of this presentation.

The next steps for the South Atlantic LCC is every year or every other year, we try to hold workshops. These are times and forums for people to come together and give us feedback on our current blueprint and to talk a little bit about some other projects that we have going on. This year, our workshops will be held this spring, and we'll be hitting the cities of Richmond, Raleigh, Columbia, Charleston, Atlanta, and Tallahassee. Roger Pugliese will have more information when we set those dates permanently, and he will be able to give you guys that information. Please come to the workshops. They're really fun. They're really great. They're great places to network, and they are really interesting, and they're really important for us to get people's feedback.

We will also be releasing, this late spring, Blueprint 2.2, which is a minor revision. It will be reviewed during these workshops and released later on this summer. The minor revision is that we are really only updating two datasets for our indicators, specifically resilient biodiversity hotspots, and that is in our landscapes habitat aggregate ecosystem, and beach birds within our beach and dune ecosystem. We will also be doing improvements to our online tools to access the data.

The next thing I'm going to talk about, I'm going to switch gears a little bit and talk about the Southeastern Conservation Adaption Strategy and what that is. I am not sure how many of you have heard about it or have been involved in SECAS. Recently, SECAS Blueprint Version 1 was

released at the Southeastern Association of Fish and Wildlife Agencies, this past summer, and so I will talk a little bit about Blueprint 1.0 and what this is.

You might have noticed, from my presentation, that the South Atlantic LCC, our geography spans about five states, and yet it doesn't cover any one state in all of its entirety. Actually, you might notice that Virginia is actually part of three LCCs, the North Atlantic, the Appalachian, and the South Atlantic LCC.

We follow ecoregions, and this might be somewhat of a challenge if you're a state agency. What good does 25 percent of your landscape being in a prioritization do? What if you're interested in a land acquisition project but you're somewhere where you have a boundary overlap? What if you're a state agency and you're looking at the best area for your state, and how does this really help you? Should you be talking to four different LCCs or three different LCCs? How does that work? How do you integrate all of those plans and those planning efforts?

Again, also, each LCC, we all have a common goal in mind, is for a conservation plan, but we all go about it a little bit differently. SECAS is kind of the answer to these questions. It is a regional look. It's trying to provide a regional blueprint and seeing together all the different efforts by the different LCCs over fifteen states.

SECAS is ultimately a collaborative process. It's a common understanding of ecosystems, one common approach, one shared vision, and the shared responsibility for the implementation of that vision, and so it's very similar to the South Atlantic LCC and what we want to do, but it's just at a much bigger, bigger scale.

Why SECAS? Why do we need to organize ourselves like this? Well, I'm sure I don't have to tell this group about all of the challenges that are coming. There's urbanization and climate change and severe weather events. Those don't impact one organization or one individual. They impact us all.

There is also ongoing potential impacts to conservation, like potential energy exploration and climate stresses, and, ultimately SECAS was initiated by the states. It was initiated by the Southeast Association of Fish and Wildlife Agencies. They need this large regional plan. It's inclusive of our federal agencies, specifically the Southeastern Natural Resources Leadership Group. It is implemented through the LCCs. We coordinate through Climate Science Centers, and we incorporate a large network of partners from diverse sectors.

The vision of SECAS is, through diverse partnerships working together, we are going to design and achieve a connected network of landscapes and seascapes. Together, federal, state, nonprofit, and private organizations are coordinating their conservation actions and investments to focus on common goals. Again, it's very similar to what we do at the South Atlantic LCC, but just at a much wider scale.

SECAS, over the past about two years, all of the science coordinators from the LCCs, from our neighboring LCCs within this region, have been getting together to integrate their conservation plans into one blueprint, and this blueprint is meant to be a living map showing shared priorities for conservation and restoration. It is integrating all the blueprints from LCCs covering the South,

and Version 1.0 is leaving plenty of room for improvement. Just like we're practicing an iterative cycle with our blueprint and updates to it, so is SECAS.

This is what it looks like. Isn't it ugly? It's a pretty terrible map. This is what it looks like when you take all the LCC plans over the various states and put them together, and so this left a lot of questions about how are we going to integrate these plans, and so LCC staff, particularly our science coordinators, worked really hard over the past year, and had many, many different discussions, and they talked about how to integrate these plans.

Some major questions were, well, how much to include and what do we do about overlap zones, but, ultimately, the Southeastern Association of Fish and Wildlife Agencies and the Southeast Natural Resource Leadership Group, those points of contact, made the final decision on what kind of approach to take.

What they ended up doing was they cross-walked each LCC blueprint to get the areas of high, and so, in our LCC, it's our highest and high priorities and medium ecological value, and so, ultimately, we're taking 50 percent of the prioritization from each LCC area. For areas of overlap, we're going to go ahead and include it if either plan identifies it, and they're going to revisit this approach during next year's revision cycle.

This is then what it looks like. This is the SECAS Blueprint 1.0, which is a little bit more palatable. It's still a lot of prioritization going on, but it makes it a little bit easier to see, and you can parse down SECAS Blueprint 1.0. You can also just say, hey, what if I was to look at all the private lands and see if maybe I am interested in giving potential economic incentives to private landowners, and you can parse it down even more and say like maybe I'm interested in giving potential economic incentives to private landowners that have cropland. You can look and see how much that is, and so there is different ways that you can parse it down.

There is a lot of caveats. Again, this is 1.0, and so there is lots of room for improvement. One of the caveats is that all the areas in blue do not represent the same things. Our indicators are unique to the South Atlantic LCC. They are not necessarily shared by the Appalachian LCC or the Gulf Coastal Plains and Ozarks. We all do things a little bit differently, and so it doesn't mean what's in blue is representative in North Carolina and it's the same thing that is representative in Texas. The methods may differ, but some datasets are consistently used.

Specific outcomes are not defined for all the individual areas. We don't know exactly what we will be doing in all the blue. We haven't ascribed conservation actions to all of the area, but we do have common strategies and actions that are broadly applicable, and, again, the blueprint is constantly evolving, and so it will be updated.

Future threats, like urbanization and sea level rise, are only included in some of the plans. Again, each LCC has a different methodology, and so some of them consider threats and some of them don't. The blueprint provides value as a region-wide perspective on conservation priorities, but, if you really want to use it, you might have to zoom in and be a little bit nimble with your analysis. There is lots of work that has occurred to get to this point, but there is a still a lot more that's left to do.

The SECAS blueprint was released at the SEAFWA meeting this past November, and the highest priority for the next update will be identifying priorities for action for the next ten years, in the face of future change, and improving our consistency in methods and approaches, and this update will be released at the next SEAFWA meeting in 2017. That is my presentation. Are there any questions?

MR. GEER: Any questions for Louise? I'm sure there is going to be some.

DR. ALEXANDER: I am interested. You talk about not wanting to reinvent the wheel and use all existing datasets that you can get your hands on. How do you guys quality control these large datasets that you're just sort of consuming?

MS. VAUGHN: That is a very good question. Our goal is to not create any new datasets for ourselves, but, if we see a gap, a knowledge gap or a research gap, we will fund a project. One example is one of our indicators of priority amphibian and reptile conservation areas, which is -- That is a dataset that we did fund, because we just couldn't find a good enough dataset that was capturing reptiles and amphibians across our area in those priority places. While we try to use existing data, if it's not existing, we will fund a project to create it.

Also, each indicator goes through three tests. One, it has to be practical. It has to be in existence, and it has to be there. It has to be able to be used. We do hold ourselves to one constraint, and that is that we try to use regional datasets. We can't just use -- For example, there might be a really great dataset in southeastern North Carolina that's only applicable to that area, and we won't be able to use that, because we're looking across the region.

We also have a test, and we call it our ecological test, and so we regularly do testing. Our science coordinator and other researchers are always testing to say, hey, is this indicator representative of what we think it is? For one example, one of our indicators was sea turtle nesting sites, and we found, through a previous postdoc, Brad Pickens, and he went out and talked to a lot of biologists and said, well, we move nest sites a lot, and it's not really necessarily a measure of high-quality habitat. It's more of a measure of site fidelity, and that's really not what we're trying to get at, and so that failed our ecological practical set, and so we didn't use that.

A lot of our datasets are not perfect, but I really do believe, through that regular testing and through the review cycle, working with our cooperative members and kind of throwing it out on the table, we're able -- That helps out with quality control quite a bit, and then also, as user support, when I'm working with our cooperative members about how to use the blueprint, I will tap into indicators and say maybe you're within medium priority of the blueprint, but you're doing exceedingly well for certain kinds of indicators, and, through that use, our own staff use of our products, whenever we see problems, we regularly go and report them.

For example, and I'll be honest. If I had all the time and money in the world, I would probably improve our regularly burned indicator. I think that we could be doing a better job on that, and I know that from a project that I was working with a user team on of saying this isn't really capturing exactly what we need it to be, and all of our staff feels that way. I mean, we have regular discussions of what our favorite and least favorite indicator is, but the idea is that each year, over time, we'll be doing better and better.

MR. GEIGER: Louise, thank you for the presentation. I have three questions, if I can. Number one is what was your total budget for this fiscal year? Secondly, of that total budget, how many of those dollars went to on-the-ground projects? Third, if you had to identify your three highest resource outcomes since your inception, what would they be? Thank you.

MS. VAUGHN: Wow, those are three good questions. The first and second question is actually easy for me. I am not sure of what our total annual budget is, and that is because that would probably be a better question for our coordinator, science coordinator. I actually work specifically under NC State, and I work with the South Atlantic LCC, and so I am not privy to the exact budget details. That really knocks out your first and second question really easily. However, I can put you in contact with somebody who does have that information. Then the third question was what was --

MR. GEIGER: Since your inception, what would you identify as your three most significant resource outcomes and not outputs? Thank you.

MS. VAUGHN: So what benefit have we really brought to our area? Am I understanding you correctly? The Wildland Fire Resilience Landscape Program was a huge win. Bringing in that money to our region was a great thing, and we're continuing to bring in money into our region. I was actually at a meeting at the National Fish and Wildlife Foundation, and there was a gentleman there who was actually working in the White House when they were developing this program. After the presentation, he said, that is what we were looking for. That is exactly the type of partnership that we were trying to target, people working on the ground, and so we've been able to, through our cooperative and through the blueprint, bring in a national funding source that might not have been otherwise available to our region, and so I consider that a win.

Also, the ability to demonstrate people's work on the ground. Again, as I mentioned before, people are doing great work for their organizations, and they've been doing great work, but the ability to demonstrate that, specifically through what we're working on now, that we have these consistent indicators, is to be able to do what we call our action indicator models, and we've made significant progress. I wish I had brought a couple of slides for that, but we've made significant progress showing, if I do this specific action, this is how it will change this specific indicator and this is how our partners and our cooperative members on the ground can show that.

Then I think another significant contribution we've made on the ground is actually just bringing people together in a forum, and so the ability to have a group like NFWF come in and say we want to do this rapid prioritization of the south and we want to look at the Cape Fear and say, hey, you need to talk to the people working here, I think it's huge. I think that really demonstrates that we are a forum and that we're -- I call it matchmaking, actually, to be able to say this is a group that needs this. They're doing great work, and how can we connect them to the places they need to go?

I think actually bringing in funding and bringing in partners and putting them together, so that they can do great work on the ground, is a huge benefit to the area. Part of our mission is we want to clear barriers to conservation actions, and so we recognize that we don't actually do conservation action. We're just trying to clear any barriers to it, to help people be as successful as they can and also measure that success and report it and demonstrate it out.

MR. HOOKER: Going back to the priorities that are going to come out of SEAFWA, can you explain what -- I know AFWA, only within the past few years, added like an ocean committee, I think, and how do you feel like the ocean resources are represented at SEAFWA, at the regional AFWA group? Is it good? Are they interested in the ocean, or is it primarily terrestrial things they're looking at?

MS. VAUGHN: As you can see from the map, the South Atlantic LCC is the only LCC in this region that was considering marine planning, and we fought really hard to make sure that was also included in the SECAS Blueprint 1.0. A lot of that has to do with the people right here. Roger Pugliese is on our steering committee, and our commitment to work in the marine zone.

That being said, this will be an iterative plan, and so, as you can see for yourself, we're the only area that has marine prioritization there, but, from what I understand, I think Florida is right behind us in also considering the marine area as well, and so this is 1.0, and I am hopeful that we're helping to pave the way for other people to start doing marine planning as well.

MR. HOOKER: Just a quick follow-up. Is there any indication yet of how the research priorities that will be developed under Blueprint -- Is it 2.0 that they're going to be developing research priorities for? I guess the research prioritization aspect is just intriguing to me, and I didn't know if you had any more information about that.

MS. VAUGHN: Well, it's prioritization for conservation actions and not necessarily -- Although that is based upon research and good science available, and I know that Gulf RESTORE project is very active, and there's a lot of money going toward science on the ground, and so whether that will inform SECAS Blueprint 2.0, I am not certain. I think the best person to contact would be John Terpak about that.

MR. GEER: I have somewhat of a follow-up to that. I was just kind of curious, with a staff of seven, could you give me an estimate of how much time the staff spends on estuarine and coastal habitats? You are covering a very large area, and I was just kind of curious. Obviously, you're spending a fair amount. You're spending more time than the other LCCs, and so I was just kind of curious, and could you put that in a ballpark amount?

MS. VAUGHN: It would depend on our year and our direction from the steering committee.

MR. GEER: How about this year?

MS. VAUGHN: This year, we're spending, I think, a smaller percentage of our time, about 30 percent of our time, on improving the blueprint, and the majority of our time is going to be spent in supporting people to use the blueprint and to get conservation actions on the ground. If that is happening on coastal marine work, it's a little bit opportunistic, but I would say -- With Simeon Yurek onboard too as a postdoc, he's working fulltime on the estuarine, coastal, and marine system. It's always part of our consideration.

I mean, we knew we were behind in that as well, but, for Blueprint 1.0, we held separate workshops for the marine environment. It was definitely part of our workshops for 2.0. and so they're always part of our consideration, but they are large environments. I guess, if I had a ballpark this year, maybe --

MR. PUGLIESE: I think, especially this year, there was a lot, because of the integration of the marine mammal extensive detailed information that had been developed and is consumed and integrated into the blueprint efforts. The activities that were ongoing with, as she indicated before, the support of the development of ecosystem models, integrated ecosystem models, that's actually funding that's coming through the LCC exclusively with the partners, and so that's going to inform both the indicators plus support and connect to the fishery ecosystem plan.

I think there is a lot that has happened this year, to set the stage for even more to happen, especially with the upcoming workshops and the modeling capabilities, and also really refining how both the blueprint and integrating it into SECAS, especially when it integrates the Florida Peninsula, integrates directly with the fishery ecosystem plan, because that's kind of the intent of this, is that it's going to be part and connected to our fishery ecosystem plan efforts.

MR. GEER: I want to thank you and applaud you for that. Given the size of the area you're covering and all the other research being done in freshwater fisheries and all of the other things going on, to be spending the percentage of the time you're doing I think is great, and so I just kind of -- It seemed like it was a high percentage, but it's good to see.

MS. VAUGH: I guess Simeon Yurek, our staff who has come onboard now, that will be his primary focus for the next two years, and he has actually been great. He's networking with a lot of good folks, and really, kind of thinking through, I think we'll make a lot of progress getting towards, if you do this action around a coastal system, how does that reflect back?

MR. GEER: A lot of times in the past, it seems like things are going along, and then it hits the coast and just stops, and so it's really good to see.

MR. PUGLIESE: Then I think the one thing that's key too is the South Atlantic has really been trying to lead the way in making this the biggest view, the scope, from if you're really, truly looking at the entire ecosystem, the scope of deepwater to the mountains and the entire system, and so it really feeds into the broader scope of ecosystem management and ecosystem conservation and really understanding connectivity.

That's one of the biggest things. Members that participated directly in the food web and connectivity section development, as I indicated, are really guiding where we go with the future, and, as she said, one of the dedicated connections is going to be working on that ecosystem model, to make tools, et cetera, and so I think things are evolving, and I think we're going to make this even more refined and lead the way for really looking at coverage that will cover the entire system, especially when we get into SECAS partnership and expansion into the Florida Peninsula and connectivity with them.

DR. ALEXANDER: I was just curious. Since you are trying to combine everything together, are there any plans to try to develop consistent indicators across the U.S.?

MS. VAUGHN: I think that's one thing that our science coordinators have been talking about, and some of the indicators are consistent across LCCs. It is a challenge to get an indicator that's consistent across all of the ecosystems, but, again, going back to using existing datasets, the biodiversity resilient hotspots, that's one of our indicators, and that's developed by TNC. That is

available for the South Atlantic, and I believe it's available for the North as well, the North Atlantic as well.

I'm not quite sure how far it extends, but I know that TNC has put a lot of work into that, and so I can imagine, if that extended to the entire realm of SECAS, that that might be a potential indicator that people use. Not all the LCCs use indicators in the same way that we do, and so that different methodology might be tricky, but I think, as they get closer to having consistent goals and what kind of actions that they want to target, we might start seeing that consistency of measurement as well.

MR. BOSTON: I just wanted to say, and Roger mentioned it, but the Ecopath/Ecosim model is being funded by the LCC for the South Atlantic, and so it's not just that time commitment, but there is actually dollar commitment there too, and I just think that that -- It's not that they have a lot of dollars, but, in terms of a priority, it says, wow, that took a big chunk of one year's budget to really fund that, and so I think there's a strong commitment to that.

The other piece that I would say, and Louise mentioned it, but, in March and April, absolutely make sure you get to the workshops on the marine indicator pieces, because I think it's real important to get that view. If it requires even having a special workshop or something for that or whatever, but we definitely need to get that coastal perspective into the plan, because we're getting real close, and so Roger, I think, is going to reach out to everybody and make sure that you're aware of them, but do come to those workshops. They are great. You will learn a lot about the blueprint itself, but you will also be able to advance our knowledge and make the blueprint better, through participation. It's a pretty cool project, and so thanks.

MR. GEER: Okay. Any more questions for Louise?

MR. BUSH: Thank you for the presentation, Louise. It was very impressive. One of the things that we discussed with a whole lot of people in here that are much smarter than I am is that a lot of things already exist, and it's a matter of plugging people in to where that data is already at, and that's a challenge we continually face. Finding at least one conduit to get those two groups together, whether it be built on or whether it be sufficient as is, it's awesome to see that. Thank you.

MS. VAUGHN: I actually have a question. The gentleman in the corner who asked what are the three things that I feel like we've really contributed to, I would be interested to pose that to our steering committee, because I know what I have been really enthused about and what I thought is good work, but I was just wondering, Roger, if you agree, or is there another project?

MR. PUGLIESE: With the ones that you had cited?

MS. VAUGHN: Yes, or if there was another one that you were thinking of.

MR. PUGLIESE: No, I think you highlighted -- From the marine perspective, you highlighted some of the key ones, in working with the Cape Fear and working with a number of these different ones. Really, just showing the example of how it affected the inland area with the fire is massive, and bringing \$2 million into a system that really advances directives, and I think that's because of

the way this process has evolved to move this forward, and so I think you kind of hit pretty core ones on target, for me at least. I see that, and I think what we're going to see is this only get better.

I think that idea of keeping things moving has been very powerful. That Lean Startup thing is a very powerful tool, and what I can envision is, especially on the marine side, the indicator revisions, and I can see a lot of the -- Some of the spatial information, a lot of it is foundational information connected to our habitat distributions, essential fish habitat and areas of particular concern distribution, and so we're tied very closely with a lot of the foundational information that is supporting the marine side, and that's only going to be refined as we get into -- We're going to be discussing a little bit more about some of the mapping discussions and things like that that will feed this with even better information and advance it farther, and, again, I think building that connectivity really emphasizes that whole view that we're looking at. Yes, back to your original question, I think you've highlighted probably the ones that I think are really key steps forward.

MR. GEER: All right. Louise, thank you very much. That was great. Are you going to be around the rest of the day?

MS. VAUGHN: Yes, I will.

MR. GEER: Okay, and so, if you have any other questions, talk to Louise. Catch up with her, and very good job. We appreciate it. Who is up next? We're going to go into GIS to Support a Developing Mapping Strategy. We need a timeout first though.

(Whereupon, a recess was taken.)

MR. GEER: All right, guys. We'll get going. It's a bad thing to keep people from lunch, and it's a worse thing to keep people from going home, and I promised you guys that we would try to get out of here by 2:30, and so we're going to try to see what we can do with that. The last item on the agenda is GIS support, and Roger is going to give a few words and then Tina is going to give a presentation. Roger, you have the floor.

MR. PUGLIESE: I will be quick. As I mentioned earlier, as part of the fishery ecosystem plan and tool support for this, we're building a mapping strategy for the South Atlantic region. As part of the effort, what we are going to do is begin to connect some of the information systems that we've been building over a number of years and look at map distribution relative to managed areas, relative to species information, so we can begin to utilize that to create a prioritization capabilities in the region, assets in the region, and really have something that's going to be a functional strategy that provides it through the plan as well as a very highlighted component on the atlas and in the digital dashboard, so that we can guide, as with some of the discussions we had earlier, guiding future mapping efforts in the region toward priority areas within various depths, various habitats, various types. What I'm going to do is pass it over to Tina to build on what we've started as kind of the first step in that process.

MS. UDOUJ: I'm Tina Udouj from the Fish and Wildlife Research Institute, and I've been working with Roger for several years now, and I know a lot of you have seen my talk before, and so I've kind of changed it and tried to shorten it and really get you out of here on time. Just a quick overview of what I'll be talking about, just a little background on our work, and then I will go into habitat depth zones, EFH, species distributions, and managed areas.

As I mentioned, I've been working with Roger for quite a while, and we have been compiling and/or creating GIS data relevant to their management needs for the last several years, and these are some of the data layers that we have compiled related to their management and their restrictions and where species are occurring and the HAPCs for coral and unique habitats in the area, general habitats, and imagery of different sources, like nautical charts or multibeam surveys.

These are some of the groups that we've worked with to compile the GIS data over the years, and I think that's well representative of the people in the room. The digital dashboard, if you have not seen it, I encourage you to check it out, because this is a one-stop shop for all of the GIS data that we've compiled thus far. It has also got some more information about projects that are going on in the region, the South Atlantic Council's partners that they've been working with, and you can access the GIS data and the web mapping applications here.

The GIS data is available through map services. We have a data catalog where you can download the data. We're experimenting with ArcGIS online. We're trying to figure out how to share data via that avenue, and that's interesting, and we're still kind of trying to figure that one out. Then there is also a new template that ArcGIS is offering called Story Maps, and I will show you a couple of examples of those.

Quickly, the map services can be accessed on one page. You can get all the information. The images are linked to the REST service endpoint for each map service, so you can get more information about what that particular map service is showing. You can see all the layers that are available. When you click on a particular layer of interest, you can learn more information about that layer. The data catalog is an easy way to access the data, if you want to do your own analysis, and most of the South Atlantic Council-related data is here. Not all of our layers are available, and we would want you to go to the original source for those.

When the FEP writing team met here in June of this year, there was discussion about classifying bathymetry based on habitat zones, and so the Nature Conservancy did a big project in the last few years called the South Atlantic Bight Marine Assessment, and one of the products that came out of that was a new bathymetry layer, and so I took -- I worked with that data and reclassified it, but this is just a little background on what that effort took. They spent a lot of time on interpolating some data soundings and really created a nice, seamless bathymetry layer for our region. It doesn't encompass all of the SAFMC jurisdictional area, but it was a good starting point for us.

In their project, they classified habitat zones kind of based on more traditional oceanic terms. Then, with our FEP writing team, we kind of -- Working with George and Marcel, with their input, we decided to look at dividing the bathymetry layer into the zones on the right. There is some that are similar, and some are different, and we are really fine-tuning the shelf itself, breaking it down a little more.

I took the newly-classified bathymetry data and intersected it with the reef fish survey, and so looking at species across these zones, and the following tables will just kind of show you the highlights of which zones had the most species richness, and it was the shelf edge, followed by the outer shelf. Abundance was highest in the mid-shelf, and the biomass was highest in the outer shelf.

Then these are just the top five species across each depth zone. There's lots of black sea bass out there and lots of tomtates and vermilion snapper. Then the last zone is on the following slide, and blackbelly rosefish reigned supreme in the last bathymetry zone that we had data that intersected with the reef fish survey.

For EFH, some updates have happened since I last talked with you guys. Pace provided some information on permits that are happening in the area for 2015, and we linked this point data file with the consultation letters and if EFH was affected or not, and so that is available through the EFH map service now, and then we also refined the EFH layers for coral and snapper grouper to reflect a new data source called the Unified Florida Reef Tract Map, and I provided a link there, so you can find out some more information about that, but that's a little more comprehensive effort that has occurred, and it's mostly in Florida, of course, but it's improving the data that we have to represent EFH for those particular layers.

Then, finally, this document, Roger kept mentioning this document and saying you need to look at this, Tina, and I finally found it. I am going to be referencing this document to improve the EFH data layers that we have, because all along we've known that it was just a good start to representing EFH, knowing that it needed to be better, and so I am proud that this document came out, and it has a lot of helpful information and ideas to improve.

Just so you know, we have a specific web mapping application where you can view all the EFH data, and it's accessible through the dashboard, but it has all of the EFH and EFH HAPCs as well as the EFH from NOAA Fisheries for highly migratory species, if you want to look at that kind of information. You can view it in one spot. This particular map viewer also has access to the habitat data, so you can look at those layers together. This is just a link for if you're not real comfortable with the Flex Viewer applications and how to step through, and it's a little tutorial.

For species distribution, we've been working with the SEAMAP data mostly. Each year, we try to update the data, when everything is working right for our online database, but we just get a general idea for the station data, the catch by tow, lengths, and age/growth information for individual species, and these are coming from the central GIS database that is housed at South Carolina DNR, and so you can see we're working with different agencies, and we had several surveys that are represented in the database, and this is just an older slide, but it shows the collaboration between North Carolina and Georgia and South Carolina and Florida, coming together and compiling data and making it accessible online. Then I go and query the data and create GIS data from that.

The fisheries viewer is also a Flex Viewer application, and you can look at all the data that I just mentioned in this web application, but the problem being that now ESRI is changing the game, and they are not going to support the Flex Viewer technology past 2016. It doesn't mean that these applications aren't going to work anymore, but I am slowly transferring to the JavaScript environment, so that it will work on more browsers and keep up with technology.

Some of the benefits of that is that it's going to work across platforms and will run on your smartphone. It will run on your iPad, and so Roger is very happy about that. The Flex Viewer was not supported on iPads or iPhones, and so we're going to be able to reach more people through this environment, and there's a lot of pre-built widgets and templates that you can use and customize for your data. I am doing screenshots, because internet connections don't always work

out well, but this is just an overview of the new environment. When it's finalized, it will replace the Flex Viewer application.

Some of your options is this has all the coastal survey data, the longline data from the SEAMAP database, the reef fish survey data is in here, and the Pamlico Sound data is available. If you click on a layer, you can enable the popup, or you can see information when you click on a point, or you can open the attribute table or get more information about a layer. It has a neat feature where you can actually open the attribute table and you can filter data or sort data here, and it shows all the active layers within the map.

You can export some of the data to a CSV file after you filter. You can select a species of interest and run the filter and only those points will show. It also has a neat widget for making charts. You can filter your data based on the map extent, or you can filter the data based on an area of interest that you draw. In this example, I draw a small circle and hit "apply". Then it shows the results in a graph form and map form, and they are actually interactive. If you click on the pie chart, it's going to show you where those species are in the map, and so the blacknose shark dots are in red squares on the map. If you were to click on the Atlantic sharpnose shark, then it would show those features on the map.

I have built some canned queries that you can run to query the data for the different surveys that are accessible, and we're going to use the reef fish. Once again, I like the common name, since I don't know all the scientific names, and I apologize for my baby science, but you can filter the data based on species or the map extent. In this case, we won't apply any spatial filters, and you can see where the blueline tilefish points from the reef fish survey are found and how many were there. If you click on one of the items in the list, then it will zoom to that feature on the map for you.

Managed areas, recent updates include we have added these layers to the managed areas map service. We've added the lobster trap gear and some ESA critical habitat layers and new information for commercial and recreational closures. When the spawning SMZs are finalized, then we'll be able to add those to the map. This, again, is the Flex Viewer application for viewing managed areas, and so I have provided the URL for that, but, since it's going to be deprecated eventually, we were also looking at using story maps to help convey information about managed areas in the region.

I really like this format, because you can provide some narrative to go with the map, to help it make more sense for users, and so one of the first story maps that I made was one for the MPAs in the region. I really think that pictures say a lot for people.

Most people don't know what the bottom of the ocean looks like, and, in this, you can step through it and see each representative habitat for the particular MPA, and I would love -- There is options to add video as well, but I was just trying to work with what I had, and some more images from those MPA research dives would be awesome to have for improving this application. This is another format for a story map that helps easily and quickly define where managed areas are in the region and what they mean. There again, a picture showing the type of habitat that's protected says a lot.

Through this one interface, you can look at MPAs, the SMZs, the Oculina HAPC, the Deepwater Coral HAPCs, the SFAAs, which is the Shrimp Fishery Access Areas, and the Golden Crab Fishery Access Areas. All of that information is available through one interface. There is no tools. It's just simple viewing with text and links to go to the regulation if you want more information.

MR. PUGLIESE: Just a real quick point. One of the things I think that you're going to see evolve as we advance these forward is the advancement of the digital dashboard, where some of these will be presented right in the frontend, before you have to go into the viewer. You would have maybe a consolidated story map for managed areas, and you would have a consolidated story map for other aspects of the different components of the digital dashboard, as it continues to evolve and expand to integrate partner activities, et cetera, and so that's at least the intent, I think, so you get to some of these things right -- You can go right there, instead of having to go through an entire thing.

MS. UDOUJ: The habitat and ecosystem atlas has all of this information. It has the EFH and it has the fisheries data. It has the managed areas. It has multibeam, and it has everything, and it's great, but it can be overwhelming, and so this format is really easy to work with and more for the general public, I believe.

Then, really quickly, I wanted to show Anne Deaton that I created a story map for artificial reefs, and it's really similar to the one that she showed or talked about for North Carolina. Anyway, it's a great way to look at artificial reefs across the region and get information. When you click on the point, you find out where it is and what's there, et cetera. In this presentation, the things I've discussed, these are all the links that are current for that, and I will take any questions, if people have them. Thank you.

MR. GEER: Any questions for Tina?

MR. HOOKER: Thanks. I might have missed it in your presentation, when you were showing all the different fisheries resources. Are all of Marcel's data available on there?

MS. UDOUJ: The reef fish survey is, yes.

MR. HOOKER: The reef fish survey is, but the other -- There was like three legs to that, right?

MS. UDOUJ: There are four right now from the online database.

DR. REICHERT: (Dr. Reichert's comment is not audible on the recording.)

MR. GEER: I have a quick question, and I think I asked you this before, but Tony Giarrusso works with Georgia Tech, and we do a lot of work with him. He has done a time slider, which is kind of interesting, because especially since we're talking about changes in distribution of species. If you showed those same densities and showed it over time, are we going to -- It's actually animated, and you might be able to start to see these movements north or to deeper water, and I think that's something that would be really neat to try.

MS. UDOUJ: That's just a widget you can apply. My problem right now is working with the date field from the SEAMAP database. It is an actual date field, and so it's kind of -- It doesn't want to work with the -- I'm having technical difficulties.

DR. REICHERT: I am not a member of the committee, and this is not a topic that we would need to discuss extensively here, but one of the increasing concerns is that an increasing number of people are using the raw data collected by various programs, because they are now available online, whether that's because we created those databases ourselves or whether that's a requirement, for instance through PAR, but what happens is that people who extract the data then subsequently make those data available through that website without actually linking to the original datasets.

Increasingly, because the tools have developed relatively rapidly, it has gotten increasingly easy to manipulate those data and do mapping and other applications, modeling, and I think it's very important that some of the applications are linked to the original data source, because, especially large datasets, they are, more often than not, continuously updated and quality controlled, et cetera, and it increases the likelihood of using old or perhaps incorrect data in these applications if that is not linked to the original dataset.

In the past, and I am speaking for our data, we kind of knew who was regularly using our datasets or who we provided the data to. Currently, that is almost impossible, because of the number of people that in the past have used our data or requested our data, and it's also impossible to then contact, whenever updates are made, to contact dozens and dozens of individuals and institutions to make sure that they are using the most recent data, and so that puts a burden on anyone who is using the dataset to make sure that they are using the latest versions of those datasets, and that's just an aside. Thank you.

MR. GEER: Thanks, Marcel. Go ahead, Roger.

MR. PUGLIESE: Just quickly, I think that's the one thing that does make the SA Fisheries powerful, because it has direct linkages to all the fishery-independent data, and so what we're trying to do is evolve as many spatial components that are drawn from that that people may be able to utilize some of those, versus necessarily the raw data. If they need a species distribution or some other types of things that we could build and provide through that, that would be the forum that we would like to be able to see that, and so that at least adds a direct line link to some of those data systems that we know is going to be supported.

MR. GEER: Anything else for Tina?

DR. LANEY: Just one more question. Especially in light of what Marcel just pointed out, Tina, do you provide any sort of instruction or advice somewhere on the site for folks who, for example, go on there and use the data and create a map? It would be, it seems to me, most appropriate for those sources to be given attribution when those people who are using the information that's on the site to produce products, especially if they're going to publish those products in some peer-reviewed literature, and so is there like a statement or something upfront that says, when you use these data, please attribute the information to this site or those original sources, something along those lines?

MS. UDOUJ: Through the Flex Viewer application, there is links for the data sources on like a splash page of this application uses this data and it came from here and go here, but what you're saying, no, there is not specific guidelines spelled out, but that's a good idea, and that's something that you could include in a splash page before you start the web mapping application. You could lay all of that information out, and that's a great idea.

MR. GEER: We've got that on the SEAMAP extraction site. We spent a lot of time going through that and spelling it out explicitly, and we're always battling back and forth whether or not every time they log in that that should pop up again and remind them, and so it's there, and Marcel is right that it's an issue, but it's like we just keep telling folks, and the committee is addressing that on a regular basis, the SEAMAP database workgroup.

MR. JONES: Either Pat or Tina, are those links somewhere that we have this year in a handout or how do we get to those links?

MR. PUGLIESE: It's all online through the mapping site, but what I will do is I will send the presentation around with the links in it, so that you can get to it. It's essentially all loaded on the council's website through the habitat and mapping section, and so you can access everything that we've seen there, but I will make sure that everybody gets it. I will highlight the links on the front, but then actually send the presentation also around.

MR. GEER: Anything else from anybody? I'm not seeing anything, but I just wanted to acknowledge Tina. Tina has been working on this for I don't know how many years now, and she's kind of always behind the scenes, but she's always at the meetings with us, and the SEAMAP meetings as well, and she does a great job of all of this. She technically works for this agency, but she lives in Arkansas, and so it makes it kind of hard sometimes for her, a little bit harder for her, to get to some of the meetings. I just wanted to say thank you for all the work you've done for us.

MS. UDOUJ: Thank you, Pat.

MR. GEER: Anything else from anybody? Any other new business to discuss? Any closing comments? Do you want to go first?

MR. PUGLIESE: First of all, thank you for everyone sticking with it and getting through the tasks at hand. I think it was an excellent involvement by all members, and, whether it be the open-forum discussions or the individual discussions, I think everybody has really contributed and provided a way forward on policies and on the advancement of the ecosystem plan, on a collaboration with our partners and with the research. I thank the presenters, Marcel and Louise and Tina and Kenric. He did a good job, but we had a little bit of some technical bumps there.

I think all of those pieces are really contributing those next steps that we need to advance to the next council meeting and into next year, as all of these different facets of the ecosystem plan, refinement of essential fish habitat, and the role this group is playing for the longer-term habitat conservation and ecosystem-based management, and so that's about all. The only other thing, and I think you will probably get this from Pat, is about a timeline to get any additional comments on those policies to me by next month. I will bounce it back to you.

DR. LANEY: I just wanted to say thanks to everybody who took the time to attend the meeting and to deliberate and provide information for the council's deliberation. I can stress to you enough how important the advisory panels are to the council. We do listen to what the advisory panels say, and I think the record would show that often the council does make changes in proposed management measures as a result of what AP members bring to the attention of the council, and so I think it's very important.

Again, I would encourage you to get to know who your council members are from your individual states and feel free to communicate with them, and, again, those of us who are non-voting members do get to vote and to speak at the committee level, and there are four of us, three of us who regularly attend. That would be myself and Bob Beal from the ASMFC and also a Coast Guard representative, and so feel free to reach out and contact us if you have issues that you would like to see brought before particular council committees especially, but also before the Full Council as well, and so thanks again, everybody, for coming and participating.

MR. GEER: Thanks, Wilson, and we greatly appreciate you being here. It's good to have council members here. I know there was at least one on the phone listening in, and I talked to him the other day, and I just want to repeat kind of like what Roger was saying and just thank you for everybody coming out today. Amber, thanks for organizing the food, and especially getting the coffee and the cookies. Brett, thanks for all the work you've done. Your energy is contagious and Brittany. Your energy is very contagious.

Just summing up, get your comments on both of the policy statements and any edits to Roger and I on or before the 21st, and so that's next Monday. The sooner the better. One of the things we talked about was defining forage fish, and so, if you have a definition you want to use, provide it. Forage fisheries, what is a forage fishery, and any impacts of some of the forage fisheries, mainly things like menhaden, and we're going to provide a table for South Atlantic forage species. I sent that out a little while ago, what Marcel sent me. It's a pretty lengthy list of species, and, last night, I was going through it and highlighting what I thought would be the forage species.

Those policy statements will be presented to the council Habitat Committee on Monday the 5th of December, and so at two o'clock in the afternoon, if anybody wants to listen in. You can hear my ugly voice again and Roger's voice and Wilson's voice. Then I think mostly -- I haven't checked all my emails, but it seems like everybody got me their research needs from the states. I saw three of them so far, and I think I got them all, and so I appreciate that.

I appreciate everybody's efforts. I will be seeing some of you again and again before the end of the year. Some of you I won't see until April, and so I just want to wish everybody Happy Holidays and safe holidays and safe travels. If there is no other business, and I don't see anybody raising their hand, the meeting is adjourned.

(Whereupon, the meeting adjourned on November 16, 2016.)

Certified By: _____ Date: _____

Transcribed By:
Amanda Thomas
December 12, 2016

