

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

Webinar

October 13-15, 2020

Transcript

SSC Members

Dr. Genny Nessler, Chair
Dutin Addis
Dr. Jie Cao
Dr. Christopher Dumas
Dr. Churchill Grimes
Dr. Wilson Laney
Dr. Yan Li
Dr. Fred Scharf
Dr. Fred Serchuk
Dr. Tracy Yandle

Dr. Jeffrey Buckel, Vice Chair
Dr. Walter Bubley
Dr. Scott Crosson
Dr. Jared Flowers
Dr. Eric Johnson
Anne Lange
Dr. Amy Schueller
Dr. George Sedberry
Dr. Alexei Sharov

Council Members

Tim Griner

Steve Poland

Council Staff

Dr. Michael Errigo
Julia Byrd
Dr. Brian Cheuvront
John Hadley
Allie Iberle
Dr. Julie Neer
Cameron Rhodes
Christina Wiegand

Myra Brouwer
John Carmichael
Dr. Chip Collier
Kathleen Howington
Kim Iverson
Roger Pugliese
Dr. Michael Schmidtke

Observers and Participants

Rick DeVactor

Shep Grimes

Other observers and participants attached.

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened via webinar on October 13, 2020 and was called to order by Chairman Genny Nesslage.

INTRODUCTION

DR. NESSLAGE: Let's get started. My name is Genny Nesslage, and I'm with the University of Maryland Center for Environmental Science Chesapeake Biological Lab, and I'm Chair of the South Atlantic Fishery Management Council SSC, and I would like to welcome you all to our October meeting via webinar, and thank you for being flexible.

Given we're over webinar, I just want to remind folks of a few things. Once Chip unmutes you, if you could mute yourself again, and, if you would like to speak, please raise your hand using the little raise-hand, and there's a little hand with a green arrow. If you click that, hopefully staff will notice that, and we'll have a list on the screen of who has raised their hand in order, and I will call on you accordingly. Then we will either -- Once you see your name, if you could put your hand down, or staff will put your hand back down. If that's not working for any reason, if you're having any technical difficulties, and you're getting desperate, please send a note in the chat box to staff or myself or our Vice Chair, Jeff Buckel, and we will try to help you out.

Another note is I sent around note-taking assignments for each of the agenda items. If you have any questions, let me know. You have a couple of ways that I would welcome your feedback. After each of the meetings, if you would like to just send me your notes, in whatever format you have them, that's fabulous.

If you would prefer to use the link that Mike Errigo sent to the Google Doc of the online version of the overview, you can add your notes as comments in that document, but Mike will have a separate document that he will be taking notes from of our consensus statements and showing that on the screen, and so that Google Doc is for compiling our notes in one place, if that's the way you would prefer to submit your initial notes, and then, of course, once we have a draft manuscript, that will circulate, and you will have a chance to edit as you see fit. That's kind of the way we'll run this. Does anyone have any questions about the webinar and how we'll run this? It will be very similar to our August meeting.

No hands raised. All right. We're getting to be pros at this webinar thing, and I appreciate this. Okay. Let's move on to Agenda Item 1, which is reviewing and approving the agenda. Hopefully you all have a copy of the agenda, and I would note, as Mike already did, that Item Number 4, which is Update on New Data in the SEDAR 73 Red Snapper Assessment, has changed a bit. Hopefully you're looking at the revised overview that Mike circulated. There is no attachments for that, and we'll be receiving a brief update on the plan of action for the snapper assessment, and we will not be reviewing data inputs at this meeting. Are there any other suggested changes to the agenda? Wilson.

DR. LANEY: Thank you, Madam Chairman. Could we add, under Other Business, at some point, a brief discussion of the council's new electronic payment method? I think I successfully signed-up everything for it, but I did have a question for Suzanna, and, when I sent the question to her via email, it bounced back, and so I don't know what's going on, and so, if we could have just a brief

discussion, maybe if Kelly is on, at some point under Other Business, that would be appreciated. Thank you.

DR. NESSLAGE: Yes, that would be great. Good suggestion, Wilson. I know the council had a briefing on that. Chip, is that something that we could arrange?

DR. COLLIER: Yes, and I can talk to Kelly and Suzanna, to see if we can get a presentation on it.

DR. NESSLAGE: That would be fabulous. Thank you. Good suggestion.

DR. COLLIER: I thought we would go through voice recognition as well, and what I will do is I will put the SSC members hands up, or their name under hands raised. That way, we can go through it in an orderly fashion.

DR. NESSLAGE: Do you want to do that right now?

DR. COLLIER: Sure.

DR. NESSLAGE: I will just -- Did we do this at the August meeting? I don't think so. Okay. I will call the name, and they will say -- Alexei, for instance, and then -- Okay. We'll just start then. Alexei, please say your name.

DR. SHAROV: Alexei is here.

DR. NESSLAGE: Amy Schueller.

DR. SCHUELLER: Amy Schueller.

DR. NESSLAGE: Thank you. Anne Lange.

MS. LANGE: Anne Lange.

DR. NESSLAGE: Excellent. Chris Dumas.

DR. DUMAS: Chris Dumas.

DR. NESSLAGE: Thank you. Churchill Grimes.

DR. GRIMES: Churchill Grimes. I'm here.

DR. NESSLAGE: Excellent. Eric Johnson.

DR. JOHNSON: Eric Johnson.

DR. NESSLAGE: Fred Scharf.

DR. SCHARF: Fred Scharf.

DR. NESSLAGE: Fred Serchuk.

DR. SERCHUK: Fred Serchuk.

DR. NESSLAGE: George Sedberry.

DR. SEDBERRY: This is George.

DR. NESSLAGE: Thank you, George. Jared Flowers.

DR. FLOWERS: Jared Flowers.

DR. NESSLAGE: Thank you. Jeff Buckel.

DR. BUCKEL: Jeff Buckel.

DR. NESSLAGE: Jie Cao.

DR. CAO: Jie Cao.

DR. NESSLAGE: Thank you. Scott Crosson.

DR. CROSSON: Scott Crosson.

DR. NESSLAGE: Wally.

DR. BUBLEY: Wally Bublely.

DR. NESSLAGE: Thank you. Wilson Laney.

DR. LANEY: Yes, ma'am. I'm here, Madam Chair.

DR. NESSLAGE: Thank you. Yan Li.

DR. LI: Yan Li is here.

DR. NESSLAGE: Thank you. Who are we missing?

DR. COLLIER: I forgot to type in Dustin's name. Sorry.

DR. NESSLAGE: Dustin, we can't forget you.

MR. ADDIS: This is Dustin Addis.

DR. NESSLAGE: Thank you. I think that's everyone. Right, Chip?

DR. COLLIER: Yes.

DR. NESSLAGE: Okay. All right.

DR. COLLIER: We have one more person that joined us. Mike E. has got through his technical issues this morning.

DR. NESSLAGE: Yay. Welcome, Mike.

DR. ERRIGO: Hi, guys. Sorry. Right now, I'm just trying to find the raised-hands document, and then, other than that, I'm ready to go.

DR. NESSLAGE: Fabulous. We're so glad you could make it. Sorry for the troubles.

DR. ERRIGO: I'm sorry. I know these things tend to happen, but it's unfortunate that --

DR. NESSLAGE: They happen at the wrong time.

DR. ERRIGO: I know.

MS. LANGE: The entire internet for several of the companies, like Spectrum and AT&T, went down around midnight last night, and it didn't come up until later.

DR. ERRIGO: We've been having some bad storms over here, and so --

DR. NESSLAGE: Okay. Well, barring more technical difficulties, we'll go back to the agenda. I just want to ask, again, if there are any suggested changes, in addition to what Wilson suggested for Other Business. We have added that, the review of electronic payment method. Does anyone have anything to add? All right. Seeing nothing, if there are no screams of protest, we will approve the agenda. This is your time to raise your hand if you do not approve the agenda, let's say. No hands raised. Excellent. Let's consider the agenda approved then.

Moving on to minutes from our April meeting, that's Attachment Number 1. I would also just briefly note that the minutes from our August meeting are still being prepared. They should be available by our next webinar, and so these that you're seeing here are the April 2020 meeting minutes. Are there any revisions or concerns with those minutes? All right. If anyone has any concerns, please mention it now. Otherwise, we will consider the minutes approved. Excellent. All right. The minutes from the April meeting have been approved.

We will move on to Agenda Item Number 2, and this is General Public Comment. I would note that, after each agenda item, after each one of the presentations, there will be an opportunity for the public to comment specifically on items that are on the agenda, but, if anyone would like to make any general comments before we begin right now, I would ask that you raise your hand, for those of you who are on the webinar. If anyone is calling in, I will have a moment at the end for you to speak, and so, if you are on the webinar and have the ability to raise your hand and would like to speak right now, please do so. I am not seeing any hands. If there's anyone on the call who does not have the ability to raise their hand, please speak now, introduce yourself. Okay. Great. Fantastic. We will look forward to public comment for each agenda item.

Now, moving on to Number 3 then, Agenda Item 3, this is SEDAR Activities. We have been asked to review and approve the draft terms of reference for the 2022 assessments of blueline tilefish, red grouper, and vermilion snapper. The notetakers for this agenda item are Dustin and Fred Scharf. I would bring your attention to Attachments 2, 3, and 4, which are the TORs for those three species, and is Kathleen going to walk us through this, or who would be guiding us?

MS. HOWINGTON: I believe it's going to be me.

DR. NESSLAGE: Yay. Let's see here. Hopefully we can break up -- Let's start with blueline, and is that the best?

MS. HOWINGTON: Yes, I think that would be the best decision.

DR. NESSLAGE: We'll go in order, not to confuse anyone, and so go ahead and take it away, Kathleen.

SEDAR ACTIVITIES

MS. HOWINGTON: All right. While they're pulling up the draft terms of reference for blueline tilefish, I do want to remind you guys that, for the 2022 assessments, SEDAR is scheduled to transition to the topical working group method, and so, instead of having a panel that meets via webinar or in-person and walks through all of the terms of reference, via discussions with the Science Center and council staff, we have determined that this is the only assessment that requires a topical working group to meet. Please keep that in mind while we're going through these.

Now, your initial statement of work for blueline tilefish, there are two, well three, really big differences between that and this term of reference that you're seeing here. The first difference is that, in the initial statement of work, you requested an update of the BAM model, but the SEDAR 50 blueline tilefish model was actually ASPIC, and so that model was changed to the latest ASPIC model configuration.

Additionally, in your statement of work, you requested evaluating recruitment and larval transport, and it was determined that that would be better as a research track, and it does not necessarily fit the operational assessment guidelines, and so that was removed. However, during the discussions between council staff and Science Center staff, it was determined that a topical working group did need to meet to review and recommend the catch and landings streams, specifically landings north of Cape Hatteras, and so there will be a topical working group meeting for that.

Right now, we do not have a draft schedule. The next time you meet, I will have a draft schedule and be requesting SSC representatives to be a part of that topical working group, but, for right now, these are your terms of reference, or these are your draft terms of reference, and please let me know what feedback and edits you have for me.

DR. NESSLAGE: All right. Hopefully you've all had a chance to look these over. If you have any concerns or comments or questions for Kathleen, please raise your hand. I have a question, Kathleen.

MS. HOWINGTON: Okay, Genny. What's up?

DR. NESSLAGE: In several of the TORs, and so this might just be a -- Hopefully you'll be able to answer this question all at once, and there is -- The request is to include new and updated information on life history and discard mortality, is that -- That's kind of open-ended, right? I am wondering if there's something in the pipeline that we know about, or is this just -- It just gives the assessors the opportunity to incorporate new information as it becomes available?

MS. HOWINGTON: This gives the assessors the opportunity to incorporate the new information. Right now, we aren't aware of anything new that required either a topical working group or something more specific. Otherwise, it probably would have been added in, but we don't want to necessarily get rid of that, just in case something does come up.

DR. NESSLAGE: Right. Okay. Thank you. Any other questions? Amy.

DR. SCHUELLER: I had the same comment, and I sort of wondered if that was encompassed in Number 2, to document changes or corrections made and provide updated input data tables. I would assume that, if there was something that came up, that it would get included, but I'm also concerned that -- You know, what's the timeline for these new things? We don't necessarily want something coming to the table at the last second, and so I don't know. These seem really general and vague, to me, and I'm not sure they need to be in here.

DR. NESSLAGE: To that point, Kathleen, I'm just wondering, with the move to operational assessments and the fact that there won't be data workshops unless there's a topical working group, is this going to be standard language? Do we know?

MS. HOWINGTON: For now, yes. This language was created after lots and lots of emails back and forth, but, since this is the first time that these terms of reference have come in front of you guys in this format, if this is not the standard language that -- If this standard language doesn't make sense to you, then please give me the feedback, and we'll try and work it out, where it makes sense to be a good term of reference for this new mode.

DR. NESSLAGE: Alexei.

DR. SHAROV: It seems to me that the Number 2 is generally thought to be applicable to landings and discard information, and 5 and 6 are separate with life history and the discard mortality, and maybe just changing the order, or at least putting the 2, 5, and 6 together, and that would help to sort of see the new quasi-standard sort of terms of reference that should be checked, and that may help to diffuse the uncertainty. I see Amy's point, but I think it certainly helps you specifically outline the elements of the assessment to check on, and so I like the Number 5 and Number 6, and so, if the Number 2 would be more specific, or if it's just landings, then it seems to be all right.

DR. NESSLAGE: Thank you, Alexei. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I have a question regarding Term of Reference 2. I presume that this will be the first assessment done for blueline tilefish in which the new MRIP data will be used, and is that correct?

MS. HOWINGTON: Yes.

DR. SERCHUK: Okay, and I expect that there might be more -- It might be more involved, given some of the experiences we've had with other assessments that initially have used the new MRIP, that it's going to be perhaps a little bit more involved than just updating the landings data, and so I'm just wondering how that will be handled.

MS. HOWINGTON: I can't necessarily speak to how it would be handled. I would probably want to ask somebody from the Science Center or one of the analysts to be able to answer that question.

DR. SERCHUK: Do you understand why I'm concerned? We've had problems with the new series not conforming to what we believe would be happening, and I know this is an operational assessment, and an operational assessment would generally just say, okay, we update the time series, but a new time series has now come in, or at least a standardized time series, and we've seen some difficulties in the past, and, typically, I thought that would be outside of an operational assessment, but I'm just wondering how it's going to be handled, and that's all. Thank you.

DR. NESSLAGE: Kathleen, do you have anything to add, other than the topical working group would do their best to address that?

MS. HOWINGTON: Well, so the topical working group will review and recommend catch and landings streams, but that is all they're going to be focusing on. If issues are raised, because of the new MRIP numbers, then -- Once again, I don't feel fully comfortable saying exactly how it will happen, because I'm not exactly sure what, if any, issues, if at all, will arise, but we have had a few operational assessments already that have been in front of panels, not including the ones that are supposed to happen in 2021, that are going to incorporate the MRIP numbers, and they have had to tackle issues, and so the Science Center is aware that sometimes issues can arise, and they know how best to try and address them, but I don't want to speak for them, saying that this is exactly what's going to happen, because I don't know.

DR. NESSLAGE: Okay, and so maybe what we can say in our report is that the SEDAR, the Center, the council, should prepare for any road-bumps that -- At least think in advance about how any road-bumps in the incorporation of MRIP into the new data stream would be handled in an operational assessment, just as a heads-up, but I would like to -- If we may, I would like to go back to the issue of combining Items 2, 5, and 6.

I guess, just to clarify my concerns, the statement "include new and updated information" implies that anything that's new will be included, and it's very strong language, and we've already seen, for instance with red snapper, that, under the operational assessment framework, that may not be possible, and so I'm guessing we can suggest that 2, 5, and 6 are combined, but I would love to hear the SSC's feedback on a potential suggestion that we might have that that wording be softened, so that the Center is not backed into a corner if a ton of new data shows up on their doorstep. How do folks feel about that, or am I the only one worried?

DR. BUCKEL: On Number 6, I think, if Number 2 is reworded to "landings and dead discards", then the discard mortality will be taken -- That would have to be done with the calculation that is already described in 2, and that says document any changes or corrections, and so, if there was any new information on discard mortality, that would be taken into account when they calculate the

dead discards. I think, with that addition to Number 2, you could get rid of 6, possibly, and that would be my vote. Then the life history for Number 5, I guess, if an analyst, or anyone that knows, if there's any -- For ASPIC, are there certain types of life history changes that can be input, or is it just catch and effort data?

DR. NESSLAGE: I see that point, but that wording shows up in some of the more complicated assessments as well, and so I guess I'm tackling a bigger issue. Is it possible, Mike, if we could start to just make a few notes on here? Obviously, these are recommendations, I recognize, Kathleen, and comments. Take them or leave them.

DR. ERRIGO: I've been taking notes, but, unfortunately, that's a PDF, and so I've been taking notes into the overview document, which is Word.

MS. HOWINGTON: If you want to, I can share my screen, and I have the Word document up here, and I can track changes. I just won't have the hands-raised document, or I can email you the Word documents real fast. It's up to you.

DR. ERRIGO: Let me see if I have them. I might have them. I do not have them. Sorry.

MS. HOWINGTON: Give me five.

DR. NESSLAGE: While that's happening, I guess I would suggest, instead of the command "include new" that it be "consider new". That would be my suggestion, but I would welcome feedback on that.

DR. ERRIGO: Gotcha.

MS. HOWINGTON: They're on their way.

DR. NESSLAGE: Thank you, Kathleen. Amy.

DR. SCHUELLER: My thinking was that "document any changes" sort of encompasses considering new, and that's why I had suggested that 2, 5, and 6 could be combined, and, if we need to put the words "life history" in Number 2 somewhere, I think that that's fine, but "input data tables", to me, sort of implies all data, including a vector of whatever, maturity or whatever it might be, and so I feel like document any changes allows for including new or considering new or not, if it's not appropriate. It is, I guess, vague, but it definitely puts the onus on the analyst.

DR. NESSLAGE: Which is what my understanding of how the operational assessments would generally work, unless there's a topical working group, and so that might solve a number of problems that might pop up. Alexei.

DR. SHAROV: I agree with Amy's comments, and I also am sort of waking up and reconsidering the new and updated information and life history. Since this is the ASPIC, and generally there are no life history parameters that traditionally are used in the age-structured model that could be, or will be, used in ASPIC, and so they are generally irrelevant then, and there is no estimate of natural mortality, and there is no growth curve, and what life history information could we think of that

would be useful in here, outside of just a general presentation on the type of the species and the biology of the species, et cetera?

DR. ERRIGO: I might have something for that. Two things. One is this language is included in all the TORs, and so, if you make changes -- If you discuss it here as if it's being used in the assessment, the conversation will carry through for the rest of the TORs that are here. Two is there is also the data-limited portion of this SEDAR, which is not explicitly listed out here, and so, for blueline tilefish, we did an ASPIC, and we did a data-limited for the north of Hatteras portion, and there were some of the methods in there that used life history information, like little bits of pieces of life history information, to come up with estimates of ABCs and OFLs. I am not sure exactly which methods were used, I'm afraid, and so maybe there weren't any used, but I know there are some that use life history information, and so they may have used life history information for blueline tilefish.

DR. SHAROV: Well, if we are using -- I'm sorry.

DR. NESSLAGE: I think we're going to say the same thing. Maybe we are. There is no mention of the data-limited approaches in these TORs.

DR. SHAROV: Yes.

DR. NESSLAGE: If the council wants that, they need to be explicit.

DR. ERRIGO: That's true, and there probably should be, because the portion of the stock north of Hatteras was done by data-limited methods. The Data-Limited Toolbox was used.

DR. NESSLAGE: That is good intel, and that would make sense why there might be updates to life history, in addition to the fact that this is standard language. Scott.

DR. CROSSON: Just to go back, I'm pretty sure that we used -- We had to substitute the life history for golden tilefish for blueline when we did SEDAR 50.

DR. NESSLAGE: Thank you for that. Maybe there is actually blueline-specific information now, with some of the surveys that have been done. Do we have a way to take some notes at this point, one way or the other? I want to keep this moving, but this is all good feedback, I think.

DR. ERRIGO: Sorry, Kathleen, but I did not get the word documents that you sent. I don't know why, but I can continue to take notes on the --

MS. HOWINGTON: That was me. Give me one sec. I typed in the wrong email to send that to, because I was typing it very quickly. Sorry.

DR. ERRIGO: It's okay.

DR. NESSLAGE: Chip.

DR. COLLIER: Thank you. I did want to point out that we are in a little bit different mindset than we have been in the past, where it's been a little bit more flexible during SEDAR assessments

and operational and updates, and so we want to incorporate some of this language, to make sure that the analysts can look into these different parameters, the life history parameters, some of the landings, and the discard mortality, giving them the flexibility, where it's not just a straight turn-of-the-crank, and they can go and look at the new information and incorporate it.

We were a little bit concerned, given some of the language that we have heard, and at least a few of the assessments that they said this is an update, and these are the only things that we could change, and, because it was not listed in the terms of reference, we could not change it, and so we're trying to address that with some of these TORs and giving the analysts some of the flexibility that might be needed to incorporate the information.

DR. NESSLAGE: That's good background information. Okay. Fred Serchuk.

DR. SERCHUK: I have sort of a general question related to all of these assessments that we're going to be reviewing the terms of reference, and I raise this because I know this has been a problem up in the Northeast, and that is, because of COVID, there have been a number of survey programs that have not been active in this year, simply because they decided it was not possible, either in the ship-based surveys, but perhaps in other surveys, to continue with the data collection program this year, and I'm just wondering whether there has been any other programs in the Southeast that were not conducted this year, which may cause additional problems for the assessment. Thank you.

DR. NESSLAGE: Thank you, Fred. My understanding is that there were no -- The survey data is not used in this assessment, but, if there's someone who -- I don't know if the tilefish survey got additional funding and will be running again. Does anyone know? Chip.

DR. COLLIER: I wouldn't say that I know, and there has definitely been some concern about the surveys that are going on out there, and I don't believe that the tilefish survey was used in the last one, at least for the southern part of it, and so, because it wasn't added in, it would likely not be added into this one. In 2019, recreational is a fairly big component of blueline tilefish, and so there were limited samples in 2020 for the recreational samples, and so that might be an issue for the recreational landings, and I'm not certain what other pieces of information might have been included in this assessment that would be impacted for this one, and we might be able to talk about the next two assessments as they come up, with potential issues for those.

DR. NESSLAGE: Thank you, and that actually reminds me of something that we said we would recommend for the next assessment, and this is jogging my memory, but I'm going to look to someone with a steel-trap memory like Scott, with regard to the blueline assessment. I thought that we used the breakdown in north versus south catches in the survey to influence how the ABC was broken out, and is that ringing a bell with anyone? If so, would that need to be revisited, if there's new data? I am going to go -- Just forgive me, Fred. I'm going to skip you for a second and go to Scott, and I will come back, I promise.

DR. CROSSON: Yes, that's correct. We used it to split out the ABC between the two councils, but it was not incorporated into the assessment itself.

DR. NESSLAGE: Okay, and so that's a decision that was --

DR. CROSSON: It was a last-minute thing that became available after the assessment was already gone through.

DR. NESSLAGE: But, to the best of my knowledge, they're not redoing that this year, and does anyone know?

DR. CROSSON: We'll have to ask the Mid-Atlantic Council staff, and they've been doing some survey work up there, but I don't know the extent of it.

DR. NESSLAGE: It might be worth making a note in the report that any new information be considered when this is presented to the SSC to make ABC recommendations, and does anyone have concerns with that?

DR. ERRIGO: I don't have any concerns, but what I was going to say was that survey very well could be continuing, because it was mostly a golden tilefish survey, which is very big in the mid-Atlantic, and so there's a good chance that they have continued that survey, but I don't know how far down south they would have continued running it, and so maybe we can find out.

DR. NESSLAGE: I saw the RFP, but I don't know if, as Fred indicated, there is concerns with COVID and whatnot in implementation of it, but I'll make a note. Fred, I skipped you, and I apologize, Serchuk that is. Please, go ahead.

DR. SERCHUK: Again, I don't want to be a nervous Nelly about this, but I know, for example, that, up in the Northeast, they cancelled the fall survey, and they cancelled the spring survey, and it's been a big problem, because a number of stocks are index-based, and so they've lost the indices. Again, I'm not familiar with all the survey effort in the South Atlantic, but I just want to be aware that there may have been curtailment, and perhaps abridgment, of some of the data sources that normally would go into the assessment. Thank you.

DR. NESSLAGE: Thank you. Okay. I want to go back to the -- There had been a suggestion to simply combine 2, 5, and 6, but I guess I would look to staff. If this isn't something that you think -- If this is going to be the new standard language, we won't wordsmith right now, but we can just make our comments in the report, and is that your take on it, Kathleen?

MS. HOWINGTON: For right now, yes, that sounds fine. This is going to be the new standard language. If you want to wordsmith, I am not going to stop you. Like I said, this is the first time it's ever coming in front of the SSC, and so, honestly, I expect you to give edits. We can combine 5 and 6, if that makes everyone feel a little bit better. That was a thought that I had. Sorry I can't give you something more specific. If you want to wordsmith, go for it, and give us edits on these. If you don't, then this is going to be the standard language, and, the next time it comes in front of you, you can add edits, if you would like.

DR. NESSLAGE: Okay. Thank you. Let's hear from Erik Williams, and then we'll reconsider here.

DR. WILLIAMS: Thanks, Genny. I just wanted to update on -- Maybe I can add more information to the discussion previously about data availability and surveys and all of that. To my knowledge, most surveys that were agency-run have been cancelled, but we have initiated a new longline

survey, deepwater longline survey, in the South Atlantic, and it's only the first year, and that is going on as planned so far, because we're using commercial vessels as the platform.

Of course, for this assessment, that would only be one year of data, which really doesn't do you a lot of good, necessarily, and, I mean, we might be able to get some information from it, but it's not going to help. The other thing to keep in mind is 2020 is -- Not only are we losing data from the surveys, but our port sampling has been limited severely, and so we may not have age samples, not that, again, that matters necessarily for blueline tilefish, but also MRIP is being hit by this as well, in terms of intercept samples that they're able to collect, and so I think they're still sort of scrambling to figure out how they're going to even produce 2020 estimates, and I have not heard anything other than they're not sure how they're even going to produce 2020 estimates at this point.

This raises the whole issue, which will come up -- Which is particularly noteworthy for this one, is whether, if you have a 2020 terminal year, is it even worth going forward with the assessment, in some ways, because we all recognize that the terminal year of these assessments is pretty important, and, if the 2020 terminal year is poorly informed, this may really end up just being like a 2019 assessment, but, again, that still could be valuable to management, but it's just something to weigh-in in the whole discussion of this, and so I just wanted to give an update on what I know about data sources thus far.

I guess the other one to note is the longline survey that they're conducting in the north, that has been curtailed, and it's limited to just -- The golden tilefish survey that they've been doing up in the Mid-Atlantic is pretty much limited to just Hudson Canyon, and so it's not really going to help us much with blueline tilefish.

DR. NESSLAGE: Thank you. That's very helpful. Let's go to Alexei.

DR. SHAROV: Thanks, Genny. Just a quick note, and it is good to have sort of a standard template for the TORs, and I have heard -- Several times we've been told that, well, this is going to be a new standard, but there is certainly much value in customizing the TORs to the species, and so I don't know where the council wanted to be and what's the optimal. I would think that the certain flexibility and customization is useful, and so I think, in a case where you have non-age-structured models, the TORs could look different, and specific elements of biology or catch information will make it somewhat different, and so I think we should -- I guess we should be allowed to modify TORs to the shape and form that addresses to the best what we want to be done.

DR. NESSLAGE: Thank you, Alexei. Kathleen, did you have something to Alexei's point or something new?

MS. HOWINGTON: I was just going to agree with him. After further thought, it's going to be best if you guys do the wordsmithing and editing now, just because, once you approve this, this is going to go in front of the council, and you're not going to see it in an editable format again. Now, it's probably good to be able to keep in mind that, as you're wordsmithing, there are going to be some changes that apply to all terms of reference, and there are going to be some changes that only specifically apply to this species, and so just keep that in mind, and then I will take all three of these TORs, the next time that another term of reference needs to be built, and I will take -- I will

be listening in, and with all the notes that I have right now, and I'll make certain that we have a generalized template that can be specified for each species.

For example, with blueline tilefish, there is no term of reference for steepness, and that's because it's an ASPIC model, and so steepness is irrelevant, but, in the next two terms of reference, steepness would be included, and so that's going to be something that normally would be in there, and it would be part of my general term of reference template that I will build, but it's not a part of this one, because it's species-specific.

DR. NESSLAGE: Well said. Tracy.

DR. YANDLE: I had a more general point than about the specific TORs, which I was thinking about the points that were raised about how badly 2020 is affecting the data collection, and not just one source, but multiple sources are going to be spreading across fisheries, and I just wanted to suggest that we might want to carve out some time in a future meeting to discuss this and possibly come up with some standardized ways, or advice, about how we want to handle this, so we're not -- That we don't end up dealing with it on an ad-hoc basis for years in the future.

DR. NESSLAGE: Good suggestion.

DR. YANDLE: I'm just adding an item to our agenda for the future.

DR. NESSLAGE: Yes, especially as the operational assessments, in particular, start to gel into something that's a little less amorphous. Alexei.

DR. SHAROV: I wonder if the SSC would want to consider if, as an additional TOR, exploring or -- Well, exploring or investigating or whatever, the effects of the issues with the data for 2020, specifically. Obviously, something will be noted along those lines, but, if you would -- I wonder if you would want to make this a specific term of reference, considering how much of the anticipated problem this year could create.

DR. NESSLAGE: That's a good suggestion, Alexei, and so I'm thinking that we might be able to kill multiple birds with one stone, and not to be morbid, but, if we suggest combining 2, 5, and 6 into something along the lines of consider new and updated information on life history, discard mortality, and I guess, because it's not specific in Number 2, recreational and commercial landings and discards. Then the second sentence could be something along the lines of note any particular concerns or problems encountered with 2020 data. Would that address your suggestion, Alexei?

DR. SHAROV: Yes, and I was thinking of not just data partially not available, which now we know that there will be an issue with that, but also the effect of this on the assessment outcome.

DR. NESSLAGE: Right. The impact on the estimates, and so the actual model performance. I see what you're saying. That would be down -- If we've gotten rid of 5 and 6, in essence, there could be an in-between one that says document any -- Describe impacts of -- Or examine and describe, and you could do a peel and take off 2020. Impacts on model performance and estimates, something along those lines. Fred Serchuk, help me out.

DR. SERCHUK: I have a different -- A related, but different issue, Chairperson.

DR. NESSLAGE: Okay. Please.

DR. SERCHUK: I think we're trying to do this, properly, on a term of reference basis for each of these stocks, but I think, if you listen to Erik, they're going to -- I think he summarized the situation well, but we are going to be faced, not only as analysts, but as managers, with a lack of information, or a lack of the types of information that we've had prior to COVID, in certainly 2020, and we don't know how much longer.

It's going to affect not only the data acquisition, but it's going to affect monitoring, how we monitor the management plans, and I'm thinking that we probably need to look at the situation generically, rather than specifically by stock-by-stock. We'll have to rely on the Center, of course, for assistance, in large measure, on this, but, if we also do it as a group grope on the situation, rather than on a particular assessment, we're liable to come up with insights that would be applicable to other assessments than the ones we're dealing with, and I think this is more or less the way we handled it when we started looking at the MRIP numbers on an across-the-board basis.

I am wondering whether there is some utility in either having a -- Convening a group or trying to get the Center to interact with the SSC to give us a better understanding of really what has changed and what is likely to persist as long as COVID is, because it has implications across-the-board. Thank you, Madam Chairman.

DR. NESSLAGE: That's a fantastic suggestion, Fred, and what I was imagining, as you were talking, was that -- Honestly, from here on out, and this will probably extend beyond 2020, we should probably request a briefing on COVID response and impacts to South Atlantic stocks for both, as you mentioned, assessment and monitoring, and it might nice if we could have a brief presentation from the Center, and possibly council staff as well, at the beginning of each our meetings going forward until this settles. Does anyone have any -- We can write that in our report, and does anyone have any concerns with that suggestion and adding that to our -- Wilson.

DR. LANEY: Thank you, Madam Chairman. I have no concerns with adding it, but I just wanted to note that, at the last council meeting, I believe, Dr. Clay Porch gave a very excellent briefing on how COVID has affected the Center's operations, and so we might just want to take a look at the administrative record for that briefing or ask Clay to give us a similar briefing.

DR. NESSLAGE: Excellent suggestion. Regarding the specific TORs thought that essentially -- Or to our modifications that Alexei had suggested, one thing I would say is, if we're going to keep them, we need to say 2020-plus. It looks like, in the above, in Number 1, it was 2020/2021, as potential terminal years. Personally, I think there's value in both modifying the TORs and having briefings and looking at the issue comprehensively, but, if folks have a differing opinion, please speak up now. Mike, if you could just say 2020-plus, or 2020/2021. I think some of these will apply to the next two sets, but are there any other specific, blueline-tilefish-specific, suggestions or concerns or accolades from the SSC? Chris, please.

DR. DUMAS: I have a comment and a question. On the general issue of having fewer data in 2020, I mean, in general, if you have fewer data for that year, you have more uncertainty, and so, from a Bayesian perspective, then we would be more conservative in any revisions made to prior assessments, more conservative, and so smaller revisions, whether up or down, from prior

assessments, and so how do you modify a prior assessment in light of new and uncertain information, and that's sort of the classic issue that Bayesian analysis tries to address, and so, if we do have some type of workshop or something to look at that in general, that issue in general, that might be a place to start.

Specifically on blueline tilefish, when we calculate the probability of overfishing, how are the MRIP data incorporated in that? From MRIP, you get a mean and a variance of catch, but there is probably -- The variance is probably pretty large, and so does the mean variance of the recreational catch -- Do those get included in the model, and then are you doing like Monte Carlo runs of the model to determine probability of overfishing?

If so, what type of distribution are you assuming for your recreational catch, and so you're using the mean and the variance from MRIP, but are you using recreational catch as sort of a normal distribution or some type of like Poisson distribution? I think that might make a difference for these rare-event species, where you might have a lot of zeroes, or low counts, in the original data, and so the catches might not really follow a normal distribution, and so I've got a concern that, if you were assuming normal distributions in the simulations that generate the probability of overfishing, it could generate the wrong probability of overfishing. I am just not as familiar with how the exact model works for calculating that probability of overfishing, and so if someone could answer that, that would be great.

DR. NESSLAGE: Chris, you're specifically talking about TOR Number 7 and how that would actually pan out. Erik Williams, is Kyle Shertzer on?

DR. WILLIAMS: Genny, I can jump in on that. I mean, you're getting into specifics of this assessment, and the way we characterize uncertainty is slightly different from assessment to assessment, but, in general, we do make distributional assumptions, but do a Monte Carlo Bootstrap sort of method, which is not Bayesian, but it is a step better than I think your basic frequentist-type approach for characterizing uncertainty, and so we do sort of incorporate fixed values that other sort of uncertainty estimation methods don't account for, such as landings, and so, specifically, on MRIP, we do assume a normal distribution, and that's a very good topic.

I have been worried about that as well for these rare-event species, and MRIP and I, and I have been serving on the rare-event species working group with MRIP, which, unfortunately, because of COVID, has come to a halt, and we haven't really done much with that, but that was one of the topics that I wanted to address with them, is what is that distribution, or what kind of a distribution should we assume for these rare-event species, because it does seem like it shouldn't be normal, given the exact properties that you just described, and so that's sort of, in a nutshell, what we do.

DR. DUMAS: For blueline in particular, I remember having the same thought last time we discussed blueline, and I've become a lot more familiar with MRIP and their process over the last few months, and so they are very specific in saying they don't make any distributional assumptions in generating their mean and variance of their catch. They just give you a mean and variance, and their method assumes no distribution. It's distribution free.

Okay, and that's fine, but then, when we take the mean and variance and we include them into a model that also adds in the biology dynamics, and then we do our bootstrap runs and calculate the probability of overfishing, the mean and variance for the recreational catch that comes from MRIP

is going to be put into some type of distribution, and, if recreational catch is important, an important part of the overall situation, which someone earlier said is the case for blueline tilefish, then that could matter a lot, and so how the mean and variance coming from MRIP are incorporated into this model and what distribution those means and variances fit into would affect the recreational -
- The probabilities of different recreational catches, and it would affect those probably a lot, and that could affect the probabilities of overfishing. Blueline tilefish might sort of be a poster-child for this particular issue, but, since we're talking about blueline tilefish right now, I just thought it was relevant, and so that's why I brought it up. Thank you.

DR. NESSLAGE: Thank you, Chris. I will go to Fred, and then we'll try to -- Think, Chris, in the meantime, if there's any changes to the wording that you would like to suggest to Number 7, although that says "landings", and maybe it needs to say "catch".

DR. DUMAS: I think my comment is really more about Item Number 3, where it talks about probability of overfishing.

DR. NESSLAGE: Yes. Okay. Is there any specific --

DR. DUMAS: Something about investigate a few asymmetric distributions, or just asymmetric distributions, for incorporating MRIP parameters.

DR. NESSLAGE: Okay. Thank you. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I, of course, agree with the comments that have just been said, but I want to remind us that we're doing an operational assessment here, and, typically, an operational assessment -- They are essentially using the same methodologies and the same approaches, and they're just using updated data, and, while that's not to dismiss that there may be issues with the way the assessment has been done in the past, remember that it's an operational assessment, and, therefore, the amount of leeway is very much less, because we just feel that these are, quote, turn-the-crank assessments with new information, updated information. That's not to belittle the comments, and I think they're really right-on about uncertainty, but we may be straying a little bit afar from what we have considered an operational assessment. Thank you.

DR. NESSLAGE: To that point, Fred, if they're going to be consistent in how they define operational assessments, then Number 7 would also be more exploration that wouldn't be part of the updates, which is this is not, and so I think maybe our report can say to stick with this and take out Number 7 or -- I guess I'm still very confused about what parameters they are putting around operational assessments. There's benefits to flexibility, but there's also time constraints. Kathleen, can you comment on that? Some of these are moving beyond update, like Number 7. Are we going off the rails with the suggestion in Number 3, or should we put this as part of our recommendations for perhaps even a broader working group on response to the rare-event species recommendations?

MS. HOWINGTON: For that, I would lean on Erik Williams. Like I said, these were created by talking with the Science Center and asking them what they thought they could do in the time that they would have underneath an operational parameter. You guys requested, specifically -- Like, Number 7, you requested that. In the conversations that were had between the council staff and the Science Center staff, it was determined that they could do Number 7 in-house and that it wasn't

a stretch for an operational, but, since you have added in to investigate asymmetric distributions, which actually I was going to mention this, and so thank you for calling on me, I would definitely want to double-check that that is something that the Science Center believes they can do in-house in the time constraint that they have.

DR. NESSLAGE: Excellent. We won't put Erik on the spot, unless he would like to comment, and this will be our suggestion, and they can negotiate with the council, and that's kind of what you're telling me, right?

MS. HOWINGTON: Those negotiations have already happened, and so I think I'm saying we need to put Erik on the spot.

DR. NESSLAGE: Erik, we're putting you on the spot.

MS. HOWINGTON: Sorry.

DR. WILLIAMS: I appreciate the conversation, and so it seems like it's something we could address, although, thinking about the workload, it is a whole re-running of the MCB process, which does take a lot of -- It's a computer-intensive method, although we've gotten quicker with it, but I think we could probably do it, and so I would say you're fine leaving it in.

This is just part of this overall conversation about what an operational is, and I think somebody said earlier, and I forget who, that we just need to wait for this process to gel a little more, because I do feel like -- Not to put the SSC in a box either, but the SSC, the council, and the Center are not all on the same page on this, and so hopefully we'll get to the same page eventually, but, yes, there are certainly some different views about what an operational is going to do and not do, but thanks.

DR. NESSLAGE: Thank you. Well said. Mike, could we switch over to our notes, unless Chris is -- Is it to this point?

DR. DUMAS: I just wanted to say that, if it's more appropriate for the investigate asymmetric distributions issue to come later, to come as part of some other type of assessment that's not operational, that's fine. I just thought that I would bring up that issue. If it's appropriate to consider here, then great, but, if it's better saved for later, that's fine.

DR. NESSLAGE: It certainly sounds like this a broader issue, but, if they can take a bite, small bite, out of the problem with tilefish and see what the impact is on this particular rare-event species, that might be a step in the right direction, it sounds like. Let's see what Erik's shop can do for us in that time period.

I want to just make sure that we've summarized the key points that everyone has brought up, if we could. Thank you, Mike. I am checking my notes against yours here, and we've already done some wordsmithing. It looks like -- Jeff Buckel, have we changed TOR 2 appropriately to address your concerns, or should we change it specifically to dead discards?

DR. BUCKEL: It's fine the way it is. I think it's been discards in the past, because that has to be done, and you have the discard mortality at the beginning, and so folks will know that those two are going to be used to get the dead discards, and so I think it's fine.

DR. NESSLAGE: Because they're supposed to report total and dead discards, correct, in that last sentence?

DR. BUCKEL: Correct.

DR. NESSLAGE: So that's comprehensive, if not worded as efficiently as it could be. We already did that, and it looks like we've got the two that we can knock off, and we've already got the suggestions. We've got the note about road-bumps, and we will wordsmith that, but the idea is to be prepared, and just a couple of notes on the SSC recommends needing to come up with standardized ways to deal with data limitations, and we can wordsmith that, but, also, I heard people request an update on the response to COVID at future meetings as well. My bad. I wasn't reading ahead. Thank you.

The other thing we haven't dealt with is the question of whether the council would like the data-limited approaches included in this assessment, and, Erik, do you know if that was part of the discussion and taken off the table, or was it just forgotten, by mistake?

DR. WILLIAMS: You are testing my memory now. I don't remember. Sorry.

DR. NESSLAGE: So it's worth bringing up in our report. Does anyone have any -- Kathleen.

MS. HOWINGTON: I am looking through my notes that I have right here of all the different emails that I have had to summarize, to make certain that I have everything prepared for you guys, and I do not see anything about a data-limited -- It wasn't in the original statement of work, for sure.

DR. NESSLAGE: Okay. So it's worth bringing up. I had a note as well, Mike, under the SSC recommends standardized ways to deal with data limitations of 2020, and there was a comment to reconsider the timeline if there's no 2020 data, for this and other species, and I guess we can make that a generic statement, unless folks disagree. You could probably make it 2020/2021, because this could bleed into the next year.

Then there was also a general recommendation that standardized TORs, that we talk about -- Maybe, after we've gone through enough of this pain, we can talk about standardizing operational assessment TORs a bit more, and I don't know how -- It seems, at this point, there's still a lot of negotiations and back-and-forth, but that might be something to consider as this process gels, and we can make that a generic consideration for the council. Was there anything else that I missed, folks? You will have an opportunity to wordsmith and to add little things, but were there any other big points, and does anyone have any concerns with what they see on the screen? This is the time.

No hands. All right. Wow. We got through blueline. That was the easy one. Let's move to red grouper, with the knowledge that a number of these same considerations will apply, and we'll probably have some new ones. I am guessing that we will want to suggest the same wording changes for what is now 4 and 5 being morphed into 2 and borrow the same -- Unless folks disagree, I would assume we want to borrow the same language about the 2020 and beyond data as well. While Mike is frantically working on that, are there any other -- Well, Kathleen, did you want to say anything about the red grouper TORs, to start off?

MS. HOWINGTON: Yes, and I have my little spiel. In your statement of work that was approved by the SSC, you did request a data update on stock structure and transport of larvae, and that was determined to be something that would be better suited in a research track, and then, just for me, right now, and I will say that this contingent on the schedule and if any changes occur, due to COVID or due to anything else, but, right now, the South Atlantic red grouper terminal year is actually 2021, and so I apologize for that, if you want to update that, or if you just want to make it a slash, like blueline tilefish, with the understanding that, right now, the schedule is a little bit in flux, but, according to the master schedule right now, it's 2021.

Other than that, everything else you requested is in the terms of reference. As you can see, we do have the include new and updated information that we had during the last term of reference, but steepness is included, and so, if we want to -- When we update I believe it was TOR 2, and we add those in, we need to make certain that we include steepness. Otherwise, no big changes.

DR. NESSLAGE: Thank you. Other comments or questions or concerns that haven't -- Other than the ones we've already made that will apply from blueline? Anything red-grouper-specific here? I have something, if there's no hands. I had a question about Number 3, Kathleen. It's provide the probability of overfishing occurring at specified future harvest and exploitation levels. During our last round, we asked for projections with the current average recruitment, and I'm wondering if the -- I guess this is a question for the SSC, but do we want to be explicit and ask for that again in advance, to aid our discussion, or would the analysts just automatically do that, Erik, guessing that we'll want to see that again? Recruitment will very likely be a big issue in this assessment as well. Any comments on that?

DR. WILLIAMS: Genny, you can probably count on us doing that again, and so we'll probably do the whole suite of projections we provided last time.

DR. NESSLAGE: Okay. Does anyone not want them to do that? I would assume we would want to see that again, since it was so important to our discussions in the last round. We will just make note for a full set of projections.

DR. ERRIGO: Did you want that in the TORs? I'm sorry, but I didn't --

DR. NESSLAGE: No, and I think we can just make a note in the report.

DR. ERRIGO: Okay.

DR. NESSLAGE: Just that we discussed that. Anything else about red grouper? Chip.

DR. COLLIER: I do want to point out that red grouper is one of the species that they had to do a new rebuilding plan for this species, and I just wanted to see if there was any comments on that, in order to make sure that the councils try and keep this species on track.

DR. NESSLAGE: So specifically regarding the TORs or how that would impact our TORs? What exactly are you asking, Chip?

DR. COLLIER: Similar to what you were talking about with the low recruitment levels, and I think that was identified as one of the issues why the stock is not rebuilding and it has not made adequate -- I think it was starting to make some progress in rebuilding, but I just wanted to make sure that this is going to be addressing everything that you guys need. I probably didn't say it well, but this has had poor recruitment for quite some time.

DR. NESSLAGE: Right. I guess, do folks want to see a specific -- Anything more regarding recruitment than what would already typically be provided by the Center in the assessment? I am not hearing anything.

DR. ERRIGO: Genny, it had once been discussed, and forgive me for going out on a limb here for what I should or shouldn't be suggesting, but it was once discussed that this time of low recruitment might be a new normal, but we don't know that, because it hasn't been in place for very long, and I'm not sure if exploring that in an alternate, perhaps, run is something that the Center can do, breaking everything where the drop happened and running it as if there were two different sets of parameters, and, Erik, please feel free to chime in if that's something more for a research track than an operational, and then that's fine.

DR. NESSLAGE: That's definitely something we were concerned with and discussed. Erik, would you be comfortable commenting on what might be done in this assessment versus something broader?

DR. WILLIAMS: Sure. I think -- I mean, I totally understand Mike's comment, and I agree that there's something going on with red grouper. I think probably the better way to approach this would be to get this assessment in hand, as a strict operational, and then, based on the results of this assessment, that's when I think you would start to discuss if we need to change the tactic that we're doing with red grouper at that point. I think we're still in this mode of we should continue with an operational assessment for this species, but maybe this next operational assessment might reveal some more information that might suggest a different course of action for subsequent assessments, and so that would be my recommendation.

DR. ERRIGO: I would say that's fair. That's definitely a good way to go.

DR. NESSLAGE: I just want to make clear that -- It would be hard to do on the screen right now, but the recommendations that were made to changes to the TORs to blueline would also be made to red grouper then, regarding wording and the 2020-plus data, and does anyone have any heartburn about that? We would rope steepness in, right?

MS. HOWINGTON: Yes.

DR. NESSLAGE: Duly noted, and I think what we'll do is we'll do the wordsmithing on all three documents and circulate that with our SSC report, just to make sure that everybody is cool and on the same page regarding the changes we made, without wasting time right here, but, Kathleen, go ahead.

MS. HOWINGTON: I was just going to say that I would really love it if you guys would approve as amended, or approve as modified, officially on the record, if you wouldn't mind. I know that a

lot of the wordsmithing is going to happen afterwards, just because you need to try and speed this up, for my sake.

DR. NESSLAGE: We didn't officially do that with blueline, and so why don't we do that first, and then we'll do red grouper, once Mike has finished taking notes, and maybe we could switch back to the blueline one, so that folks can look at those wording suggestions one more time. Could you switch over real quick, Mike, to the blueline TORs, just to make sure, and I just want to make sure that everybody is on the same page. The stuff in red, folks, does anyone disapprove? I am going to consider quiet to be approval of these TORs as modified. Raise your hand or forever hold your piece. Seeing no hands raised, everyone seems fine with that.

Then what we're proposing is that these same modifications would be made to the red grouper TORs, with the addition that steepness would be rolled into Number 2 as well, and are there any concerns with that? Do we approve these modifications? If there is no concerns, we will consider these approved as well. No hands raised. Excellent. Thank you. Does that help you, Kathleen?

MS. HOWINGTON: Yes. Thank you.

DR. NESSLAGE: All right. Vermilion snapper, last, but not least. Once again, I would assume the same red-line changes that would essentially be made to red grouper would be made here, and they would include steepness, life history, and discard mortality would be wrapped into Number 2, and we would include the caveats, questions, and concerns about 2020 and beyond data. Anything else regarding vermilion snapper? Kathleen, you have to do your spiel, right?

MS. HOWINGTON: Yes, and just my little spiel. Based on the original statement of work that you approved, there were two data updates that were removed, and the first one was vermilion snapper with FWRI's selectivity study, and that's being taken into account with the selectivity workshop that's going on right now, and so that was removed from this term of reference.

The second was a concern that you raised about the decline in the headboat index since 1992. After multiple back-and-forth emails between council staff and the Science Center, it was determined that the drop in 1992 had more to do with the implementation of a minimum size limit, and it's been taken into account since the first benchmark, and it has been documented in there, and so that didn't need to be addressed in these terms of reference either.

Otherwise, the data that you requested are in here, and then, finally, as you can see with vermilion snapper, again, that is terminal year 2020 or 2021. Right now, according to the master SEDAR schedule, that terminal year is 2020, and so, once the scheduling call happens and we're able to finalize that, that is going to be the final terminal year date. If you want to leave it as 2020 or 2021, you may, and that is up to you, but, right now, 2020 is going to be the terminal year.

DR. NESSLAGE: Excellent. Thank you. Any comments or questions regarding the vermilion TORs? We have worn you down. I just realized that I have not asked for public comment. We have a few SSC comments, and we'll take those, and then I will go to public comment, and then we'll do the final approval, and the public comment can be for all three TORs, so we can consider that. Jeff, please, go ahead.

DR. BUCKEL: Chris can chime in if I'm got it wrong, but the one addition that was on blueline, and I think it would apply to red grouper, was about the asymmetric distributions for the rare-event species. If it's just for rare-event species, then it may not be an issue for vermilion, that are not rare-event species.

DR. NESSLAGE: Would that also apply for red grouper?

DR. BUCKEL: In recent years.

DR. NESSLAGE: Okay, and so you're saying keep it in blueline and red grouper, but not vermilion snapper, you're saying, and so you're suggesting that that be taken out.

DR. BUCKEL: Yes, if the asymmetric distribution issue was only for rare-event species.

DR. NESSLAGE: Okay. Chris, would you like to comment on that, since it was your suggestion?

DR. DUMAS: Yes, and I agree with those comments.

DR. NESSLAGE: Excellent. Alexei.

DR. SHAROV: Just a quick question. After watching this for three times, or two times, I wonder why steepness was specifically selected to be a separate terms of reference. In a general sense, this part of the life history characteristics, essentially, is a parameter of the stock-recruitment relationship, or so we think, and so, I mean, you could similarly identify natural mortality, or anything else, as a separate term of reference. Not that I am against it, but it just sticks out, and I wonder what the SSC thinks of it. Is it the way you want to see it for every species every time, or could it be just in the life history parameters? Apparently there was a reason and some thought behind it, and so I don't want to drag it out for too long, but I just wanted to ask.

MS. HOWINGTON: I can give you a little bit of the history.

DR. NESSLAGE: Please, Kathleen. Go ahead.

MS. HOWINGTON: These terms of reference were built on what a standard term of reference -- If you remember, that's what we switched from, but I took the standard term of reference template, and I -- After negotiations with the Science Center and council staff, of course, this is what it ended up being, but, initially, in the standard term of reference, it was Term of Reference Number 3, I believe, and it was include new and updated information on life history, discard mortality, and steepness.

Now, we determined that it would be better if we could separate that out for these operational assessments, but, if you don't think that steepness needs to be specifically listed -- That's where it came from, and I don't know where it came from before that, and that's a little bit before my time, but that's why that is in here, is it's left over from previous templates.

DR. ERRIGO: I might be able to comment on why it's pulled out separately. It's actually, as you guys know, a very important parameter, but it's important in our ABC control rule, because, when the steepness is set for -- When we specify steepness ahead of time in the assessment, we consider

-- Basically, we consider the MSY parameters to be proxies, and so it's very important in the ABC control rule, in that respect, and so I think the -- We get a lot of our -- We do specify them ahead of time for almost all of our species, because there's not enough information to estimate them, and we get a lot of that information from one meta-study, and so that's why I think it's in there, in case anything else is done, if a new study is done, if a new meta-study is done. We can take that information and update the steepness with it, and so I think that's why, but it's up to you guys whether you want it separated out or not.

DR. NESSLAGE: Thank you, Mike, and thank you, Kathleen, and so it is a super-important assumption in all of these assessments, and I totally see Alexei's interest in the fact that it's part of the life history suite of parameters, and does anyone have any major heartburn over keeping it as it is, which is the path of least resistance, or do we want to make a specific, probably overarching, recommendation that it be roped into life history and removed? Does anyone have a very strong opinion on this, or a mild opinion? Alexei.

DR. SHAROV: Thank you, Mike. I think that was a pretty good description as to why it's actually needed and important, and so it's part of the process, essentially, of making it necessary to check it out every time, and so I'm good with that the way it is.

DR. NESSLAGE: Thank you, Alexei. I am not seeing any other hands raised, and I'm going to assume that everyone else is okay and appreciates that explanation. Are there any other general comments or concerns with the vermilion snapper TORs? As I mentioned before, I realized that I have not asked for public comment, and we've already been unofficially, or officially, approving the TORs, and I would like to take a moment, since there are no SSC member hands raised, to ask the public if they have any comments or questions or concerns with the TORs for these three species. This is your time. Please raise your hand. I am not seeing any hands raised.

Just to confirm, the SSC -- Given I saw no more hands raised, I am going to assume that, unless someone is raising their hand and speaks now, that we approve the terms of reference as modified for vermilion snapper as well. Last chance to raise concerns or suggest modifications. Excellent. Thank you, all, for your patience and your excellent suggestions.

I noticed that Table 1 is in our overview, and I just want to make a couple of comments, and perhaps, Mike, you can chime in as well. You may notice that Marcel Reichert is still chair of the scamp assessment, despite his being off the SSC, but, considering his intimate role in that, and his leadership role in that, I believe the understanding is that he will remain on those working groups, and is there anything that staff wants to add to that?

DR. ERRIGO: The only thing I would say is that we're very well into the process, and it would probably be disrupting to replace him on that, and so we felt that it was -- As long as the SSC is fine with it, we felt it was fine to just leave him there as-is.

DR. NESSLAGE: Okay. I just wanted to bring that to the SSC's attention, as well as, under 2021, mutton snapper, assignments will be made at the joint SSC meeting on October 30. Is there anything else that we need to tell the SSC, staff, regarding the table?

DR. ERRIGO: I don't think so. I think we're good.

DR. NESSLAGE: Great. Thanks. Are there any questions from the SSC? Julie.

DR. NEER: I just want to clarify that we're actually probably not going to -- We're going to take volunteers for mutton, and I don't believe you were going to do at the joint though. I thought we were going to do it at the April meeting, but I will clarify with staff, timing-wise, what will work best.

DR. COLLIER: That's probably right, and it's going to be the terms of reference that we're going to be reviewing at the October meeting.

DR. NEER: Right, the terms of reference, and you will have the schedule, I guess if people want to volunteer, or if they're chomping at the bit, we'll take your names down then, but, officially, I think it's going to be April, because we don't actually begin that assessment until August of 2021.

DR. NESSLAGE: Excellent. My apologies. I misspoke, but we will be hearing some mutton snapper information at the joint meeting, but we just will not officially appoint folks. Thank you for that. Any other comments or questions or corrections or accolades? Okay. Great. Thank you, everyone who is participating in the assessments, for your work. Is there any other business under SEDAR Activities, staff, that I have forgotten?

DR. ERRIGO: No, and that was all the business under SEDAR.

DR. NESSLAGE: Great. I don't know about you all, but I need a biological break. It's now 10:42. Can we take a ten-minute break and be back at 10:52? Does that sound reasonable to everyone?

DR. ERRIGO: I think I can manage that.

DR. NESSLAGE: All right. Then we'll take a quick break, and everyone please return in ten minutes. Thank you.

(Whereupon, a recess was taken.)

DR. ERRIGO: I think Genny might be having connection issues.

DR. BUCKEL: I just sent her a text. I just heard back from Genny. She lost internet, and so she said proceed without her until she gets back up. I guess, since I'm the Vice Chair, that means I'm good to take over the reins here for a minute, or hopefully just a few minutes. The next agenda item is Number 4, Update on New Data in the SEDAR 73 Red Snapper Assessment. The appropriate attachment is Attachment 5.

DR. COLLIER: Don't look too hard for that, because there is no attachment.

DR. BUCKEL: There you go. Who is on the --

UPDATE ON NEW DATA IN THE SEDAR 73 RED SNAPPER ASSESSMENT

DR. COLLIER: I will start it off, Jeff, and, if Erik Williams wants to fill in, he's more than welcome to. We are working on the update assessment for red snapper, and it's going to be SEDAR 73, and, based on the new topical working group that was kind of brought up I guess in May at the SEDAR Steering Committee, we put together a selectivity workgroup, and that's going to be looking at some of the issues that the SSC identified at the last review of the red snapper stock assessment, SEDAR 41.

In that, they identified some of the potential issues of different selectivity between trap and camera gear and also whether or not trap and camera gear should be combined into one index, and so the workgroup has had two meetings to discuss some of these issues, and they're continuing to work on them. We're going to be having two more meetings, hopefully to finalize everything, and it looks like we are on schedule to have our report to SEDAR by November 16, which is the working paper deadline for SEDAR 73.

There has also been a couple of meetings talking about the data for red snapper, basically background workshops, in order to plan for the upcoming SEDAR 73 meeting in December, and so there's been a couple of those, and they were really good meetings, and they have been talking about a lot of data that might be available for the SEDAR, and so it might be good to have you guys -- Since it red snapper, and you guys are going to be doing the review of this in April, it might be good to have an update of this at the January meeting as well, and so, in January, you guys are going to be talking about the snowy grouper stock assessment, and you're going to be doing the review there, and it might be good just to get an update on what's going on with red snapper at that meeting. There is no other business for this, and we just wanted to give you an update on what's going on for red snapper.

DR. BUCKEL: Thanks, Chip. Erik, did you want to add anything?

DR. WILLIAMS: Thanks, Jeff. Chip gave a pretty good overview. The only thing I would add is I think the selectivity was sort of a new data source and issue that we identified pretty early on, but another one that's come up that may be important for the SSC to recognize that's going on is Florida is going to be submitting a repeated time-drop hook survey that they I think have five years of data for, and so that is another new data source that's likely to be considered in this red snapper assessment. I think Chip highlighted that the importance here is that there is a lot more new data coming to the table with this one than is typical, and so we're just trying to get the SSC as much heads-up on that as possible, so that you guys aren't caught off-guard when this thing comes to you for review.

DR. BUCKEL: Thanks, Erik. I guess I will open it up to the SSC, if they have any questions for Chip and Erik, but this seems like a good strategy, to get an update at that January review webinar, snowy grouper review webinar, and so, if anyone has any questions for Chip or Erik, please raise your hand. No hands, and I would say that means that no one has any questions and everyone is okay with getting an update in January, and so if staff or Erik's group could prepare to have someone give us an update in January, that would be excellent. Then I just got a text from Genny that she has called in. Genny, are you on the line?

DR. COLLIER: We will need to find her. Hold on one second. Chris Dumas had a question.

DR. BUCKEL: Please go ahead, Chris.

DR. DUMAS: On the red snapper, right now, folks are estimating the different selectivities of the trap, the hook-and-line, and the camera gear data, and so are you -- After you estimate those selectivities, are you going to combine the three different data streams, the trap, hook-and-line, and camera, and are you guys looking at sort of a multi-frame sampling framework to combine those data streams? Then, as new data streams come online, and I think you mentioned something from Florida, how will they be incorporated? Are you guys going to do some type of Bayesian thing or -- Has that been discussed yet, or it so far just the only effort has been to estimate the selectivity? Any thoughts on how these are going to be combined? Thanks.

DR. BUCKEL: Great question, Chris, and I will let Erik tackle that one, if you don't mind, Erik.

DR. WILLIAMS: No problem. Thanks, Jeff. I mean, I think the main issue here is trying to address selectivity, and, to the degree that the selectivities for these gear types are different, that will sort of dictate whether we treat them as separate data sources or combine them, and so it really is going to come down to how different are the selectivities for these different gear types, and I think the jury is still out on that one, and so I don't want to get too far ahead of where we're going with this workshop, and so I think the workshop is going to lead us in that direction, and, yes, I would anticipate that, if we do have like very different selectivities, then probably where we would end up going is treating these as independent data sources, in a sense, and not completely independent, and that's where it gets a little tricky, but at least providing different information to the stock assessment model.

DR. BUCKEL: Thanks, Erik. Are there other questions related to the new data on red snapper?

DR. DUMAS: My point was that, even if the selectivities are different, you still might be able to combine them, using sort of a multi-frame sampling framework, and take advantage of any correlations across the different indices and combine them to get better estimates, and that's all. I was just looking forward. Thanks.

DR. BUCKEL: Erik, did you want to respond to Chris at all on that one?

DR. WILLIAMS: Other than to say, yes, we're on that track. I mean, that's exactly what we're considering, is how we're going to -- I mean, the trick is how to measure that correlation, and that's the tricky part.

DR. BUCKEL: Thanks, Erik and Chris. Okay. I don't see any other hands raised, and so I think we'll go ahead and move on to the next agenda item.

DR. NESSLAGE: I am back, Jeff, if that helps.

DR. BUCKEL: Yes, and I will let the Chair take over.

DR. NESSLAGE: You're doing such a great job though.

DR. BUCKEL: I know it was a test, and so thanks.

DR. NESSLAGE: Thanks for being the backup there, and I apologize to everyone. My internet, of course, went out at the perfectly inappropriate time. I have one question on red snapper, and I apologize, because I away, if you talked about it, but did you discuss the fact that we'll be asking for volunteers for a P* working group for red snapper?

DR. BUCKEL: We did not.

DR. NESSLAGE: Okay. I just wanted to update the group, and we can look for volunteers when we have that winter meeting, but we did discuss the idea of frontloading some of the projections that the SSC would most -- Is most likely to request, so that we have them in front of us at the April meeting, and so one way -- One idea we came up with for dealing with that is to get a small working group of members of the SSC together right after the assessment is out and you've had a chance to read it and to kind of go through the decision tree and come up with their recommendation to the SSC for what the P* should be, so that the analysts can run those projections in advance of the meeting.

Granted, we may change our minds at the meeting, and that's fine, but having that frontloaded would allow us -- The most likely set of projections would give us the most information on-hand at the April meeting, and it will already be packed, and so I would just ask folks to think about who has time to tackle red snapper quickly in early April and have a brief meeting and make that recommendation to Center staff, to Kyle and the lead analyst. Are there any questions on that? Great. Thank you. Thank you, Jeff, for stepping in. I really appreciate that. Hopefully we will have no more disruptions.

As Jeff was kindly saying, then let's move on to Agenda Item Number 5. Go ahead.

DR. COLLIER: I will be taking control of this, and Julia is going to start off and give a presentation, or start off the presentation for us.

DR. NESSLAGE: Before you take off there, I just wanted to remind Dustin, Wally, Jared, Eric, Fred Scharf, and Alexei that you are on the assignment to please take notes for this particular agenda item.

DR. COLLIER: I see that Dustin has his hand up.

MR. ADDIS: Sorry, but did we take public comment on Agenda Item 4? I was just making sure.

DR. NESSLAGE: No, we didn't. Did we, Jeff?

DR. BUCKEL: We did not. Good catch.

DR. NESSLAGE: Thank you for keeping us straight. That sounds like leadership material there, Dustin. Watch out. Let's take a step back very quickly, before Dustin has a chance to hang up on us, and see if there is any public comment. Please raise your hands, regarding the red snapper agenda item. I can't see now, and so you'll have to tell me, Chip.

DR. COLLIER: Rusty Hudson has his hand raised.

DR. NESSLAGE: Rusty, please go ahead.

MR. HUDSON: Like Genny, my whole internet went down too, but at least I caught the gist of the red snapper, and I like what Erik had to say, and I just wanted to say that, and so thank you.

DR. NESSLAGE: Thank you. Any other public comments?

DR. COLLIER: I am not seeing any.

DR. NESSLAGE: Excellent. All right. Thank you, Rusty. Thank you, Dustin. Is there anything else, with that disruption, that we've forgotten with red snapper, before we let Chip take the floor here?

DR. COLLIER: I am not seeing any hands.

DR. NESSLAGE: Great. All right. Everyone just note that Attachments 6 and 7 are what we're looking at, and go ahead, Chip. Thank you.

DR. COLLIER: There is a revised version of Attachment 7 that was added to the briefing book this morning, and there are just some slight modifications based on recommendations from Genny, and so that is in there, and Julia will start us off.

REVIEW OF THE KING MACKEREL LENGTH MEASUREMENT METHODOLOGY FROM THE FISHSTORY PROJECT

MS. BYRD: Good morning, everyone. I am Julia Byrd, and I'm the Citizen Science Program Manager, and I kind of appreciate the opportunity this morning to share some information on one of our citizen science projects, FISHstory. In particular, we're hoping to get some feedback from you guys on kind of a length analysis methodology that we've developed as part of this project, where we're trying to estimate length distributions from historic photos.

On the next slide, you should see an outline of the presentation, and, as Chip mentioned, we're going to kind of be tag-teaming this presentation, and so I'm going to give you a little background information and an overview of kind of the FISHstory project as a whole, and then I'm going to turn things over to Chip, and he's going to get into the details of the length analysis methodology that we have kind of put together, and then we're hoping to get some feedback from you guys on these kind of techniques that we have developed.

To give you guys a little bit of background information, and I know that you all are very familiar with this, but, in the South Atlantic, there are limited recreational fisheries data available prior to 1970, and so the Southeast Regional Headboat Survey kind of got underway in the 1970s, with the kind of exact timing dependent on kind of the geographic location, and then the MRIP survey, which collects information on the private and charter sectors, started in the early 1980s.

Often, to account for this kind of lack of information for this historic time period, stock assessments have often relied on kind of using species ratios or measurements for other sectors or using more

modern landings that are regressed back in time, to kind of recreate an historic landings time series for the recreational sector, and there is very little -- There is typically very little, if any, information on the size of fish back from this historic time period, and so, in the for-hire fisheries, they have a tradition of, after a trip, coming back and displaying their catch at the dock for kind of a commemorative photo for their clients or customers. These historic photos can really be an untapped source of information that can provide insights on what was being caught during these historic time periods and even on the size of fish caught during those times.

The FISHstory project is a pilot project that is trying to use historic dock photos to estimate for-hire catch and length composition, and so, in this pilot project, there are over kind of 1,300 photos, and they're a mix of color and black-and-white photos from Daytona Beach, Florida from the 1940s to the 1970s. The photos were provided by Rusty Hudson, who you just heard from, and he's really been a key partner in this project, and these photos represent his family's fishing fleet from this historic time period.

There are three main components of the FISHstory project, and the first is kind of digitizing these historic fishing photos. This portion of the project is complete, and Rusty did a lot of work scanning in all of these 1,300 photos and providing us kind of some metadata, and then we created kind of a photo archive, with a corresponding spreadsheet that contains all of this metadata, things like kind of date of photo, the vessel name, captain name, homeport, that sort of information.

Then the second component of the project is where we're trying to get information on for-hire catch composition, and we're doing this portion of the project using an online crowdsourcing platform called Zooniverse, and so the Zooniverse platform allows us to kind of create a FISHstory project, where volunteers can be trained to identify and count the fish and the people within these photos, and so we have developed kind of online tutorials and training materials, so that even folks who may not be as familiar with kind of species identification can participate in the project.

Within the Zooniverse project, we have multiple volunteers looking at and classifying each photo, and then we have a validation team that's made up of fishermen and scientists who can help verify the species IDs and counts when the volunteers disagree, and so this portion of the project is underway now. It launched in Zooniverse of late May of this year, and we have been really excited, and we've had a lot of interest in the project, and, as of last night, we have had over kind of 1,420 volunteers participate in the project, and they have made over 24,400 kind of classifications, and so that's identifications and counts within kind of the photoset.

The third portion of the project, which is where we want your feedback on today, is we have kind of developed methods to estimate length composition from these photos, and so we're estimating fish length using kind of the lumber in the leaderboard, where the fish are kind of hung and displayed, as a scale, and so we've developed a protocol using kind of the opensource ImageJ software and then a resampling technique to produce length comps with their associated uncertainty.

We are pilot testing these, these methodologies that we've developed, on one species, king mackerel, and king mackerel were chosen because they occur frequently within the photos, and they are typically displayed hanging on the leaderboard within the photos, as opposed to kind of laying in front of the photos, or sometimes the photos will have kind of wheelbarrows of fish, or

trashcans full of fish, but king mackerel were generally kind of hung on the leaderboards, and they are also relatively easy to ID within the photos, compared to some of the other species.

Again, these are the methodologies and techniques that we're hoping to get feedback from you guys today, and I'm going to turn things over to Chip now, who is going to kind of go into the details of these different methodologies, and so take it away, Chip.

DR. COLLIER: Thank you, Julia. Today, we are going to just be focusing on the length analysis, like Julia had mentioned, and so I'll go into the process that we were going through as we developed this length analysis. The first question that popped into our minds is we wanted to make sure that there was -- If there were differences between the readers and estimating the size of the fish, that we were going to be addressing these. The second thing we wanted to make sure that we could do is accurately get the length of known length objects, and so we developed some test protocol, and so, in that test protocol, we also developed a protocol to collect data from historical photographs.

Then, finally, what we want to do is develop a length distribution with error estimates from the historic photographs for the potential use in future stock assessments, and, if you look at this picture to the left, you can see some of the challenges that might come up. First of all, it is a good photograph, but some of the species can be hard to identify. Some of the species you don't see from head to tail, and so you might not be able to get a length estimate, and so all these differences that could occur in there could lead to differences between the readers, and so we felt like we really needed to develop a sound protocol for this.

The first thing we wanted to do is we wanted to get a measurement of a fish, and you can see the blue line here, and we used ImageJ to basically measure a gag grouper that's pictured here, and that's the easy part. Putting a line on a fish isn't that bad. Now, we need to translate this line from pixels into some kind of length estimate, and what we were looking -- What we had considered looking at were several different things, and a couple of them are actually pictured here.

Up top, where it says "FISHE", that's the leaderboard, and we had considered maybe using that as a length estimate, and one of my thought processes with that was, that way, we would be minimizing error as we're going from a large object to a small object. Another potential item was looking at the two-by-fours, and you can see some of the nails coming out of these two-by-fours, and maybe that would be useful for estimating lengths of fish.

Other things we looked at were actually -- We considered maybe using the lengths of sunglasses or the distances between some of the fishermen's eyes. However, those tend to be in front of the fish, and that can lead to some inaccurate estimates, and so those were thrown out fairly early, and I will go into some more of the length methods that we came up with, but what I want to do is talk a little bit about how we came up with our process.

Within each of the citizen science projects, they all have a design team, and so, with FISHstory, we have a specific design team, and we worked with that team to develop and pilot a draft protocol, and, in that draft protocol, we detailed the length analysis protocol, and this includes descriptions of all the data fields, what the analysts are supposed to fill out, and, basically, all the information that the analyst is supposed to fill out is already supplied to them on an Excel spreadsheet, and they just fill in the appropriate information.

Some of the information is populated through ImageJ, and so the analyst will just go into ImageJ and hit “length measurements” and then fill out the rest of the Excel spreadsheet. So far, we have trained five analysts for the production of length measurements, and all of these analysts have completed a virtual training with staff, and they have also gone through a calibration photoset prior to production of length measurements.

As we’re going forward from this initial calibration phase that we’re going to be talking about today, as we go into the other 700 photographs that are going to be analyzed, two individuals will be looking at each photograph, and so we’ll be getting slightly different measurements from each of the analysts, and we’re going to need to incorporate those into a length distribution.

Starting off with ImageJ and how the analysts are actually doing this, you can see here, in yellow, there is three marks on the board. These first three marks are done consistently by the analysts before they measure any king mackerel that are present, and this is to get basically reference tracks of the scalar that will be used to estimate lengths of fish, and these can be either a two-by-four or a two-by-six, and the analyst has to report exactly what it is, and it’s kind of nice in this process, and we generally know, based on the dock, if it’s a two-by-four or a two-by-six, and so we’re able to do some error checks in there as well. Then, after they measure the reference board, then they will go in and measure the fish, and you can see the fish being measured with red lines.

Now, how we came up with this process for measuring the three and using the two-by-four, we actually went with a series of scalar developments, and you can see all the different processes that we went through, and we have this large board that was eighty-one inches, and that was measured, and we had another board that was forty-one inches, and we also had several different pieces that we measured, and you will be able to see the lengths of all of these in a later one.

We also have this G, which is the scalar bar, which would be similar to what I was talking about before. This G was measured, and that was used -- All of these were used to scale and measure the lengths of these pieces of wood that were known lengths, and they all had names on them, and so we’re able to go through and test how well the analysts did in estimating these lengths, and this was only done with the two primary readers at the South Atlantic Council, and this was done prior to recruitment of other analysts to measure the historic lengths.

In the scalar development, what we did was we did a regression of the true length compared with the predicted length, and this had an intercept set to zero in the regression analysis, and, here, you can see, on the left, each of the different scalars that we used, the true length of that scalar, and then the slope of the line. In my mind, the slope of the line was one of the most important parts of this. Ideally, we wanted a one-to-one ratio, indicating that it was completely overlapping with each other.

Then we also provided, for you guys to review, the standard error and the adjusted R-squared. Over here, to the right, I also have the ranks of each one of these, so you’re not having to calculate in your mind which one did the best. The average two-by-three, in this instance, did the best, and that was used as a proxy for the average two-by-four and average two-by-six that would be used later. The standard errors were all pretty small in this, and, generally, the larger boards did better, and you can see the eighty-one-inch board down here performed the best, with the standard error being the smallest, and then it gradually increased as you went up in size.

Here is an image of the length distributions from the two analysts that measured all the boards. All the way to the right is the true length, and one thing that I do want to point out is this average two-by-three over here -- That performed the best, and you can see it actually has a slightly larger range than what was presented in the true length, which is good, indicating both positive and negative from the estimation, but you can also see little clusters that tend to match up with the little clusters in the true length, and so we're getting right around the true length estimates, and with maybe a little bit of uncertainty around those as well.

Then, in the scalar, we also wanted to compare among readers, and this is just some non-parametric and parametric tests to look for significant differences between the two readers. The first one we did was a Kolmogorov-Smirnov, and this isn't a paired test. This was just on the length distribution overall, and there was no significant difference. However, when we did a paired T-test, because, as I had mentioned, there were letters on each of the boards, and we're able to identify each measurement, there were not significant differences, but there were pretty close to significant differences among the two readers. These differences that were present, they were only about 0.3 inches, and so we figured that those weren't substantial differences between the two readers.

Then, looking at accuracy, and so basically looking at the classification success, and what we wanted to do with -- Or what we considered success in classifying was getting the length measurement within two inches. The reason we had selected two inches is this is pretty close to the five-centimeter differences, or five-centimeter blocks or bins, that were used in the SEDAR for king mackerel.

If you look at the different scalars that we had there, the one that we had selected had 96 percent success, and there was, the forty-one-inch scalar, that had 100 percent success, and, also, the eighty-one had a 99 percent success. In looking at all these scalars, the two larger ones were going to be very difficult to get, and we did not know the length of those larger leaderboards that were going to be at the top, and, in order to get those lengths, what we would have to do is change from a two-by-four or a two-by-six and estimate the length of that board and then back-calculate out, and so we felt the simplest approach was to take the average two-by-three, average two-by-four, in order to get the length estimate.

Going through our selection for the scalar development, we did select the two-by-three as the preferred method, and this had the closest slope to one, indicating minimum bias with increasing size, and we also felt that this best captured the full range of size distributions, and the length estimates were not significantly different amongst readers, and then there was a very good success, and 96 percent of the measured boards were within two inches of the actual measurement.

Now we're going into the historical photographs, and, once again, this is looking at the historical photographs and using the five different analysts, and here is a density plot from the five different analysts, and you can see the distributions there, and they're all slightly different between Analysts 1 through 5. The variation in these -- If you look at Analyst 3, that analyst tended to have about an inch difference from the other readers, and, once again, this is smaller than the two-inch difference that would be present in the stock assessment.

Then, taking another approach, we did statistical tests using the Kolmogorov-Smirnov, as well as Anderson-Darling, and we did both of these because, in reviews of both of these tests, one performs

better in certain situations than the other, but we just wanted to make sure that we're not running off in a bad direction, and, looking at this, Analyst 3 tended to be a little bit different than the other analysts that were there, and there were no other significant differences.

I do want to point out that these comparisons are slightly different than the paired T-Tests that were done before, and we did not ask the analysts to -- In the protocol, we did not have them go through different ways in order to measure the fish, and they also had different numbers of fish that they would measure, and so it was going to be impossible to match up the lengths perfectly, but what you can do is actually look for changes in the distributions, and, based on this analysis, most of the readers did not have a significant difference amongst each other, but just Analyst 3 was significantly different than the others.

Since we don't know which one is accurate, we wanted to incorporate the data from all five analysts, and so we developed a resampling protocol, in order to get these measurements -- Get all the measurements incorporated into the length distribution, and I will talk about that resampling in just a second.

Another way that we actually did some comparison of historical photographs was actually looking at some items that were of known length and compared those with what was predicted based on the length analysis, and the two things that we had that were of known height, or length, were Rusty's mom, Phyllis Hudson, and we had her military records that he provided to us, and so we knew her exact height, and then also oil barrel measurements are of standard height, and that's been standard since I believe after World War II, and so basically shortly after this photographs had started.

In classifying the lengths of Phyllis, 62 percent of the length estimates were within two inches, and that might not sound great, but, in my mind, I think we're actually doing fairly well. If you look at this picture of Phyllis, you can see that she is slightly in front of the photograph, and it's also hard to determine if she's standing straight up, exactly where the heel of her shoe is, and so there are several different pieces that could be leading to this error that we were seeing, and then a similar thing was happening with the oil barrel.

71 percent of the length estimates were within two inches, but, once again, the oil barrel tended to be off to the right of the photograph, which could have some slight distortion there, and it also tended to be slightly in front of the leaderboards, but, once again, we felt like this was just getting us an idea of how well we were doing and not looking for absolute accuracy, but just trying to make sure we were getting close to the true measurements.

Now, looking at the length distribution from the historical photographs, what we did was we did bootstrap resampling based on the photograph. We assumed that the photographs here that are being provided to us were a census of all the trips that were occurring from the fleet, and, therefore, we were actually using the photographs themselves as the sampling unit, and we would go within the photograph and resample lengths from both the readers and the fish, and so one of the readers was assigned to give the total number of fish in a photograph, and then we resampled within there, in order to fill out the length distributions.

After we had developed a length distribution, we combined the lengths from each photograph, in order to develop a mean sample, and then we took this and, once, again, we resampled it, and we

derived error bars for the mean sample number for each of the distributions, and then the error is provided there as well.

What we're asking the SSC today, or sorry. Let me go into a little bit of background here. We did notice a significant difference in the length estimates among the readers. The accuracy of known objects were estimated with some success. All the lengths were within five inches of true length, and most of the lengths were greater than -- 60 percent of the lengths were within two inches of the true length.

Given all the potential issues that we had with measuring those items of known length in the historical photographs, we felt like we did pretty well with that, and then the length distribution -- This is an ongoing process, but what we want to do is get some information from you guys before we go into true production analysis of the lengths, to make sure we're on the right path in the beginning, before we come to the end of the research project.

Looking at the length distribution, it matches up pretty well with what was included in the SEDAR stock assessment. Lengths for king mackerel range from eighteen to forty-eight inches, and this was about ten photographs that we had looked at, and there's going to be about 700 that we will look at, and so this length distribution is likely to spread out quite a bit. The peak lengths range from twenty-six to twenty-nine inches fork length, and that matches pretty well with what's currently observed in the most recent length distributions in the stock assessment, and so we felt like we're on the right path, and we're getting similar length distributions to what is currently available.

Some of the discussion questions that we do want to talk about with the SSC are is this method appropriate to use for measuring fish in the pictures? Can we provide an informative size composition, using this methodology? Then, finally, does the methodology adequately address uncertainty for size composition?

What we would like to do is eventually provide this information for a future stock assessment on king mackerel, and, before we go into the questions from the SSC, I did want to provide some information to you guys, just as a reminder, and I know you reviewed the SEDAR 38 stock assessment not that long ago, but I just wanted to provide some highlights from that.

The model years for the king mackerel assessment, it modeled from 1900 to 2017. In 1901, it was assumed that the population was a near-virgin population. The landings were reconstructed back to the start of that assessment. The recreational lengths that were currently included in that are from 1978 to 2017 for the headboat and 1981 to 2017 for the charter and private. Then, finally, the recruitment deviations started in 1981, when there were length estimates from the recreational and charter boat fisheries.

Going back to -- Once again, this where we would like input from the SSC, is really trying to make sure that we have decent methods for estimating the length distribution and that we're adequately addressing some of the uncertainty for the size composition. With that, I will let Mike E. pull back the questions. Mike, if you want to take over the screen.

DR. NESSLAGE: Thank you very much, Chip. What I would like to do now is have the SSC ask any questions they might have of Chip, clarifying questions, and then we'll take public comment,

and then we'll tackle the questions that we've been asked to address under Action Item 5.5, and so are there clarifying questions for Chip? Please raise your hand.

DR. COLLIER: I see that Fred has his hand raised.

DR. NESSLAGE: Which Fred?

DR. COLLIER: Fred Serchuk. Sorry.

DR. NESSLAGE: Fred Serchuk, please, go ahead.

DR. SERCHUK: Thank you, Chair. First of all, the presentation was excellent, and so thank you very much for that. I have a question about the fish that are in the photographs. Do they include all the catch or just the landed portion of the catch? That is, are fish discarded that are not in the photographs?

DR. COLLIER: There was no size limit at this point, and I can't say that there were no fish discarded, and I know Rusty has told us about this in the past, and I would have to check with him to see if there were some fish that were discarded in the past.

DR. SERCHUK: I am just saying that if -- I just want to be careful about using the term "catch" versus "landings". You used in a couple of different ways in your presentation, and you talked about landings reconstructed back to the start of the assessment in your last slide, but now you're talking about the size composition of the catch in the discussion questions, and I just want to make sure that we're understanding whether it's landings or catch or a mixture. Thank you.

DR. COLLIER: Good point, and I will make sure to clean that up.

DR. NESSLAGE: Chip, I guess, if you are trying to characterize the catch, and not just the landings, then should we ask Rusty to comment at this point, or can you just clarify very clearly what it is you're trying to accomplish?

DR. COLLIER: What we're trying to do is actually look at the landings, and so that was just a misprint by me in there, and we can check with Rusty, just to make sure that -- Just to see if there were historical discards.

DR. NESSLAGE: Okay. Excellent.

DR. COLLIER: Rusty does have his hand raised, if you want to ask him.

DR. NESSLAGE: Do you mind, Rusty, commenting?

MR. HUDSON: Like Chip said, there was no minimum size, and so, generally, all the pictures are from the late 1940s, post-World War II, all the way until the mid-1970s, and a lot of the council stuff doesn't start until after the council was created in 1976 or 1977 with Magnuson, and so occasionally we would use a small vermilion or a small sea bass or something small and catch a bigger fish, but only -- Generally speaking, all the red snapper and sea bass and king mackerel and amberjack, et cetera, were all part of the normal thing, but, every once in a while, back in the 1960s

and early 1970s -- There were plenty of sharks, just like there are now, and you would come up with a head, and so, yes, there will be some discarding, and there will be those type of damaged animals, but, otherwise, some people would cut up a fish, just to make cut bait too, and so a lot of that has changed with the minimum size rules and the careful handling and release protocols, et cetera, that's been part of the period in recent decades, and so that's about the best I can say about it.

DR. NESSLAGE: Thank you. That's very helpful. Let's go to Anne next, please. Go ahead.

MS. LANGE: I think this is a great opportunity to use some of that, again, historical pictures. I do have a question though relative to the scaling. In the mid-1960s, two-by-fours went to three-and-a-half inches, and two-by-sixes to five-and-a-half inches, and so I'm not sure -- A two-by-six may not make a difference, but going from three-and-a-half to four inches on a scalar may be an issue.

DR. COLLIER: We talked with some of the wood experts, some guys that actually worked in the historical renovations, and they said it wasn't exactly clear when some of these changes had occurred in different regions, and it appeared to be regional changes, and that is one thing that we're struggling with, but we're not seeing much of a difference anywhere else, when we did some other comparisons, and so we felt like it was pretty good that we did not observe a significant change in the two-by-fours, but we're going to be looking at that, just to see if anything does pop out.

DR. NESSLAGE: Thank you, Chip. Church.

DR. GRIMES: Actually, I'm good. I had the same question that Anne did, actually, about the varying lengths and widths of either two-by-fours or two-by-sixes over that long of a period of time, and now they're five-and-a-half inches for a two-by-six, and they probably weren't then, and I don't know, but that was just a question, and also about discards, and so this is a neat project though. Thank you.

DR. NESSLAGE: Excellent. Yan, please go ahead.

DR. LI: Thank you, Genny. I have a question about the paired-T test. When you say paired-T test, or paired test, you're comparing the estimates from Reader 1 and consider that it's paired with the estimates from Reader 2 on the same photo, and is my understanding correct?

DR. COLLIER: That is correct, yes.

DR. LI: Okay. In this case, I just feel they are not like paired, in a way, and we use the paired-T test, for example, when you have a subject that you have a treatment on the subject, like before treatment or after treatment, and that's called one pair, but, in this case, I just feel it's not paired, and this is my feeling about the paired-T test, and then I see the outcome is quite different when you don't use the paired-T test, because, to me, even though two independent readers examine the same photo, but they are independent readers, and so I would consider them as two independent observations, but not -- Instead of paired observations, in this case, and then I see the test results is quite different when you use paired observations versus non-paired observations, when you assume them.

DR. COLLIER: Yes, it definitely changed things, and what I was thinking about was, I guess, the, quote, unquote, treatment here was the reviewer and whether or not what they were doing ended up resulting in a significant difference between the two. I definitely see your point, and I just could not figure out a good way to get at this kind of -- They were measuring the same thing, and so let's try to see if there's a true difference between their lengths.

DR. LI: I understand, and that's just like my feeling about that, especially when I see that they come out with quite different outcomes, conclusions, when you pair them up versus not pairing them up.

DR. COLLIER: Gotcha.

DR. LI: Thank you, and this is very great, and I will save my comments for later, but this is a very great presentation and method.

DR. COLLIER: Thank you.

DR. NESSLAGE: Thank you, Yan. Wilson.

DR. LANEY: Madam Chair, my question is, is there any reason that we would have expected the length frequency to change from the 1940s to the 1970s, and so we're talking fifty to ninety years ago, and Question 1 is, is there any reason we would expect -- For example, maybe there were a lot more larger fish in the distribution historically than there are today, and I know Chip took a look and compared the distribution of lengths from the photo to present day length frequency, and so that's Question 1.

Question 2 is are there any fishery-independent or other length data from that era that could generate a distribution against which the lengths could be compared, so that you would be comparing more apples-to-apples, as opposed to apples-to-oranges, even though that's not quite correct, because you are using the same species, and so I will mute myself and listen for the answer.

DR. COLLIER: I will try to respond to the second question first, and we're not aware of any other data that might be out there, as far as fishery-independent data back from the 1940s to the 1970s, and so we felt that this was an opportunity just to look at the size distribution that might have been caught in that time period.

One of the reasons to look at this is the fishing really ramped up in the 1940s, and it kind of increased over time, and so what we want to do is help to inform the stock assessment model with some of these length distributions and just to see how much use it is and see what happens to the model. It could just be another sensitivity run that is conducted, just to see if there is a difference in the results, but it could also help the model pick up on differences that might be available.

One of the best things that could have happened back then was to get age estimates, but we can't get that. The only thing that we can do is reconstruct some of these length distributions from these historical photographs, and we don't know if it will be of use in the stock assessment, but we want to explore and just see where these historical photographs can fit in.

DR. NESSLAGE: Was that both parts of the question? I have forgotten the first part, I will admit. Wilson, did you get your questions answered?

DR. LANEY: Yes, he did. He answered the second one first, and so, yes, I think I'm good. Thank you, Chip.

DR. COLLIER: Sure.

DR. NESSLAGE: Thank you both. Alexei.

DR. SHAROV: I would like to understand a little bit more about sort of the physical part of the experiment, or the measurement process. I was a little bit surprised to see that much of an error in measuring the objects, or the boards, with a known length. Have you looked at what is the source of this variability? Is this because you essentially take the picture, and then your object of known length is a distance, and so it's a small object on the picture, and so it's essentially measurement error, and it's the measuring the length on your computer of like this short line and then expending it to the true scale, and is that where the source of variation -- Where is the source of variation? Have you tried to investigate this?

DR. COLLIER: It definitely appears that a lot of the variation is coming from that scalar, and so going from a pixel length and scaling it up to a size, and that is a source of some of the error, and we're trying to work on that a little bit more here and there, and the resolution on these pictures isn't the greatest, and so you can imagine that the pixels aren't going to be always at the best resolution in order to estimate the length of the fish, and so there's naturally going to be some uncertainty in I guess the number of pixels that you're measuring.

It can get a little hazy in some of the photographs, and so it might be a little difficult in order to estimate where the nose starts and the tail stops, and it's not as clear as it is on a measuring board, and so there are some errors that are going to be associated with that, but I think you have a good point, and I will try to look into how different the actual pixel lengths are, in order to see if that's some of the error that might be coming into place.

DR. SHAROV: Right. I can see that with the historic pictures, but I was thinking of the test part, where you actually are testing the precision of measurements by individual observers, where you have an image of the object, like a piece of board, taken for the current level of resolution, and that is like where there were twenty megapixels, and high-quality pictures, and so I thought it would be a little bit more precise.

The distance, probably, from the objective to the object itself -- Was that a point as well? In other words, if you take the same piece of board, and you take a picture ten feet from it, or thirty feet from it, and the error might sort of be larger in the second case, I would assume, and have you tried to make any correction for that, or have you looked at that? Maybe that is something to consider as well, the distance from which the picture was taken.

DR. COLLIER: Yes, and I will look into that. I actually didn't measure the distance from where I was taking the photograph to the boards, but it's still a resolution thing, even though we do have twenty-megapixel cameras, because we were looking at it on a computer screen, and they're much

sharper, but the clarity still isn't 100 percent, and each person might be doing slight differences on what they consider the end versus the -- I guess the frontend versus the backend of some of these.

Another thing that -- As you were talking, it kind of popped into my head, and that was distortion is also a significant factor that could be coming in here, and what I can do is actually look at a photograph and see how it changes, potentially, with some of the distortion that might be occurring on the edges, to see if that is an issue, and so, going from our 3D world into a flat world, you get distortion on the edges, both the right and left and top and bottom, and so I'll look into that, to see if distortion could be an issue as well.

DR. NESSLAGE: Great. Thank you, Chip and Alexei. Amy.

DR. SCHUELLER: I have three questions. The first is what proportion of fish are folks unable to measure? For example, these pictures have people in them, and say their head is in the way of being able to measure the complete length, and so my question related to that is, is the sample from the picture adequate to get a representative sample or distribution, sort of within the picture? What I am concerned about is are longer fish much more likely to have someone's head in the way and not be able to be measured, for example, or are shorter fish, or is there some way that this could be potentially problematic?

My second question is -- I know, for this pilot study, you're using the pictures provided by Rusty, and they're only from Daytona Beach, and I'm wondering if you have any other pictures from any other folks that could potentially be added in later, in order to get at the limited spatial distribution of the photos and then, therefore, the data.

Then my third question is, or maybe it's just a comment, because we sort of mentioned this, but I think it would be really important to have a good discussion about whether or not all of the fish are on the boards or did -- I get that there was no minimum length limit, and so they would keep everything, but is everything on the board, meaning did they take out their biggest fish and put them on the board and the smaller fish never made it in the picture to begin with? I will stop.

DR. COLLIER: I appreciate those questions, and I wrote them down, so that I can remember them. As far as the proportion unable to be measured, I will start off with that one. The analysis that you looked at was just for ten photographs, and so we don't know what the full distribution is going to look like, or the full sample is going to look like, and what proportion have the measured fish match up with the proportion that are measurable compared to the total number of king mackerel that are caught, and we do have a field in that Excel spreadsheet, and it indicates the total number of king mackerel that are present in the photograph, and it also indicates whether or not there is bias in the length distributions.

If somebody didn't feel like they could measure all the king mackerel, all the large king mackerel, that were present, that photograph would be flagged for bias, and we're going to try to figure out how to deal with some of the bias. We will know the photograph number, and so we'll go back into there and look at how to deal with it, and we could just resample from other photographs, in order to develop a length distribution for that one, or we might have to look at certain size categories, and so we're going to be looking at that as we get more information, but we just don't have enough information on the ten photographs right now.

As far as adding other photographs in later, we are pursuing additional grants to hopefully keep work like this going. Right now, we're just funded to do these photographs, the 1,300 that Julia had mentioned, and, of that 1,300, we're doing a 700 subset to get a length distribution as a pilot, just to see how well this will work.

Then the third one, the biggest fish on the board, we definitely feel -- This is one of the reasons that we selected king mackerel. In looking at the photographs, Allie, who has been the champion on this project, and she's probably looked at almost every photograph, along with Rusty, and they felt like this was the species that probably had the least probability of having a biased length distribution, from everything that was provided, and that's why we wanted to go forward with it, but, once again, we are going to be looking to see if there's a significant bias, based on what the people are reporting, what the analysts are reporting.

MS. BYRD: Chip, can I hop in to add one thing, real quick?

DR. COLLIER: Yes.

MS. BYRD: I just wanted to let -- Amy, one of your questions that Chip kind of mentioned already was are there pictures from other areas, to get at this limited spatial distribution, and I know, since we kind of have launched FISHstory, there have been -- We have been contacted by other fishermen that have said, well, I have a series of photos like this from my area, and so there have been other kind of fishermen, and we have kind of presented information, through our advisory panels, and so we have a list of some other kind of fishermen in other areas that seem to have a similar kind of bank of photos, and so, again, as Chip said, we have to kind of get other grants to kind of pursue those avenues, but there do seem to be other pockets of these photos out there, and the fishermen who have reached out to us seem willing to kind of share those as well.

DR. SCHUELLER: Thanks, Chip and Julia.

DR. NESSLAGE: Thank you, Amy, Chip, and Julia. Chris, you're up next.

DR. DUMAS: Looking at the problem of just measuring the length of a particular fish on a particular photo, and having lots of volunteer identifiers try to measure the length of that fish, it seems like, to me, that you're going to have two measurements. One, you will have sort of the length of fish in pixels, an estimate of the length of fish in pixels from each estimator, and you will have an estimate from each estimator of the width of the two-by-four or whatever, whether it's two-by-three or two-by-four, just whatever the width of the thing is, in pixels, and so there will be a measurement that's inches per pixel, and so fish is measured in pixels, and the board is measured in inches per pixel. You multiply those two things together to get the length of the fish in inches, and so you're multiplying two random variables.

You could use Goodman's formula for that, and there's a version of that where the two variables are independent and there is a version where they are dependent. In the case of particular volunteer estimates, the pixel and inches per pixel estimates are not independent, and so that's one thing. Then, as you think of having multiple volunteers looking at a given photo, and so you have a given photo and multiple volunteers looking at that, then, as the number of volunteers increases, you could rely on the central limit theorem to say that those estimates of the two random variables,

pixels, length of fish, inches per pixel, length of the board, each of those will kind of hone-in on its true value.

To rely on the central limit theorem, you want to make sure that your volunteers -- That their estimates are independent of each other, and so one volunteer's estimate of the other, and so, if you've got these different volunteers going to a website or something and estimating the length of the fish and the width of the board, you want to make sure that any volunteer does not see the estimates provided by prior volunteers, because that could bias it. You want to make sure they're independent estimates, and so, before you reveal what other volunteers have estimated for that fish, you want to make sure that a given volunteer makes their estimates before they see what other people have done or use some other method to make sure those estimates from the different volunteers are independent. That's all, and it's just some comments. Thanks.

DR. COLLIER: Thank you very much for that.

DR. NESSLAGE: Thank you. Let's go to George next.

DR. SEDBERRY: I was just wondering, for images for which you don't have the entire length of the fish, have you thought about measuring head length, or pectoral fin length, or some other thing that is in the photo and regressing that to the total length, or is that going to just introduce an additional source of variation that would make it not useful?

DR. COLLIER: I mean, I think we can look into that, especially if we're seeing significant -- If a lot of the readers are indicating that there is bias in the lengths that they were measuring, and, right now, fingers are crossed that we're not measuring bias, but, maybe if you could provide a good way to do, would it be good to go from the snout to the end of the preopercle or go to the origin of the pectoral fin, if you feel like there would be a better place to measure or more consistent for these fish, and that would be excellent.

DR. NESSLAGE: Thank you. Wilson. Did you have a follow-up, George?

DR. SEDBERRY: I was just going to say that I don't know that I have that information, but, in the taxonomic literature, there might be regressions of head length into total length and other kinds of measurements that might be out there, and I'm not aware of them right now, but I can look around and see what's available.

DR. NESSLAGE: Excellent. Thank you. Sorry for that, Wilson, and did you want to go ahead?

DR. LANEY: Yes, ma'am. I will. To Julia's point about sources of additional groups of photographs, one other group of folks that we should ask are the professional photographers out there, and I know, for example, that, when I first started going offshore back in the early 1980s, there was a group of professional photographers, based at the Oregon Inlet Fishing Center, and I know that they archived a lot of their photos, especially the ones that didn't get purchased by anglers, because, after the trips, I would sometimes receive solicitations from those photographers offering the photos after the fact, and so we shouldn't overlook querying professional photographers about the availability of their archives and whether or not they would be willing to make those available to the project.

DR. NESSLAGE: Great suggestion, Wilson. Have you guys done that, Chip?

DR. COLLIER: So far, the photographs that have been supplied to us have mainly come from fishermen, but I will let Julia follow-up on that.

MS. BYRD: I see Rusty is next on the list, and so he can certainly speak to this a little bit more than I can, but it seems like there are kind of two primary photographers, at least, that were working in the Daytona area during this time period, and that was actually a suggestion that Rusty had, Wilson, and so great minds think alike, about reaching out to some of those professional photographers.

I know we haven't yet, but I think Rusty has kind of tried to follow-up with some of them, and so I think it's a good idea, and it seems like there are two main groups who were kind of photographing, at least in this area, and I don't know that we've looked -- I don't know about kind of further along the coast, but I'm guessing that Rusty might be able to speak a little bit more to this, too.

DR. NESSLAGE: Great. Why don't we go to Rusty next then?

MR. HUDSON: I would like, before I address the photograph professionals, and Amy had brought up about the fish on the board. In the case of where we're looking at just king mackerel, that's called the smaller boats, charter and partyboat, trolling out and bottom fishing, if the conditions are right, the weather and the water temperature, et cetera, and then trolling back in.

In the center of the board, the top of the board, is usually the trophy fish, if you want to call it that, the bigger fish, the ones that people that really liked, and then you will see, out to the edges, a drop in sizes and other types of species down in the lower levels, and it was brought up about the wheelbarrows and the trash cans, but they weren't trash. I mean, you would stick fish in there, and, a lot of times, that's the smaller stuff, the black sea bass, the red-mouth grunts, the vermilion snappers that were small, et cetera, et cetera.

That being what it was, there is a portion of the catch that you cannot estimate without understanding what's in the wheelbarrow or the can, and, going back to the photographers, many of them are deceased, just like many of the captains and the mates and stuff, except for me, in some of those pictures are deceased, and most of the professional photography stuff, in our region anyway, sort of ended between the mid-1970s to let's just say the mid-1980s. Some captains were owners of boats, and their wives and stuff would take over some of the pictures, but they weren't on the professional level like these bigger pictures, black-and-white or color, were.

Then, when the headboats came in, you could see the end of the trolling, because of the volume of people on the boat, and you just couldn't troll. You would just steam out to the bottom-fishing area and fish, and so, that being said, I did contact widows and children of and the spouses of these people that took these professional photographs, and there were more than the two, but John Vaughan, and, of course, that's not his last name, and his German name was never used in the pictures, and some of his daughters had participated in helping him, and then a couple of other people, including my uncle, took some photographs, and there were at least four or five professional photographers in our region, and then there were the other people that were in Port Canaveral and in other areas where they had headboats and charter boats, but we would up

essentially being in the heart of red snapper country out of Daytona and Ponce Inlet, and that's why we had such a volume of pictures of this bottom fishing.

As you go south of Port Canaveral, the shelf gets smaller. As you go further north, it gets wider, and it's a lot more distance to travel, and then, when you get up to the North Carolina stuff, the Gulf Stream is coming back in, and then you have a little bit of different effect, as far as the fish that are there.

All of this comes into play, and keep in mind that this wasn't a year-long thing for most boats, except for maybe some of the big headboats that started coming into the picture in the 1960s and 1970s, and most of this was seasonal, and including with my grandfather, starting back in the 1930s, and then, into the 1940s and 1950s, they would spend the time in Daytona, and let's say March or April through Labor Day.

Some of them would then go into commercial fishing, and some of them would shift down to let's call it the Pompano Beach area and stuff like that, and they would go fish for sailfish and more mackerel fishing and other types of stuff, and so I have pictures that are in the stuff there that are from those areas, but not very many, and that was a wintertime shift, because the weather was too bad north of Port Canaveral, and we had a lot of nor'easters and ten-foot seas, and that's not where the tourists want to go and participate.

I just wanted to throw all that out there at you, because what we've got is what we've got, and there is a methodology that you kind of have to apply, historically, through the late 1940s, the post-World War II period, all the way into the big changes that started taking place with the World War II military surplus stuff and fathometers, and later the A-LORAN and the c-LORAN and other types of stuff that started making things a whole lot easier for people in the 1980s, the early 1980s is when C-LORAN started replacing A-LORAN, and now you have GPS, and everybody has got charts, and I've got charts from the late 1960s and what have you that just show where the reefs are.

Martin Mowes, in 1963, January I think it is, and I'm talking Junior, and he is still alive, and he went and interviewed all these people from Florida, from the Florida/Georgia border all the way around, from Pensacola to the Alabama/Florida border, and he laid out all these reefs and stuff, and that document is great, but you don't have a lot of measurements there, and, yet, when you have stuff on the leaderboard, you're looking at, in the middle and the top, probably the best fish of the day, and the stuff that was stuff you would clean at the fish-cleaning table, some of that stuff never got seen, unless it was a really poor day, and I'm sure Allie can pull up some of those pictures, where you're see some little small stuff of different species, and it was just a tough day. I just wanted to throw all of that out there.

DR. NESSLAGE: Thank you, Rusty. I recognize that it's 12:15, and I want to be respectful of folks, particularly who have family obligations at noon, given the COVID restrictions and whatnot, and we are coming up -- We're past our time to break for lunch, and so I'm going to take one more question from Wilson, and then we'll return after lunch and wrap up questions and public comment and this agenda item, and so, Wilson, go ahead, please.

DR. LANEY: Thank you, Madam Chairman. Not so much a question as just a comment, and that is I appreciate Rusty's clarification. It sounds like he did a pretty good job of looking for all the

professional photographers in the Florida area, and I still think it would be worthwhile for us to at least make some inquiries north of there, and it could be that the Sea Grant folks may have already done some of that work for us.

I know, in North Carolina, they have focused a lot on recording interviews, and whether or not they did any interviews with professional photographers or not, I don't know, but I think it would be worth asking the question, and so I may try and do a few inquiries, just to see what might be available. I also still believe, and I'm pretty sure, that I have the cards from the professional photographers that were working Oregon Inlet back in the early 1980s, and so I can maybe check with them, to see if they're still around and if their photos would be available.

DR. NESSLAGE: Excellent. Thank you. Is it quick, Rusty? Was your hand raised again?

MR. HUDSON: Yes.

DR. NESSLAGE: Can you make it quick, because I do want to break for lunch, and we'll revisit after lunch, I promise.

MR. HUDSON: Right, but all I'm saying is, at our Snapper Grouper AP, we had numerous people, up and down the coast, offering their pictures, if they had them, and that's a good thing. Again, like Julia said, we need to be able to get funding to be able to get all that, and I had one guy alone that has different boats, the Snow White fleet, and he has another 500 or 600 pictures that he wanted me to handle, but, again, we're in hurry-and-wait mode, just like we were for ten years for a lot of this. Thank you.

DR. NESSLAGE: Thank you. Okay. We are scheduled to come back at 1:30.

DR. ERRIGO: Lunch is however long you want to make it. If you want to come back at 1:30, that works.

DR. NESSLAGE: That would give us a little over an hour. If folks can think of any remaining clarifying questions they have, so we can get through that right after lunch, and then we'll pick up with Item 5.4. Unless there is any screams of protest, I am going to ask that we put a little note up, if we could, that we'll reconvene at 1:30. I hope everyone has a great, restful lunchtime. Thank you.

(Whereupon, a recess was taken.)

DR. NESSLAGE: Let's pick up where we left off. Does anyone have any other clarifying questions for Chip and Julia?

DR. COLLIER: Let me clear the hands raised, and so there's four people that still have their hands raised.

DR. NESSLAGE: If you have a question remaining, keep your hand up. Kick us off here, Alexei.

DR. SHAROV: I was wondering -- Did you guys look at where was the CV on your estimates, and it looks like it's, in general, less than 10 percent, and so like your sort of model sizes were on

the range of twenty-five to twenty-nine inches, and like 70 percent of them were within five inches measurement, and whatever, 50 percent or whatever it was, was within two inches, and I don't know if you calculated the stats, and I'm just trying to understand the level of precision. It seems to me to be reasonably good, but maybe just calculate the number?

DR. COLLIER: I think the CVs were -- They were less than 5 percent, I believe, which seemed overly optimistic, to me, and maybe, as we get more data, it's going to expand a bit, but it definitely seemed like they were pretty small for a length distribution, given the error that we've already observed.

DR. NESSLAGE: If I could follow-up on that, unless Alexei has something, because that's similar to the question that I have. The length distribution that you calculated on Slide 12, that's across all years, correct, whereas, in theory, you would be providing either annual length distributions or a length distribution in whatever year you were going to start.

DR. COLLIER: The length distribution that we have presented, this is just a preliminary analysis, and so it was basically ten photographs, and I believe they were over maybe twenty years that were in those photographs. As we build up the sample size, from people measuring more fish, we're going to try to do it on an annual or biannual basis, whatever seems most appropriate.

DR. NESSLAGE: So your error bars will likely be much wider once you start incorporating more readers and less data, right, potentially?

DR. COLLIER: Yes, we're thinking so.

DR. NESSLAGE: Okay. Thank you. Amy.

DR. SCHUELLER: I don't have any additional question. I think I just didn't get my hand down in time.

DR. NESSLAGE: Gotcha. Thank you. Scott. Is Scott unmuted?

DR. COLLIER: That might have been another hand issue.

DR. NESSLAGE: Does anyone else have clarifying questions for Chip at all? Okay. I am not seeing any, and I'm going to go to public comment, if there's any member of the public who would like to comment on this, this agenda item, please do so by raising your hand now, and we'll call on you. Rusty Hudson. Please go ahead.

MR. HUDSON: Anyway, I wanted to thank Chip and Julie and Allie for the most recent efforts with all these photographs. To me, it's a picture of the past, and it's worth a thousand words, but, at the same time, I want to also give credit to Ken Brennan and Erik Williams for trying so hard for nearly a decade to try to get this stuff available and into our science, and so thank you all, and that's my comment.

DR. NESSLAGE: Thank you, Rusty. Anyone else from the public who would like to comment at this time? If there are no hands raised, then we will move on to addressing the questions that have been posed to us. We were asked to review the methodology and then answer three questions.

The first is, is this methodology appropriate to use for measuring fish in pictures? The second is can a reliable size composition of catch be derived from this methodology, and does the methodology adequately address uncertainty?

Why don't we tackle them in this order, as much as we can, and I would like to hear any -- People have, through their questions, raised a number of good comments, and potential suggestions could arise from those, but I would like to hear what the SSC would like to suggest regarding the actual methodology. Are there any specific recommendations regarding if there's any -- In particular, if anything needs to be changed to make it appropriate for us. I know, in particular, folks talked about ultimately getting greater spatial distribution, and there might be -- We're talking about the method, right, and is this question with regard to like using ImageJ or whatever, and this is specifically the how do you measure the fish in the pictures, right?

DR. COLLIER: Yes, this is more the methodology. We recognize that there's going to be issues with the spatial coverage, but we just can't fix that within the terms of this grant.

DR. NESSLAGE: Okay. I know there were some questions raised by Chris, and he mentioned something about -- Forgive me, but I'm not familiar with Goodman's formula. Is that something that would be worthwhile mentioning, or is that just simply for the pilot test?

DR. COLLIER: No, I think that would be really good, because we should have two readers. We want to have two readers for each photograph, and we might have three, and so it would be good to have that Goodman's formula and use that.

DR. NESSLAGE: Okay. We might have some suggestions here. Perfect. Thank you. You're reading my mind, Mike. What I think we should do, unless someone is very familiar with what Chris suggested, and, given he's not here, we can have a placeholder for that, and I will ask him to provide some wording, but, if someone has specific wording they would like to suggest, feel free. Fred Scharf, while I'm looking at my notes. Please go ahead.

DR. SCHARF: Chip, it kind of comes back to a point that Alexei brought up earlier, before lunch, in terms of how you set up the scalar, and so I was wondering if maybe a suggestion would be to consider looking at fitting some of those relationships without forcing the line through the intercept, through the origin, and so instead of fitting zero-intercept models.

Oftentimes, when you fit zero-intercept models, the R-squared values are inflated, because the null hypothesis has changed, and the software doesn't really adjust for it, and so the sums of squares aren't being corrected, and so, instead of the null being that Y equals the mean value of Y, the null assumes that Y is zero, when you force it through the origin, and so you can get an inflation in the R-squared, but it also can cause a bias in the slope, because you have added -- You have forced the line through a point that has high leverage, and so I would just maybe look at some of those, to see if there are other ways to evaluate the best scalar to use, because, as you indicated, that is a really key part of the process, is just to identify the best scalar before you start to apply that scalar to the lengths of the fish.

DR. COLLIER: Thank you.

DR. NESSLAGE: Excellent. Thank you, Fred. Are there any other comments or suggestions?
Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I don't mean to be a bugbear, but I do believe that this is an adequate method for size composition, but what more could we glean out of this? Is there anything more than just the size composition?

DR. COLLIER: For king mackerel -- So we're looking at photographs for other pieces of information, such as species composition and things like that, but, for king mackerel, what we're looking at is the length distribution. We do have number of people in the photographs, and so we might be able to get how many king mackerel are generally being brought back on a trip, and we'll have some other pieces of information that we would be able to incorporate as well.

DR. SERCHUK: Is what you're suggesting that we could get some information on demographic changes in the size and age composition of the population through the years that might give us some indication of changes in population dynamics, recruitment, or increasing mortality on certain age groups?

DR. COLLIER: Yes, and that's -- The goal of this would be to provide it to the next SEDAR, and it would be incorporated in that manner

DR. SERCHUK: Okay. I'm just thinking it would be useful to say, okay, we think we can get an unbiased assessment of the size composition of the population, and perhaps we can extend it to the age composition, but I'm looking for how we could then use that, and that's the important thing, I think, about this, because it's a big investment of time, and it seems to me, in looking at the pictures, quantifying the size composition, and it's important, I think, to realize can we take it to the next level. Thank you.

DR. COLLIER: Fred, just to clarify on that, you mean the next level is to take it to the next stock assessment, and is that correct?

DR. SERCHUK: Well, I don't know whether you can use it in a stock assessment, and that's what I am trying to get at. How do you see it being used? One is a static or annual changes in the size composition of the resource, but we have no way to put that with the abundance of the different age groups, and so it's just a snapshot. Changes in the age compositions, or the size compositions, can result from the differential fishing on different age groups, and it can also result in differential size population abundance of recruiting age groups, and so on and so forth, and I am just wondering -- Obviously, we don't have estimates of total removals, or is what you're suggesting that we have enough photographs that we can actually estimate the total removals?

DR. COLLIER: There is catch from that time period, and that was estimated through the SEDAR process.

DR. SERCHUK: Okay.

DR. COLLIER: So they have it for charter and private separate from headboats.

DR. SERCHUK: Okay. Great. Thank you.

DR. NESSLAGE: To that point, just a reminder, given that we reviewed this in April and it's been a few months, the initial abundance at-age, they tried a couple of different methods, but, ultimately, they assumed it was an equilibrium, and so, correct me if I'm wrong, Chip, but my understanding is this might provide an alternative hypothesis, or an alternative run, regarding the potential initial length distribution, which could inform -- Instead of assuming initial F and estimating the initial abundance at age from that, being at equilibrium, that this might somehow inform the initial model configuration, and is that correct, or am I -- That was what I was anticipating would be the most likely use of this and not necessarily trends over time.

DR. COLLIER: In going back and looking at the assessment, they took it back to 1901, and we would have data that began in 1940, and, in 1901, they assumed a virgin population. Then, all the way up to 1940, it seemed like there is a little change in the spawning stock biomass, maybe slight deviations, and so this might be useful for informing the actual distribution of those age classes, or size classes, back then.

DR. NESSLAGE: Thank you. Alexei.

DR. SHAROV: I certainly agree with the fact that -- Well, probably we'll not be able to take it, very soon, beyond the size composition, but size composition is very important and useful information, when we have it for a historical time series, compared to having nothing. I have seen it, and I have experienced it, so many times now, that, when we just don't have any information, people generally don't ask any questions.

The more you start offering, the more and more questions and challenges people ask, and so definitely, yes, it is going to be limited to the size frequencies, and, yet, it's still quite useful, compared to just considering equilibrium conditions for fifty years, and it's a burnout period or whatever, and then we have this plot of the huge biomass that then steeply drops down, but then a decade, or five years, which is quite unrealistic, and this is where probably this will change, and so I see a lot of possible useful information coming out of it.

I just wanted to go back to the second question on methodology, and so I think, given the method, the testing part of it can provide us with the expected measurement there, and that is, as we discussed earlier, that you essentially measure the number of pixels from Point A to Point B for your reference unit, and that would be a piece of board or whatever, and then, if you do it multiple times for one reader and then for different readers, you will have an estimate of the error, and so you have an error estimate of what your average error is expected to be, given the level of resolution of the picture that you are going to have to work with, suppose it's 10 percent, or 15 percent, and that moves into the answering of the next question.

Can a reliable size composition of catch be derived using this methodology? Yes, but only for a given level of resolution, and so that should be understood, and I think it's rather obvious, but I still wanted to point it out, that we could specifically identify the level of resolution that the method offers.

DR. NESSLAGE: Good point, Alexei. Thank you. Mike, if you could grab that last bullet from the first question, I think it fits better under the second question, unless I am misinterpreting. Thank you. Are there other comments or caveats or questions? Fred Scharf, please, go ahead.

DR. SCHARF: I just wanted to remind you of George's comments before about being able to potentially estimate total length from partial measurements. Like Amy suggested, there may be individuals that are blocked out in the photos, and there may be ways to get length information from those, realizing that sometimes you may have a multiplicative error situation, but those kinds of morphometric equations are pretty standard, and you may even be able to build those from the photographs themselves, but there may be some ways to glean more size information, and so that was a good point that George had made, and I just wanted to make sure that we didn't forget it.

DR. NESSLAGE: Yes. Thank you. Thank you very much. George, if you have anything to add to this bullet, please do. In the meantime, Amy.

DR. SCHUELLER: I guess I just wanted to make sure, and is this all relative only to this pilot study for king mackerel, or is this trying to move beyond that, and then I think my thoughts changed slightly with respect to the fact that, if I'm understanding Rusty correctly, if they caught a king mackerel, it probably was on the board to be measured, and so I'm less concerned about fish not being there or being biased large with this species, but that may not be true for other species.

DR. NESSLAGE: That would be under the reliable size composition, right, and so, Chip, can you just first clarify if this is -- Are these questions general methodology and applicability or with regard to king mackerel? That will help guide our discussion.

DR. COLLIER: I think for king mackerel, just in the beginning, because, as this is a pilot, that was part of our grant application, was we said we would do this method, develop this method, for a single species. If we're going to expand to additional species, or even additional photographs, I think we would need to get another grant in order to do that, and so I think your comments related to king mackerel would be most appreciated right now, but we will definitely note that, for other species, we definitely need to take caution and make sure that they are not in wheelbarrows and there's not some biases.

We noticed another species that is somewhat easy to identify is amberjack, but some of the really big amberjack didn't end up on the board, and they tended to be laying down on the ground, and we were worried about that bias, and so that's one of the reasons that we selected king mackerel, and Julia might have some additional comments as well.

MS. BYRD: Thanks, Chip. I was going to say, kind of along the same line, that I think we want to focus on king mackerel here, but I think it would also be helpful, if you all have things that we should consider as the project moves forward, and if we're able to find additional funding, if there are things that we should look out for, and so, you know, obviously, Amy, we hear what you're saying about kind of bias if the majority of fish in a certain species aren't always hanging, if they're in wheelbarrows or laid out in front, and that could pose a challenge, but I think focus on king mackerel here, but I think we would be -- It would be helpful to have some of those broader thoughts as well included in the final writeup, just because that can be something for us to consider as we try to find some additional funding to expand the project.

DR. NESSLAGE: Excellent. Thank you. Yan.

DR. LI: My comment is, first, I like what we wrote down for the first question, is this methodology appropriate to use, and I agree with all you've wrote down here, and I think this methodology is very useful, especially given for the historical time period that we don't have much information about the size structure, which is a critical piece of information in stock assessments, and so this is very useful, much better than nothing, to inform the stock assessment.

Then, for the second question, regarding a reliable size composition, my comment, or concern, is how representative are the fish captured in the picture of the whole population, and like how realistic, and this is some information that we cannot justify, but, just looking at the picture, I don't know about the fish you see in the picture -- Is that a realistic representation of the true population or catch composition, or did they take a picture of those fish for some purpose? For example, those are the bigger fish, the larger fish, that they caught, the largest fish they caught, from the catch or something else?

To me, given that it's still useful information, and then can someone apply this information -- For example, when they apply the size composition developed from this method to a real stock assessment, and then the uncertainty incorporated in the methodology itself, like the standard error that Chip just showed us, and, other than this uncertainty, there is other uncertainties there, like I just mentioned, and how representative are the fish, and, also, the spatial coverage we have talked about as another layer of uncertainty.

Also, my comment is, when we apply those size structures developed from this methodology, we have to keep in mind other uncertainties there, and so, when we apply it to the stock assessment, we have to somehow keep that uncertainty incorporated in a certain way. That's my comment. Thank you.

DR. NESSLAGE: Thank you. Excellent comment. Alexei.

DR. SHAROV: Thank you, Yan, for bringing the different perspective into it, because I was reading this question mostly in terms of providing reliable size composition of landings from the pictures, and that is, for each picture, for this particular trip, we have ten or twenty or thirty fish on the picture, and can we get a reliable size composition from it, given the proposed methodology, and I thought that the answer is yes, given, of course, the level of resolution and not the expected level of resolution.

Beyond that, you're absolutely right, in terms of the representativeness, whether the catches and size frequencies were similar in other ports and other marinas along the coast, and we probably will never have a fully-satisfying answer, and hopefully there will be pictures available, or they are available, and hopefully they will be processed and funding will be available, et cetera, and they will be collected from other areas, but I suspect that this will be sketchy, and you're absolutely right that there is a potential for bias, and there is a potential for error, and that would have to be taken into consideration by stock assessment scientists doing this, but I don't think that we, at this point, can offer anything at this level, other than just simply saying, yes, there are uncertainties associated with the spatial and temporal representativeness, but we're assessing a method here, and that's why I thought we were giving a positive evaluation.

DR. NESSLAGE: Thank you, Alexei, and, to that point, I think it might be good if we make a note to ourselves and to staff and the council that this is probably prime topical working group

material, and it might be worth suggesting that, when it comes time to incorporate this into the next assessment, that this is -- We can frontload this, very likely, unless people disagree with me that this should be a topical working group issue, just because how this gets used could have an impact. Who is next? Tracy.

DR. YANDLE: This may be beyond the scope of what we were asked, and, actually, it's definitely beyond the scope of what we were asked, but I was just wondering how the committee would feel about adding a comment encouraging the SAFMC to continue to try and expand this program and to increase the geographic diversity and the robustness of it, including grant seeking, sort of as encouragement for this project to keep moving forward.

DR. NESSLAGE: I think perhaps we can have some general statements before we answer the three questions, and one of those could be these comments are directly related to the following comments, and then everything else can follow, but maybe one of the first comments is that we generally support this approach and encourage the expansion, as possible, to other species and a greater spatial coverage, if possible, something along those lines, and is that what you're thinking, Tracy?

DR. YANDLE: Exactly. That would be great.

DR. NESSLAGE: If anyone disagrees, please raise your hand. Wally.

DR. BUBLEY: I don't know if I need to harp on it, and, I mean, this has kind of been discussed already, but we've been bringing up the spatial coverage a lot, and this is one species where, while there still could be some component of that, we're not as concerned, because they are so migratory, compared to a lot of the reef fish species, and so what we're getting off of Florida, in whatever months of the year, might be the fish that you're getting later in the season, or earlier in the season, off of North Carolina, and so, while I definitely think it's something to look into, it might not be as big of an issue as it will be for different species that might have a closer range.

DR. NESSLAGE: That's a good point. Thank you. Maybe we need to massage the "however" statement. However, there are uncertainties associated with the spatial and temporal extent of the photos, and we can think about that. If anyone has specific wording, like, although, for king mackerel, the spatial extent may be adequate, something along those lines. Think about it. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. I wonder whether it would be useful to see whether we could validate the method as a measure of the size composition of the resource. By that, I mean that one could, off the top of my head, sample, or ask a headboat if they would sample, all the catch that is brought upon the vessel, and they could discard the small ones, but all the fish that were caught would be brought onboard, and somebody would sample the size composition and then compare that with the size composition of that from MRIP data or from the sampling data and see whether there are any obvious differences between what we would get from our current recreational sampling program and what would be produced from using what I would say is the photographic method now, because you have measured all the fish that came aboard the headboat. Would that be something that would be useful, in terms of validating, or at least looking at the shortcomings, of the current method of estimating size and age composition in the recreational catch to the census that we are using in our photographs?

DR. NESSLAGE: Chip, do you want to respond to that?

DR. COLLIER: As opposed to having to get some additional lengths, like Fred was talking about, that's kind of why did the route of those boards that we measured, just trying to see how accurate we could get and looking at that classification success, and so getting within two inches, and we felt like it was pretty good for having 96 percent of the photographs within two inches, or lengths within two inches, and we felt that we were on the right path.

To do something like that, we would need some photographs, and we would also have to have those length estimates. We could definitely work with MRIP, or the headboat group, in order to get some of this information, but I'm not certain if those leaderboards are even out there like they were in the past, and I think that will be a critical component, people hanging fish.

DR. SERCHUK: You are misunderstanding me, I think, or maybe I haven't been clear enough. We assume, from the photographs, that all the fish that were landed were all the fish that were caught, because there were no minimum size regulations in place. Therefore, we deduce from that that it's an unbiased picture of the size composition of that resource at that time. Now, we no longer take photographs, but the photographs say that we took a complete census of all the fish that were captured on the headboat.

You could put a sampler onboard a headboat now and ask that all the fish that were caught, even if they were undersized, be brought onboard, at least to be measured, and then the other -- If they were undersized, they could then be put back in the water. Then we could evaluate that size composition against the size composition that we would get from the MRIP sampling and see whether there was a systematic difference or whether they paralleled each other, and I am just wondering whether that would be one way to validate the methodology. Thank you.

DR. NESSLAGE: Chip, I don't know, and maybe I'm misunderstanding Fred still, but I would be concerned about the current behavior versus historical behavior, and is that -- Am I misunderstanding still?

DR. COLLIER: Well, I think what we can do is -- I know one of the concerns was our labeling it as catch, and I will just certain to make sure that all we're describing is landings, but I think also what Fred was talking about was just trying to make sure that what was caught and measured is representative of what is in the population, and then taking that forward, and so getting some of the estimates from the headboat samplers out there now and how does that compare, and do those lengths match up with what's observed in the population as well.

DR. NESSLAGE: This is not the Chair, but this is the stock assessment person in me going I'm not sure, given the changes in fishing behavior and regulations and spatial coverage of the fishery -- I mean, is that going to be a valid comparison, given that almost eighty years have gone by, in some cases? I will toss that one back to Fred Serchuk, or am I still misunderstanding?

DR. SERCHUK: The photographs are, as I understand it, are taken from certain vessels that fished in certain areas, or mini areas, at the time. Is that incorrect, or what do the photographs -- What do the catches and the landings in the photographs represent? Is it a true picture of the resource throughout its range or where the vessel is fishing at the time, and they may change their fishing

practices by month, year, or they may use different bait, we were told, or different sizes of bait, and I'm not really quite sure what we're trying to glean out of that, in terms of the uncertainties that are viewed within the methodology. I know we're looking for equilibrium conditions, but what does that mean? Is it equilibrium conditions at a certain area or a certain time or in the stock? Sorry to be a bugbear about this, but I'm just trying to -- I am trying to find out how far we can extrapolate that information.

DR. COLLIER: I guess, from my thoughts, Fred, that what we were trying to do is really describe what was being landed and not necessarily take it beyond that. Does that help?

DR. SERCHUK: Okay.

DR. NESSLAGE: All right. Alexei.

DR. SHAROV: It is what is being landed, and certainly some assumptions could be made, depending on the species, as Rusty explained earlier that, for a number of species, there were no size limits, and so probably most of the catch was landed, but we don't have a clear idea, and Fred's concerns are absolutely valid, and we'll probably never have a full answer to what extent these pictures are representative, and they might very well be, assuming that they are coming from the areas that have sort of the highest level of fishing intensity or fishing effort, but it's an open-ended question.

Compared to having no information whatsoever and starting with just equilibrium conditions and riding them for fifty years, then we'll have some size frequency from one site, and it may be fish for the whole year, or it may be five pictures from the same area for the same year, and eventually it may be ten, and eventually they might be covering June through October, and maybe, in the end, there will be three different sites.

For every addition, there is a chance for having a better representativeness and still a pretty good chance for it to be biased relative to what it was, but I think, just in this case, we have to accept it, that it is what it is, and only -- The assumptions would have to be still made by the analysts to provide a level of CVs or any other measures of the uncertainty that would be still applied to that historical period. I can't see anything we could do beyond that.

DR. NESSLAGE: That's a good point, Alexei. Wilson.

DR. LANEY: What I was attempting to say was that, if I understood Fred Serchuk correctly, it seems to me that his suggestion would be of value for looking at current MRIP data and assessing whether or not they are reflective of what is actually out there, and so, Fred, give me a reality check if I'm misstating, but it seems to me that his suggestion would have value for current use, and I don't know -- I don't see how it would necessarily apply to the fish in the photographs, especially if, based on the comments about there being no size limits back then, if all the fish are being landed, but I did get Fred's point, or at least I think I did, about the utility of what he was suggesting, and I see he wants to talk further, and so I will listen to his response. Thank you, Madam Chairman.

DR. NESSLAGE: All right. Let's go to Fred.

DR. SERCHUK: Thank you. The bullet point, the last bullet point here, attempt to match lengths from photos, that was not my point. My point was, if one has an observer on the headboat now, and that observer then measures all the fish that are captured, that is analogous to a historical photograph, and that's the assumption we make in the historical photographs, that all the fish that were captured are brought in and the photograph represents what was captured.

All I'm suggesting is that, if you put an observer onboard a vessel, a headboat, and that observer can measure all the fish that were captured, that's a photograph. That's equivalent to a historical photograph. Then you could compare that size composition to what MRIP would estimate the size composition and see whether there is close agreement or systematic bias or a small discrepancy.

I wasn't trying to match the lengths in the photos. I was trying to say that we have a method now of assessing whether the -- Currently, whether the tenet of measuring all the fish on a vessel of, quote, a modern photograph gives you the same representation of the size composition as we could get from the MRIP data. That's all I was trying to get at.

DR. NESSLAGE: I hear you, and I think I understand what you're saying now. I am wondering though if that's more of a research recommendation for moving forward, as opposed to this particular section of our report has to do with the current study that's been done, and would you agree, Fred, that that could be moved down into an other recommendation --

DR. SERCHUK: I am just trying to give some food for thought for people who want to get a grant to use it, and that's all.

DR. NESSLAGE: I think we just need to move it, and maybe in our general comments section, something about future research recommendations include blah, blah, blah, and move -- Yes, that's perfect. While we're watching Mike type furiously, Anne, do you have some comments?

MS. LANGE: I have a couple. I think I share Fred's curiosity as to how this would actually apply -- How these data could actually be used in the current assessment. It's useful information to know what sizes of fish, especially king mackerel, would be taken back in the 1940s and 1950s and 1960s, but, to expand that to -- It's helpful information, but I'm not sure how fully it could be used.

The other part of it was Fred's suggestion of how observers -- Now, we have size limits and species limits that weren't available, from what Rusty was saying, and there wasn't an issue of not being able to land something back then, and so I'm not sure that doing a modern photo, by taking observer lengths and comparing that to the MRIP size composition, would be comparable to what was happening back in the 1960s and 1950s or 1940s or whatever, where everything, presumably, was landed. I'm not sure how useful that would be.

DR. NESSLAGE: Okay. It looks like Erik has some comments, and perhaps he can shed some light on this. Erik, would you like to speak?

DR. WILLIAMS: Yes. Thank you. A couple of points of clarification. Headboats are not sampled by MRIP. We actually have a separate headboat program that is focused on headboats, and that would be equivalent to the boats that the pictures come from, and that's run out of our lab, and it's the Southeast Region Headboat Survey, and the sampling design for that one consists of a logbook that is filled out by the captain that, in theory, should enumerate every single fish that's

caught on the trip. It's not to measure them, but it at least counts them, and then random trips are intercepted at the dock, where representative samples are taken from the catch.

Just to put this into context, you can debate whether a modern-day photo would be the equivalent of measuring every fish caught at-sea or, because there could be discarding still that might happen at-sea for some species, whether the equivalent modern-day photo would be a complete enumeration and measurement of all the fish at the dock. That's the difference between catch and landings.

To put this in perspective, when we -- Our current sampling programs are sampling trips with only a subsample of the fish from that trip, and a subsample of the trips from a region, and so the value of these photos is far beyond what we typically sample, because, in theory, to the degree that it's a complete record of almost every trip, which, from what Rusty has told me, it pretty much covers almost every trip that was made, and, in theory, it's measuring every fish that was brought to the dock, it is much better sampling than what we have now.

Now, where the limitations come in is, of course, the spatial and temporal limitations, but we won't know that until we get sort of a full enumeration of what all the pictures represent, both in time and space, but that doesn't limit our ability to use that data in a stock assessment and inform about the population. What matters is the selectivity that is occurring in the catching process, and there is selectivity processes, both gear as well as availability as well as time of year and so on and so forth, that affect the catch, but, with enough samples, we kind of overcome that and are able to measure that within our stock assessments. I just want to sort of clarify some points that have been discussed that may or may not have relevance for this photo data.

DR. SERCHUK: Thanks, Erik, for that clarification. I can remove my comment now. Thank you very much for that information.

DR. NESSLAGE: Excellent. Alexei.

DR. SHAROV: It's one thing to note -- At least for me, I'm thinking of this historical period of the 1940s and 1950s and 1960s as a very important one, and, indeed, there was a transition from limited fishing, limited access, the use mostly by the local human population that was not large to the extensive expansion of the fishing activity, and so that was the period where the populations really were transitioning from the very high level of biomass, or hopefully, or that's we think, to much lower, to sort of recent periods.

What I am generally hoping to get out of that, that we will get out of this, is just that signal. If this method realizes the length frequencies that clearly, given all the level of measurement errors, et cetera, will show a significant difference in size frequency, as it's related to lower fishing pressure, that's where it matters. We will hopefully be able to capture that transition from a nearly-unfished population, or a moderately-fished population, to a heavily-fished population, through a period of two or three decades, and so that's the value in it.

I never would expect it to be totally representative, and I never would expect this data to be able to provide us with the ability to measure fishing mortality with the precision of 0.01, but the substantial transition from one level of biomass to another should be reflected in that size frequency, and so that's what I would expect from this data, hopefully, with a rough scale.

DR. NESSLAGE: Thank you, Alexei. Fred Serchuk.

DR. SERCHUK: I lowered my hand, Chair. Thank you.

DR. NESSLAGE: Excellent. We are starting to fill out the first two questions, and I would bring people's attention to the last question. Does the methodology adequately address uncertainty for the size composition? I would appreciate any comments you have, but, in particular, if we could start thinking about how to respond to this question, and I would entertain raised hands, please. Jeff.

DR. BUCKEL: Thank you. I think is where Chris Dumas was -- Maybe move his suggestion for using the Goodman's equation to deal with the variance of two to three, when you're multiplying two or three different values. That's all I had.

DR. NESSLAGE: That's great. Good suggestion. Thank you. Any other comments or suggestions on this question or any of the other two questions, or questions we haven't even thought of yet? While we're thinking, Erik.

DR. WILLIAMS: Thank you for indulging me a little. Just on this topic, it would be interesting to compare the sort of variance level in the measurements that we're getting from this to variance levels you get in measurements from electronic measuring boards, because I think there's enough variance there too, and maybe this might -- This variance level, in comparison to our current measurement methods, may not be as bad as we think, and not that they're bad, but it may actually be comparable.

DR. NESSLAGE: Right. Good suggestion. Chip, I assume that you would redo all of this for each species, and some species are going to be more bendy or have a more forked tail, et cetera, and you would be redoing each of the -- You would be redoing this methodology, essentially, for each new species that would be assessed in this manner, if this is the direction you go in and expand the project.

DR. COLLIER: Yes, and we would definitely look at the species and see if there needs to be significant changes. I mean, greater amberjack, I think, if you guys remember back to some of those photographs, the definitely had a nice C-shape to them, and so how do you measure that accurately? I know, in ImageJ, you can do a curved line and different things like that, but we would definitely want to test out different methods, in order to get it and figure out exactly what it means, and it would likely come to you guys again, or potentially just taking it to a SEDAR, if it is a research track, and we might be able to just take it in that approach, but, with king mackerel, figuring it might not be a research track the next time it comes up, and what you guys have mentioned, to consider this for a statement of work into the next operational assessment, I think that is something that we were hoping that you guys would say, that it's close enough to that, and it could be considered in a more operational style and not necessarily a research track.

DR. NESSLAGE: Great. Thank you. Mike, would it be possible to scroll up just a tad, or maybe make it a little -- Just so we can see everything we've written so far, if that's at all possible? I feel like we're winding down here. I think this captures our discussion so far, at least before we start

wordsmithing. Are there additional comments or concerns or suggestions? While the SSC is thinking, let's hear from Rusty again.

MR. HUDSON: One of the things that I want to express about a charter boat versus partyboat versus headboat is partyboats generally troll. Partyboats, in the day when they were smaller capacities of passengers, trolled and bottom fished, and headboats virtually never trolled, and they might put a drift line, for a happenstance that the king mackerel would get hooked up. A twenty-four-inch minimum size that we have for king mackerel currently, that's a one to two-year-old age to maturity, female/male, and that's a big deal, because you're not going to find a lot of twenty-four-inch king mackerels on the pictures.

With the older ages, of course, you're getting into a different situation at that point, and I just wanted to also express the fact that the Keys to North Carolina, with the Atlantic king mackerel, the driftnets ended in the late 1980s, and they were a big deal in the 1970s through the 1980s, and I saw them, and they used airplanes and everything else, and that no longer exists.

For the king mackerel, when you're looking at these pictures, you're dealing with a situation of change that is useful to know, and then Clay Porch and Jeff -- I'm trying to remember his last name, but he, in May, asked me to put together a list of boats, back in the king mackerel stock assessment, and that might be useful to help people understand stuff.

On a headboat, we would put a drift line out every once in a while, and we would catch the king mackerel. Otherwise, you would be bringing up a certain kind of fish, and the king mackerel would hit it, and so you would see a rare-event king mackerel with mostly bottom fishing, but, when you're dealing with charter boats that were trolling, mostly, you're going to get predominantly king mackerel and bonito and stuff like that.

With a partyboat, that was a cross of trolling out and bottom fishing and trolling back in, and I just wanted to throw all that out there, because it affects the reality of the sizes, but the twenty-four-inch, the minimum size, versus the maturity age, which is a little bit around that area, below and above, for male and female, that's an important feature when you're looking at these pictures, and so I'm just trying to give you an idea of context about what you're looking at in the pictures, and so thank you.

DR. NESSLAGE: Thank you. All right. I am not seeing any more hands raised from the SSC, and, unless I hear any protests in the next few seconds here, I think we can wrap up this agenda item, unless, council staff, I am forgetting something here.

DR. ERRIGO: No, and I think we're good, unless, Chip, there's something else you need from the SSC.

DR. COLLIER: No, and I just wanted to thank everybody for looking at this and putting their minds to it. We've been thinking about it quite a bit, and trying to address some of these, and we really appreciate your time today.

DR. NESSLAGE: We appreciate your work on this. This is a fantastic project. Thank you.

MS. BYRD: I just want to echo Chip's comments, too. I think the feedback you all have provided is really helpful as we move forward, and so, again, just thanks for the opportunity to present this information to you guys.

DR. NESSLAGE: Thank you. All right. Our next agenda item is Ecopath with Ecosim, Number 6, and I would like to take a quick bathroom break, if we could. If we could be back in ten minutes, and so 2:47 on the dot. If you could grab extra coffee and do what you need to do and be back in ten minutes, that would be greatly appreciated. Please, SSC members, raise your hand on the return. Thank you, all.

(Whereupon, a recess was taken.)

DR. NESSLAGE: Okay. Our next agenda item is Number 6, the review of the South Atlantic Ecopath with Ecosim model, and note there are several attachments, 8 through 12, that you want to pay attention to, and there were new versions sent around, and so check your email if you don't have -- Some of them are still listed as placeholders.

Before we start, I just want to note that our notetakers for this pretty substantial item are Wally, Jie, Church, Wilson, and Amy. I believe we'll start with an introduction from Roger and move on to a description of the model from Lauren, and then we'll have a response from the SSC's workgroup from Yan, and then we'll have a summary of potential applications for Ecopath, Ecosim, and Ecospace from Luke. Then we will launch into as much -- In the remaining amount of time, we'll go through the questions that we've been asked to address, and so I think, unless there is other business regarding this item, we can just start with Roger, and is that correct? Am I forgetting anything, Mike or Chip?

DR. ERRIGO: No, and I think we're good. We can get started.

DR. NESSLAGE: All right. Great. Roger, would you like to take it away?

SOUTH ATLANTIC ECOPATH WITH ECOSIM MODEL REVIEW

MR. PUGLIESE: Okay. If we can go ahead and load or make Lauren a presenter, and what I wanted to do was provide at least a quick introduction and basis for where we are today, and this has been a long process over a number of years to get to this point, and it's an exciting time, but I think what I did want to touch on were the partnerships and the connections and what has really got us to this point, and, given that, I think what you see before you is steps of different activities over time that have led us to the development of the more sophisticated South Atlantic Ecopath with Ecosim model.

It goes all the way back to when the council first began discussing advancing ecosystem modeling, or ecosystem activities, and how we would begin to even think about ecosystem-based management, and it's very opportunistic timing that the University of British Columbia had been engaged to develop the Sea Around Us Project, and it represented many, many areas, and it built, in many cases, the first preliminary views, and, in our case, what we called the strawman model for the South Atlantic region.

It was a forty-eight-group model, and it provided the first snapshot of the entire system, and we worked with Tom Okey, back when he was working with the University of British Columbia, and this really set the stage for advancing how you begin to compile all these different information sources to begin to understand the system as it exists at this time.

That was followed-up by further evaluations and discussion, where the council was actually, at that time, looking at management of snapper and grouper by functional groups, and we actually tailored another generation in around 2004 to begin to structure it that way, and that was a preliminary ninety-eight-group model that was developed. However, given resources at that time, and the recommitment of Tom's time for other modeling efforts throughout the world at that point, we really weren't able to go far beyond that, and, as I turned out, the council actually changed direction, in terms of that management action and advancing it based on those functional groups, and so that led to a little bit of a lag time beyond that.

Finally, with, again, and this is coordination with regional partners, we were able to, as part of the South Atlantic Landscape Conservation Cooperative, advance and get funded efforts to move forward a substantial model beyond this, but, prior to that, the one stage that I think added a lot more to this model effort was in 2012, and they reached back out to me and to the council, and there was an effort to look at forage fish and be able to take the core, basic model structure, without a lot of manipulation in terms of structure, and really provide the most information they could on forage species relative to changes, big changes and shifts, really looking at some of the climate issues, if you had reductions, et cetera.

That provided that foundational model component that then translated to that connection with the Landscape Conservation Cooperative, where we took that information, as well as core information that had been developed to-date, and we really set the stage for the development of the more fully-developed South Atlantic Ecopath with Ecosim model, and that really ended up in the 2019 version that was presented, actually, to the SSC. It really shored up a lot of the key components, input components, and restructured it very significantly and advanced it.

The intent was to really be the best representation of the South Atlantic ocean ecosystem, and that's some of the reason it was funded, to be able to connect with the land-based systems that were built for the conservation blueprints, which are still in existence, and it's still advancing today, but more under the Southeast Connectivity Adaptation Strategy, and so there's still some connections and opportunities as we move to the future.

That provided the foundation for the last iteration, and we had then, after this iteration, advanced to further refine it, and the SSC created the workgroup to look at a review of the system. However, there is significant refinement by the model team to bring us to what is today the 2020 model refinement, which is a 146-box, 700-species-plus, model. It really eliminated a lot of some of the different components that were of concern or advances, to get the best representation of everything from diets to catch information, et cetera, and so that's where the partnerships that we've been building with everything from our fishery-independent surveys providing a lot of information, all the stock assessments being drawn on and coordinating with the Southeast Center, to get that information directly integrated into this latest iteration, working with MRIP to do this, working with ACCSP.

All that will be detailed more when Lauren actually gets into where we are, but that set the stage to get us to this point, so that the SSC can begin to evaluate and look at what some of these recommendations are coming from the workgroup, to really look at operationalizing the opportunity to understand how this can be a tool and how this can help the SSC and the council move into the future and look at everything from inter-species interactions to climate interactions.

Really, it's interesting, because the council has been discussing -- Recently, there's a lot of uncertainties with different species, and a lot of concerns over the environment, and everything is begging to be able to have some kind of capability to do that, and hopefully, today, as we get into the different presentations and the review, it really does set the stage to have pretty significant discuss this ions and some guidance and movement into the future, to begin to look at the bigger context of the South Atlantic ecosystem, and that's pretty much all I wanted to do, is to set the stage for the discussions.

As Genny indicated, there is the actions and discussions, and I think, as these presentations are going on, a lot of the information, I think, will be in the review discussions and the presentations, et cetera, and that really, hopefully, will provide some of the context to be able to address those, as you get further into the agenda after the different reviews. With that, I think I will pass it on over to Lauren, if that's okay with you, Genny.

DR. NESSLAGE: Absolutely. Thank you for that, Roger, and please go ahead, Lauren.

MS. GENTRY: Hi, everyone. I'm Lauren Gentry from the Florida Fish and Wildlife Research Institute. I'm just going to build on Roger's intro there to give you a look into some of the progress that's been made on this model in the last year, with the help of the workgroup and the review team, and a little bit of how it was done, but, before we get into the updates, I thought a quick Ecopath crash course might be a useful refresher, especially for our newer members, even if it just means having this slide to refer back to later.

The name of the program itself is Ecopath with Ecosim, nicknamed EwE, and it's made up of three parts. The first is Ecopath, which models an ecosystem structure and function as a single snapshot in time. The basic inputs are listed here, though there are lots of other things that you can add in too on top of those, and these inputs are put in for every group in the model, and so, for us, that's 140 groups.

Then the program assumes a mass balance system in which a predator's consumption is a prey's mortality, and all of the groups are connected via the diet matrix, and that's demonstrated by the flow diagram there on the right, which isn't terribly useful at that size, but it is at least demonstrative of how interconnected the groups are. now, once the user gets all the inputs and outputs balanced as an equilibrium model, this Ecopath model becomes the starting point for further simulations.

A user can tweak an input to observe the effect on the ecosystem, which you will see near the end of this presentation, or they can build on top an Ecosim model, which adds time dynamic simulations, in order to model like catch and biomass over time. Now, this is done by feeding the program time series of almost any input you want, like biomass, landings, effort, discards, anything, and you can also add an environmental forcing function to help drive those estimates,

like monthly Chlorophyll A or the seasonal sea surface temperature or river runoff, anything like that.

Then, using those time series, the program creates what you see on the right, and so, on that little graph, the solid orange line, that's the biomass estimate of snowy grouper from our EwE model, and the circles are the actual biomasses from the stock assessment that we fed to it, and we can further fit that model line to the real data. We can nudge it closer and closer, first by systematically and then by individually modifying the vulnerabilities of certain prey to certain predators, essentially making prey easier or harder to eat for those predators, and we can use that to sort of finagle that line closer and closer.

Now, this step could, theoretically -- That could go on until a modeler reaches insanity, and so it's done, quote, unquote done, when the modelers and everyone else involved agree that all of the estimates for every species important to them are as close as they want it to be, or as close as it's going to get. Then, with a fully-fit model, a user can tweak an input and test a scenario, like exploring climate change effects by adding predicted sea surface temperature time series, and you can model that into the future and then look at the outcomes versus using say stable sea surface temperatures from today, if temperature stopped today.

Now, finally, at the bottom, there is Ecospace, which models the ecosystem in space, hence the name, and time, and it makes a raster of the model area, and it runs the fit Ecosim model, that balanced fit Ecosim model, in every cell, and, since the biomass is allowed to move between the cells between each time step, you can test spatial scenarios, like the benefit of a new marine protected area, or possibly like where are the big dolphinfish going, or something along those lines.

As Roger said, this South Atlantic model has a long history of expansion and articulation, of putting together groups and taking them back out again, and many of you will have seen this exact blue slide on Tom Okey's model update in April of 2019, and the only change to the makeup of the groups was regrouping a few data-poor deep groupers, and that was decided by the workgroup, and, if you're curious as to what these final 140 groups, aka boxes, are, they are actually in an appendix at the end of this slide show, which is in your briefing book, and, if you want the list of the 700-plus species, you will have to email me for that one.

Now, the diet matrix progress is something we are particularly proud of, both in the effort and in the impact that a detailed diet matrix has on the model's efficacy. As you can see, a lot has been done since 2019. We went from seventy diets to 250, and we're still adding more as I need them, or as I come across them, and we removed all the proxies, which meant that they were using a diet from a similar species for a group, and there's none of that any more, and there's no more best guesses or place-fillers or anything. The only diets left over from the old West Florida Shelf model, which was, I guess, the progenitor for this model, are for the small invertebrates, because a worm is a worm, regardless of where it lives.

Now, primarily, these diets that we're talking about have come from gut content studies done by SEAMAP and NOAA and found in published literature and from our own gut lab here at FWRI in St. Petersburg, and these images demonstrate how we would -- We would start with the publication, there on the left, and we would copy the stomach contents, along with the percent weight, or the percent volume, into Excel, and then we would determine which of our 140 groups

each prey item belongs to, and then we add it altogether and get a final diet record, with a list of every prey group and the proportion of the diet each group contributed.

On top of that, individual prey items were added to kind of flesh out the details of the diets, and those come from lots of places, like -- If you guys have seen the new BBC Planet Earth 2 that came out, it had a wonderful shot of a crevalle jack hunting seabirds at the surface, and there is that great Okeanos live video of the wreckfish eating the dogfish, and I think the whole world saw that one, and then, more scientifically, there is this photo catalog that a researcher collector in Hawaii is keeping, I think primarily of social media photos, of beaked whales chasing prey at the surface, and so individual records like that were sort of added in as a very small percent of each diet, just to add more detail.

That table up in the right, that gives you a breakdown of the general quality of these diet records used, and so, to keep track of even more data quality, rather than just is it good or bad, we also created a metadata organization scheme seen here, and we're not going to go into the specifics right now, but having a score for each diet source and for each of these categories gives us a standardized way of finding which groups need better data and for what reason too, so that we can do a deeper and directed literature search, and, if nothing is there, we can make a research recommendation.

Of course it comes up of how do we get the most bang for our buck with these recommendations, and maybe we don't know what shallow gobies eat, and maybe that doesn't matter, and maybe no one cares what shallow gobies eat, and so, fortunately, EwE gives us this. It's a sensitivity analysis that's actually built into the software, and this function is a Monte Carlo routine that works toward reducing the sum of squares by adjusting the prey proportions up and down within the matrix, but, obviously, the predators with the rich, detailed diets have more prey items to be adjusted, even if those are tiny, tiny little adjustments, and so they end up with the largest overall change, but you remove those correlated groups, and that gives you a list of which group's diets have the biggest change or the biggest adjustment.

Some of these groups are -- They're leaning heavily on a few prey, and there's really nothing that we can do about. We talked to experts and commercial and recreational spear fishermen about how to get deep groupers to the surface with intact stomach contents, and the answer was no, you don't. That's fine.

Menhaden, they've got a gizzard, and so their stomach contents are all ground up and low detail, and, regardless, menhaden and herring both, they are going to rely heavily on a few prey items within the model, because those are the only groups that fit in their mouth, and that's fine. There's nothing to do there, but you can see this list gave us Auxis mackerels, and those are you bullet an frigate tunas, and blue runner, and they have a large impact to both predators and prey, both of those groups do, but we don't have very much information about their feeding habits, and so those were isolated as high-impact research recommendations for diets.

Now, I don't want to beat this diet thing to death, but we can also further dig into which individual interactions were outliers in that sensitivity analysis, and some of them show me where we just needed to add more detail, like halfbeaks do not eat 10 percent seagrass, and, once I went in and looked at the paper, it said in the paper that that was incidental ingestion, and so that was removed,

and more diets were added. Hogfish don't eat 40 percent echinoderms, and that was just a low-detail diet, and so it just took a little more searching, and we found more diets.

Then the program didn't like that red snapper we eating 19 percent black sea bass, and so we looked further into that one, and it turns out that was only from 200 fish from SEAMAP, and that may have been net feeding, and so I hunted down a whole bunch of additional diets, and none of them even have black sea bass listed as more than a tiny percent, and so, once all of those were added, that evened back out, but some certainly stuck out as interesting and reliable, once we did some digging.

Coastal bottlenose dolphin eat 30 percent weakfish, but you would too, I guess, if you were hunting in a muddy estuary and your lunch was croaking loudly on the other side, and that's pretty easy to find, and the shortfin mako -- Those were 400 sharks collected across three decades, and bluefish were around 80 percent of the diet the entire time, and then we've got two sources saying that Auxis mackerels are over 50 percent of the diets of blue marlin, and so that stays, but, overall, what I wanted to show you guys is we have this kind of granularity, not just for the diets, but for other inputs, too. That was a lot of detail about diets, just to give you an idea of how this data collection process generally went, and goes, but we'll speed it up for now.

The biomass inputs came primarily from stock assessments, but FWRI staff and the modeling team also calculated others, and like we used the FWC winter manatee survey, seagrass surveys, and lots of other GIS components, and so, like the picture that you see there, that's from a map of Duke University's cetacean density data, and I think that one is probably coastal bottlenose dolphins, and I overlaid the bounds of the South Atlantic region, and then ArcGIS summed up the annual number of individuals. Then you multiply that by the average weight of that species, and, boom, biomass.

We ended up with sixty-one groups with input biomasses, and then we allowed Ecopath to estimate the rest, rather than just guessing, and those estimates, of course, we checked in the balancing process, to ensure that they were reasonable, and this is another point at which we can modify biomass and see which groups' biomasses have the biggest impact, and therefore would benefit most from better biomass estimates. For us, generally, it was the forage fish, and everything gets better when you know more about how much herring you have.

Now for landings, and landings are very important. The commercial landings came from ACCSP, and landings, by the way, are caught fish and discarded dead, and so total number of dead fish, I suppose, and they assigned an excellent data analyst to work with me to ID 1,100 species from their records, plus a bunch of higher taxon groups. Like when the records are only at the genus or the family level, or, for the invertebrates, sometimes at the phylum level, and we also worked together to reallocate ninety-million pounds of previously marked unknown landings that had been just distributed across all of the groups, but we found that that weight was almost entirely seaweed and invertebrates, and those have their own groups, and so that's where that weight needed to go.

ACCSP was also kind enough to track down outliers all the way back sometimes to their paper records, and like this crazy person in Georgia in the 1990s who apparently caught a 200-pound bull shark by hand with no equipment on the beach, and so that was real. That was a record, and it stayed in, and we thought that it was a typo, but we also discovered, more importantly, like a problem with their query code that had previously been switching the landings for large coastal

sharks and dogfish sharks, and that explains the issue we saw in 2019 with the large coastal sharks being terribly overfished. They weren't, and that was the weight that supposed to be dogfish sharks.

Then we did the same thing with recreational and headboat landings time series from the Southeast Region Headboat Survey and from MRIP. I found the expanded MRIP species list with 400 species landings that hadn't previously been in our recreational data, and that allowed us to add about twenty new landings time series for groups that didn't previously have them, bringing us up to 153 total time series.

The SSC's own Wilson Laney then lent a hand by knowing people who know people, and he helped us chase down a handful of MRIP data outliers, and we were able to track them back to instances, like one in which a single fisherman caught thirteen cownose rays for bait in one year, and that got extrapolated out to 138,000 individual rays that year, and so that was causing a huge peak and driving the species extinct, and so, obviously, those data points were removed, and it was something similar for scamp. I think that was actually five scamp that were caught and accidentally extrapolated out.

Some other inputs and steps that we've done sort of during the review process that you all may care about here is discarded alive numbers were, obviously, obtained from MRIP and elsewhere, and each fleet, and, for the commercial, each gear type are assigned its own discard mortality rate to estimate how much of those living discards end up as detritus in the model, and so SAFMC's Chip Collier sent me the numbers that they used in the stock assessments and other NOAA inputs, and then Brendan Runde from NCSU, and descending device fame with the SAFMC, provided me with a number of updated rates from brand-new research that they're doing up in North Carolina for deep groupers and gray triggerfish.

Luke McEachron, of our modeling team, also added a monthly satellite-derived Chlorophyll-A environmental forcing time series from NASA, and then the model outputs were checked against best practices, thermodynamic rules and those published kinds of rules-of-thumb that everyone has to follow, and, finally, we made a huge pedigree to rank every input source, and that's for our own use for Ecopath to use to direct or constrain calculations.

What did we learn just by doing this, just by building this monstrosity of fish? Well, first, we got a giant diet matrix out of it, and that's already been used when I participated in the climate change vulnerability assessment workshop last year, plus all this data is going into, and some of it actually came from, the Ecospecies database, which is also positioned to serve as a long-term kind of easy to access repository for all the inputs and outputs.

Further, this model provides a quick and accessible comprehensive prey list for any time that kind of thing is needed, and like there was a recent discussion of new, or possible new, ecosystem component species, and I think that was like sailor's choice and saucereye porgy and a few others, and those diets came straight from this matrix. This building process and the systems that we have put in place also help us ID species that can be research, or to recommend for research, either for stomach contents or biomass, with assurance that those results will have an immediate and tangible benefit to the performance of the model.

It also helps find some of those strange anomalies in fisheries datasets that we need to scrutinize, like that cownose ray situation, and there may even be another one. Blueline tilefish has a strange

spike, but I think we might have to wait until the next assessment to see what that ends up being from. Finally, we can find valuable interactions, like the shortfin mako relying on bluefish as much as they do, or marlin needing their bullet and frigate tunas, and it was oh so timely that bullet and frigate were designated as ecosystem components right as I was doing this analysis the first time, and that was wonderfully validating.

Now, as we wrap this up, I wanted to show you a little scenario testing that we did, just out of curiosity, to see how the model was behaving, and so, while talking discard mortality rates with Brendan, he sent me a paper that was just published recently out of North Carolina, and it's there at the bottom, showing reduced discard mortality of black sea bass if they were descended or stabbed with a venting needle.

Just to see what happened, and because it's an easy change to make in the model, I reduced the recreational discard mortality on black sea bass accordingly, and it was already very low, and it was 14 percent for recreational, and so that dropped only to 9 percent, and I did this in Ecopath, which is that first one, to see what would have been hypothetical effect if we had been using these devices say all along.

The model did just what it was supposed to do. It predicted the annual biomass, and, as compared to the results from the higher mortality runs, there were, as expected, winners and losers. Interestingly, all the groups that you see listed under the winners and losers -- Those are all prey of black sea bass, but, due to trophic cascades and all those interconnected diets, planktivores and squid and bivalves, they ended up top, and they actually gained some biomass, likely because they are prey of prey, or they would have to be like prey of prey of prey of prey, or just some other larger interaction with black sea bass than just being eaten by them, and, so, regardless of why, this was a nice hypothetical test to see that the model is behaving the way it's supposed to, even when the change was just a little 5 percent drop in recreational discard mortality.

Finally, here is my favorite function of the EwE output so far, and this is entirely my favorite because I was doing all of those diets, and I was obviously seeing the same prey groups over and over, and I was thinking I was seeing patterns, but you don't really know, as you're doing it, and this is an actual quantification of who eats the same food and in what proportion, and so this prey overlap function lets me then create a matrix of species that we have all been talking about recently and look at whose diet is overlapping who else.

Red snapper and red porgy, they have a 41 percent diet overlap, while red porgy and red lionfish only overlap by 17 percent. Now, I should add the context that the average overlap of all the fish predators is around 20 percent, and so, while black sea bass and red lionfish have about an average amount of their diet in common, black sea bass and red grouper have an above-average diet overlap.

At the bottom, we can also look at each predator individually, like a column, and list out the top species that share prey items with them, but some of this is inevitable, due to the structure of the groups, especially for invertivores, like red porgy and spiny lobster there, and there are only so many invertebrate groups in the model, and so, if you like crabs and shrimp and oysters, which, I mean, even I do, then there's going to be a lot of diet overlap between you and other invertebrate groups, or invertivore groups, but this is at least a really neat place to start, with a lot of those shared resource questions that we have, and, from here, we can look through the diets individually,

to actually see what's going on, and this also lets us make a similar matrix, but with predator overlap, where you can combine them together, and they call that niche overlap.

Last, but not least, I would like to thank our data contributors and consultants and everybody, and this isn't even a fraction of the total list, but especially all the folks who have expressed interest in the future of this project and have been keeping in touch and helping us make the connections that we need and having a network of collaborators like that who are all really interested really makes every question and outlier mystery and data search easier and just so much faster, and so thank you, and, before we hand this off to Yan for the workgroup report, I guess does anybody have any questions?

DR. NESSLAGE: Thank you, Lauren. Would it be possible to go back to the hands-raised screen, and perhaps we can entertain some clarifying questions at this point? Great. Thank you. Eric, please go ahead.

DR. JOHNSON: I'm good. It was left from the earlier time, when we were coming back from the break.

DR. NESSLAGE: You're back, but you don't have questions at the moment. Is there anyone on the SSC with clarifying questions? Wilson.

DR. LANEY: Yes, Madam Chairman, and thank you, Lauren, for that excellent presentation, and I'm not sure this is the appropriate place for this particular question, but I will ask it anyway. Last week, and I think you may have been on it as well, but I was on an ecosystem modeling for fish management in the Gulf of Mexico webinar, and David Chagaris, I think it was, gave the presentation of the validation approach that they used for that model, which I thought was a very nifty way to do it, and they basically whacked off -- I think they looked at five, the last five, years of the actual time series of biomass estimates, and they whacked those off, and then they ran a simulation, to see how well their simulation compared with the actual data, and my question is are you all going to do something similar with this model, in terms of validation?

MS. GENTRY: Yes, I believe that that's the plan. Right now, we're at that step where I said that you can kind of individually modify things, as much as you want, and, with a little more guidance and direction from the workgroup, or the council, then we'll be able to move forward with deciding that we're done fitting and then going through that validation process, absolutely.

DR. NESSLAGE: Thank you, Lauren, and thank you, Wilson. Are there other questions? Yan.

DR. LI: Thank you, Genny. Regarding to Wilson's question about validation, I would like to add to Lauren's comments that I remember doing the review process, and the work team -- Lauren, you correct me if I'm wrong, but the work team actually validated the estimates, validated the biomass estimates, and validated lots of things as you go, as we go through the process, like every time, and that's not in a form validation setting, but, every time they have an outcome, I believe the model team will compare to the actual observation, to see if they are similar or not. If not, they will dig into it, to see what is causing that difference, and is that right, Lauren and Luke?

MS. GENTRY: Yes, that's absolutely right, and I was referring to -- Wilson was referring to these very specific validation of Ecosim processes that Dave Chagaris presented for the Gulf of Mexico

Fisheries Council last week, in which they truncate the last couple of years of data and see how the model performs predicting it.

DR. LI: You have like a training dataset, and a present dataset, and so they kind of compare and like truncate the time series, and is that what Wilson was talking about?

MS. GENTRY: Yes, just like that.

DR. LI: Okay. I've got it.

MR. MCEACHRON: I will just add that it really depends on your question, too. Like, if they're trying to look at making predictions forward in time, it makes sense to do that approach. If you're doing some kind of space-time question, you could a totally different type of validation, and it just depends on what you're trying to do.

DR. NESSLAGE: Great. Thank you. Are there other questions? Fred Serchuk.

DR. SERCHUK: One thing that we all are cognizant of is there are changing distribution patterns going on in the environment in relationship to changes in temperature and changes in other environmental attributes, and how does the modeling effort handle those changes relative to changes in diet or changes in predation? Thank you.

MS. MCEACHRON: I think, when I go through my presentation, I think that will be a little more clear, how you do that, how you approach these kinds of questions, and I will try and map that out.

DR. SERCHUK: What about changing distributions that are now going from one ecosystem to another ecosystem, and we've seen large changes in the distribution of fish stocks away from the South Atlantic and moving north into the Mid-Atlantic, for example.

MR. MCEACHRON: Right, and so, in Ecospace, it will just either assume -- Like you can either force some kind of migration to happen like that or it will just assume that the biomass is lower or has changed, and the habitat conditions within the system you define have been reduced, and therefore the overall biomass in the spatial box we're making is declining.

DR. NESSLAGE: Okay. Jeff, questions?

DR. BUCKEL: I really enjoyed the presentation, and it's great to see how this has evolved over the years, and so nice job on the latest iteration, and it's really nice. I was curious what -- You may have mentioned this and I missed it, but what's the time period? You talked about how the Ecopath is for a certain time period, and then Ecosim would take off from that time period, and is there a particular year or decade that this Ecopath model represents?

MS. GENTRY: Yes, and it's built on 1995 to 1998, as like an average. That's the reference time period.

DR. BUCKEL: Great. You mentioned how -- I had a question, a year or so ago, about all the different diagnostics that people can do on the Ecopath, and you mentioned that you've done that,

and is that available somewhere that we could check out those relationships, like the pre-balance that Jason Link has and some of those relationships that he recommends checking?

MS. GENTRY: Yes, and I can certainly put those together. We did find that the way the model was structured, with some groups being, you know, a hundred-plus species and some groups being a single species, that a handful of those, the length pre-bal sets, they didn't -- They didn't apply, essentially, but, for the rest of them, absolutely. I will, I guess, get with Roger and figure out how to provide those to the group.

DR. BUCKEL: That would be great. Thanks. Then I was curious if you used the mixed trophic -- Is it MTI? I can't remember what it stands for, but just where you can look at some of these direct impacts, the predator-prey, and there's some tool within Ecopath, and mixed trophic impacts I think is that -- Did you look at any of that output?

MS. GENTRY: Yes and no. We have been running it, and it looks like it's the kind of thing that may take a few weeks to run, or else we're just going to have to get access to a better server to do that for us, and so, with a model this large, that's going to be an undertaking, but, yes, that is an output that we are very eager to look at.

DR. BUCKEL: Great. Yes, and it would be similar to the pre-bal diagnostics for Ecopath, and I would be interested in taking a look at the mixed trophic interaction results as well. Thanks.

DR. NESSLAGE: Other questions? All right. There will be opportunity to pepper the group with questions as we go along as well. If there's no hands raised, then perhaps we can move on to then to the working group's overview. Yan, if you are ready.

DR. LI: Yes. Thank you, Genny. I am ready.

DR. NESSLAGE: Great. Take it away, please.

DR. LI: Thank you. First, I want to thank everyone for being here with us, and, before I start the review, I would like to bring your attention to the process, including development and review of the whole process, and it takes a humongous collaborative effort to get us this far, and the effort among the model team, the review workshop, and the support from the council staff and many other technical experts is incredible.

As we recall, the workgroup, including selected SSC members listed here, was established back to April of 2019 to provide an initial review of the South Atlantic EwE model. During the review process, the model team may provide some model development updates and address these questions and the requests from the workgroup. Here, I would like to thank the model team, especially Lauren Gentry and Luke, for their tremendous effort in the development of this model and addressing questions from the workgroup during the review process.

I would like to thank the workgroup for their contributions in this review process, and a special thanks to Marcel Reichert, and he is no longer with the SSC, but he stayed with the workgroup, and he contributed until the review was completed. Lastly, I would like to thank the council staff, especially Roger, for coordinating the review process, especially during a difficult time, when we underwent delays, and there was rescheduling issues, due to the pandemic, and the workgroup

members and the chair changed, and so there were a lot of things going on behind the scenes, but I would like to thank everyone who contributed to this big effort.

For the review, the whole purpose of this review is to support a defensible base model for the South Atlantic region, and so, building up from this base model, we can address so many things, as Lauren just showed. There are so many things that we can address and update and improve by addressing specific research or management questions, and so this review focused on those areas, at least here on this slide, including the appropriateness of data, and we evaluated the validity of the data sources, to make sure they are reliable.

Also, the review focused on the model parameterization and those decisions of what parameter values to include and what functions to assume, and, actually, you won't believe it, but it actually happened that the workgroup and the model team -- We sat together, and we went through the individual input values, to identify any suspicious variables that we need to look into, and we spent a lot of time on it, and, also, we looked at the model assumptions, to make sure the assumptions are reasonable and also to make sure the whole model can realistically represent the South Atlantic region that the model was intended to model.

Also, the workgroup looked at the initial model outcomes, based on a hypothetical scenario, and, also, the workgroup spent lots of time discussing the functionality of this model in fisheries management, because I recall back to April of 2019, the SSC meeting, and there were a lot of questions and concerns raised about how we can use -- This model looks very complicated, and it's huge, and how can we use it in stock assessment, to aid in stock assessment, and so we spent lots of time discussing that aspect.

Here, I would like to bring your attention to that, and Lauren just mentioned the whole EwE model has three components, the Ecopath, Ecosim, and Ecospace, and this review is for Ecopath and Ecosim, and, during the review process, the workgroup mostly focused on evaluating the Ecopath components, because, as you can see, the Ecopath is the foundation for the rest of the model development.

The workgroup was unable to fully evaluate the Ecosim components, because of the lack of a specific question, and, once the specific questions are developed by the council, or by the SSC, then the further evaluation of the Ecosim component can be carried out.

The whole review process went through a series of workshops and phone calls and webinars, back to July 24 and 25 of 2019, and an in-person workshop was held to discuss a collection of diet information and the spatial settings, and then a conference call was held on December 6 of 2019 to develop the terms of reference, which I believe you can see the details of the terms of reference in the full review report. After that, between February 2020 and September 2020, we had four webinars to review the model and to complete the review process.

Here is the major conclusions from the workgroup. Overall, the workgroup is very impressed with the tremendous effort that the model team has dedicated to the development and maintaining and updating such a complicated model system with great details. During the review process, the model team was very super responsive to the workgroup's questions and requests, and they did modify the model according to the workgroup's recommendations, and we believe, the workgroup

believes, this process, the whole process, already significantly strengthens the functionality of the future use of this model system.

The workgroup concludes that the model team addressed each of the terms of reference adequately, and this EwE model provides a valid base model that can be further modified and updated for specific research and management needs. Please note that, as we go through the whole presentations today, please keep in mind that what you see here, the model and the review, was -- The model was developed, and the review, was made based on the best information available currently, and the model is a living tool. It will be updated and improved as new data and new information becomes available.

Here is a summary of the major discussions and concerns raised around the review process, and this part is the discussion and the concern we focused on for the Ecopath components, and the workgroup evaluated the functional groups that were built in in the model, and the workgroup agreed that the functional groups that are currently incorporated in the model captures the biological components of the ecosystem of the South Atlantic, again based on current information.

Also, the workgroup noticed that the functional groups can be adjusted to address specific research or management questions, and, as I mentioned earlier, the workgroup went through individual input values, to make sure they are realistic, and so, during this process, the workgroup did raise concerns over the difficulty of evaluating input values for certain species that have very limited information, for example golden crab. Also, the workgroup spent time and discussed the tradeoff between inputting biomass values versus allowing the model to estimate.

Also, the workgroup noticed that the decision of -- How to solve this tradeoff, the decision may depend on the specific research and management questions that you ask, and, eventually, the workgroup supported the model team's suggestion to input biomass for species that have biomass information available and to allow the model to estimate biomass for species that do not have biomass information available currently.

The workgroup also discussed how to specify the biomass accumulation for certain species, for example, for certain species that have experience dramatic biomass change during time period, and, for example, for some invasive species, like lionfish, or for species that are overfished and/or undergoing overfishing. Also, for species that have substantial biomass change, as I mentioned, and, for example, like the red snapper and black sea bass and red porgy and the king mackerel.

The discard mortality and discards were a huge topic and focus during this review process, and the workgroup discussed specification of the discards and individual discard mortality rates, and the workgroup did emphasize that it is very important to incorporate discards in the correct way in the model, and the workgroup raised concerns with the current default value of 20 percent for calculating the commercial discards for species that does not have discard estimates from the stock assessments.

Both the workgroup and the model team realized this default value of 20 percent may not be realistic for certain species. However, the workgroup agreed that this assumption is acceptable at the current stage, without any additional information, and, also, the workgroup noted that improving the commercial discards input may not substantially improve the model performance

and the functionality, and, in the following slides, I will present the recommendations from the workgroup and what are the key factors that could substantially improve the model performance.

Also, the workgroup raised concerns over the potential overparameterization of the model, with a total of nineteen fleets separated, but, after discussing with the model team, and the workgroup agreed to keep nineteen fleets in the model, because the workgroup believed that having fleets separated allowed for estimating landings with high spatial resolution in Ecospace later, and, also, it would allow for specifying discard mortality by gear type.

Here is the discussion and concerns that occurred during the Ecosim component evaluation, and the workgroup evaluated the time series data, the input and series, and the workgroup agreed that those time series are from reliable sources, as Lauren presented in her presentation, and, also, the workgroup noted that the model is very complicated, but it's also flexible, and it can be adjusted to suit specific questions, and, also, for the model fitting process, as I mentioned earlier, for the Ecosim part, because we don't have a specific question to ask, and so the model fitting process was not able to be fully evaluated, but the workgroup noted that the model fitting process will need to be modified or redone for each question being asked.

For this reason, the workgroup did not have specific recommendations on the model fitting process at this moment, and the model team -- In terms of handling extreme estimates, and, here, the extreme estimates refers to the extinction event, or extremely high biomass estimates, in the model, and the model team did a great job exploring and trying to solve those problems with extreme estimates, and the workgroup was very satisfied with the process and strategies used to contain those extreme values, and the details of those strategies and processes are included in the full review report.

During the review process, those identified extreme estimates were investigated and modified by the model team to improve the -- Eventually, they improved the model performance, after they handled those extreme estimates, and, as Lauren mentioned, the workgroup discussed the potential of adding a Chlorophyll-A index to represent the primary productivity, and, as Lauren mentioned, it's already in the model, and the model team is exploring how this adjustment would affect the model fits.

As I mentioned earlier, the workgroup spent a lot of time to discuss how this EwE model system can be applied in real life, in real fisheries, and so the workgroup believes that, agrees that, this EwE model system will serve as a living tool to complement the stock assessment and the fisheries management. It can be used to inform management decisions at the ecosystem scale, and it also can test hypotheses and evaluate uncertainties, again at the ecosystem scale, and so Luke will have a detailed presentation to expand on the functionality and the potential application of the EwE model in fisheries management. Again, please keep in mind that what you see here is not fixed, and so it's a living tool, and so the model will be updated and improved as new data become available, and also as our understanding about the system becomes better.

The workgroup has come up with recommendations for the model team to consider, and also for the SSC to consider in the future, to improve the model. Here, I break down the recommendations, based on they may improve the model input and the model output and the overall model performance, and so here is recommendations from the workgroup that may improve -- By improving the model input, that will improve the model, eventually.

The first recommendation is to establish a well-maintained and regularly-updated documentation of the model inputs with justification for the use of individual values, and, here, I have to give credit to the model team, and, so far, they have done a great job to document this huge model system, and there is tons of input, and you can see, just from the diet matrix, that component, that there is tons of input there, and they have done a great job to maintain that data source and the documentation. The workgroup recommends to continue that great effort, because, later on, when you update the model, you want to trace back where you changed and why you changed it.

Also, we believe this model is a living tool, and we can develop goals for decades in the future, and so we want to have a very good documentation, so that, somewhere in the future, we can come back to look at what we did today, and so, because this is a living tool, again, keep updating it, and so it's very important to track where we were and where we are heading.

Also, for the biomass accumulation discussion, the workgroup recommended to adjust the biomass accumulation based on the available information that can match the biomass trend of those species during the reference time period, and those trends can be either the trends from the fishery-independent indices or the biomass estimates from stock assessments, or even just the trends from the surveys, for example the surveys for the shellfish. Also, the workgroup recommends to validate the individual discard mortality rates, to make sure they are realistic.

Also, the workgroup recommends to potentially add a discard fleet to the fisheries data in the future. By adding this discard fleet, it would allow for a time series representing the changes in the discard mortality over time. For example, we can track the changes before and after the changes to gear regulations, and, also, the workgroup recommends to explore other alternatives for the default value of 20 percent to calculate the commercial discards. The workgroup also recommends to request discard estimates from states, especially for those inshore species.

Here are the workgroup recommendations focusing on the model output. First, the workgroup recommends to validate the model-estimated biomass based on similar species in the model or in other models for this region, and to identify and evaluate extreme estimates. Again, as I mentioned earlier, I feel the workgroup has done a great job to validate the single output estimates and the biomass estimates, to make sure they are realistic, by comparing those estimates to the empirical values or studies from other regions and similar species. I feel they have done whatever they could to try to make sure -- To try their best to make sure those estimates are realistic, and so the workgroup really appreciates that effort.

Here is the recommendations to improve model performance, and so both the workgroup and the model team realized and agreed that inputs of biomass and inputs of diet -- Those two inputs are critical to the model performance of the Ecopath components, because the Ecopath is the foundation for the Ecosim and Ecospace, and so, by improving the inputs of these two components, it can improve the performance of Ecopath, and it can surely further improve the fitting and performance of Ecosim, and even Ecospace.

Based on this, the workgroup discussed with the -- After discussing it with the model team workgroup, they came up with recommendations for the research topics in the future that may improve the diet input and may improve the biomass input for this EwE model. The workgroup recommends further research that can improve the diet information for those species that are

important to either the ecology or the fisheries of the model region, and so, for those ecologically-important species, it may include the forage fish, such as herrings, anchovies, shad, and sardines, and Auxis mackerels, including bullet and frigate mackerel, and red drum. Those fisheries-important species may include Nassau grouper and goliath grouper. Also, the workgroup recommended research into -- Here is the biomass estimate. My apologies. Here is a recommendation for the species that needs to improve the biomass estimates. Next slide, please.

Here are the research recommendations for the species that needs improved diet information. Those species may include Auxis mackerels, again, including bullet and frigate mackerel, blue runner, tarpon, mutton snapper, and Nassau grouper. Also, because lionfish is a species that have a great influence on the ecosystem here, the workgroup recommends to further monitor the lionfish diet, to make sure the model has fully captured their impact on the ecosystem.

Also, for the future development of the EwE model, including Ecospace, and to be able to improve the functionality of the EwE model for fisheries management, the workgroup recommends to establish a standing workgroup in the future development and update of the EwE model. I think that's all, and I'm happy to take questions, and, again, thank you, everyone, the workgroup and the model team and council staff, and thank you, everyone, for bringing us this far. This is a huge effort. That's all.

DR. NESSLAGE: Thank you very much, Yan, for that excellent presentation. Let's see if we have any clarifying questions from the SSC for Yan and the working group. Marcel.

DR. REICHERT: Hello, everyone. It's good to hear a lot of familiar voices, and, although I'm no longer part of the SSC, thanks for allowing me to make a comment. All I wanted to acknowledge is Yan's efforts during the review, and she jumped in as the workgroup chair mid-review, to replace Rob Ahrens, and I don't think we could have completed this review without her efforts, and so thank you, Yan, and that's all that I wanted to say here, and so thank you for allowing me this brief comment.

DR. NESSLAGE: Thank you. I think we all echo your thanks for the rescue. Thank you for rescuing us, Yan, in this particular task. Eric Johnson.

DR. JOHNSON: You guys stole my thunder, and I was going to say the same thing. Thanks to Yan and the rest of the workgroup, as well as the entire folks working on the model team as well, and they did an excellent job, and I just wanted to reiterate that.

DR. NESSLAGE: Yan, your presentation was so perfect that no one has questions.

DR. LI: Great.

DR. NESSLAGE: You have to give all the presentations from now on out. That's the thanks you get for your hard work and good work.

DR. LI: Thank you, everyone.

DR. NESSLAGE: If we don't have any questions right now, there may be some that pop up, and I don't think she's going anywhere. Let's take this opportunity, because we have a little less than

hour left, to hear from Luke, and then we'll take questions and see where we are time-wise, if Luke is ready. Are you ready, Luke?

MR. MCEACHRON: I'm ready.

DR. NESSLAGE: While we're waiting, we will not get through our discussions today, and will you all be available tomorrow morning to rejoin us?

MR. MCEACHRON: I will. I don't know about Lauren.

MS. GENTRY: I'll be here.

DR. NESSLAGE: Good. Roger?

MR. PUGLIESE: Yes.

DR. NESSLAGE: Fabulous. We really appreciate your flexibility. Okay. It looks like Luke's PowerPoint is up. Are you ready to take it away?

MR. MCEACHRON: Yes. Today, I kind of want to step back a little bit and just give like a high-level view of the ecosystem model and how we use different components, because it can be confusing to keep everything straight, and so I will just walk through each component of the model and work through some examples, and hopefully, by the end, it will be clear how and when to use each component, and, in this context, I'll talk about the South Atlantic model and where it is and where we can go.

The first component, Ecopath, as we said, we're just constructing a mass-balance model to represent one moment of time. We're simply defining the groups and the diets and inputting the growth and fisheries data and getting a snapshot of the trophic structure and function of the system, and, if we just stop here, as some people do, we could get a sense of the key groups in the system, and we could produce a wide variety of ecosystem indicators that describe the system.

In fact, there's a series of best practices that we talked about in the Jason Link paper, and that provides an established acceptable range of some of these quantities that help us determine if the model is reasonable, but, importantly, Ecopath serves as the foundation for Ecosim and Ecospace.

In Ecosim, we're converting the Ecopath master equations that we established into differential equations to model biomass over time, and, in this case, we're using time series data to tune a vulnerability parameter that defines the relationship between prey mortality and predator density that calibrates the model, and, when we do that, we get annual predictive time series of biomass and catch, and it helps us understand the time dynamics in the system.

How could you use this information? In the meeting documents, I provided two papers as examples, and one is a Dave Chagaris paper on lionfish, and he wanted to estimate the effects of lionfish on reef fish in the West Florida Shelf, and they evaluated different reef fish harvest strategies, to see if they could communicate some of those effects, but how exactly did they do this?

Well, first, they took an existing Ecopath and Ecosim model and modified it, and so, in Ecopath, they added a lionfish group, and they added lionfish growth information, and they created an artificially-high fishing mortality reference area, to make sure that adding lionfish didn't really disrupt their initial model balance. This also made it easier for them to modify harvest strategies in Ecosim, and they modified fishing effort in Ecosim to assess different fishing mortality rates, not just on lionfish, but on different reef fish as well, and then they did a series of alternative runs that they compared to their baseline run.

This is what it looks like when you compare multiple runs, and so, here, they are plotting the predicted lionfish biomass under different reef fish fishing mortality rates, and so this is just showing that the model predicts lionfish biomass will increase if you increase reef fish fishing mortality, and, alternatively, we can see that, if we don't harvest lionfish at all, the model predicts a decline in biomass for nearly all the other reef fish groups in the system, but crustacean groups might increase in biomass, and so this is probably because the predation pressure on crustaceans is reduced when these other reef fish predators decline.

Now let's talk in a little more detail about Ecospace. Here, we are basically applying an Ecosim model in a spatially-explicit cell, a raster map, but biomass can move between these cells in different time steps, and the result is a series of biomass and catch distribution maps for every group within the spatial domain that we have defined, and this domain won't change.

The distribution of biomass is governed by several things. First, you have to define environmental preference functions to determine if the cell contains environmental conditions favorable to a group, and so, for example, for a specific location in the map, there will be a depth value, a distance to shore value, and a temperature value, and these curves define those values that are preferable to a species or group or not, and the product of these values becomes a habitat capacity value, and biomass in the model will gravitate towards cells with high habitat capacity.

You can imagine, like in the climate change scenario, we would basically be adjusting the temperature values in the map, to either reduce or increase them, but this environmental preference function -- That relationship would stay the same, and so it would ultimately just predict less biomass in areas with less-favorable temperature conditions.

How quickly they move to different high-habitat capacity areas between time steps depends on a dispersal value, which is the rate that organisms would move as a result of random movement, and so it's basically like diffusion, and, last, fishing effort is distributed by a gravity model that considers distance from ports and the species targeted in different fleets.

Now we have a full picture of the entire Ecopath/Ecosim/Ecospace model. In Ecospace, we have inherited the Ecosim model, and we have defined environmental preference functions from raster layers of depth and other imagery. That other imagery might be satellite imagery, like SST or model-direct products, like sea surface height, and it would also define port locations and fishing effort. It would define dispersal values, and we would get out predictions of catch and biomass in a series of maps.

Ecospace doesn't replace Ecosim, and Ecosim doesn't replace Ecopath. Each component is just used to address different questions, and they do inherit information from each other, and so how do people use Ecospace? Some of these capabilities are pretty new, but, in the Gulf of Mexico,

Kim de Mutsert wanted to look at the effects of hypoxia on the ecosystem, to ask questions like should we restrict effort during hypoxic events off of Louisiana, and, on one hand, you have an increased load and nutrients that might increase biomass, but, eventually, those nutrients will lead to these hypoxic events that might decrease biomass.

Kim used a model-derived raster data to represent nutrient enrichment and hypoxia, and so she basically just changed the set of imagery that different Ecospace model simulations were reading, to see what could happen to biomass when you either include no forcing, like a baseline model, or when you include like enrichment only, just including Chlorophyll-A and nutrient loading, or a third simulation where she included enrichment and hypoxia as environmental drivers. When you include enrichment and hypoxia in the model, the model predicts increasing biomass and catch rather than decreasing biomass and catch. Thus, they recommended that effort didn't need to be restricted during these events.

Where are we at with the South Atlantic model? Well, we're here. We're approaching a calibrated Ecosim model, and we're also looking at time series data to identify appropriate vulnerability parameters, and, simultaneously, we're looking ahead in Ecospace and looking at available spatial data and spatial relationships in anticipation of inheriting the Ecosim model.

Where can we go? Well, we've heard some general interest in questions about recruitment, changes in discard mortality or climate change impacts, and so, like many models, there's many different approaches we can take, but, if we wanted to look at recruitment, you could add a juvenile age group or a species in the model and run Ecosim under different biomass forcing scenarios to look at the effects of a strong or weak year class, and that's just an example.

If we wanted to look at the effects of say like gear type, we could adjust discard mortality in Ecopath and compare different Ecosim runs with and without that gear type for changes in discard mortality over time, and, if we wanted to run Ecospace forward in time, to look at different climate change scenarios, we could read in IPCC raster imagery, or raster models, into Ecospace and build habitat capacity around that and evaluate different scenarios, and so there's many ways you could go.

At the end of the day, you have a framework for looking at these questions. The strength of the approach, I think, is really having the ability to predict indirect effects in these complex food webs that otherwise you might be hard-pressed to predict by yourself. In some cases, as we saw in those other cases, some of these indirect effects may change, or they may not, and we just don't know, but, in most cases, when we're looking at different simulations, we're not building this entire model from scratch. If I come in here and tweak one parameter, or time series, I don't have to rebuild the entire model, and, last, because this is the most common marine ecosystem model in the world, chances are that anyone else trained in this model could come in and do the same thing. If you haven't had a chance to look at those papers, they're good examples about what you can get out of Ecopath or Ecosim or Ecospace, and so I'm happy to take questions.

DR. NESSLAGE: Thank you very much, Luke. Are there clarifying questions for Luke about Ecospace? We've got a question from Wilson. Wilson, go ahead, please.

DR. LANEY: Thank you, Madam Chairman. I will just throw this one out there, but, given that striped bass, which is a model component, and certainly at one point was a major feature of the

part of the South Atlantic ecosystem, at least north of the Outer Banks, has pretty much disappeared from the system, due to the distribution shifting north and offshore, would it be possible for us to use the model to take a look at what that means in terms of the available prey biomass that should now be available for other species, given that striped bass has shifted north and offshore, although I suppose that also presumes that maybe at least some of their prey didn't shift in biomass, the point being that I would certainly be interested in using the model to ask those sorts of questions, and it seems, from the presentation, like that is certainly something that we can do.

MR. MCEACHERN: Right. When you're looking at your calibrated Ecosim model, you get like a dashboard of every trophic group, and so you can hone-in on how the predation mortality on that group is changing over time, how the fishing pressure is changing over time, and how is its prey changing over time, and so those type of dashboards are really helpful for that type of question.

DR. NESSLAGE: Great. We'll put that in our back pocket. Any other questions for Luke? I am not seeing anything. No hands raised at the moment. We've gone through at least an initial round of clarifying questions from the SSC, and I think we'll take a moment here to see if there is any public comment, if you could raise your hand if you would like to comment on the material we've seen so far. No hands raised. We've worn them down. Excellent.

Hopefully you all are working off of the latest version of the overview. If you aren't, you will want to take a look at that, and Mike has that on the screen. We have grouped the questions that we have been asked to respond to into three different categories, and the first having to do -- Because there's quite a few of them. The first is having to do with the EwE Ecopath with Ecosim configuration, model configuration, as it stands, and its strengths, its weaknesses, its potential uses, and then you will notice, if you scroll down a little bit, just to orient folks, we're going to handle some of the Ecospace questions that came up, or that we were presented with, and then we'll wrap up with considering establishing a standing workgroup to advise on these issues.

Because there's a lot of questions to go through, I want to try, as best we can, to deal with the Ecopath with Ecosim versus Ecospace questions in order. If you have something you want to say about Ecospace that's fabulous, make a note of it, but I would like to try and organize the discussion in this fashion, and so we have a little bit of time left before five o'clock, when we wrap up for the day, and so I would like to start by taking a crack at some of our initial impressions about the EwE model, especially with that first bullet there, where we're asked to identify and summarize and discuss uncertainties and limitations.

DR. ERRIGO: Genny, if I could just hop in for a brief second, to let you guys know that -- Feel free to lean on and draw from the workgroup and their report. That's what they were there for, and you don't have to reinvent the wheel on this one. If you agree with let's say the uncertainties and limitations, because there were already some in the report, and in the presentation that Yan gave, you can refer to those. If you have anything additional, I would suggest putting it down here. Otherwise, I can put in to refer to workgroup report, and then we can get them in there later.

DR. NESSLAGE: So I guess then, if that's the case, we don't have to start from scratch, and perhaps we should all have it open on our own screens, hopefully. If there's anything in here that Yan provided, as a way of summary, or if there's anything in the report regarding the recommendations that folks disagree with, this would be the time, in particularly with regard to

any of the concerns that they may have raised regarding limitations and uncertainties. I know it's the end of the day, and this is a very technical agenda item, and so we'll see how far we get.

DR. ERRIGO: One thing I can do is, overnight, if we don't get much here, I can pull some of this stuff from the workgroup report and put it in here, and then the SSC can agree or disagree with that and then add, as appropriate, and I will fill in what I can, where I feel it's appropriate.

DR. NESSLAGE: That would be very helpful. I am wondering if we should -- If that's the case, if we could possibly go backwards in tackling some of these questions, even though I put them in this order. We've got some comments. Let's hear from Yan first.

DR. LI: Thank you, Genny, and thank you, Mike, for being willing to pull up those things from the report. I would like to say that what I presented in the presentation covered the major discussion and concerns and limitations, but all the details, and also other discussion and concerns, are included in the full report, and so I am thinking that -- Mike mentioned that he might be able to try to pull some of those limitations from the report to this here, and so I'm thinking that, as he pulls information from the report, he may not be able to cover everything, all the uncertainties and limitations in the report into here, and I don't know if that's possible.

I am thinking that it's kind of redundant, and I like the suggestion that Mike made earlier, by referring, if everyone on the SSC agrees on the uncertainties and limitations that we discussed in the report, then we could just refer to the full report. Here, we put additional uncertainties and limitations that are not included in the report. I feel, that way, it's more efficient.

DR. NESSLAGE: I agree. Thank you. I agree. Anne.

MS. LANGE: I had the same thought, that why be redundant, if we can use the report, unless there are issues, additional ones, as Yan suggested, that have not been raised, and I think the biggest issue that they identified, or one of them, was the standard 20 percent discard for all the species, and that was one of the things that stood out to me, but using what's in the report would be good.

DR. NESSLAGE: In the interest of time then, Mike, if you think you'll have a little bit of time, especially if maybe we end a few minutes early here, to fill those in, and then we can start in the morning, with fresh brains, to make sure that we agree with the points in the working group's report that they worked so hard on, and then we can add anything, as needed. I feel like that's a good plan.

Some of these aren't necessarily addressed in the report, and there are some very specific questions here about this last bullet with regard to specific applications, and I am wondering if now is a good time to launch into some of that or if we should at least get all on the same page about how we feel about the model in general, and then I feel like that would be putting the cart before the horse, and so, while I'm thinking of a way to wisely use the last half-hour, let's hear from Churchill Grimes.

DR. GRIMES: I don't know if I would have any solutions, but I was thinking that -- Not to lean on the people who were on that committee too much, but, in terms of identifying things that they thought maybe weren't dealt with as comprehensively as they might have been, or might need further discussion, we could sort of rely upon the people who were on that working group. I mean,

they seem to be the best qualified to make some of those -- You know, draw some conclusions about that.

DR. NESSLAGE: With regard to the general model review or those specific questions?

DR. GRIMES: Well, actually, maybe both, but the questions that were -- To begin with, before you scroll down to the lower ones, because you were talking about citing the working group report, but are there additional things, or are there some things that they thought maybe weren't covered as comprehensively as they might have been? Anyway, that's just a suggestion.

DR. NESSLAGE: Yes, and, in particular, I'm looking at the report, and I'm not seeing a whole lot about Ecospace, and I'm wondering if maybe, unless Jeff has an alternate suggestion, we could tackle a couple of those questions right now. Jeff, did you want to chime in?

DR. BUCKEL: I guess there's the Ecopath portion of EwE that it seems like that's further along, right, and then, Luke, you can correct me if I'm wrong, but, in terms of the Ecosim, you're at the point where you're fitting to biomass and trying to estimate vulnerability, and so there's not a -- You don't have a vetted Ecosim model that you're comfortable with, and is that correct? It sounded like you were in that part where you're still trying to get the vulnerabilities for functional groups.

MR. MCEACHRON: Yes, that's right.

DR. BUCKEL: I think that should be captured here, right, because this is -- The one bullet is EwE and is it ready for addressing management questions, but we can deal with -- The Ecosim part of it, that might be useful for that, is still in development.

DR. NESSLAGE: Help me out, Jeff. Are you -- I wish these were numbered.

DR. BUCKEL: I was on the --

DR. NESSLAGE: Are you making a specific recommendation?

DR. BUCKEL: I think we could start at the top bullet, and, if folks have some uncertainties or limitations, we can discuss them, and, if they've already been -- If folks that were on the committee say, well, those were already addressed in the report, then we don't need to add them, but so, under that one, uncertainty or limitation, right now, in terms of Ecosim, that is still in development, and we can say what stage it's at, and Ecopath is -- It looks like things are -- With the exception that I had requested to see the vital diagnostics with the biomass versus trophic level and the production and consumption and respiration versus trophic-level analyses, or correlations, to see what those look like, because those are used as a diagnostic tool for Ecopath.

DR. NESSLAGE: Right, and Wilson mentioned the broader truncation-based validation method as well, the Chagaris approach, would be good eventually to see, and is that correct?

DR. BUCKEL: I think that was for the Ecosim, but Lauren or Wilson can correct me.

DR. LANEY: My understanding is that's correct, Madam Chair, and I would defer to Lauren on that point, because she listened to the same presentation that I did last week, I believe, but I think that's an Ecosim validation.

MS. GENTRY: That's right.

DR. NESSLAGE: Great. Under final diagnostics, can we just -- Jeff can flesh this out, but I believe he wanted to see some of the mixed trophic interaction results, specifically. Is that right, Jeff? Help me out here.

DR. BUCKEL: For the diagnostics, those were like the biomass versus trophic level, and there should be a negative relationship there, and a high biomass being in the lower trophic levels, and then another one that Jason Link recommends are the production, consumption, and respiration and regressing those against trophic level, and I don't remember all the details, but it sounds like Lauren has done that. In the presentation, she mentioned -- There was a bullet point that those were examined, and I just would like to see them.

MR. MCEACHRON: You can just say the pre-bal diagnostics.

DR. BUCKEL: Excellent.

DR. NESSLAGE: Thank you.

DR. ERRIGO: What's that called?

MR. MCEACHRON: Pre-bal, like pre-balance.

DR. NESSLAGE: Just so we're specific about what we're asking. Great.

DR. BUCKEL: Luke and Lauren, if there's -- There may be something that folks consider better than those these days, and I am not up on the literature, and please let us know if there's other diagnostics that you examined and would be good for us to see.

DR. NESSLAGE: Modeling team, is there anything that you want to respond to Jeff with?

MS. GENTRY: There is also a best practices paper by Sheila --I forgot her last name, but was it 2016, and that was adhered to and checked against, too.

DR. BUCKEL: Great. Yes, I know the paper you're talking about, and so that's great.

MR. MCEACHRON: Really, it's those two papers. I mean, otherwise, there's just kind of these -- There's another paper by Cam Ainsworth, but, aside from those papers, it's kind of these rules-of-thumb types things that are really not well cited, but everyone doing Ecopath uses them, but we'll see if we can find additional citations for those.

DR. NESSLAGE: Great. Thank you. Under that second sub-bullet, Mike, the Ecosim still needs fine-tuning, but it's close to being ready, I believe, from the working group report, that they did

not thoroughly review -- The working group has not fully reviewed that, and it would be good to reiterate that. Thank you. Yan, go ahead.

DR. LI: There are a lot of things to clarify. First, to Genny's comment, or question, about the report, it does not cover the Ecospace part. Genny, you are right, and so the report, and the review, fully covered Ecopath. For Ecosim, we focused on the data input, the time series validated in other data sources, and we validated the data inputs, and we validated the process to compare extreme values, and we went through the fitting process with the model team. However, because there is no specific question, and Luke can explain more and better.

Without specific questions -- The fitting process, we can focus on certain time series of species of interest, and that depends on the question you ask, and so that's why, because there is no specific question during the review process, and so that's why we could not evaluate how the model fit the data, how the fitting is, but we did run through the fitting process.

DR. NESSLAGE: Okay.

DR. LI: But we cannot evaluate the goodness of fit.

DR. NESSLAGE: Right, and so change that to cannot fairly review until question is identified, or something like that?

DR. LI: Right, and the question from there -- There are many questions. On the Ecospace, we didn't mention -- We didn't cover Ecospace at all, but we did mention Ecospace somewhere, because we believe the improvement will help Ecospace. For example, we have the fleets separated, and that will help Ecospace, but the whole review is not about Ecospace at all. That's why Ecospace is not in the report. That's one thing.

The second thing is -- The second bullet, the Ecosim still needs fine-tuning, but it's close to being ready, I would say -- Luke and Lauren, correct me if I'm wrong, but I think Ecosim development is done, and the fine-tuning, again, needs to be based on the question, and so I would not say that it's not ready or it's close to being ready. I would say it's ready to be updated and improved and adjusted based on the specific question.

MR. MCEACHRON: We are fine-tuning our vulnerability parameters, but, when you have a lot of groups like this, you may get to a point where you have to decide if one group is going to have a better goodness of fit than another group.

DR. LI: Yes, but, again, it depends on the question, and so I would suggest that, instead of saying fine-tuning still needs to be done, I would say fine-tuning will keep ongoing, and it's an ongoing process, to keep ongoing and keep being adjusted, based on the question.

MR. MCEACHRON: Right, and so, for example, if there are five groups that you really want to start asking questions about now, it would be helpful for us to know those groups.

DR. LI: That's right, and so I'm thinking, for the SSC to focus here first to evaluate and confirm the model is ready to go, and the second was we have questions, and are they listed down there, to evaluate those questions, to see, based on what we presented, or what we know about this model,

if we believe we can address those questions. If so, which one goes first, the priority, maybe, and that's just my understanding about the focus of the SSC under this item.

The second sentence, continued here, that we cannot fully review until the question -- What cannot fully review? It's not Ecosim, the fitting process, and it's the goodness of fit, how the performance is, because we already reviewed the model structure and the data sources and handled the extreme values, or reviewed those things, and the process of fitting, but we just cannot review the goodness of fit until you have -- Thank you. Now it's straight up.

The last thing about the validation that Wilson brought up, and, Luke and Lauren, correct me if I'm wrong, but, to me, the validation is a critical step during the model simulation, and, as I mentioned earlier, the model team has done -- The model has done validation, and, in terms of validation, there are different ways to do it, and, like Wilson and Lauren mentioned, they broke up the time series into two parts, and then they used the first part of the fit model, and then they used the second part of compare the predicted model output, and that's way to do it, and, as Luke mentioned, that is the case, the good practice of validation, when we need to do prediction, when we want to do prediction.

Now the way of validation is what the model team has been doing all the way along, which is to compare the model outcomes with empirical values with expert opinions, with our understanding, to see if they are real, and that's another way of validation that has been done. If it's not in the case of prediction -- If the major interest is not predicting the future, then the validation can be done in a different way, maybe, depending on the model team and depending on the research question, again, and so I want to make that clear, and I think that's all. Thank you.

DR. NESSLAGE: Thank you. That's really helpful. Before we go on to more comments, I just want to capture, while we're thinking of it, before I forget, that Wilson had mentioned earlier, and maybe we can put it as a bullet under the how can the model be applied to a fishery management problem of a council, commission, or similar body, but the suggestion that striped bass moving north and -- But that would be for Ecospace, wouldn't it? This is very complicated and confusing.

That question would have been an Ecospace question, and so do we have a place to put that comment, before we forget it? Maybe what additional questions could be answered for the South Atlantic region, and possibly the striped bass shift in distribution, just so we don't lose it, unless people disagree. While Mike is typing, let's hear from Roger, please.

MR. PUGLIESE: I was really going to jump in on the middle on the Ecosim originally, and Yan absolutely pinned down that, because I was a little bit concerned about it looking as if we had not gone as far as we did in the model team and advancement of it, and I think she captured it right on the money, and, also, this issue on Ecospace, that's coming, and there's going to be things far beyond -- The striped bass, you can address, because I think the discussion has to come forward.

The other point I would make is, while we have a list here, it's been put there, but I think you have the opportunity to think of any of the different species that you've been discussing, or know potentially could be addressed, and those could come under the recommendations on what could be potentially advanced to evaluate through Ecosim or other efforts, and, even in there, we have climate change, and some of that really is tied to, again, to Ecospace, and so I think it's a guidance

for the discussion, but, if there's specific areas to address beyond these, or as part of those, I would recommend doing it.

The only other point I was going to make is that the workgroup report really did get into a lot of the detail, and I think Yan was also right on target with indicating that a lot of the discussion on things beyond that may be good, but make sure -- You know, you could almost walk through and verify those and add or subtract or whatever, if you want to, tomorrow or whenever, instead of necessarily compiling it all, when it's already in front of you. That's the only comments that I wanted to make. Thank you.

DR. NESSLAGE: Yes, and we could just say to see the workshop report, and also blah, blah, blah, and so maybe that's what we can do first thing in the morning, and I feel like we're starting to wind down though, and so maybe we'll do that with fresh eyes in the morning, and we'll go through the major bullet points very quickly, or not very quickly, but thoroughly, and maybe throw in climate change there, as a placeholder, Mike, while you're typing. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I wonder whether just a question of this type could be investigated by these models, and we know, in certain cases, that stocks didn't rebuild in the timeframe in which we thought they were going to be rebuilt, and the rebuilding plan, a ten-year rebuilding plan, didn't result in stock rebuilding, and could we ask the models to evaluate, let's say for red porgy, or for any other species that didn't meet its rebuilding goal, why that was with the catch limits that were placed on the stock, why that didn't occur. Are there ecosystem constraints that, apart from the quota itself, that mitigated against obtaining the desired result from a management point of view? I mean, we know it's poor recruitment, but that doesn't tell us anything about the system dynamics that may have precluded good recruitment. That's just a question, Madam Chair. Thank you.

MR. MCEACHRON: I think, any time you have something like that, and you have like a catch time series, where you can show that the catch changed like halfway through the model run, due to some regulation, I think you can look at how key prey items may have changed, and you can look at -- You may not be able to answer every possible alternative, but I think you could look at changes in trophic dynamics, right?

DR. SERCHUK: I mean, the management plans go forward as individual-species-specific plans, and so we say, okay, we look at it, and we need a reduction in fishing mortality to rebuild the stock, and we think we can do it in ten years, and, in ten years, after we have low quotas, the stock is still at a low size, and there should be some system dynamic parameters that might be helpful to explain why we didn't get the intended results from catch reductions, in terms of stock rebuilding.

DR. NESSLAGE: That's a good point. I would just ask that we soften the wording a little, and I don't know that we're going to be able to answer the questions, but how about help address questions, because, like Luke was saying, if the answer is actually let's say something about the fishery, or something that's not in the model, it might not -- That's excellent. Okay.

DR. SERCHUK: Okay. Thank you, Chair.

DR. NESSLAGE: Thank you. Wilson.

DR. LANEY: Madam Chair, thank you. To Fred's point, I think that's an excellent question, and we've had some discussion, in previous meetings, of wondering if there might not be some correlation between the decline in red porgy and the resurgence of red snapper and red lionfish, and so, again, I think that's exactly the kind of thing you can look at with this sort of model.

Let's see. I had -- I think I was just going to agree with Roger's comment with respect to striped bass distribution, and striped bass certainly is a species that, at least from the Atlantic migratory striped bass stock, has pretty much shifted its distribution right out of the South Atlantic, but there are other species that we're all well aware of, such as black sea bass, that has certainly shifted its distribution significantly north as well, and there is a recent 2020 paper that just came out, which I think I distributed to everybody, and so it would be interesting to look at what's going on with the black sea bass within the South Atlantic, given such a pronounced northward shift in that species, and so that's another one that we could specifically look at.

DR. NESSLAGE: Excellent. Thank you. Jeff.

DR. BUCKEL: I am going to move back to the Ecosim, and I guess I'm not quite sure -- I understand how the vulnerabilities would be dependent on the question being asked, but you have your fishery-independent or whatever datasets that indicate some changes in biomass over time, and you're going to fit the Ecosim model to that, to estimate your vulnerabilities, and you get the best fit you can across all of those time series, and then those are your vulnerabilities that you're going to move forward with, no matter what the question is, and maybe that's because I am familiar with the smaller models that don't have as many functional groups, and so maybe that's the issue here, but it seems like it would be -- You wouldn't want to change vulnerabilities just because of the question being asked, and so one of the analysts can respond to that.

I guess I just would like to see what the Ecosim model -- You can pick whatever functional group you would like, but just going with the default vulnerabilities and showing the SSC some -- If you have one functional group, how does the model respond, in terms of when you're changing the fishing mortality rate on it, with the default, and then with it fit as well as it can to all the biomass indices that you have, whatever those vulnerabilities are, and so that would be two different Ecosim models, with default vulnerabilities as well as vulnerabilities estimated based on the time series. I will stop there, but that would be something that I would be interested in seeing.

DR. NESSLAGE: Can you help us with wording here? I think Mike and I are both not sure exactly where and what to say, based on what you just said, Jeff.

DR. BUCKEL: Okay. Well, maybe the analysts can respond to it.

MR. MCEACHRON: I would rephrase that last sentence there. I would say it's really to prioritize your groups that you want to be fit the best. Like there's 140 groups, and assume that we can't assign a vulnerability parameter to every group, right, because our best practices say that you really shouldn't estimate more vulnerability parameters than you have time series. If you have 140 time series, that's the most vulnerability parameters that you should define.

You can, of course, define a vulnerability parameter different from the default, for all possible combinations, but that would be a very over-fit model, and that would be almost 20,000 vulnerability parameters, if you did that, and so it's just trying to follow the best practices of saying,

well, these vulnerabilities that are different than the default are our currency, really, and I have a limited number of them that I can use.

If I had a model where I'm really interested in red snapper, I want to make sure that my red snapper time series fits really, really well. I can be -- If I am less concerned about just some random like benthic trophic group, where the time series isn't that well defined, I'm not going to use all my currency trying to make that fit, and so it's a way to help us prioritize what should get the most vulnerability parameters, the highest currency we can give it. I would just say you can't review the goodness of fit until the vulnerability parameters are defined, or finalized.

DR. NESSLAGE: That's on the question being asked, correct, and so can we keep the first part and say "and"?

MR. MCEACHRON: I would say and the groups, primary groups, of interest, or something like that.

DR. NESSLAGE: Right, but this is a report to the council, and so I'm going to push back a little bit. This is not going to make -- They're going to be like, well, why don't you just define the primary groups of interest, and we're going to turn to them and say, well, we need you to -- There we go. It's depending on the problem that you're trying to address, correct? That will help prioritize which are your primary groups of interest, and, therefore, you will identify which vulnerability parameters you have to be concerned about, correct?

MR. MCEACHRON: Right. I mean, as an aside, there is the sensitivity routine in Ecosim that just tells you which groups are most sensitive to a vulnerability parameter, and that's not necessarily the same as those groups are of the most interest.

DR. BUCKEL: Thanks, Luke. I certainly didn't expect 140 vulnerabilities, but, if you had twenty good time series, or time series for twenty functional groups that you felt were really solid, then you could move forward with fitting to those twenty time series, and then there's the generic Ecosim that's out there now that could be used for some exploration of a variety of different questions, and then, if the analysts decided, well, I would rather fit these ten a lot better than the other ten, then they could do that, but there could be a starting point for a general Ecosim model, like has been done in other systems, where you may only have -- You definitely don't have 140 time series. Usually, you just have a small percentage of the functional groups that you have in the model that you have time series that you are comfortable with.

MR. MCEACHRON: Right. Yes, it's a good point, and, really, this issue is a pretty nuanced issue.

DR. BUCKEL: But I can see there is maybe one camp that says wait until you have the question and fit those five species really well, but there's another side that says let's get a general Ecosim model that folks could ask questions of and then maybe see that, well, I can try to fit this better, or I'm happy with the output the way it is.

MR. MCEACHRON: Right.

DR. NESSLAGE: Yan.

DR. LI: Thank you, Genny, and I would like to chime in. I think Luke hit right on the target about the limitations on including all the vulnerability parameters in the analysis. What I would like to further address is, as Luke mentioned -- Based on my understanding, and, Luke, you can correct me, but the number of vulnerability parameters you can have in the model is limited, and you have to decide -- It's limited by the data availability and the complexity of your model.

You have to decide how many vulnerability parameters you want, and you can estimate, and which of those, among all the possible vulnerabilities, you want to estimate, and can estimate, and that's why, originally, we were saying that it depends on the question, and I like the wording so far, and it's really nice, and that captures everything that I wanted to say.

Also, here, we are talking about the Ecosim model for the South Atlantic region, and it's a huge system, very complicated, and so those concerns -- Like the number of vulnerabilities that the model can handle, and those concerns may not be a problem for smaller systems, but, for what we are talking about, the South Atlantic system, it's a huge system, and so it is a problem, and you have to make choices, and that's why it depends on the questions. We have to prioritize what predator-prey relationships we want to focus on. Thank you. I like the wording so far.

DR. NESSLAGE: Thank you, Yan. Okay. We are at five o'clock, and I know we're starting to - I know I'm starting to lose energy, and I imagine that others are too, and I want to make sure this gets the attention it deserves, especially given all the work that's gone into it and the big questions that are being asked.

I was just scanning the working group report again, and there's a lot of detail in here and very specific recommendations. I am feeling as though we -- I would really like the SSC members to do a little homework tonight, or early tomorrow morning, and look at the consensus statements from the working group, which Yan summarized in her presentation as well, but, if you could, take a close look and see if there is anything in here that's a red flag to you, especially regarding uncertainties and limitations and current state of the model.

I don't think we have time to go through every single statement that they made and still stay on track for the complete meeting, and so I would like to start tomorrow with any questions or concerns that folks have with the working group report, and, if there are none, then we can accept it as an SSC and refer to it in the report, but I feel like our SSC report needs to be kind of the high-level summary statements for the council, and we can refer them to the gory details in the working group report, and so I don't -- I am rethinking the idea to put -- I don't think we should put all of the recommendations in our main report, but, if folks disagree strongly, folks from the SSC disagree strongly with that plan, I would like to hear from you now, because we do have other big questions here that were not addressed by the working group report, and that's going to take a lot of time to discuss tomorrow morning. Roger, is it to that point or something different?

MR. PUGLIESE: It was something different. It was beyond -- Once you finalize that, I will --

DR. NESSLAGE: Okay. Hold off for two seconds, and let's see if the SSC has any concerns with my suggested approach. It involves a little bit more work on your part, but it might save us some time. If you see any red flags, bring them tomorrow morning. Anne.

MS. LANGE: Are you saying that our report will not contain the information that's in the working group report, or do you want us to pull out the highlights under each of the bullets that you've got here? I wasn't sure if you were saying you didn't want to duplicate things or if you do want to.

DR. NESSLAGE: There is a lot of detail in the working group report about this first bullet summarizing uncertainties and limitations, et cetera. If we repeat the entire report in here, I think we'll lose the council, and I could be wrong, and you're thinking that we should include the whole report inside our report?

MS. LANGE: No, and that's what I thought you were saying.

DR. NESSLAGE: No, and I'm saying that, no, I don't want to do that.

MS. LANGE: So we want to just -- Of the things that are in their report, we want to be sure to include the ones that we want to highlight in our report, and is that what you mean? We will refer to the full report of the working group, but then, within our SSC report, we will include ones that we think are most important for highlights.

DR. NESSLAGE: There's a lot of highlights in here.

MS. LANGE: Okay. Never mind then.

DR. NESSLAGE: I'm worried about that as well, but I will welcome suggestions. This could take a whole other day, if we do that. I'm a little worried, because the comprehensive ABC control rule could take a day-and-a-half, in and of itself. Fred Serchuk, I hope you have a solution.

DR. SERCHUK: My solution, Chairman, is to essentially follow your guidance here, with the additional item that I think we should append this review report to our report. We can then take out what we really want to highlight, the few things that we really want to highlight, but I think the review group has done a great job, and I think that, in the future, we need to probably include one or two members of the council in the standing committee, standing workgroup, to make a closer connection with the council itself, and I know they have an ecosystem-based management committee, but I think this is an important report, and I would highly recommend that we append it to our report. Thank you, Chair.

DR. NESSLAGE: That's a great suggestion, and we can then refer to it in the main body. I like that. Scott, do you have another suggestion?

DR. CROSSON: I am glad that Fred brought that up, because it's just sort of our -- I don't know if it's our standard operating procedure, but, when we do sub-committees, and we have a sub-committee report, whether it's a standing committee, like the SEP, or a working group, we should probably be appending those reports to the end of our SSC report and including the highlights, which is what we do with the other stuff, and so I agree with both Anne and Fred, and that's all.

DR. NESSLAGE: Excellent. Wilson, do you concur, or do you have another point?

DR. LANEY: I was just going to concur with Fred's suggestion, Madam Chair. That's what I thought you suggested in the first place, was that we just basically adopt the workgroup's report,

and then I thought you had asked us, if there are any red flags, we should just bring those up in the morning, but I don't think there will be, or at least not from this quarter.

DR. NESSLAGE: Excellent. It's such a well-done, thorough report that I feel like we would waste a lot of time trying to say it better. They have already invested so much time, but, if there is anything that people disagree with, who weren't on the working group, that's what I want to hear first thing in the morning. Chip.

DR. COLLIER: I think you guys are hitting it on the head, the information that we need, and I think it would be really good to state, as you and Fred just both have stated, your feelings on the workgroup report and whether or not it was adequate and other areas where it could have been improved or other issues that you guys have identified.

DR. NESSLAGE: Great. So some of these questions that we've been asked are addressed very thoroughly in the working group report, and, in those situations, when we go through these questions, we can say we have adopted the working group report, and see appendix blah, blah, blah, and the details are in there, and then, for these other questions that haven't been dealt with, we will go through those in the morning, but please do, everyone, review the working group report, and this will be your chance to raise any red flags. I am not seeing any more SSC hands, and so I'm going to assume that folks are okay with that plan, and let's go back to Roger. You had a different point?

MR. PUGLIESE: Just a last thing, in addition to looking at the workgroup report and those actions, I would just touch-back at the presentations, especially when you're going to get into the discussions of if you want to have --

DR. NESSLAGE: You just broke up.

MR. PUGLIESE: Specific recommendations on evaluations, because there are some things that have been -- that may guide directly toward areas you would like to see evaluated.

DR. NESSLAGE: Am I the only one who is hearing Roger break up, or am I breaking up?

MS. LANGE: It's him.

MR. PUGLIESE: Did it not come through?

DR. NESSLAGE: We only got about half of what you said.

MR. PUGLIESE: Very simply, look at the presentations, because I think some of the material that was presented in there will give --

DR. NESSLAGE: We lost him again.

MR. PUGLIESE: There is some species-specific information that is -- I am not sure why it's breaking up. Is it still breaking up now?

DR. NESSLAGE: Yes, and I think -- Let me summarize and see if I got it, that we should look at the presentations, in particular for any species-specific questions, as to whether the models can address some of those questions, particularly that last bullet, I'm assuming you're talking about?

MR. PUGLIESE: Yes.

DR. NESSLAGE: All right. We will do that. Everyone please skim those PowerPoints again as well, when you're brainstorming responses to those bullets, to that last bullet in particular. All right. Sorry to take you past five o'clock. We'll start again at nine o'clock in the morning, and are there any last burning questions or concerns? Is anyone confused about what's going to happen, other than me? I am not seeing any hands raised.

Then let's adjourn for the evening. I would like to thank everyone who presented today, and I would like to thank council staff for their frantic notetaking and monitoring of the webinar, and all of you for your time and your excellent contributions, and so thank you. Get a good night's rest, and we'll be back at nine in the morning. Have a good night, everyone.

(Whereupon, the meeting recessed on October 13, 2020.)

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OCTOBER 14, 2020

WEDNESDAY MORNING SESSION

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The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened via webinar on October 14, 2020 and was called to order by Chairman Genny Nesslage.

DR. NESSLAGE: Welcome, everyone, to day-two of the marathon SSC meeting, fall SSC meeting for 2020. Thank you for your participation yesterday, and I'm looking forward to another good day today. A couple of things, to try and guide our walk through the agenda here. I am going to suggest that we break at noon for lunch and take one hour, instead of an hour-and-a-half, and I will try to make that hard break, so that folks can plan if they have family or other obligations, so, from noon to one, we're going to break for lunch, and, if anyone has any concerns with that, please email me directly.

I am also going to suggest that we take a mid-morning break around 10:30. We'll get through as much of the EwE discussions as we possibly can, but then I think we need to switch to the ABC control rule agenda item. It's quite hefty, and it's going to take up most of the rest of our time. If there is additional time tomorrow morning, we can return to it, but I think we may not get to answering every question that we've been asked, given the time allotted on the agenda.

Keeping that in mind, I have some very specific goals for the next hour-and-a-half. The one thing I would really like us to get through, if at all possible, is to approve the working group report with any modifications that the broader SSC would like to see, and that may take an hour-and-a-half in

and of itself. If we get beyond that, which would be great, I am going to suggest that we prioritize Bullet Number 5, which are the very specific questions about can we use this model, as it stands, to answer questions about red porgy and climate change and red snapper, et cetera.

I think, based on what I've heard from the council discussions, that's top on their minds, and so it will be good to give them feedback, if we can. Part of that question, and this is what goes to Lauren and Luke and Roger, is notice that the last little bullet there says to rank the above questions in order of feasibility to be accomplished in the next year, and I don't know that we can answer that question alone.

I think we need feedback from the analysts, and so, while we're discussing the working group report, if you guys could think a little bit about, if we were to say, yes, it's ready, to any of these suggested 1 through 4 topics, give us a -- If you can, and I know it's hard, but if you can give us a ballpark of, yes, we could definitely do it in the next year, or no way, Jose. I think we need to have some frank discussions about what is actually possible, and I think the council would appreciate that, so they know what to expect. Is that something you guys could give us a little feedback on, Lauren and Roger and Luke?

MR. PUGLIESE: Yes, and I think definitely, and it really gets to one of the quickest things I would like to say, is that I think it also gets to if you specify individual species or groups or whatever that you would be focused on, and I think that will also zero-in on being able to address these, and that's going to be important to be able to advance the reviews, and then, depending on -- I think it's clear that the Ecospace is still under development, and so that's an implication for maybe at least the climate change discussion.

DR. NESSLAGE: Right.

MR. MCEACHRON: I would rank them as 3, 4, 1, and 2, from most likely to least likely.

MS. GENTRY: I will 100 percent agree with that already.

DR. NESSLAGE: Wow. You guys are quick. Okay. Thanks.

MR. PUGLIESE: I think it's pretty straightforward here.

DR. NESSLAGE: All right. Well, we'll just check that off our agenda. You guys are helping us blaze through this. All right, and so we'll keep that in mind as we discuss, and I really appreciate that. Thank you. Okay. Are there any -- From the SSC or council staff, are there any concerns about my suggested approach to tackling this agenda item?

DR. ERRIGO: I have no concerns, myself.

DR. NESSLAGE: Thank you, Mike.

DR. COLLIER: It sounds good.

DR. NESSLAGE: Chip, thank you. I am not seeing any hands raised from the SSC, and so I'm going to assume that that's approval of the approach, and so that takes us to reviewing the working

group report and seeing if there are any -- What we approve, if we approve it whole or in pieces, with modifications, and so, once Mike is done typing there, based on the feedback we got from the modeling team, maybe we can switch over to the report.

I am not going to read it all, and that would be a bit much, but what I would like to do is go through by term of reference and ask for any concerns or suggested modifications that SSC members may have with what the working group has concluded and/or recommended.

We will start with -- If you notice, the terms of reference are organized into Ecopath and then Ecosim, and so the 2.1 is Ecopath, and the 2.2, et cetera, is Ecosim, and so hopefully that helps guide the discussion. The first TOR has to do with the functional groups in the model, are they reasonable, did they characterize the biotic components of the ecosystem to be considered? Are there any questions or concerns with the working group's conclusions? If not, they become the SSC's consensus, just to be clear. Wilson Laney.

DR. LANEY: Thank you, Madam Chairman. Just a question, I guess. My perception is that, with 140 functional groups, this is one of the largest models around, and the question to the rest of the SSC is whether or not there might be any particular groups or species -- Well, the first question is to Lauren and Luke and Roger, and that is whether or not it would even be possible to add any functional groups, and I presume that means, if, for example, we wanted to take a group that is currently a multispecies group and break out one species that might be of particular interest, could we even do that, and that's Question 1.

Then Question 2 is to the SSC, regarding whether or not anybody sees any additional single species that are not presently single species groups that they would like to see broken out, and those are my two questions. Thank you.

DR. NESSLAGE: Thank you. Modeling team, what's your feedback on the first question?

MS. GENTRY: I would say that, yes, it is possible to break out single groups, especially if that group comes with a good data -- You know, if we already have a stock assessment for that group or really good input data for that group. It is an undertaking, but absolutely it can be done, yes, and it has been done a lot of times, but, obviously, then you have to change all of the inputs for the group that it came from and this new group that you created.

MR. PUGLIESE: One aspect is I think, as it stands right now, virtually -- At least most all of the species that have stock assessments are generally a stand-alone group, or, even in some cases, such as king mackerel, they actually have an adult and a juvenile group, and so there's been a lot of conscious effort to identify some of those as this process was building, so that you would get most of the best information of species that have been assessed to date, and so that's one consideration.

However, I would reiterate Lauren's, about, if you do go down the road, and I think maybe it's to the future, and say, if you do create a standing group, more focus on questions for individual species, I think a lot of that can be done with just the analysis and the future development of Ecosim analysis, et cetera, but it's definitely more of an undertaking if you want to see the model redone at this stage.

DR. NESSLAGE: Great. That's very helpful.

DR. LANEY: Thank you, Lauren and Roger, and I don't have any recommendations for any further breakouts at this point in time, and I was just wondering if that was possible and how much work it would entail. Thank you.

DR. NESSLAGE: Great. As people raise their hands, if you have comments on that, please do so, or if you have other comments. Anne, go ahead.

MS. LANGE: I was just going to say that I think that the way the working group captured this is efficient and complete. It indicates that there are constraints by computing capability, but it does indicate that the model can be modified to whichever functional groups need to be addressed, and so I think that section is well done.

DR. NESSLAGE: Thank you. Yan.

DR. LI: Thank you, Genny. Thank you, Anne. Anne just said what I was going to say. In the report, it's written down that the functional groups can be adjusted, and they also can be modified as we have more information and asking more specific questions and we have more understanding of ecosystem structures, and then the model can evolve, and so Anne just said what I was going to say. Thank you.

DR. NESSLAGE: Great. It sounds like there is general agreement that this is well described. Does anyone have any concerns with this TOR, the working group's response to this TOR? Chris.

DR. DUMAS: I just have a brief comment, and that is, when you're talking about disaggregating functional groups, or aggregating, then, if the output from those functional groups feeds into a non-linear function, then you need to be real careful about aggregating or disaggregating, because you can have very different results if then that feeds into a non-linear function just above it or just downstream in the model, and I think the modelers are probably very aware of that, but managers or council members, people who are not modelers, may not be aware that if they aggregate or disaggregate groups, and they feed into a non-linear relationship, they could get very different results, just due to the aggregation or disaggregation and not changing anything else about the model, not changing any of the other parameters, just because of Jensen's inequality, about what happens when you aggregate or disaggregate and feed into a non-linear relationship after that, and that could be an issue with the aggregation or disaggregation. Thanks.

DR. NESSLAGE: That's a great point. I wonder if we could add a caveat, in our notes, that model performance may change if functional group setup is -- Maybe "setup" isn't the right word, but the functional group configuration changes, something along those lines. Yan.

DR. LI: Thank you, Genny, and I agree with Genny and Chris that the model outputs, or performance, will change. It will likely change after the setup of the model, and that's true for many models, especially those models involving non-linear functions. However, to me, I would not say it's a caveat. We will not -- We change the model setup, for example, to disaggregate or aggregate the groups, functional groups, and it's based on our understanding, because our understanding changes. It's not based on our fear of the outcome would be different, and so we change it for the reason that we want to better represent the reality, the true biology, and not because of our fear of having different results or not.

DR. NESSLAGE: No, I don't think that's what I was implying. I was just implying -- I think what Chris is worried about, and I think it gets to the questions that we were posed. The council seems to be interested in the model, in its current configuration, is it ready to be used, and I think we need to note somewhere -- What Chris is suggesting is that we need to note somewhere that the current configuration -- These comments apply to the current configuration. If you change it for the better, for based on our understanding of the system, the answer may change, and so it's just a general -- Maybe "caveat" isn't the right word, but just to help the council understand the modeling process.

DR. LI: Yes, and I agree with that, and I would not say -- When you say the model is ready to use, I would reiterate the sentence to be the model is ready to adjusted, to be updated, to be further modified, based on the questions, and it's not like you can directly grab the model and to apply it to those questions listed below and to directly grab it and address a question. We need -- This is just a base model, a very, very basic base model. Then, from here, then we need to adjust and modify, including changing and adjusting the functional groups to make it be able to apply it -- To make it applicable to address the questions listed below.

DR. NESSLAGE: That's a great point. I am going to ask that we put that one on the back-burner, because I think it -- I'm making a note that we will return to that, because I think that comes up later. Good point, Yan. Fred Serchuk, go ahead.

DR. SERCHUK: Thank you, Madam Chair. I have a naïve question. It's clear to me that the information that has been -- The model inputs have been based on the best available data, but I'm wondering how does one validate these models based on a known outcome, and can the model do that? I mean, we're talking about the uses of the model, but it seems to me that it would be prudent, or best practices, if one could use the model as it's been developed and see whether it can produce a known outcome that we have seen already, and is that possible? Is that validation part of the process, or how does one go about doing that?

DR. NESSLAGE: Fred, that's a great question, and we discussed it a little bit yesterday, but I'm going to table it, and I'm going to try and keep us going through each one of these, just because we're going to get to that, but not in this particular TOR, but I'm making a note of it, so we don't forget. TOR 2.1.1, functional groups only. Wilson.

DR. LANEY: Thank you, Madam Chairman. I was just going to note what you noted, that we discussed that briefly yesterday, and that's exactly what Dave Chagaris and the Gulf of Mexico group did, and so, again, we can discuss it more later.

DR. NESSLAGE: Great. Thank you. does anyone have concerns or suggested modifications to the working group's response to the first TOR regarding functional groups? Sorry to be heavy-handed, but I feel like we have to get through this in a short period of time. Chip.

DR. COLLIER: There are some stocks that are in the South Atlantic region that have, I guess, some stock ID questions, like hogfish with the Georgia/North Carolina stock and the east Florida stock, as well as different stocks of spotted seatrout and potential stocks of white grunt. Were species like that addressed in the functional groups, and how was information like that handled?

MS. GENTRY: All three of those species do have their own group, and I'm not quite sure how the question of different stocks would be addressed though, or whether that would have to be done in Ecospace, perhaps.

DR. COLLIER: Okay.

DR. NESSLAGE: Any other questions or concerns? Okay. I am going to ask that we move then to the second TOR, which has to do with model inputs to the Ecopath model. Are they coming from reliable sources, and so, specifically, we're talking about biomass, production per unit biomass, consumption per unit biomass, diets, and ecotrophic efficiencies, if used, and, if you could scroll down, the working group had several comments and recommendations. SSC, do you have any concerns or caveats or recommendations or questions regarding this TOR? Again, this is the Ecopath model. Anne Lange.

MS. LANGE: As in the first TOR, I think that this has been done very well. They have specific recommendations, and they describe why, what the concerns were within the working group, and so I think this is done well as-is.

DR. NESSLAGE: Excellent. Thank you. I will give folks a little bit of time to think about it here. Jeff.

DR. BUCKEL: I will just add that, in addition to these looking really good, Lauren showed us that she had done a really good job of dealing with the first one of documenting the model inputs and how good they were, the pedigree, as the Ecopath people call it, and so well done.

DR. NESSLAGE: Kudos to the modeling team. Yan.

DR. LI: Thank you, Genny. I just would like to -- Because we have been talking about validating and validation of the model outcomes, I would like to highlight, in the report, that the workgroup did recommend validating the model-estimated biomass, based on single species in the model or in other models for this region, and so this is what the model team has been doing through the whole process, and they keep validating the outcomes, estimated outcomes, compared to empirical values, to make sure they are realistic, and so this is one way of validation, but this may not address Fred Serchuk's and Wilson's question about another way of validation, which is involving predicting, predicting the future, and so this is the validation part, and the model team has been doing validation by comparing the model outcomes with the empirical values, to make sure they are realistic.

DR. NESSLAGE: Excellent point, and so there's really two levels of model validation. There's the kind of gut check as you're going along, and then there's assessing the overall predictive ability of the model. The former has been done, I think is what Yan is telling us, but the latter has not, and I believe, yesterday, we already agreed on a suggestion that they do the more formal validation process, but I think, ultimately, you would need -- Correct me if I'm wrong, but something other than the base model, some more specific model to do that validation, like Dave did, and am I right in my interpretation, Lauren, there, or Yan?

DR. LI: Yes, Genny, and you just well captured what I meant to say.

DR. NESSLAGE: Good. Lauren, do you agree?

MS. GENTRY: Yes, and it's more so that we would need sort of specific guidance on which species to focus on for that final step, and then we can do that, the validating its predictive abilities.

DR. NESSLAGE: Right. Okay. So we can clarify that perhaps -- Mike, can we switch over to our statements from yesterday? Since we're on this, let's just capture it, since it's coming up repeatedly, and we want to make sure that people understand the difference, including the council, and so we had -- The SSC recommends a validation study, and maybe we need to be more specific there and say that the SSC recommends performance evaluation and validation study, as was done, blah, blah, blah, once the model has been developed to answer a specific question, something along those lines, and is that what you think -- Help me with the wording there, Lauren. You said it more nicely than I am.

MS. GENTRY: Maybe fit to a specific set of ecosystem-important species, maybe.

DR. NESSLAGE: Yes, and so once it's been fit, yes, something along those lines. What does the SSC think? Wilson.

DR. LANEY: Thank you. I think what Lauren just suggested is fine, and I did want to clarify, based on Yan's comments about future projections, that my understanding of that Chagaris did was not projections. They were just saying, as Lauren indicated yesterday -- They just truncated their time series by five years, and then they ran the model, to see if it would accurately predict the time series that actually occurred within that five-year period, and so, yes, it is sort of predicting the future, in one sense, but you're predicting the future based on what you know already happened, and I thought that Yan was maybe talking about trying to project beyond whatever the terminal year in the model might be, and so I just wanted to make that clarification.

DR. NESSLAGE: Yes, and so let's -- Just to be clear, the Chagaris approach is more of a retrospective analysis style, with a single peel, essentially, whereas I think let's tackle the projection into the future issue in another section. Thank you for clarifying, Wilson. Fred Serchuk.

DR. SERCHUK: Thank you. I had a similar comment as Wilson, and I would also suggest that we don't put Chagaris in there, because we ought to say what we want without reference to that paper, because people probably won't read that paper, particularly managers or other people, laypeople, and we ought to say exactly what Wilson has said, that we want to validate the model based on known events, and I think projecting by a five-year peel -- I just want to get away from being a little bit arcane, in terms of our wording here. Thank you, Madam Chair.

DR. NESSLAGE: No, that's a good suggestion.

MR. MCEACHRON: You could say based on retrospective data.

DR. NESSLAGE: Yes, and I think the word "retrospective". People are pretty familiar with retrospective analyses. Yan, go ahead.

DR. LI: Okay. Here is what I am thinking. First, to Wilson's point, thank you, Wilson, for bringing that point up. What Wilson just mentioned, yes, there is -- You chunk the data into two

portions, and one portion you fit to the model and the other portion you try to see if what you predicted for that chunk of time can match what you observed, and so, in this process, it's trying to be retrospective, and that's way to reevaluate the model's ability to predict, and so it's -- Right after you evaluate, you confirm that the model can predict well, and then the next step will be you can confidently use the model to predict the actual future, like project from now into the future, and so those two steps are addressing the same question, which is the predictability -- The model has can estimability, and then it has predictability.

One is to estimate the trend. Based on the data, you can dig out the true trend of the data, to estimate the trend, and the other one is to predict -- You chunk the time series to predict, try to verify, the predictability, or you actually project for the future, and it's the predictability part, and so, here, in the wording, what I am thinking is -- Where is it? Okay, and, here, the SSC recommends the performance evaluation and the validation study, and I agree with Wilson and Serchuk to make it specific and not refer to that study, because I don't think the council will read that study, and I have no clue about that study at all, and so, here, I would like to suggest to put the predictability somewhere in this sentence, that the SSC recommends performance evaluation and a validation study, and so I'm thinking validation of the predictability of the model.

The predictability implies either retrospective, like you chunk the tool, and that's one way to verify, the validate, the predictability, because we can use what we know for the artificial future and then to compare the model-predicted future, and that's one way we can validate, and we cannot project the future, then we have no data yet to validate your projections, correct or not, and so I'm thinking that -- That is my suggestion, to put that predictability there. Thank you.

DR. NESSLAGE: Thank you. That's excellent. I appreciate everyone's patience. This is a good point. Okay. Unless there is concerns with this, or additional suggestions, maybe we could go back. Excellent. Are there any other concerns on this second TOR or questions? I am not seeing any raised hands, and so I'm going to suggest that we scroll down to Number 3, 2.1.3, and are there limitations in the fisheries data used to initialize the Ecopath fishery groups, and so this is specific with regard to the fisheries data. The working group raised some concerns over potential over-prioritization and agreed on nineteen fleets, and that represents sufficient catches for inclusion and that this might allow for the use of Ecospace. Any concerns or caveats or additional comments that we want to make? No hands. Okay. I won't belabor it then. Wilson Laney.

DR. LANEY: Sorry, Madam Chair, and so the only thought that occurs to me here is whether or not the working group would think it was appropriate to just note -- It may already be in the report somewhere, and I don't remember, but that they are still -- That the council and the SSC are still looking at additional sources of data, and I'm thinking about our discussion of the FISHstory project yesterday, and I don't know whether we would want to just add a sentence in there that says that that is a potential future modification that could be made, and I don't know, and I will defer to the workgroup and to our model team on that point.

DR. NESSLAGE: Yan, can you address that directly?

DR. LI: I will try. Wilson, your suggestion is specific to the length composition data, based on the photographs that we talked about yesterday, or just in general, like if they turn out, in the future, like more data, more information?

DR. LANEY: Yes, and the photo discussion was what prompted my question, Yan, but, yes, it certainly could be made more generic, and you all may have already addressed that somewhere in the overall recommendations, and I don't remember.

DR. LI: My answer would be yes. Lauren and Luke, you two are very welcome to chime in anytime, but, as we keep saying, throughout the report, the model is a base model, and it's ready to be modified and ready to be updated, and so we've built the backbone here, and many details - It's already in very great detail, but, as Wilson mentioned, if other information becomes available, I think the model has the ability to incorporate them, and it will be refined as more information comes in. Is that right, Lauren and Luke?

MR. MCEACHRON: Yes, and you can change the fleets, just like the groups.

MS. GENTRY: Yes.

MR. MCEACHRON: In fact, in some cases, people add a fleet just to address a specific question, like in the lionfish case study. We'll just add like a generic lionfish fleet, so they can specifically manipulate the fishing mortality just on that group, and so there's a lot of things you can do with the fleets, just like you could do with anything else in the model.

DR. LI: Also, like in the report, when we talk about discards, the workgroup recommends potentially adding a discard fleet to the fishery, which means, yes, the fleets can be changed and modified.

DR. NESSLAGE: It sounds like the model is very modifiable as new data and new questions arise, and it seems like that was pretty well characterized, but, Wilson, do you think we absolutely need to be specific? I feel like saying something specific about a specific data series might be premature at this point.

DR. LANEY: Yes, and I'm fine with our discussion, Madam Chairman. We have documented it for the administrative record, and so I'm good with that.

DR. NESSLAGE: Cool. Great. Fred Serchuk.

DR. SERCHUK: I have a small change in the language of the bullet on the screen regarding the fleets, and I want to be a little bit more positive than what's there, and so, in the bullet under the workgroup raised concerns of overparameterization, I would say the working group agreed to keep nineteen fleets in the model because having fleet separated allows -- I would take out the "would", and then allows for mapping landings with high spatial resolution in Ecospace, and it also allows for specifying discard mortality by gear. I don't think that we need the "would". The fact is that, by having the separate fleets, it allows that capability in the model, and then the second thing I would say is the workgroup agreed that sufficient catches exist for each of the nineteen fleets for inclusion in the model. I know these are small changes, but I think they're helpful, Chair. Thank you.

DR. NESSLAGE: Okay, and so this will become the SSC's recommendation. We can't change the working group report, just to be clear. While Mike is working on that, let's hear from Jeff.

DR. BUCKEL: I just wanted to have a bullet that explicitly captured the earlier discussions, and so, whoever is reading this in the future, particularly the council, will know that those fleets could be modified, and so something like the statement that was similar with the functional groups, and so the fleets can be adjusted to address a specific research or management question, and it could be reduced or increased. I think that would help folks know that it doesn't have to stay with nineteen fleets, and it could be just recreational and commercial, if there was a question just related to comparing those two, for example.

DR. NESSLAGE: I hear you, and so let's see what Mike does here, and so we're going to take out the two "would".

DR. SERCHUK: I would say the working group agreed that sufficient catches exist for each of the nineteen fleets for their inclusion in the model.

DR. NESSLAGE: Thank you. That's what we needed, and then, Jeff, you're suggesting that -- I am just waiting for Mike to catch up here, the poor guy. Then we can modify it and wordsmith it a little bit later, but --

DR. BUCKEL: The number of fishing fleets can also be modified in model improvements and -- Let's see. Can be adjusted to address the specific research or management question, and I think that was borrowing the language from the functional group TOR, and so the number of fleets can be adjusted to address the specific research or management questions.

DR. NESSLAGE: Yes, and that's perfect, I think. I think it's perfect, and let's see what other folks think. Chris.

DR. DUMAS: To that point of adjusting the numbers of fleets, if the adjustments are by aggregating or disaggregating the fleets, a similar type of issue arises with aggregating or disaggregating, and so, if for each fleet, you've got an estimate of effort, say number of trips, and you've got an estimate of catch per unit effort, and you're multiplying those to get catch, then, when you aggregate or disaggregate across locations or across gear types, or similar types of things, aggregate or disaggregate, when you multiply catch times catch per unit effort, you're going to get different numbers.

You're going to get different estimates for catch with the disaggregated fleets compared to the aggregated fleets, even if the underlying data and parameters don't change, because catch -- Because effort times catch per unit effort is multiplicative, and so aggregating or disaggregating is going to give you different outcomes for catch, even though nothing in the underlying data changed, and so that's just something to be aware of, that aggregating and disaggregating can affect your catch outputs. As you think about adjusting the fleets, that can affect your catch outputs, even if the underlying data and the underlying model doesn't change.

That's specifically an issue for MRIP, potentially, if you ask them for estimates of catch for a large region and then ask them for estimates of catch for sub-regions, and you add up the catches across the sub-regions, and they are not likely to match the catch of the combined region, depending on how that aggregation is done, and so just to be aware that just aggregating or disaggregating itself can change those catch estimates, and potentially discard estimates as well. Thanks.

DR. NESSLAGE: That's a great point, and, honestly, I think this is going to come up with each model component, frankly, and I'm wondering if we change the first bullet to say something like model performance and outcomes may change when configurations change, because, whatever question we ask, the configuration is going to change, and then, in parentheses, have "e.g., if functional groups or fleets are aggregated or disaggregated", and just give them some examples of things that might change, but there's numerous things that could change in this model, and then the performance and outcomes will change.

DR. DUMAS: That sounds great. I just think aggregation and disaggregation, for the functional groups or the fleets, is something that might come up often.

DR. NESSLAGE: Yes, and so let's highlight it in the parentheses, and so may change when model configuration changes, and then we'll put, in parentheses, "e.g." and something along those lines. We can wordsmith later, but hopefully that captures the general concern that's going to keep popping up, but also highlights the fleet and functional group aggregation issue.

DR. DUMAS: That looks great. Thanks.

DR. NESSLAGE: Awesome. Thank you. Fred Serchuk.

DR. SERCHUK: Sorry, Madam Chair, but I didn't lower my hand.

DR. NESSLAGE: Okay. Great. Let's see if we can -- Yan, anything to this particular TOR?

DR. LI: Yes, and I would like to suggest adding the current model configuration.

DR. NESSLAGE: To the wording?

DR. LI: Yes, and like model performance and outcomes may change when the current model configuration changes.

DR. NESSLAGE: Good point.

DR. LI: Thank you.

DR. NESSLAGE: Let's be specific. Excellent. Any other comments on this TOR, 2.1.3? This is all good discussion so far. Okay. I'm not seeing any hands raised, and let's move along to discards, TOR -- Fred Serchuk, is this about the last or the next?

DR. SERCHUK: The last one, Chair, and it gets back to the working group agreed to keep nineteen fleets in the model, because having discrete fleets -- In some cases, we may want to have less fleets in the model, depending on aggregation. Rather than "having fleets separated", "having discrete fleets". Then we would take out the word "separated".

DR. NESSLAGE: I see what you're saying. Okay.

DR. SERCHUK: I am just trying to make it a little bit more easy to understand.

DR. NESSLAGE: No, that's good, I think. If anyone disagrees, speak now. Excellent. Okay. There will be an opportunity to wordsmith a little bit too, stuff like that that makes it more clear, and I think we can work on that offline, but they're all welcome, and so 2.1.4 has to do with discards and the fate of discards for the fishery. Has it been well characterized? This spans two pages, and so it's a little hard to read, but there were some concerns raised with how discard mortality was treated in the model. Does anyone have additional concerns or disagree with any of the concerns raised here? Excellent. I am not seeing anything, and this is very specific, and I appreciate the working group's response here.

It looks like there's a little bit more work that needs to be done, and we've given some recommendations, and so I'm not going to belabor it, if folks think it's fine, and we've got a lot to do in the next forty minutes, and so let's move to 2.1.5. What assumptions about the data or model beyond the established EwE assumptions have been made? The working group had a few comments and a few recommendations. Does anyone have any concerns, or additional concerns, concerns with what's written or additional concerns or caveats or comments? Again, the working group was very specific and thorough here. I am not seeing any hands raised, or Chip isn't seeing any hands raised, and so let's keep moving. We have a lot to do.

2.1.6, are the estimates from the Ecopath model, specifically food web characteristics, suitable to inform stock assessment and fisheries management? This is a big question, right, and the council essentially has asked us this as well, but remember we're keeping Ecopath responses separate from Ecosim here, and so this is specifically with regard to the Ecopath model, and we'll deal with the Ecosim in the next section, and so the working group had some comments and felt that the EwE model will serve as a living tool. I love that phrase. In other words, we're going to keep modifying it as we go along and as we address each question, and it would be used to complement stock assessment and fisheries management. It will be updated and improved as new data becomes available, and does anyone have anything to add or disagree with the statements that the working group has made? Yan.

DR. LI: I just would like to emphasize that, here, the model team has been validating the parameter estimates from the model by comparing to the empirical values, as we showed here, and they are considered biologically feasible, based on diagnostic tests and published literature, and I would just like to emphasize that.

Another thing that I would like to highlight here is this model, this work, is different from others, because, when you ask if the estimates are suitable, here, the whole work they provide is not any specific estimates, but the product from this project is a base model. As we mentioned here, it's a living tool, and it's a base model, and so it's not -- We don't focus on specific estimates at this moment.

DR. NESSLAGE: Right. I wonder -- I think this is really well worded, and is it possible that we can copy this out and put this at -- I think we need to be specific here, and this says the EwE model, and this TOR has to do with the Ecopath model, and so I think we need, possibly, to modify it accordingly, and so, Mike, can you -- I am going to suggest that we copy this and wordsmith it just a tad, and I want to add Yan's word of the base model, the base Ecopath model. While he's doing that, Jeff, what do you think?

DR. BUCKEL: It sounds like you're going to change EwE to Ecopath, and that was one small minor comment that I had for that.

DR. NESSLAGE: Yes.

DR. BUCKEL: To modify that, and then the other one is there are outputs that you can get from Ecopath, and so metrics about the ecosystem and cycling indices and various network attributes, ecosystem network attributes, that are outputs that we didn't see, and I don't know if -- They're not always related to fisheries management, but they are interesting to compare to other systems, and then the mixed trophic impact that I mentioned yesterday is something that can be an output from Ecopath by itself, and so that's something we didn't -- Lauren said that the computer power, I think, wasn't there to take a look at that one, and so I don't know if that needs to be included or if a future evaluation of the Ecopath or a future output or a future examination of output would include those things, so we could -- If folks were interested in those network metrics or the mixed trophic impact analyses that are output from Ecopath.

DR. NESSLAGE: Would it help if we moved the statement from yesterday up, given that it applies specifically to -- We can adjust the wording of this report, but does the bullet below that says Ecopath is well developed and would like to see final -- Does that capture your -- I feel like both of those bullets may be -- Sorry. The top one is about Ecopath, and should that go under this modified TOR? Would that address your concern, Jeff, or are you suggesting something additional?

DR. BUCKEL: Where are you?

DR. NESSLAGE: If we took this Ecopath is well developed comment and put it up under -- Mike has got it. If we put it up under TOR 2.1.6.

DR. BUCKEL: Yes, that sounds good. Great.

DR. NESSLAGE: Do we need to add anything, based on what you just said? I didn't catch it all.

DR. BUCKEL: The mixed trophic input is an output that you can examine, and it's not a pre-bal diagnostic, and so that could be taken out of that parenthetical statement. Mike, if you could take out "mixed trophic impact" of that. We would like to see final pre-bal diagnostics and other Ecopath outputs, e.g., network metrics and mixed trophic impacts.

DR. NESSLAGE: Thank you. That's what we needed.

DR. BUCKEL: Others may have other Ecopath outputs that they know of that they would like to add, or they may feel that some of those network indices -- Ulanowicz's long list of network metrics may not be of interest to the council, but I would -- The mixed trophic impacts are interesting to me, because you can see how important -- That's where you might modify a predator or prey biomass and see how it impacts the other functional groups.

DR. NESSLAGE: Yes, and that sounds very important, given what the council seems to be interested in exploring. Thank you, Jeff. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. Can we go back to 2.1.6 just for a second? My feeling is that the answer to 2.1.6 is yes, but we really haven't said yes, and we've been a little bit saying that the results are biologically feasible, and could we not say yes?

DR. NESSLAGE: Well, let's go back to what we have and see if we can --

DR. SERCHUK: I mean, I'm trying to be very positive here.

DR. NESSLAGE: Right, right. So can we add, to the first bullet there, something along the lines of the base Ecopath model is well -- We have Ecopath is well developed, and maybe we can borrow that, steal that, phrase.

DR. ERRIGO: I was looking to see how it's worded in the TOR. Is suitable to inform --

DR. SERCHUK: I want the word "yes" in there someplace, that, yes, we believe the estimates -- Yes, because the estimates from the model are considered biologically feasible, and I want to answer the question.

DR. NESSLAGE: Right, but the thing is we don't know what the management and assessment issues are, and you can't just take the base model and --

DR. SERCHUK: The question is, yes, the Ecopath model is suitable to inform stock assessments and fisheries management.

DR. NESSLAGE: Is it? Does everyone agree with that?

DR. SERCHUK: It's because the biomass production rates are considered biologically feasible. I mean, if the question is not yes, then why are we doing it?

MR. MCEACHRON: I would think the mortality estimates in Ecopath would be of interest to stock assessment, in addition to things like the mixed trophic impacts.

DR. NESSLAGE: Okay. I hear what you're saying, Fred, but I want to hear from some other folks too, and so hold off on wording. Yan, let's talk about -- Is this to a different point or this point?

DR. LI: This point.

DR. NESSLAGE: Okay. Good. Go for it.

DR. LI: Thank you, Genny. There's a lot of things going on, and, Mike, do you mind going back to that TOR for a second? Thank you, Mike. First, to the point that, for this TOR item, it's very difficult to address. The workgroup thought, because the whole review is for a base model, and without asking a specific question or questions, we don't -- The review did not focus on specific estimates from the model.

As Jeff said, yes, there are estimates from even just the Ecopath component of the model, and there are, and the model team has been validating those estimates, and they have done a great job, and

so this -- We couldn't, in this TOR, as Fred Serchuk pointed out -- If this TOR is asking are these estimates biologically feasible, as a whole workgroup, we can comfortably say that, yes, they are biologically feasible, but, as also Genny pointed out, the question is asking are those estimates suitable to inform stock assessments and fishery management, and then, because we don't have the question, we cannot answer this question here, and we cannot just say yes or no, and we don't know without a specific question.

That's why the report here, in the report here, we put down those languages to highlight that, biologically, it's good. It can inform or not, depending on the question, and that's why we emphasized, in the bullet point, that it is a tool. It's not evaluating specific estimates. It's not like a stock assessment that is estimating the biomass or catch estimates are reasonable or not, and it's not like that. It's a tool, and we are evaluating a tool.

This tool is ready to be modified, again, based on questions to ask, and so that's why we put down this language here without saying directly address yes or no, and, also, when you go down the report, the TOR, to the last TOR item for Ecosim, we expanded the language to explain how this tool can help stock assessments, can inform stock assessments and fisheries management, in that section.

Here, also, I would like to clarify that, in the bullet here, we say EwE instead of saying Ecopath because it's a package. It's a model system together, the Ecopath or Ecosim. When you use it, you apply the package. Lauren and Luke can correct me, and maybe you can take one component, but we are looking at the whole package together to be applied to the fisheries management, and that's why here we say the EwE, the model, the whole package, is a living tool, including Ecopath and Ecosim, and later Ecospace. That's why we put EwE model instead of saying the Ecopath component will serve as a living tool. I tried my best to clarify.

DR. NESSLAGE: I hear you.

DR. LI: I would suggest that maybe we can put some language in the SSC report saying it's difficult to directly address this TOR item, because we didn't focus on estimates, and we focused on it as a tool, the base model as a tool, as a whole package model system, and its suitability to inform stock assessments and fishery management will depend on the question to ask, and, at this stage, at this moment, we didn't evaluate it. We could not evaluate it without those questions there.

DR. NESSLAGE: That makes perfect sense. Can we go back to our wording? I think I really like how Yan identified the difference between the tool and the estimates, and so I think what I heard her saying, and what I think I heard Fred saying, was that, in particular, where we have that Ecopath is well developed, and as a tool it is ready to be modified to address specific management questions, assessment and management questions, something along those lines, and so we could be more specific that, yes, Ecopath is ready.

I am going to push back, though, a little bit on Yan's suggestion that it's -- I want to separate out Ecopath and Ecosim though, for the moment, and maybe we can come back and make an overarching tool statement later, just based on some feedback that I've gotten, and so let's get through the second set of TORs, and we can wrap around to whether we feel comfortable saying the whole package is ready. Fred, does this get at your --

DR. SERCHUK: It does, and could we add to be modified to address specific assessment and management questions.

DR. NESSLAGE: Yes. I like that. Lauren has been waiting a long time. Sorry, Lauren. Go ahead.

MS. GENTRY: I just wanted to add that, yes, there are specific questions that can be answered just in Ecopath, and, as far as outputs, or I guess you wouldn't really call it an estimate, but you all have seen that diet overlap, the matrix in the last slide of my presentation yesterday, and that is an Ecopath-only estimate, and so that is one of the things that we already have output for, and we can already look at those diet overlaps, and, yes, those have been tested to make sure that they are biologically relevant, meaning that, for the extreme estimates, very low or very high, I went in and looked at the diets, sort of one-by-one, to make sure that that overlap made sense.

DR. NESSLAGE: Okay, and so we do still have the issue of estimates, because that's what the question actually asks, which was what Fred raised, the question he was raising, and can we possibly have another bullet that says some Ecopath estimates are ready to --

MS. LANGE: I have a contrary position on this.

DR. NESSLAGE: Okay. Go for it.

MS. LANGE: Just before you modify everything. Mike, can you go back to the terms of reference, as written? It says the estimates from the Ecopath model -- The food web characteristics, I believe they are suitable to inform stock assessment and fisheries management. It's not saying do those numbers go right into the assessment, and they're informing management, and so, by looking at the food web characteristics that Ecopath has come back with that shows the diets, that shows the interactions between the different species, the predator and the prey, that informs management in and of itself.

Whether or not you have a number that you can plug into the assessment from that, it's not asking does it answer assessment questions. It informs the assessment, and it informs management on what those interactions are, and I think that it does, in and of itself, as Ecopath, and not EwE, but just Ecopath, with the food web, which I think is what the question is. Sorry.

DR. NESSLAGE: No, that's great. Thank you. Can you copy the question itself, Mike, and let's paste it over by where we have our -- Because we have to keep switching, and we don't have two screens, and let's see how that fits with what we're starting to say, and, if folks are comfortable with that -- While you're doing that, let's hear from Alexei, unless you're going to a different topic, Alexei. Is it to this topic?

DR. SHAROV: It's on this topic. I am keeping quiet for this whole discussion, because I was a member of the working group, and so it's an opportunity for others to comment, but Anne said exactly what I wanted to say. It is ready to inform the management and stock assessments. That does not mean that the estimates that come out of it are true and absolute measures and should be, or must be, immediately included in the assessment, and it's a different model, and it's a different way of looking at the dynamics of a number of populations, and so this will be, or should be, taken

into context in the analysis that the assessment folks will do and by the management council. It will do exactly that. It will inform analysts and managers, given all the assumptions and limitations that will be considered and used in different formats, and so the question is not, as I understand it, about using specific outputs immediately, but rather it's what is the general sort of answer, in terms of trends and interactions, et cetera, et cetera.

DR. NESSLAGE: Would a compromise be -- I am thinking, if we take the wording of estimates from the Ecopath model, the food web characteristics, are suitable to inform, but not replace, stock assessment and fisheries management, and we'll put "but not replace" in parentheses. I think what I heard folks saying was some of these numbers are ready to go, but with the idea that they will inform stock assessment and management, but not replace our current stock assessments, and they would be used to guide other decisions, and is that kind of getting -- Would that help? Does that get at what you're talking about, Alexei and Anne?

MS. LANGE: I think so.

DR. SHAROV: Yes, but I don't think anybody is asking that they should replace the assessment estimates, and I don't think anybody does that far.

DR. NESSLAGE: Well, I think we need to be specific though. That's my personal opinion, but, if everyone else disagrees -- I let things get away. Alexei, why don't you respond, and then we'll go to Anne and Fred, just to make sure this is capturing your comments. Alexei.

DR. SHAROV: For example, if you are doing a stock assessment, and you are considering four different models to estimate natural mortality, each of them informs you, and then you make a decision based on all the information that you have. Ecopath will provide you with the same informed background about the expected trends and interactions, which will probably complement the stock assessment, and so it provides us with an alternative perspective, because it accounts for the ecosystem interactions, and it depends on the question you are asking. I see this as complementary, and you're right, and so it's a complementary tool and not to replace the assessment. I only just said that we were not asked whether this should replace the stock assessment, per se, but I see where you're going.

DR. NESSLAGE: If folks aren't comfortable with the phrase "but not replace", put, in parentheses, "i.e., complement", which implies that it's not replacing, right?

DR. SERCHUK: I would say "and complement".

DR. NESSLAGE: To inform and complement? Yes, that would work. Yan, you've been waiting a while. What do you think?

DR. LI: Thank you, Genny. I like the way of the wording right now, to inform and complement, and I do agree with you that the ecosystem base model, the EwE, will not replace. It's not meant to replace the stock assessment, because, like Alexei just said, it gives that information from a different view, and so "complement" is a good word to use here. Also, I am thinking like the estimates from the Ecopath model -- Here, when you say the Ecopath model, which Ecopath model? It's the base model, the Ecopath model that we have right now, or are you talking about the Ecopath model in the future, after the --

DR. NESSLAGE: The base. Let's add the word "base", to be clear. Is that what you're getting at?

DR. LI: Like updated according to specific questions. Those two are different. The base model right now, we did not evaluate if they are suitable to inform stock assessment, and we did not evaluate that in the review, and we just evaluated the structure and the assumptions and the potential of EWE, because, without asking a specific question, we cannot evaluate if it can do a good job to address questions, because we don't have a question.

DR. NESSLAGE: Yes, and can we modify the second bullet then to say that the model will be updated and improved and reviewed as new data become available, because that's really -- As new data become available and the model is modified, something along those lines, because the idea being that we can get a lot out of the current base Ecopath model.

MS. LANGE: Sorry to keep interrupting, but ASPIC is a model that is used for stock assessments. We don't say that it's not good for stock assessments unless you tell me which species we're going to be working on. We say that it's an approved model for stock assessments, and all of the other models that are used. This is a tool, and it is a model that has been looked at for a specific set in our area, a set of species, and it's a tool.

Of course it's going to be updated, and it's also going to be modified to address a particular species, but, as a general model, I think it's been demonstrated that it is useful, and to keep putting caveats on it about, well, you're going to have to update it, we have to update your BAM model every year, and you have to change it if you're looking at red snapper instead of bluefish.

All of those things are standard expectations, and I don't see that we have to keep putting caveats on this is a modeling tool, where it's a tool to inform assessments or management. Of course you're going to have to change it, depending on the specifics, but, as a tool, in and of itself, I think it serves its purpose, and sorry again for interrupting, but I am afraid that you're to keep making modifications that may not be needed.

DR. NESSLAGE: The specific TOR though is about the estimates from the Ecopath model, and, if they were asking about its use as a tool, they should have phrased it that way, and so I feel, given that I'm going to be the one trying to explain this to the council, that we need to be clear on the difference between the current output from the Ecopath model being ready to be used in any fashion versus it being a tool, as you said, that's ready to be modified, as needed, to address specific questions, and so I'm going to push back a little bit on that, because the council needs to understand the difference between the estimates being ready now and the tool being ready to be used. Anne, does that -- You can disagree with me, but I feel like this is a pretty important point for them.

MS. LANGE: I am not sure that they were looking at taking these exact estimates to be used immediately. They are looking at whether or not the model is appropriate, and so I am not -- Whatever you want to do, but I'm just expressing my interpretation, and so sorry.

DR. NESSLAGE: Is there someone on staff who can elaborate on where this question came from, because maybe that will help us. Do they really mean the estimates or the tool, or are we prognosticating? Is anyone from the council -- Who is onboard here?

DR. COLLIER: Genny, I also see that John has his hand up as well, but this discussion is great, the discussion on whether or not it's the tool or the estimates, and I think your discussion will inform the council considerably. What we're looking for is trying to figure out what this model can do and how it can be used. It's been in development for quite some time, as you saw in the original presentation, and what we're trying to see is where we can go from 2020 on.

DR. NESSLAGE: Right, and so we're talking about soon. They want to know if this is ready to go. John, do you have a follow-up to that?

MR. CARMICHAEL: I do. Just to reiterate Chip, I do appreciate the discussion that you guys are having. I think it's been excellent, and I think the point that Anne made is good, as well as the points that Yan has made. What we are hoping to accomplish from this is really drawing that line between where this model is and where it can go and to know do we, at this point, have a tool, like a stock assessment package, and that you guys think has the potential that it then could be applied to a very specific set of circumstances to generate an answer to a question, which is, as Anne kind of said, akin to taking a stock assessment package and applying it to a specific stock assessment.

The critical thing now, here, is to know where is that line and what we have. Do we have a tool that then will take a project of some sort of to answer questions? Then great. So it sounds like, based on the discussion, I think the questions are directing you guys to the kind of debate that we need, and it's been really helpful, I feel like, in terms of really getting down to brass tacks on what this model is about.

DR. NESSLAGE: Thank you. Roger, is this to the point of trying to understand what this TOR is about?

MR. PUGLIESE: Yes, and I really just was going to say that I think one of the foundations here is that it is specific to the characteristics of the food web, and this is what the TOR was trying to address, is that is this a good representation of the food web, and, as has been stated before, once you get into the -- There are aspects of the Ecopath model that immediately can be used or looked at or provided that can begin to give you some information about conditions or situations, and then, as you move into specific questions, you fine-tune the components under the Ecosim to address those, and then you actually can move into theories, but this, I think, goes back to the characteristic of the food web and the representation that this advanced model development has resulted in.

DR. NESSLAGE: Okay. I am looking at the time, and we haven't even gotten to Ecosim yet. I will take Fred and Yan, who have been waiting for a while, and then we'll go to Marcel, and then we need to wrap this up. Fred.

DR. SERCHUK: Thank you, Madam Chair. I think we can reduce the number of sub-bullets here by at least one. I think what we can do, under the first one, is say that the model will be updated and improved as new data become available and the model is modified, and that can go up as a second sentence under Number 1, and we can remove the second sub-bullet there, because I think we have already said it, and then I think we have a little bit of dissonance here, because we said that Ecopath is well developed. Either we should say that in the second bullet, that Ecopath is well developed, but the model will be updated and improved as new data become available, and then

do away with the lead sentence in the third one. I think we can condense some things, and I think there's too many sub-bullets here.

DR. NESSLAGE: Okay. I agree, but we are running so short on time that I don't want to wordsmith. Is there anything in here that folks disagree with? While we're thinking about that, Yan, go ahead.

DR. LI: Thank you, Genny. Okay. Then go back to the tool, or the estimates, and so, here, it's estimates from the base model are suitable. I don't want to give the council the wrong impression that you can grab the estimates and just use it. Again, here, we evaluated the tool and not the estimates, but some estimates, like Roger and Lauren mentioned earlier, in like the food web, that matrix, maybe they are ready to go, and they can just grab it and use it at this moment, and so what I suggest is, if we want to say estimates from this model are suitable, can we make it specifically what estimates, and, for example, the food web, the matrix, the diet matrix, from this is suitable to go.

We don't want to modify it too much, and we're not asking questions, specific questions, but some estimates, for example -- I know like the trophic efficiency and the like biomass estimates or something -- For those estimates, it will be adjusted, and so those estimates we cannot just grab and go, but, for the diet matrix, maybe yes, and Lauren and Luke can correct me, and so I would suggest making it specific. If we want to say something is suitable to inform here, in the first bullet, then I would like to suggest that we make it specific what estimates are ready to go.

DR. NESSLAGE: So we would take "food web characteristics" out of parentheses and put at the very beginning of the sentence?

DR. LI: Yes.

DR. NESSLAGE: Then add anything else that --

DR. LI: Yes. Then add anything else that is ready to go.

DR. NESSLAGE: Like diet overlaps. Did you guys -- Did the working group approve anything else besides -- This specific TOR should be -- It says, "food web characteristics", and so perhaps we should just, as Fred suggested, answer the question that was asked. Does anyone disagree with that statement?

DR. LI: Sorry, Genny, for the interruption, but can we say -- I just don't like the word "estimates".

DR. NESSLAGE: But that's what they asked for.

DR. LI: I know. It's should be TOR to address -- Can we say estimates, such as including food web, and it's not like the food web characteristics has some estimates. It's the food web is the output, and it is the so-called estimates. Thank you.

DR. NESSLAGE: Sure. Marcel, I know your hand was up there for a while, and I apologize. I'm trying to wrangle the group here. Do you have something you need to add or would like to say?

DR. REICHERT: I just texted Chip, and Chip and John made my points. I think the working group really extensively discussed this point, and I think there is text in our report to address this, and I also think it's important to realize when the terms of reference were drawn and what we knew about the model at that time, and I think, at the time, we thought that we could get some very specific estimates from the Ecopath model, but that has evolved, and so I think that's all I wanted to say, and I don't want to belabor this point anymore, but I think there's a lot of stuff in the report that addresses this. Thanks.

DR. NESSLAGE: Thank you. Okay. It is 10:30, and I would like to take, if we could, a ten-minute break. During that break, Chip, could you give me a call? I just want to pow-wow a little bit on the agenda, and let's meet back at 10:40, please.

(Whereupon, a recess was taken.)

DR. NESSLAGE: It looks like we've got the group, or at least most of the group, and, after chatting a little bit with Chip, I think we've got momentum on the working group report for EwE, and let's continue through until lunchtime and see if we can tackle the rest of the this report, and we won't get to answering all the questions we've been asked, but it would be good if we could keep this momentum going and inform the council on these concerns.

The ABC control rule is a big agenda item as well, but we'll have a lot of opportunity at future meetings to go back and forth on this issue, and so let's try to -- Given all the work that's been put into this working group report, let's try to address it and come up with our -- Let's continue as we were, and so let's see. We were wrapping up the Ecopath TORs, and sorry if I was cutting people short, just because I'm looking at the time and realizing that we have a lot to do, and so, with the knowledge that we'll have the opportunity to wordsmith this as we edit the report and see people's notes, is there anything in this section so far that anyone has major heartburn over? Eric, please.

DR. JOHNSON: I just forgot to take my hand down. I have no heartburn. I like it.

DR. NESSLAGE: All right. Seeing no cries of protest, let's plow through the Ecosim TORs. Now we're at 2.2. Remember this is the second component of the EwE package, and so there are very specific questions here. Are there limitations in the fishery-dependent and independent data used in the Ecosim model, and then there are sub-bullets, and so let's tackle the first one.

Are the time series of catches for fishery groups reliable? The working group evaluated this and agreed. Does anyone have any concerns or caveats? Excellent. No hands raised, and so let's move on to b.

If other forcing time series have been used, such as mortalities and hatchery production, are they reliable? They talked about adding an index of chlorophyll as a forcing function, and the modeling team is exploring how those adjustments would affect the model fits, but, at the moment, it sounds like there isn't, and hopefully that's a correct interpretation. Does anyone have anything to add or to change to this section? No hands. The next two sections were moot, and they were about abundance indices, and they aren't being used, and the TOR is irrelevant. If anyone has comments -- Jeff, please, go ahead.

DR. BUCKEL: I am not sure that I understand the -- Relative abundance indices have definitely been used as a calibration tool in Ecosim, and so there's a way -- If you have biomass, absolute biomass, trends, that's the ideal, and so we have those from some stock assessments, but, if you have relative abundance indices, say from SEAMAP or the trap program, those can be used, and there's just a scalar that links up that relative abundance to the absolute abundance in Ecopath, and so then you're able to convert that time series of relative abundance to absolute abundance, and so relative abundance indices have been used to calibrate Ecosim models.

DR. NESSLAGE: But not this one, correct?

DR. BUCKEL: They could be. I was reading this as abundance indices are not an input in Ecosim.

DR. NESSLAGE: Because the question was have them been used, and I thought this was with regard to this particular Ecosim model, I think is what they were asking about, but you're saying the response needs to be nuanced, to indicate that they haven't been used at present, but they could be used in the future, and is that what you're saying?

DR. BUCKEL: Correct.

DR. NESSLAGE: All right. Can we make a note to that, unless Yan or --

MS. GENTRY: There is relative biomass, a number of relative biomass, time series from SEAMAP in the model for time series right now.

DR. NESSLAGE: Were those reviewed by the working group?

MS. GENTRY: Not specifically. I believe they were provided by Marcel, but I don't think we went into the individuals of them. They've been in the model for a couple of iterations now.

DR. NESSLAGE: Okay, and so maybe we do need to modify the wording here for the consensus report, for 2.2.1, c and d. Maybe Yan can help us out here. Go ahead.

DR. LI: I will try, Genny. Lauren, I want to make it clear, and so, by the time we finished up the report, the review, were there any abundance indices used in the model? This is a question for Lauren.

MS. GENTRY: I could be misunderstanding what you mean by abundance indices, and I am referring to the time series we had. Landings, absolute biomass, and relative biomass were the different input time series, but I'm not sure if that's what we're asking about right here or not.

DR. LI: The abundance indices refers to the relative biomass trend, right?

DR. NESSLAGE: They are specifically -- I am not sure where this question came from, but it says "indices" and not relative -- It's specific to indices and not biomass estimates derived from indices, and does anyone who was involved in generating these TORs know the back-story on this, just to help us out? Do they really mean indices, or do they mean -- Go ahead.

DR. LI: First, I would like to know that, at the time of this review, the completed -- Were there any abundance indices used in the model? That's my first question, because, since the report has been completed until now, and that's like one month, and so the modeling team may have updated since then, and the second is, as Lauren asked, abundance indices on -- Does any other workgroup members recall what we discussed about abundance indices?

DR. NESSLAGE: Let's get the response from Lauren about straight-up abundance indices in the model first.

MS. GENTRY: Give me just one moment. I am looking -- I think I might be slightly misunderstanding, or need some clarification, on what you mean by abundance indices, but I can tell you that the relative biomass time series were put in in weight per unit effort, and so I don't know if that's what we're going at here, and I'm getting a little lost, I think.

DR. NESSLAGE: Me too. Again, if there's anyone who knows the background on these questions, it would be really helpful, so that we're not spinning our wheels.

MR. PUGLIESE: Genny, first of all, the question, I think, is really tied to -- A number of these are tied to similar questions that have been used in assessment reviews, and so I think there's carryover still on some of these, and this is one that I know has been traditionally used in a number of things.

With regard to the specific area that Lauren identified with SEAMAP, because that's something from the first iteration of that model that this was used, but it's not indices, and it's information from the SEAMAP trawl surveys and lower trophic species and building some of the estimates of biomass by area, et cetera, into the system, and so it's not a traditional fishery-independent index. It was just basically using the information from those trawl surveys for especially, as I mentioned, lower trophic species or ones further down in the food web, to have something, where there was literally no other information at that time, and it has been brought forward and updated over time, but it's not a traditional what I would consider an index.

DR. NESSLAGE: Yes, at it's used in a traditional stock assessment model, which it looks like that's how the working group interpreted it, and so, if that is the correct interpretation, then, Jeff, do you think this is the correct response, as opposed to -- It sounds like they have reviewed the relative biomass estimates that are used, as opposed to using survey data or fishery-dependent data as indices in the traditional fashion.

DR. BUCKEL: Yes, and so I understood that there could have been some surveys used to get biomass estimates to put in the Ecopath, and, Lauren, you mentioned that there were some time series of relative biomass, and so what programs did those come from, and what species? Do you remember? That might help us here.

MS. GENTRY: I believe those came from SEAMAP, and I don't know, off the top of my head, anything more detailed than that, but the specific species -- There is maybe ten or so of them, and it's everything from mullet and Spanish mackerel and some demersal coastal invertivores and southern flounder, a couple of flounders, Gulf flounder, groups like that, like shad and shrimp and seatrout. I think there's about twenty-ish in here.

DR. BUCKEL: It's a fishery-independent trawl survey, and then those are being -- Those catches are then converted to biomass, somehow, and so probably a catchability, and so there would be some methods on converting that fishery-independent data into the biomass, the biomass per meter squared, that you have as an annual estimate of that time series, and so I think that's -- If that is captured somewhere, that methodology on how that's done, then that's great, and it's just a -- It is a fishery-independent program, right, that can either produce an index of catch per unit effort, or you can convert that catch to biomass, with some estimate of catchability, and so I guess it's a little bit splitting hairs of how we want to interpret this.

If it's a fishery-independent index, the abundance index, we could say that they weren't used directly in the current -- As they would be modeled, but there were catch data for fishery-independent surveys that were converted to biomass, and that wasn't reviewed, or it was reviewed, by the working group.

DR. NESSLAGE: Okay, and so let's switch over. Thanks, Mike. Just to -- I hear what you're saying, Jeff, that we need to be clear that fishery-independent data were used to generate relative biomass estimates, but they were not used in the traditional stock assessment fashion for tuning the model.

DR. BUCKEL: That was much better said than the way I said it. Thanks, Genny.

DR. NESSLAGE: Two heads are better than one here. Fishery-independent data were used to generate relative biomass time series, but were not used in a traditional stock assessment fashion as tuning indices. Hopefully that's correct. While Mike is typing, Fred Serchuk.

DR. SERCHUK: Thank you, Chair. There are a couple of words that I think are leading us astray, at least in my mind, and the word is "generate". I think fishery-independent data were input, were used as inputs, to generate biomass time series, and Ecosim doesn't generate any fishery-independent or fishery-dependent indices, as I understand it, and so, if we go back to the -- What methods have been used to generate fishery-independent and fishery -- I think it's talking about the model generating indices, rather than the input data, and we talk about the input data up in 2.2.1, and so, if we're talking about the Ecosim, as I understand it, no abundance indices are generated by Ecosim itself. Is that correct?

DR. NESSLAGE: I am just looking at Luke's slides, and he has got what looks to be data and fits to the data for relative biomass, and I assume that's coming from Ecosim. Luke, can you address that question?

MR. MCEACHRON: Right, and it's just producing predictors of relative biomass.

DR. NESSLAGE: So does this question then have to do with the model's ability to generate relative biomass indices, or is this is a data input?

DR. SERCHUK: That's my question, quite frankly. Either it belongs in 2.2.1, in terms of the data used, input into the Ecosim, or does it refer to information that is generated by the ecosystem model itself, which I don't believe, and maybe I could be corrected, but it doesn't generate abundance indices, or does it? Thank you.

DR. NESSLAGE: Luke, those are simulated data then, right, based off of the Ecopath inputs?

MR. MCEACHRON: I think this refers to inputs, yes.

DR. NESSLAGE: So you think this is all about inputs? Does anyone disagree that this is about inputs, as opposed to model-based estimates? We can be clear in our wording.

DR. ERRIGO: As a point of clarification, all of these are part of 2.2.1. The a, b, c, and d are all part of 2.2.1, which deals with input data.

DR. NESSLAGE: Okay, and so we are not talking about Ecosim estimates. We are talking about the data that's going into the model. Yan, go ahead.

DR. LI: I would like to clarify that, although the abundance indices here -- The use of this word might not be accurate at this moment, under this TOR. Whatever it is, the whole TOR, 2.2.1, is dealing with input fishery data, and the workgroup, with the model team, we did evaluate the input data, the input spatial data, including catch time series, and you see, under Item a, and, also, whatever you call that, the WPUE, whatever relative biomass data, whatever you call that, we did evaluate that, and they come from reliable sources, and that is what I would like to say at this time.

DR. NESSLAGE: That's great. That helps. Can we go back to our wording then, real quick? What are we saying here? Fishery-independent -- That's just to clarify for c and d, and, as Yan mentioned, in the above sub-bullet, the working group reviewed the data and found it adequate. Does this then capture the concern, in particular Jeff's concern?

DR. BUCKEL: Yes.

DR. NESSLAGE: Just to clarify, in case anyone gets confused like we are. Go ahead.

DR. BUCKEL: Yes, that captures it, and that's great. Thanks.

DR. NESSLAGE: Excellent. All right. Okay. Where are we? We are at c and d, and that should, hopefully, cover c and d, unless anyone else has additional concerns or clarifications.

DR. SERCHUK: What about the fishery-dependent data?

DR. NESSLAGE: Let's go back, real quick. Can you go back to our wording, real quick, Mike? Thanks. Those WPUEs, are they all from independent data sources, or were there catch per unit effort from fishery-dependent data sources that were used, just to be clear?

MS. GENTRY: I believe the weight per unit effort time series all came from SEAMAP, and so that would be the fishery-independent trawls.

DR. NESSLAGE: Maybe we can be specific and put, in parentheses, SEAMAP, after "fishery-independent" data, and it sounds like there were none, Fred, for dependent.

DR. SERCHUK: I think we should state that, that no fishery-dependent data were used.

DR. NESSLAGE: Excellent, if that's the case. Let's hear from Marcel. He may have some clarification.

DR. REICHERT: I just want to clarify a couple of things. We have provided data from our trawl survey, and it's the Shallow Coastal Trawl Survey, but also the Reef Fish Survey, and the Shallow Coastal Trawl Survey can provide data absolutely, because it's a trawl, and so we know the area swept, and that's what we used in some of our analyses. Obviously, for the Reef Fish Survey, that's based on our trap survey, and that's a relative abundance, and so Lauren or someone else can correct me I'm wrong, but these are two different data sources that were used, and so I just want to make sure that everyone understands that, depending on the species, the data source may be different. I am not sure if that helps, but that may clarify things a little bit.

DR. NESSLAGE: Yes, and let's be specific.

DR. REICHERT: Especially once you start talking about absolutely or relative abundance, and that may vary by species, and I forgot how that is dealt with within the model, and so sorry for butting in, but that's my recollection of how that data was used. Thanks.

DR. NESSLAGE: Thank you. Chip.

DR. COLLIER: Another clarifying question for Marcel. When you mentioned SERFS, it was the SERFS data, I would imagine, if it's going back to 1985, and that's going to be focused on just the trap data, or is it trap and video?

DR. REICHERT: Trap data. I am not sure if video data was used, because we usually don't have biomass estimates, because we don't have lengths for the cameras just yet, and we may have provided some earlier data on the Florida trap and some of the other gears that we used, but I think it's mostly the chevron trap, and so MARMAP and SEAMAP and the SEFIS chevron trap relative abundance, and that's mostly for reef fish species.

DR. NESSLAGE: Okay. Are folks comfortable with the statements, modified statements, as shown on the screen? If not, speak now, or raise your hand, and then we'll have you speak. It sounds like, or it looks like, folks are -- Again, you can wordsmith later, but the main gist is here. Thank you for that. It's all good suggestions.

I think then we're on to 2.2.2 under Ecosim. Do the time series used for model fitting represent the functional groups that they are intended to? Again, this is about functional groups, and we kind of addressed this a little bit before, and the working group agreed that the time series -- That the current model reasonably represents the functional groups and that that can be adjusted, as we've discussed, depending on the research or management question. Any concerns with these statements? Anything you want to add or disagree with? Please raise your hand. I am not seeing anything.

Then let's keep trucking. 2.2.3, are there any limitations to the procedure used to create time series for the functional groups, and so catch and abundance indices, again, and so this is where there may be a misunderstanding, if I'm reading this correctly, and this might be where Jeff's concerns might apply, and so time series data were obtained directly from the sources, but, obviously, there

was some methods used to generate either biomass trends or relative abundance trends. Lauren, or someone on the modeling team, can you speak to that, or am I misunderstanding the question?

MR. MCEACHRON: I think the issue with abundance indices is that sometimes people use visual census data, and they assume like an average weight, or something like that, based on observed length, and so it's just converting that into some kind of biomass index. I don't think Lauren has used any visual-assessment-based indices.

MS. GENTRY: There weren't.

DR. NESSLAGE: But were any of the indices modified to generate biomass or catch time series? It sounds like they were. You can't just take SEAMAP and directly plug it into the model, and there were manipulations, correct, or am I going down a rabbit hole? Jeff, help me out.

DR. BUCKEL: I think you were -- That's what I was curious about, and so Marcel mentioned the trawl data, and so that was area swept to get to biomass, and so was it assumed that it was 100 percent catchability, because, if you're going to go to absolute biomass, then you need to know what the catchability was of the trawl.

It sounds like it may be a weight per unit effort, that WPUE, and so then it's a relative biomass time series, and then, as I mentioned before, within Ecosim, they can take the relative biomass and then link it to that absolute biomass estimate for the time period that Ecopath -- In this case, it's 1995 to 1998, and it would say, okay, here's the absolute biomass of that time period, and now we have a scalar, and then it can convert that time series of relative biomass to a time series of absolute biomass, and so I think that's what's being done, but it would be nice to have that procedure documented.

DR. NESSLAGE: Would a member of the modeling team want to respond to that, or, while you're thinking, perhaps Marcel can chime in, and then we'll go to the modeling team.

MR. MCEACHRON: I am just looking at the last iteration that Lauren sent me, and there are series here of relative biomass and weight per unit effort, and so it sounds like we just need to document that process a little better relative to biomass time series.

DR. NESSLAGE: I guess the follow-up question then is, is there are way -- If that is being scaled up to total biomass, is there a way to -- Has that been evaluated?

MS. GENTRY: No, and weight per unit effort is put directly into the model as weight per unit effort, and that's a unit accepted by the model for the time series.

DR. NESSLAGE: So it doesn't estimate a catchability and expand it up to biomass?

MS. GENTRY: It may do that in the underlying program, but that wasn't done by hand, no.

DR. NESSLAGE: Right, and so that may be going on, and has that been evaluated, because that can have a big impact then, right, depending on what those scalars end up being, because this is getting at limitations, and so, if the limitation is that the only available information is fishery, let's say, independent CPUE, that's totally understandable, but the limitations would then be -- We have

to estimate catchability and scale it up to total biomass, and, if that hasn't been looked at, if those are reasonable, or if they're producing reasonable estimates, then that's something we just need to flag for future investigation. Am I going off the rails here, Marcel?

DR. REICHERT: No, I don't think you are, but, again, a couple of clarifications. I think that how we calculate biomass -- I would need to look that up for the trawl survey, but it's in our metadata available online for the -- I believe, for the reef fish, what we have done is basically use the same methodology, and we provide relative abundance to the stock assessment, which is currently, I think the zero-inflated standardization, and so it's standardized relative abundance, and the other thing is -- Maybe someone can correct me, but didn't you guys also use data, in terms of abundance, that came out of completed stock assessments? I may be mistaken there, and so that is already one step further, in terms of modeled abundance, region-wide.

The other thing is that one of the things that we discussed in an earlier phase is, and that probably is something that can be discussed and further refined in Ecopath, is, for total biomass in the entire region, of course, you need to know, for instance, how much hardbottom habitat you have, and so that kind of gets to the habitat issue, and so that is obviously something that needs to be refined when spatially-specific information is added, and I hope that this is useful information for you guys.

DR. NESSLAGE: Thank you, Marcel. Roger.

MR. PUGLIESE: Specific to Marcel's point about stock assessments, that's exactly right, because we coordinated directly with the Southeast Center, and they had gone through and compiled all that information for another effort, and we were able to use that directly into the model, and Lauren can get into any additional detail, but, yes, and I just wanted to verify that that was one of the things that was important to do, is make sure that we use the information that did come directly from stock assessments.

DR. NESSLAGE: Great. Thank you. Yan.

DR. LI: I would like to clarify that, here, the question is to ask the procedure used to create time series, specifically for functional groups, and so my interpretation of this TOR item is -- When you say create, it comes from nowhere, and you just guess the time series for certain functional groups and species, and the model team -- Those data, they don't create -- They did not create those time series, and they obtained information from the data sources, reliable data sources, and then they had to -- Lauren and Luke, correct me if I'm wrong, but they may have to scale up and down, based on spatial coverage and based on the fleet, like among fleets, but they did not create time series for certain species, and that's my interpretation. Thank you.

DR. NESSLAGE: Right, which makes sense, given the response, that it's coming directly from data sources, and so perhaps the issue that Jeff is raising is not so much with 2.2.3, but 2.2.4, right, if we may start considering that one. Well, maybe not. Jeff, do you have a suggestion for a caveat, or maybe not a caveat, but additional wording to clarify 2.2.3?

DR. BUCKEL: I think the big one has been handled above. I mean, there were fishery-independent data used. These relative catch time series were used, and so I think of those as an abundance index, and so that was handled. We handled that above, and then, so here, if those are

time series that are created for stock assessments, and maybe it's a GLM approach, and so, just like we would comment on the time series, are we happy with it for a stock assessment, are we happy with it for going into the Ecosim, as a tuning index, or a calibration index, and so these are vetted approaches, likely GLM or similar approaches, to standardize the time series data, and so I think this one is fine. As Yan mentioned -- Then my main concern was that these were being used, and we captured that above, that the relative abundance indices were being -- Fishery-independent program data was being used.

DR. NESSLAGE: But, to clarify, time series data were obtained directly from data sources, and so there was manipulation, I think is what folks are saying, that you obtained it directly from stock assessment sources and that standardized procedures for preparing those indices were applied, and is that -- Does that clarify what you were trying to say?

DR. BUCKEL: I'm not sure how -- That's my guess as to how it would be handled, because usually Marcel's shop is -- They do that standardization for their trawl or reef fish program.

DR. NESSLAGE: That's what he was saying, yes. Yan.

DR. LI: Just a clarification to that point, and, Lauren and Luke, correct me if I'm wrong, but my understanding is, in the model, the model took the biomass estimates from stock assessments and then split them, and like what -- What you did before into the model might be just splitting the total biomass estimates among fleets or among something, among functional groups, and is that correct? You didn't do GLM and those things to standardize the CPUE.

MR. MCEACHRON: Right, and we would have just taken the time series that were given to us and either defined them as like just a relative reference only or something else.

DR. LI: Okay. Great. Then, to that point, when we see the abundance indices, or whatever you call it here in this case, it's not it's traditional in stock assessments, like you have the independent survey data and then you use GLM or some other models to generate the relative abundance index, and it's not like that. They took the biomass estimates directly from stock assessments, and then they split them in a way that is required as inputs to the model.

DR. BUCKEL: I think that's true, Yan, for some of the biomass time series, but then it sounded like what Marcel was saying, and what's in the text, is that, for other species, there is weight per unit effort data coming from the survey directly, and so not out of a stock assessment estimate of biomass, and so I think there's two types of data, and maybe that's the confusion. There are biomass time series coming out of an assessment, but then there's also relative biomass time series being generated from the surveys, which that's what I was -- I was talking about those standardization methods from Marcel's shop. In other words, they didn't come out of an assessment. They came from his shop directly to Lauren and Luke.

DR. NESSLAGE: I am wondering if we need to say that standardization methods were used to modify fishery-independent data to generate relative biomass time series for use in Ecosim. Does that get at it, Jeff?

DR. BUCKEL: That's my understanding of what I've read and what Luke and Lauren described.

DR. NESSLAGE: That needs to be independent. Yan.

DR. LI: Thank you, Jeff, for clarifying that part. Yes, I agree with Jeff that, when the WPUE time series were used, then, yes, of course, certain standardized methods might be involved, if it's not an absolute abundance index, in that case, and, however, because this TOR is for the Ecosim model input, the standardization, based on my understanding, those indices -- The WPUE was given to the model team as inputs, right? The model team did not do the standardization.

DR. NESSLAGE: That may be true, but it still happened, right, and so we need -- If what's said in the report isn't correct, we need to modify it.

DR. LI: Yes, and the wording here, that standardization methods were used, but by who? It's not by the model team.

DR. NESSLAGE: By data preparers.

DR. LI: Yes. Thank you. That's better, because, that part, the workgroup did not develop that part. That's not the job of a workgroup. We worked on this part.

DR. NESSLAGE: Yes, and that's a good point, and we should probably add that, that these methods were not reviewed by the working group.

DR. LI: Right, and we are assuming, because those surveys are there, that they're already being well established and well evaluated, and so, once the model team has those data, we would assume that the standardization method has already been evaluated and it's well developed.

DR. NESSLAGE: So maybe we can add, before "standardization methods" -- We can say "standardization methods currently used by data providers".

DR. LI: Thank you.

DR. NESSLAGE: Marcel, is that -- Thank you. Marcel, is that correct? How are we doing?

DR. REICHERT: Yes, and some of those have been used in stock assessments. The point that I was going to make is -- I don't want to lengthen the discussion, by any means, but please keep in mind that this is just for a number of species. The SEAMAP and MARMAP inputs were -- That was only part of the total biomass, and there is a significant number of functional groups where biomass estimates were either not available or were from other sources, and so keep that in the back of your minds, please.

DR. NESSLAGE: Okay. Thank you. I think we're there, or at least close enough that we can wordsmith later. If anyone disagrees, raise your hand. We need to keep moving. Okay. 2.2.4, are there limitations to the base input parameters for the Ecosim model? Are there limitations to the base input parameters? Does anyone have issues with what has been commented on by the working group? I am not seeing any hands. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. Just I find this to be a very technical explanation, and is there any way that we can make this a bit easier to read, for people on the management council?

DR. NESSLAGE: I feel like this is a very detailed question as well. I am not sure --

DR. SERCHUK: I don't know what they mean by "risk-sensitive feeding behavior", and I don't think many other people would either, and I realize that the working group was trying to address some technical issues, but, for anyone that's not familiar, some of this sounds a little bit like jargon. Sorry, but trying to convey our report to the council really means that we need to try to make sure that we can make it as understandable as possible, and I don't have any explanations right now, but I'm just feeling like this is likely to be glossed over very quickly by people, because they really don't understand what is being discussed here. Thank you.

DR. NESSLAGE: That's a good point. I think, if I were explaining this to the council, I would say there were some concerns with one particular parameter, but, otherwise, Ecosim-based parameters were default and can be modified -- Use that last sentence. I wouldn't go into that level of detail with the council, unless they really wanted to know about the effects of risk-sensitive feeding behavior, in which case I would have to get back to them, because I don't know either, but I assume that the modeling team knows what this is about. If you don't, we need to clarify.

MR. MCEACHRON: I think this just speaks to kind of like a best practices type of thing, where there's these default values and when do you want to keep them and change them, and so I think what you said about only one base input parameter was changed -- That sentence you said was probably perfect.

DR. NESSLAGE: All right. Jeff.

DR. BUCKEL: Genny, to Fred's point, maybe just starting, prefacing, that that Ecosim -- A general sentence about prefacing that the input parameters have to do with how the predators and prey interact and that there's several parameters that you can change for that, and then go into the next sentence, just to give them a sense of the input parameters have to do with how the predators and prey interact.

DR. NESSLAGE: Okay. I'm making a note. Maybe something like the working group generally -- With one exception, the working group approved the -- No, that's not right either. What did I say before? With minor exceptions, the ecosystem-based parameters used were default values and can be -- I will steal that sentence.

MR. MCEACHRON: We do want to be careful that people don't think that we're using just default vulnerability parameters, but you might qualify this a little bit and say the initial Ecosim parameters regarding search time and things like -- Well, let me think.

DR. NESSLAGE: Yes, and it gets technical really fast.

MR. MCEACHRON: There are these kind of initial parameters on the backend that are not vulnerability parameters, but they do influence these predator-prey dynamics that default them to values. This is tough.

DR. NESSLAGE: Can we just say something general, to Fred's point, of, with minor exceptions, and see the working group report, in parentheses, the SSC approved the initial parameterization of the Ecosim model, something like that? Anne, what do you think of that, or something else?

MS. LANGE: This is TOR 4 and not 3.

DR. NESSLAGE: Good catch.

DR. ERRIGO: I'm just trying to capture what everyone is saying, really fast, before I go in and put in that this is 2.2.4.

MS. LANGE: Sorry, Mike. I wasn't rushing you.

DR. ERRIGO: No problem. What was that, Genny? With minor exceptions --

DR. NESSLAGE: The SSC approves the initial parameterization of the Ecosim model, and then you can grab the second-half of the second sentence. That the working group approves initial parameterization of the Ecosim model, and then you can grab that parameter values can be modified as specific management questions are explored, something along those lines that the working group already pointed out, that additional work can be done, depending on what you want to use the model for, is my understanding. Would that --

MR. MCEACHRON: I would say the initial parameters for the pre-calibrated Ecosim model. I think that covers it.

DR. NESSLAGE: Then we don't need the additional caveat. What does the SSC think of that? Any concerns? Yan.

DR. LI: Under this bullet, several of the input parameters dealt with how predators and prey interact, and what is this sentence for?

DR. NESSLAGE: I think this was the lead-in that Jeff had suggested to try and orient the council to what input parameters are actually about, and it's hard to explain this in more layman's terms. Maybe the wording isn't quite right.

DR. LI: This sentence is out of place here, just saying that several parameters deal with how predators and prey interact, and then what -- It's just my feeling, and I just feel it's out of place here, and what are we going to want to say about those parameters? Are they good or not?

DR. NESSLAGE: I think that's the second point, with minor exceptions, and so maybe -- If you guys can trust me to present this to the council, and I don't think they really care about the gory details of the input parameters, and they just want to know whether we think the initial parameterization of the pre-calibrated model is reasonable. Someone correct me if I'm wrong, and so maybe they don't need that.

MR. MCEACHRON: I would maybe just change "exceptions" to "minor adjustments", because you're not kind of -- It implies that you are approving everything except this one parameter, and then that could raise some questions, but it's really just one thing that was adjusted, and it's specific

to feeding times, and so I don't know if that falls under predator-prey interact, and so, if you want to say feeding times, that might be an alternative.

DR. NESSLAGE: Jeff, this was your suggested bullet. How do you feel?

DR. BUCKEL: Those initial input parameters -- Before you estimate vulnerabilities, there are several, like prey switching, the foraging time adjustment, and I think there's one more, and, to me, they all have to do with predator-prey interactions, and so I was just trying to orient the council to Fred's point about it just jumped into the technical aspects, and so just to let them know that these initial input parameters that deal with how predators and prey interact. If the SSC doesn't think it's necessary, then we can certainly take it out, and it was just to provide some context for the council or other managers that might read this.

DR. NESSLAGE: Yan, can you live with this as it is?

DR. LI: Yes, and I would like to suggest another option. With minor adjustments to what parameters, and maybe you can say with minor adjustments to the above management parameters, and then we link this bullet to the above bullets, because there is several parameters dealing with predator-prey interactions, and this could have to do with something else, and so why just mention those parameters dealing with predator-prey but not others, and what was the purpose of mentioning particularly those parameters? Thank you.

DR. NESSLAGE: Jeff, is that a reasonable compromise?

DR. BUCKEL: Sure.

DR. NESSLAGE: Okay.

DR. ERRIGO: I took out "see workgroup report", because we now specifically said which parameters, and I believe that's why you had to see the workgroup report, because we hadn't done that before. Does that make sense?

DR. NESSLAGE: Yes, and we're specifically referring to that TOR and modifying the recommendations, and so, yes. Okay. It's quarter to noon, and we're getting there. 2.2.4, are we okay with the modifications as recommended here? Does anyone have any major concerns, minus some wordsmithing that can occur later? Speak now. I am not seeing any hands raised.

Let's go to model fitting. There is quite an extensive response here. I don't want to start wordsmithing their report, but, at the same time, if folks disagree with anything that's said in here, and I mean disagree, I would like to hear that now. Let's focus first on a, what process was used to tune the model, and so this is really more of a description. Hopefully, folks won't have -- Let's just say, if you have any problem with the description, raise your hand. Okay. No hands raised. Excellent.

Let's move on to b. Are there limitations to the process used for model fitting? Again, a nice extensive response, and they have listed some of the complications. Does anyone disagree with what they said or have anything to add? Okay. I am not seeing anything.

Let's move to c. Is the process used to contain extreme estimates reasonable? They go on to describe some of the things that have been identified as extreme events and how they were dealt with, and the working group was generally satisfied, but they recommended identifying and evaluating extreme estimates. This is a little bit contradictory. They were satisfied with the process, but then -- Are you suggesting, Yan, that they continue to do that process moving forward? Is that --

DR. LI: Yes, Genny.

DR. NESSLAGE: Okay. Great. Then I'm not misinterpreting. Does anyone have any problems or concerns with the working group's response? Jeff.

DR. BUCKEL: Are they extreme estimates -- It seems like one interpretation of that is the predictions from Ecosim that you could have these extinction events, or extremely high biomass estimates, and so that could be extreme, and then the other interpretation in the paragraph talks about extreme input values, and so I just wanted to get some clarification on are we talking about extreme estimates from Ecosim projections or extreme estimates of input values, or maybe it's both?

MR. MCEACHRON: I think it's both, because sometimes you can have these extreme events that, after some kind of investigation, might be caused by some outlier, and so then you go and look at the outlier, and you try to figure out if that's reasonable, and then you either set it to reference or adjust it accordingly, or maybe you find some error in the data you were given, and so they are related. Then, other time, the extreme events are just a misparameterization of the vulnerability estimate, and so it's a little bit of everything.

DR. NESSLAGE: Does that address your question, Jeff? Do you need to modify the wording somehow?

DR. BUCKEL: No. That was great. Thanks, Luke, and then I'm just reading to see if the model team text has something about that vulnerability that Luke just mentioned. I think the last sentence, that the model will be updated and improved as new information becomes available, and it's not explicit about vulnerabilities, but that is the one time that I know that you can get these extinction -- If the prey functional group is too vulnerable, for example, and so it looks good.

DR. NESSLAGE: Great. Great. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I am wondering whether -- This is wording issue. Is the word "contain" or "constrain"? Is the process used to constrain extreme estimates reasonable, or is it contain? It seems to me that constrain would be a better word, and it means limit. Contain means to hold.

DR. NESSLAGE: Well, that was the question that we were given, and so I'm not going to change it at this point. If you have a suggested change to our response to the question --

DR. SERCHUK: Okay.

DR. NESSLAGE: I hear your frustration, and I agree with your point, but I just don't think we can change that at this point, but I think the response was essentially to what you were suggesting, which is does it constrain, but they need to deal with those extreme estimates, and the working group seemed to think they had a good process and that they need to continue that as the modifications to the model are made, and does that summarize the group's consensus?

DR. SERCHUK: Okay. Maybe it's too late at this stage to change it, but it just seems to me that our response should be to constrain extreme values, but I understand the difficulty of doing it at this stage. Thank you.

DR. NESSLAGE: No, I appreciate your concern though. Yan.

DR. LI: Thank you, Genny, and, Fred Serchuk -- I agree with Fred Serchuk that it really means constrain or handle or tackle extreme estimates, and then this is a question I was given, and so I agree with Fred. Then, to Jeff's points about the extreme estimates, for this section, it's under the fitting process evaluation, and so it's more talking about the estimates, output, that predict our estimated or predicted biomass. Also, as Luke pointed out, when you are looking at those extreme estimates, it really means extreme outputs, in this process, and the possible reason causing that extreme output might be some outliers or extreme inputs, and so I just wanted to point out that, here, we are really talking about extreme outputs under the fitting process.

DR. NESSLAGE: Okay. Thank you for that clarification. Do you think we need to add anything though, Yan, to our response, as a consensus SSC group, or do you -- Are you just clarifying for the record?

DR. LI: Yes, I'm just clarifying. If Jeff is happy with it, with the information, then --

DR. NESSLAGE: Okay. Great. Any other comments or concerns on Section c here? Okay. Let's move on to 2.2.6. How have productivity changes been incorporated into the model? The working group generally agreed with the overall approach and direction they are taking and describes how it has been incorporated. Does anyone disagree? I am not seeing any hands. All right.

Then we get to then the final big question that we've all been waiting for, and, since we're hungry, I'm sure we will answer this efficiently. Section 2.2.7, are the estimates from the Ecosim model suitable to inform stock assessment and fisheries management, and so notice this is Ecosim and not Ecopath, and, in parentheses, they have said, for instance, the time series, output of fishing mortality rates, changes in the strength of food web interactions, et cetera.

Again, I think we need to -- When you're making comment, I would ask that you specify whether you're talking about the current configuration, as the working group has looked at the model, versus what it can do as a tool, because it looks like the working group felt that it could inform stock assessment and fisheries management. Again, it's nice that they use the word "inform", but they mostly evaluated Ecopath, and not so much Ecosim, but you really need to have a more -- It sound like you need to have a more specific question, and this is where we can get to that question of the standing working group, so that, as specific Ecosim configurations are made, we might be able to help continue to review and give feedback on the model. Yan.

DR. LI: Thank you, Genny. I would like to bring your attention to that -- As Ginny mentioned, the workgroup focused on the Ecopath component. For Ecosim, because we don't have specific questions, and the fitting process is still ongoing, given more information, new information, and so this process cannot be fully evaluated, which means the estimate from the Ecosim part was not fully evaluated.

The second point here is, although the TOR is asking about the estimates from the Ecosim particularly, however, when the workgroup went through the review and wrote the report, we kept saying EwE instead of referring to Ecosim specifically, because it's a package, and I don't believe you can use Ecosim without Ecopath in it, and so that's why you see EwE here and not specifically referring to Ecosim, and I just wanted to make that clear. Thank you.

DR. NESSLAGE: Thank you, Yan. Amy.

DR. SCHUELLER: I am not sure if this is exactly the right place to bring up this comment, and so you can table it or reject it if you would like, but I think that the SSC should probably make some sort of statement about a process that would need to be followed in order for this to actually be used in assessment or management.

So far, we've used this nice term of "inform", but I'm thinking a little bit further, and so, if we do specify that this could be used for something, I think that it would need to go through SEDAR, and I'm thinking about this looking at the Atlantic menhaden example, where several models went through multiple rounds of review and then were incorporated together and then had a CIE review, and so I would like to see, in our report somewhere, where we recommend that, if this tool moves forward to inform the assessment or management decisions, that it probably needs to go through some sort of formal review.

DR. NESSLAGE: Thank you, Amy. Fred, is it to that point or a different point?

DR. SERCHUK: A slightly different point, Chair.

DR. NESSLAGE: Okay. Let's take your point, and we'll come back to both of them and see how folks feel.

DR. SERCHUK: One of the strengths, I think, about these systems models is that I -- It gives an opportunity to evaluate the effect of single-species management on the multispecies system, and, therefore, it may mean that, if you decrease the quota for Species X, because you feel that they are probably abundant, you will not achieve what you think for Species Y when you set the TAC, because there are going to be inter-specific effects and so on and so forth.

I think, in one sense, there is a tool here to evaluate whether or how closely you could approximate the desired outcomes from your single-species management system within a multispecies ecosystem, and I think that is a really powerful way to evaluate why didn't we get there and why aren't we increasing this, but, because the abundance increased here, we couldn't get the desired outcome for Species X, Y, or Z, and I would like to inform managers that those are important considerations and that we have a tool, perhaps, that we can get insight to that. Thank you.

DR. NESSLAGE: Excellent point, and I think perhaps -- Mike, can we switch over to our comments, in addition to the working group report? I think we've got two suggestions so far, and the first one was Amy's, having to do with a suggestion, and, again, we'll put it on the screen as a strawman, and folks can comment. The first suggestion is that any application of the -- I am assuming the whole package. The SSC recommends any application of the EwE to specific assessment or management questions go through the SEDAR process, and that's been suggested here.

Then the second -- Fred's suggestion was that we make a comment that a strength of the EwE approach is that it can help evaluate the impact of single-species goals on the broader ecosystem, or single-species management goals, something along those lines. Fred, does that capture what you were trying to say succinctly?

DR. SERCHUK: It does. I just wanted to give an example, and we talked about why we didn't see certain species increase in abundance when we thought the management TACs were set to do that, and it could be because of interactions, and I don't know, but the fact is that we know that the system is an interactive system, and we know we set our management, catches, based on the single-species approach, and that's all.

DR. NESSLAGE: Right. Okay. I am looking at the clock, and I promised a hard stop at noon. I see that Wilson and Anne have comments. Would either of you be offended if we picked up with you after lunch?

MS. LANGE: I can wait.

DR. LANEY: Madam Chairman, that's fine.

DR. NESSLAGE: Great, Wilson. Anne, would you be offended?

MS. LANGE: I'm fine. I can wait.

DR. NESSLAGE: All right. Let's keep their names upfront, and I will make a special note that we call on them first, and then we can continue this discussion. Again, hopefully we'll be able to wrap this up right after lunch, because we do have another big agenda item, but I think we're almost at the end here. We will not get to answering all the questions that we've been asked, and this will be an ongoing process, I imagine, but I think we'll give a lot of food for thought to the council and start the discussion of this model can be used, and so let's come back at one o'clock, please, and, when you return, if you could raise your hand. Thank you, all. I appreciate your participation.

(Whereupon, a recess was taken.)

DR. NESSLAGE: We'll get started again, and we'll pick up where we left off, and I believe we were going to hear from Wilson and then Anne regarding to the two strawman points, I believe regarding the two strawman points, one or the other, or maybe something different. Let's hear from Wilson first.

DR. LANEY: Thank you, Madam Chairman. No, you are correct, and I was just going to --

DR. NESSLAGE: You are breaking up, Wilson.

DR. LANEY: I was just going to second Fred's recommendation that we include that statement about the strength of the EwE approach and note that a classic example of what happens when you are not able to evaluate the impact of species interactions is reflected with what happened with striped bass being managed to a very high level and then subsequently consuming large quantities of juvenile American lobsters and blue crabs.

DR. NESSLAGE: Excellent comments. Anne.

MS. LANGE: I just wanted to note that I agree with both Amy and Fred's comments, and I also believe that the EwE model's greatest strength is to evaluate the potential impacts of management actions or to inform the analysts of potential interactions as assessment models are developed. I have cautioned, during our previous reviews of this model, that it's important to not portray such models as the answer to all management concerns. The more complicated these models are, the more potential there is for misinterpreting the outcomes. I think this is a tool that should be used in conjunction with assessment modeling and the assessment scientists' understanding of both the species and the fisheries involved.

DR. NESSLAGE: Well said. Would you like to add any of that verbiage to the bullet point that we've got up here?

MS. LANGE: Well, since you convenient broke and gave me time to actually write this, I can cut it and paste it and send it to whomever, and they can address as you like.

DR. NESSLAGE: Maybe you could send that to Mike, and we can get it on the screen, and let's see if other folks concur. It sounded good to me, but there might be other opinions out there.

MS. LANGE: All right. I will send it to Mike.

DR. NESSLAGE: Thank you, and thank you for drafting that. That was --

MS. LANGE: Again, you gave me the opportunity by having a break at the right time.

DR. NESSLAGE: My stomach felt it. Okay. While Anne is doing that, let's go to the bullet above about recommending that EwE-model-specific assessment or management questions or applications go through the SEDAR process. Does anyone on the SSC disagree with this statement or would it modified in any fashion? I assume, Amy, you were suggesting that this would be like any other information that would be used to inform a stock assessment?

DR. SCHUELLER: Yes, and that's my point.

DR. NESSLAGE: Chris.

DR. COLLIER: These might be just left over from saying that they got back from lunch. I apologize, but I haven't cleared it yet.

DR. NESSLAGE: Understood. Chris, are you just back from lunch, or do you have something to tell us?

DR. DUMAS: I was just back from lunch. It was quite enjoyable. Thank you.

DR. NESSLAGE: Excellent. Dustin.

MR. ADDIS: My hand was up I think from lunch. Sorry.

DR. NESSLAGE: No problem. I'm glad you're back. Yan.

DR. LI: Thank you, Genny. Sorry, but I will have to bring our attention back to the previous discussion, the application, that Anne is drafting, that bullet point, the strengths, that sentence. I looked at the report, the workgroup report, and the workgroup -- In the report, there is several sentences, and I don't know if it's sufficient to cover what we discussed, but there is language there to highlight the application of this EwE approach, including, for example, the management strategy evaluation is there, and then the ecosystem-based management might be included in the - - It did not specifically say single-species management, but it's, in general, the ecosystem-based management, including single species and multispecies there, and I just want to highlight that there is language in the report, and I don't know -- Is the purpose of repeating that -- Do you want to put something that is additional to what's already in the report?

Also, another thing is like, here, we highlight strengths that can help evaluate the impact of single species management, but there is other strengths, and so, here, the wording, I am thinking, maybe can say one of EwE applications is that it can help -- All the applications have strengths, and so these are strengths, but others are not strengths, and so just to make it clear to the council that they know exactly what the EwE model can do. That's my comment. Thank you.

DR. NESSLAGE: Thank you. I do see there's quite a bit in the paragraph right underneath the question for TOR 2.2.7, and there's quite a bit of detail on how the EwE model could be used to inform management decisions, et cetera, et cetera. Maybe we can add a sentence, after this one that Mike is editing, to say the report identifies a suite of potential applications, like see TOR 2.2.7, so we don't have to be redundant, since you've already wordsmithed it, but we can highlight that suite, if folks agree with what's in the report.

Again, before we get back into this bullet, I do want to address last call for Amy's bullet about the SEDAR process, and we'll come back to this, Yan, I promise, and Anne, but I want to try and knock this one off, to see if folks agree. Does anyone disagree with the SSC's suggestion that the EwE model go through the standard SEDAR process? I see you, Roger, but I want to hear from the SSC for a second here. Please be patient. I am not seeing any SSC member hands raised, and so go ahead, Roger.

MR. PUGLIESE: Related to that, one of the beauties of our collaborations and coordination and building this model and working with our partners is we've been building an online Ecospecies online species information system that Lauren had mentioned earlier on, and one of the aspects of that is all the Ecopath with Ecosim input and output parameters are ultimately going to be housed within that system, and it already is housing all the -- This is kind of where made the link, and all the diet information and all the life history, et cetera.

One of the things that has been discussed in the past is the opportunity to tap in on that information as you go through say a data workshop for a stock assessment, so that you can draw on it, and then, after the assessment, actually update and refine and go beyond it, and, as questions are developed, I would assume these could actually be integrated into some of the terms of reference and something similar, so that then it becomes part of both the data input information, et cetera, as well as some of the specific actions relative to the SEDAR process.

DR. NESSLAGE: Is that mentioned in the working group report at all, this -- I would want to call it a database, and what are you calling it, again?

MR. PUGLIESE: It's the Ecospecies online species information system. We didn't get into that level, other than highlighting it as being the repository for the long-term information, and it really was kind of getting to the next steps of the discussion of where the SSC wanted to go with the overall efforts, and this is something that we want to highlight in the future, is how that system is going to support and include this information and be able to be drawn on for either individual life history components or, in this case, as you're moving forward, and now you're identifying it as potentially being addressed under the SEDAR process, but potentially one of the say terms of reference.

DR. NESSLAGE: I wonder if we could add, under the bullet that's highlighted right now, that strength of the EwE approach and its underlying data components, and then we could put, in parentheses, the Ecospecies. That's just to bring everyone's awareness to this as a potential -- Not only a tool, but also a compilation of data that can be used to inform management, both single species and a broader ecosystem. Thank you for that, Roger. Alexei.

DR. SHAROV: On the SEDAR process, I missed the moment when Amy talked about this, I guess, and I had to step out, but it seems to me, if EwE is going to be used within the assessment -- Well, none of the current assessments are, obviously, using the EwE outputs, as far as I know, but, once that happens in the future, and it becomes part of the assessment process, then, if that assessment goes out for peer review, automatically the EwE application goes with it, right?

It would seem to be almost automatic, but, at the same time, there could be smaller, more focused management questions asked to be explored by the EwE, which would be more like a research type, and I'm not sure that every time that somebody would be doing this that it would have to be going through the SEDAR process, but, of course, if it has a direct application for management, if it affects the conclusions on the stock status or TACs, then yes, but I can envision just more narrow focused, like I said, research-type questions, and will they always be going through the SEDAR process?

DR. NESSLAGE: Well, I think, as it's currently worded, it would be specific assessment or management questions, management meaning it would be used for management, is how I'm reading that, but, if you think you can -- Not for just research projects, but I think, if it's going to apply to a specific assessment or management question, it would go through the SEDAR process. Is there any specific wording you think we can add to make that more explicit, Alexei?

DR. SHAROV: Well, I was thinking that, for example, there could be question, like will the changes in regulations for a particular predator have any significant effects for a particular prey,

and that could be a very specific question that could be explored with the model if, for whatever reason, the council is interested in exploring this potential effect, and I suppose the public would be concerned about it, and that would be a very specialized research question. Then suppose it's done and presented, and should it be going through the SEDAR process? The smaller projects like this, it seems to me that they will not necessarily need to go through all those steps.

DR. NESSLAGE: Maybe the word "questions" is too broad. Management -- Specific assessment or -- Are you thinking ABC setting questions, or ABC setting exercises, or something like that? Amy, what was your intention?

DR. SCHUELLER: I mean, if it's going to be used to set an ABC, right, then it seems like it should be -- I didn't mean it to be for research.

DR. NESSLAGE: So maybe we can refine this to what Alexei is suggesting, and maybe something more like the SSC recommends that an application of the EwE model to ABC setting. As he's mentioning, if it's in the assessment, it will go through either our internal SSC review or external SEDAR review, CIE review. Catch-level recommendations. I like that. What do you think, Alexei and Amy?

DR. SHAROV: That's fine.

DR. NESSLAGE: Amy, are you good with that?

DR. SCHUELLER: Yes, that's fine with me.

DR. NESSLAGE: Great. Let's go to Church.

DR. GRIMES: I took my hand down. This discussion has answered my question.

DR. NESSLAGE: Fabulous. Thank you. Yan.

DR. LI: Thank you, Genny. I have a couple of suggestions, or comments. First, the sentence right here, the application of the EwE model in a stock assessment, or catch-level recommendations, like at what level? What I keep imagining is we are not going to take the estimates from EwE to directly input into stock assessments, and it's rather the other way, the reverse way. EwE takes inputs from stock assessments. It takes estimates from stock assessments as their input, and so I imagine how we apply the EwE model to the stock assessment is that, for example, in the case of a stock assessment, when we make assumptions for natural mortality, and then we have no information about natural mortality for a certain species, and EwE may be able to help inform what natural mortality level we should set for the stock assessment.

Then the specific estimates of natural mortality will still be informed through the catch data and the abundance index data, and that's how I imagine one of the ways that the EwE model can help inform, and so, here, I would suggest to change the wording to the SSC recommends that any application of the EwE model to inform specific assessments, and then, if we change to like "inform", it's not to directly use the EwE estimates in the stock assessment. Under this situation, do we still need to go through SEDAR, or would we consider it's just a research project, as Alexei mentioned, and I'm not sure about that part.

DR. NESSLAGE: I am guessing that -- Amy, correct me if I'm wrong, but we're both coming at this from the menhaden point of view, where we had a multispecies and ecosystem models that informed specific assessment and catch-level recommendations for menhaden, and we did have the multispecies and ecosystem models reviewed as part of that, because they ended up being used. I think that's where -- Amy, is that where you're coming from?

DR. SCHUELLER: Yes, it is. That's exactly where I'm coming from, and so I can imagine a lot of the single species assessment data would go into maybe an EwE, but outputs from that could be fed back into a single-species assessment, and so, for example, a matrix of natural mortality, or, in the menhaden case, we're doing some sort of long-term equilibrium projection in order to get an F rate, which we then use to put back into the single-species projections and give catch level recommendations. I think that there are situations where things could be pulled out of the EwE model and put into single-species assessments, and, if that's the case, then that needs to go through the review process.

That happened with the MSVPA too, under the menhaden example, and so that model itself was reviewed initially and then reviewed as part of the assessments, as they used that, before where we currently are, and so I just think there's precedent for that, and I want to make sure that the council understands, and just everybody understands, that these things still need to be reviewed through a formal process.

DR. NESSLAGE: Speaking of formal processes, Julie Neer.

DR. NEER: Good afternoon, everyone. I just want to clarify some of these things here with regard to SEDAR. From what I am hearing from you guys, if -- It sounds like, if, perhaps, as the Yan that just gave, where we don't have any information on natural mortality, but we can get, perhaps, a matrix of mortality estimates from the EwE and put it in the assessment, that would be part of the data and assessment vetting of that development of that assessment, and so that would be a portion of the SEDAR assessments. Whether it comes to a review via CIE or just straight to you guys would depend on the type of model and stuff, but I do want to point out that SEDAR does not make management advice in any way, and so we don't give -- Catch level recommendations do not come out of SEDAR. They come from you.

I would not put any sort of management making it go through SEDAR, because SEDAR provides scientific advice only, and then it comes to the SSC, who then translates the science into catch level recommendations or some other component for management, and so, if you want to use information from an EwE model, and you want it vetted, to see if that's actually providing a useful ABC or whatever, that vetting and review would come to, most appropriately, probably to the SSC itself.

Now, if you want the overall EwE model reviewed externally, that's something else that could happen, but, again, remember that SEDAR provides just the science component, and I know the EwE model itself is science, but the management half is the SSC's responsibility, and I just wanted to clarify that a bit, because, as I've been reading this, I'm not quite sure what you mean by "go through the SEDAR process". This discussion is helping, but it sounds like -- Menhaden was a very specific case, where it only came to SEDAR for the review component, and we weren't involved in those other stages, and so let's remember that as well.

If there's a particular application and you want SEDAR to provide the review for it, then that is something that the council could certainly request at the Steering Committee level, and, if we had the time, the money, et cetera, it could potentially be done, but remember that SEDAR only provides the science, and so I would not put the catch level recommendations go through a SEDAR process, because SEDAR doesn't give you catch level recommendations.

DR. NESSLAGE: Okay, but I think, if we add the phrase "science to support catch level recommendations"; that would address your concern?

DR. NEER: Yes.

DR. NESSLAGE: Okay. Good.

DR. NEER: I just want to make sure that everyone is clear about what SEDAR produces and gives you guys.

DR. NESSLAGE: Thank you for clarifying, and I think, when we get an actual application, I'm sure there will be lots of discussion about how this would go through the actual process, but we just want to alert the council to the fact that we would like an additional level of review. Eric. If you're talking, you're muted.

DR. COLLIER: I have sent him a PIN, but it's saying he has to enter it again. His hand has gone down since he had originally raised it, but, Eric, if you're having issues connecting, or if you want to ask a question, you can type it into the question box, and I will read it for you.

DR. NESSLAGE: In the meantime, Roger, did you have something?

MR. PUGLIESE: Just a quick point. If the SSC does move forward with creating a standing workgroup, some of the extended discussions or guidance on some of these types of issues can really be built once the group actually has an opportunity to get into the weeds on where this can go.

DR. NESSLAGE: Good point. I think we're going to get there quite soon. Amy.

DR. SCHUELLER: I had just raised my hand to respond when you nicely made the ability for me to do that on the spot.

DR. NESSLAGE: Good. Okay. Eric, did you still -- Do we have any -- I don't want to ignore Eric Johnson. Okay. Any other comments on this bullet point? I am not seeing any hands raised, and we'll move back to the listing describing the strengths of the EwE approach. Jeff, was this with regard to the SEDAR issue or the next bullet?

DR. BUCKEL: It was the next bullet.

DR. NESSLAGE: The next bullet. Okay. Take it away.

DR. BUCKEL: Actually, it's, I guess, the broader 2.2.7. I think we've gotten into some of the broader things that can be done with EwE, but I guess the question that the council -- Are the estimates from the ecosystem model suitable, and I don't know if we've addressed that. I guess, if it's the current model, or this Ecosim model that will be available in the future, that's kind of what we've been talking about, and so I just didn't know if we needed to address the Ecosim model in its current state, to let the council know that leading with the sentence that is in the report, that the working group was unable to fully evaluate the Ecosim model, and so, in the current form, it's not suitable. Then, however -- Then we could get into some of the things that we've talked about, the future and what we expect, given the Ecopath-based model and the fitting that's been done within Ecosim, and we expect it to be -- These are some things that we expect it to be useful for, and does that make sense?

DR. NESSLAGE: No. I need you to help me with wording. We need to -- We're running out of time, and I need something specific. What would you like changed or added?

DR. BUCKEL: I guess I'm trying to see -- Maybe, Mike, if you could scroll up.

DR. NESSLAGE: Sorry. I don't mean to be difficult.

DR. ERRIGO: Bring up the report, or are you looking here?

DR. BUCKEL: Where do we begin addressing 2.2.7?

DR. ERRIGO: I think we agreed with the working group for 2.2.7, and then we wanted to add in these things here.

DR. BUCKEL: Okay. If there's a statement that says that we agreed with the working group's conclusion about the current form of Ecosim or something like that, just to lead off that -- Because I just didn't feel like, in this document you're working off, Mike, that we had addressed that TOR directly, in terms of the Ecosim model. It could be language that just says we agree with the working group's conclusion about the estimates and the utility of the current form of the Ecosim model. Thanks. I just wanted to address that question, the specific question directly.

DR. NESSLAGE: Thank you, Jeff. Can I go to Yan? Go ahead, Yan.

DR. LI: Thank you, Genny. Okay. First, I agree with Jeff that the SSC needs to put a consensus statement regarding the utility of the EwE model. Again, at this stage, the workgroup agreed that the EwE, including Ecopath and Ecosim, as a base model, they are ready to -- Again, they are not ready to be grabbed and used, but they are ready to be -- As a base model, they are ready to address data or modified to meet the research and management needs, and that's the workgroup conclusions. Here, again -- Where is it? Here. The SSC agrees with the conclusion about the utility of the estimates of the current form of Ecosim. First, there is no estimates that have been evaluated from the Ecosim part, first. Second, Ecosim cannot exist, or function, without Ecopath going with it, and am I correct, Lauren and Luke?

MS. GENTRY: Yes.

DR. LI: You cannot just take Ecosim without Ecopath, right, and that's the foundation, and so, when we go through the Ecosim part of the -- Actually, we are talking about the EwE as a whole.

DR. NESSLAGE: Right, and I think we would just -- I like your suggestions here, but I think, because the group seemed pretty comfortable with Ecopath, but maybe had more questions about Ecosim, and the TORs were organized that way, I think we were trying to be explicit, but I think, unless the rest of the SSC disagrees, I think you're on the right track with these suggestions and modifications.

DR. LI: Thank you. I like the wording right now. Then, when we go down, the third bullet, I would like to suggest that we change the wording that a strength of the EwE approach -- I would like to suggest a change in wording of this phrase to like one of the EwE model's applications, just at the wording for the fourth bullet. When you say this is a strength, that implies something else, and it's not a strength. Actually, they are potential applications. That's just my suggestion.

Then, for the fourth bullet here, there's one sentence down there that says, the more complicated the model, the more potential there is for misinterpreting the outcomes, and I would like to suggest we remove this sentence, if other SSC members feel comfortable with it, because it implies that - - It's interpreting the outcomes, because the model is too complicated, and it's just -- I don't feel comfortable to say that.

DR. NESSLAGE: Anne, how do you feel about taking that sentence out?

DR. LI: It's just my feeling.

DR. NESSLAGE: I think you still make a very strong point here without it. Would you be upset about removing it?

MS. LANGE: I am not upset about removing it, but I do believe that, that you can put in all kinds of numbers and come out with a result that you are looking for, and, the more complicated it is, the more likely it is that things can be misinterpreted, but I have no heartburn with removing it, if other people want it out of there.

DR. LI: I agree with you. I 100 percent agree with you on that sentence. I just feel that there might be -- I don't know about others, and someone -- At least, when I read it the first time, I don't want to have that type of misunderstanding, from my point of view, but I 100 percent agree with you on that sentence, and that's true, at least for me.

MS. LANGE: I think the rest of the paragraph takes care of it, I think, and so there's no problem removing that sentence, in my view.

DR. NESSLAGE: Thank you both. I think we've made a lot of progress here, and I think we're going to have given the council a lot to chew on. We are not going to get to answering all of these questions, and I'm hoping that, if the council still has these questions, they will send them back to us, and we can address them potentially at a future time, but I would like to start wrapping this up, for real this time. I know I keep threatening, but I mean it now. Are there any outstanding issues with the last TOR or with regard to its suitability to inform stock assessment and fisheries management? We can provide more detailed feedback as this progresses, but I feel like we're

getting close to having a good amount of feedback for the council, to give them an idea of what we're thinking. Yan.

DR. LI: Sorry, Genny, but a very quick point. The first bullet under this TOR, may I suggest to add, at the very end, to say that the utility of the current form of the EwE model as a base model. Thank you.

DR. NESSLAGE: Thank you. Alexei.

DR. SHAROV: I know you want to wrap it up, and I would be happy to submit a writeup later, but I think it's -- Identify, summarize, and discuss uncertainties and limitations of the analysis, and it would be important to remind the council, and ourselves, that probably the most useful results, or maybe more reliable, and I don't know which is the most appropriate word, would be exploring the effects and interactions where the trophic interactions are the strongest one, and well described, because this is the model that's built on the trophic interactions and the description of the pathways of the energy and biomass.

Yes, it is complex, and, yes, there is quite a bit of uncertainty, and, therefore, I guess the most -- The most that we will learn, or maybe the best results, or more reliable indications, that we would get from considering those elements where the trophic interactions are the strongest ones and could be measured, and, therefore, the model results probably would be sort of most believable, if I could say that, and we certainly could find a better term, but I just wanted to stress that this is the model about the trophic interactions, and, therefore, the strongest and most conclusive results would be for those elements that are most significant.

DR. NESSLAGE: Alexei, you said a lot. Are you recommending specific wording?

DR. SHAROV: Could I submit it in writing? I just don't want to stall the -- I know we are running out of time.

DR. NESSLAGE: I'm a little -- Okay, and so did anyone -- The problem with submitting wording later is that we won't have a chance to see it, and did anyone disagree with what Alexei just said, and we can work on wordsmithing it, when he provides some suggestions.

MS. LANGE: It sounds good to me.

DR. NESSLAGE: Thank you, Anne. Anyone else?

DR. LANEY: It looks good to me also, Madam Chairman.

DR. NESSLAGE: Thank you, Wilson.

DR. GRIMES: I agree with Alexei about this.

DR. NESSLAGE: Thank you, Church. Okay. I am not hearing any screams of protest, and I just want to make the point that there will be several questions here that will go unanswered, and we will -- You will see this in the draft. I will draft up some sort of verbiage about we just simply did not have time to address this question. I think we can provide them with feedback that the analysts

provided on what the feasibility of that -- Those rankings, we'll make it clear that those were provided by the analysts regarding feasibility, and they are not our rankings. I'm not even sure that it should have been our rankings, per se, and so we'll make sure that that's clear in the report.

Then the last thing I want to do, before we wrap up this agenda item, is it sounds like an ecosystem model working group, to help with future updates and developments, including the development of Ecospace -- In my mind, it sounds like we need it. Does anyone disagree that we should have a standard ecosystem modeling working group to inform these models and the use of them as we go forward to help the council out? Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I am just wondering if we need to restrict the composition of the workgroup just to SSC members, and this seems like a group that would benefit, perhaps, with access to a few council members, if they were interested, simply to get their views on issues and how it might -- How these efforts might be useful to them.

DR. NESSLAGE: You mentioned that before, and, staff, is that possible, to have a joint working group?

DR. COLLIER: That can get a little complicated, having council members on the actual committee, and we would recommend that -- They could be there, as an observer, and provide comments, but it would be better to have them not necessarily part of the standing working group.

DR. SERCHUK: Okay. Let me ask you another question. I know the council has an Ecosystem-Based Committee, and how do you see this group interacting with them?

DR. COLLIER: Go ahead, Roger.

MR. PUGLIESE: The bottom line is that this actually is going to be brought forward to the Habitat and Ecosystem Committee, and that will be the committee that advances recommendations and review, et cetera, to the council. As a matter of fact, a component that feeds into that is the Habitat and Ecosystem Advisory Panel, where this essentially will be all presented to the panel next week, and so that committee will be the one that provides additional recommendations on the advancing and utilization, and Genny will be presenting directly to that committee as part of the discussions for that in December. That will be the group that will be moving that forward, and Steve Poland presently is the chairman of the committee, and he is also now the vice chairman of the council.

DR. SERCHUK: Wonderful. Thank you for that.

DR. NESSLAGE: Steve Poland, is this to -- Anne, I don't want to skip over you, but if this is to that point, Steve.

MR. POLAND: Hi, everybody. Roger pretty much covered it, and I was just going to point out that was I was the chair of the Habitat and Ecosystem-Based Committee, and the role of the committee is to review recommendations relative to habitat and ecosystem-based management, and we set the priorities, or recommend the priorities, for the council on that type of work. Roger and I do communicate frequently about what's going on in the world of ecosystem modeling, and

certainly there is a desire among the committee to see how this progresses, and so the council will be very, very involved with this. I just wanted to put that out there.

DR. NESSLAGE: Great. Thank you, Steve. Anne. Sorry to have skipped over you.

MS. LANGE: No problem, and I was just responding to your question of where members stand, and I believe it's a good idea to have a standing working group, and, to Fred's point, if we can't have actual council members be members of the committee, maybe we can be sure to invite them, whoever they name from their committee, to any meetings with the group.

DR. NESSLAGE: That's a good suggestion. That way, if they have feedback, they can provide it at that time. Any other comments on workgroup recommendations? Roger.

MR. PUGLIESE: I just wanted to touch on the fact that, as we've been going through this process over a number of years, we actually had a broader ecosystem modeling workgroup that helped set the stage to focus in on the use of Ecopath and Ecosim, and there are some key people that have been involved in that process, that maybe they're not on the SSC, but they may be valuable, or former members of the SSC, like Marcel, and I'm not sure if he has enough time, but there is the opportunity to make sure that we don't lose connections with some of the other individuals, and it may even be useful to have some of the individuals that are providing say input parameters for Ecospace, such as a representative that's involved with ocean observing model activities. There is some really significant opportunities for benefits of having individuals be on the SSC to help guide the further refinement, as well as how you advance and operationalize this.

DR. NESSLAGE: Great. Thanks. As we move forward, we will keep all of these suggestions in mind. Any last comments from the SSC? If not, I am going to suggest that we take a quick break and reorient ourselves and be back to start promptly at 2:00, and we will attack the next agenda item, the ABC control rule amendment. When you get back, please raise your hand. Thank you, all.

(Whereupon, a recess was taken.)

DR. NESSLAGE: It's two o'clock. Again, I'm not sure we'll have Tracy, but, in the interest of time, I think we'll get started. First of all, thank you for your time and all of your energy dealing with the EwE agenda item. It's greatly appreciated, as is all the work of the working group and Yan and the modeling team. Thank you all very much.

Let's change gears not to another big, weighty item, Agenda Item Number 7, the Comprehensive ABC Control Rule Amendment. This is a very large topic, and staff has suggested that we break it down into sub-topics, kind of in the order that you see them here, and so Mike is going to present, as is -- We're going to have another little presentation inserted in there from Erik Williams as well on ORCS and risk analysis, and we'll go in that order, and then we'll probably -- It will be tomorrow morning by the time we get to phase-in and carryover, but it will go in that order. Please bring your attention to Attachments 3 through 21, and some are Excel spreadsheets, and some are documents.

The notetaking has been broken out into sub-topics, because this is such a big agenda item, and so, for ORCS, we have Jeff, Chris, Jared, Wilson, Yan, and Fred Serchuk. Just as a reminder,

when we get to risk analysis, we have Jie, Yan, Amy, George, Alexei, and Tracy. Then I will remind folks when we get to phase-in and carryover, and so I believe we're going to start with a presentation from Mike on what we're being asked to do, what we've said in the past, and then, specifically, start tackling ORCS. Is that correct, Mike?

DR. ERRIGO: Actually, I think we'll start with Erik's presentation, because, throughout the presentation, we use terminology of risk and uncertainty, and Erik's presentation addresses that, and so, I think if we start with that, it would make the most sense.

DR. NESSLAGE: Okay. Why don't we do that then? Erik, are you ready?

DR. WILLIAMS: I sure am.

DR. NESSLAGE: Fabulous. Why don't you take it away?

COMPREHENSIVE ABC CONTROL RULE AMENDMENT

DR. WILLIAMS: Thank you for inserting this effort at the last minute and allowing me a brief time to just sort of relay some ideas and concerns that the Southeast Science Center has, and so I'm speaking on behalf of the Science Center with this. We have had discussions about ABC control rules, and we just want to sort of emphasize certain things that need to be considered when sort of setting up an ABC control rule.

One of them is making sure that everybody recognizes the role of uncertainty in the ABC control rule, and so uncertainty -- If we draw our attention to the middle arrow there, and so, if you imagine a spectrum of increasing uncertainty that comes from our scientific advice, there are certain things that we expect to sort of follow that trend of increasing uncertainty, and so one of them would be model complexity, so that, as we go from simple models to complex models, assuming parsimony has been sort of kept in check along that spectrum, we would expect uncertainty to sort of decrease as you go from simpler models to more complex models, and that's just of a guiding property that we would hope would exist.

Another one is the data quality, so that, as we go from poor data to good data, in terms of information content, we would expect uncertainty to decrease. Now, I put data quality next to model complexity, and those aren't necessarily correlated, and so you could have a very simple model with very good data, and, likewise, you could even have a complex model, but it might have some poor data. In any event, I wanted to highlight those as separate.

The other concept, of course, as uncertainty increases, of course, variance increases, and we would expect that that property sort of maintain itself across this spectrum of model complexity and data quality, such that we may even have to impose minimum variance levels associated with either a model type or data quality type to maintain that.

The reason I bring that up is recognize that one of the issues we run into with simpler models is sometimes the variance is harder, or incomplete, to estimate, and so it may not be fully reflective of the total uncertainty, and so that variance may be biased low with very simple models, and so that's where something like the concept of a minimum variance level might need to be put in place

to ensure that we're maintaining this sort of spectrum and progression of uncertainty with various properties. Of course, with increasing uncertainty, you get -- We should expect to see an increasing buffer, with all the same, except for, with an increase in uncertainty, you would expect an increase in buffer.

The other concept I wanted to make sure, and I think most people are aware of this, but this is just to sort of reiterate that there is this division between science and management. Some people blur the lines, and some people draw a stark line, but there are things that clearly fall into the realm of the science part and the management part when it comes to an ABC control rule, and so, in that sense, the Science Center wants to reiterate that measuring and quantifying uncertainty is certainly in the realm of science, and that's where we estimate variances, and we come up with, ideally, probability density functions.

We can also develop metrics of risk, and so we can compute things like P^* or others that might be economics-based or sociology-based metrics of risk, but then the determination of what level of risk you're going to take, when you basically apply those metrics to your uncertainty estimates, that is clearly the management realm, and so we need to be careful about keeping those separated, but, of course, the problem is they both come together in an ABC control rule, and so this is why this should be an iterative back-and-forth process, and it should involve both the SSC and the council at the same time.

The other thing that the Center would like to sort of emphasize is that we try to seek some regional consistency, perhaps, with our ABC control rules, so that we take note of what our neighbors are doing in the Gulf Council, the Caribbean Council, and possibly even HMS, and so, to the degree that we can do that, that would be ideal, and I think that was it, and so I will be brief.

DR. NESSLAGE: Thank you, Erik. Any clarifying questions for Erik? Alexei.

DR. SHAROV: Erik, don't you think -- I was a little bit in disagreement with your last statement about the selection of risk level that belongs exclusively to the management, although it does, but the selection -- Wouldn't you agree that the selection of the risk level should be dependent on the consequences, and those consequences could be also quantified, to some degree, by the science, and the science can provide the analysis, and it informs a management strategy evaluation, and that would then help the management to define sort of the range of risk that they're willing to consider?

DR. WILLIAMS: I completely agree with you, Alexei, and I think that's not inconsistent with what I'm saying. What I'm saying is we shouldn't -- The science shouldn't be choosing what risk level that ultimately gets chosen for the management action, and so what I think you're describing is us analyzing the outcomes of various risk choices, which is fine for us to do as a science body, but then it is ultimately going to be the council that then decides which risk level they end up going with, and so I think that's the distinction that can still be drawn there.

DR. NESSLAGE: Thank you. Alexei, did that address your comment?

DR. SHAROV: Yes, and thank you. Drawing the parallel informs, as we talked many times just earlier, and the risk selection would be informed by the science. Thanks, Erik.

DR. NESSLAGE: Great clarification. Jie.

DR. CAO: Thanks. I just have a quick question about the minimum variance that you mentioned, Erik. Do you have an idea of the value of that minimum variance?

DR. WILLIAMS: I don't. Others have considered it, and there are papers on that. There's a paper by Ralston et al. that sort of suggests a minimum variance estimate to work with. I think the idea here is that could be constructed based on the points at which you do have what you consider complete variance estimates, and so let's say our data-rich, very-good-data scenario, and we get good variance estimates, and we can kind of look across-the-board at what levels of variance we're getting from that, and then we can then build off of that this assumption that we should see greater variance in the cases where we're not measuring it as well, necessarily, and that could establish sort of a minimum variance level, but, yes, and I say that lightly, but it is a complex thing to consider, and it may be tricky to actually sort of put a good structure in place, but there is some, I believe, and I think it's the Gulf ABC control rule might have this, or one of the other regions, and it may be the Mid-Atlantic, but they have considered this idea of a minimum variance level.

DR. CAO: Thanks, Erik, and I think I completely agree with you, because you have an assessment, and you get the asymptotic estimate from the assessment model, and it still likely underestimates the uncertainties, because, obviously, it's conditioned on a selected model, assumed parameters, and assigned weight to data, et cetera, and I like the idea that you have a minimum variance.

Also, I agree with you on the setting buffers is kind of a two-step process. I mean, it's basically calculated based on the log normal distribution centered on the overfishing level, and so the first step is basically setting the standard deviation of that log normal distribution, and that's purely scientific, but the percentile selected is sort of a management decision.

DR. WILLIAMS: Thanks, Jie.

DR. NESSLAGE: Good discussion. Anyone else? Dustin.

MR. ADDIS: I accidentally hit the button.

DR. NESSLAGE: Are there others with comments or questions for Erik? If not, then I believe, Mike, you're up next. Alexei with some last-minute hand-raising there.

DR. SHAROV: Thank you. I was thinking, Erik, that maybe the level of uncertainty is not necessarily one-directional, and that is assuming that, as you get a more complex model and more information, your uncertainty, presumably, is being reduced, but then, in some cases, you might have a very simple model, but, if the model is appropriately describing the population dynamics, the variability, both on the input data and the outputs and the variance in those estimates -- It possibly could be less, because of the number of compensatory factors that are sort of absorbing all those internal dynamics into the dynamics of the simpler parameters like biomass, the overall biomass, of the stock. It could be that -- Could it be that, with a simpler model, we might have less variability in the variance?

DR. WILLIAMS: I agree with you, Alexei, and maybe you didn't catch my caveat when I mentioned that one, and that was provided parsimony was being equally applied across that spectrum, and that's the catch I think you're getting to, and so you would -- If parsimony was being applied the same way across a spectrum of models, and there was increasing complexity, you would typically expect decreasing variance, but, like you said, there's a lot of other factors that come in, and so you would expect some differences there, and so we do have to allow for that to happen in sort of an ABC control rule setting, and I completely agree that you can end up with very well informed simple models that could have lower variance than a more complex model with some poor data, which is also why I separated the data from the model itself too, because it is both the quality of the data as well as the complexity of the model, so to speak.

DR. SHAROV: Right. Thanks for the reminder.

DR. NESSLAGE: Chris. If you're speaking, Chris, we can't hear you.

DR. COLLIER: He said he will pass for right now.

DR. NESSLAGE: All right. Well, hold your thoughts, and, once we get your audio fixed, you can share them. I am thinking, unless there is other burning questions or comments for Erik, we will move on with Mike's presentation then.

DR. ERRIGO: Okay. What we're going to do is I'm going to pass it to Mike Schmidtke, and he's the lead for the ABC control rule amendment, and he and I are co-leads, but he's going to take the reins here for the first part. Then I will jump in later.

DR. NESSLAGE: Great. Thank you.

DR. SCHMIDTKE: It's great to be back working with the South Atlantic Council and the SSC. Some of you may remember me, and I was a grad student that worked on tilefish for some of the DLM tool stuff that was mentioned yesterday, but I'm glad to be back now on the council staff and working with all of you. Today, I'll be going over the Comprehensive ABC Control Rule Amendment, and we'll go ahead and get started.

Erik kind of talked through these topics, and we wanted to just reiterate definitions that are going to be used throughout the course of the discussion today, and risk, when we mention that, that's denoting management risk, and that is the purview of the council. Also, uncertainty is being used in reference to scientific uncertainty of things like assessment results and projections, and that is the purview of the SSC.

One note to mention, before we get into all the discussions of the amendment, is that Attachment 16 is kind of the reference for that, and that is the most recent public draft, and there have been additional discussions that have occurred internally since then, and edits are still being made, and so that's just some reference, if there are some discussions that we reach today that are a bit redundant to some things that happened a while back in the past, and that's the reason why. We're using the most recent public draft, even if there has been some work since then.

The ABC control rule amendment, this whole process began -- At this point, given 2020, it feels like a lifetime ago in 2018, and it was developed to consider five general actions, first to modify

the ABC control rule to specify a process for risk tolerance, specifying probability of rebuilding, and then addressing phase-ins and carryovers. The changes that will be made through the amendment would impact the FMPs for coral, dolphin wahoo, golden crab, sargassum, and snapper grouper. The carryover and phase-in provision for coastal migratory pelagics are being addressed through a separate joint amendment with the Gulf Council.

Just a brief history of kind of the steps that we've gone through to this point, and so, in January of 2019, scoping was conducted for this amendment, and the council reviewed those comments in March of that year. Following that, you all reviewed the document to that point in April, and you provided some recommendations, as well as requested some additional information, which Mike E. has worked on, and we have some of that for you today.

After this point, the document was put on hold, because the council was made aware of guidance that was coming out from NMFS on carryovers and phase-ins, and so, in July of 2020, we received that guidance. That was released, and that is Attachment 20 in your briefing book, and we'll be referencing that later on in the discussion, and, in September of this year, the council gave the direction for staff to resume developing this amendment, and so now we're back here, and kind of the purpose of today's discussion is for you all to review the recommendations that were made a little bit over a year ago and to view the requested additional information, as well as the NMFS guidance to see if you would like to maintain those recommendations, expand upon those, alter those, however you would like to provide those to the council as this amendment continues to move forward. Here, I'm going to pass to Mike E., and Mike E. is going to talk through the current ABC control rule.

DR. ERRIGO: Our current control rule is based on assessment categories, and it's organized into levels, and so there is the stocks that are assessed using age, length, or biomass-based models, and that's the top rung, that's the top level, and that's the ones where we have the P* dimensions, where we go through -- There are five dimensions we go through, or the four dimensions that we go through, and we categorize that, yes, that's a Tier 1, that's a Tier 2, that's a Tier 3, and the PSA score is in there and things like that.

The rest of the levels are for unassessed stocks, but at different levels of information, and so we've got unassessed stocks where we have reliable landings and life history information, and we would use the DBSRA, and we have Level 3 is the unassessed stocks, where we it's data deficit for DBSRA, but we can use the DCAC methodology. Then, of course, some of our FMPs, but not all of them, and specifically dolphin wahoo doesn't have it, but most of the other ones have Level 4, which is ORCS, only reliable catch stocks, and then there is Level 5, which is we don't even have reliable catch, and we use a decision tree approach to try and get at the ABC.

One of the biggest issues with the current control rule -- Well, there are two. One is it was inflexible, and you couldn't add new methods in there, and it was very prescriptive, and so, when the DLM Toolkit came out, we weren't sure how we would be able to use that, let's say, to get an ABC, based on our current control rule. The other one was that it mixed scientific uncertainty and management risk in the P* analysis, and the SSC wasn't very comfortable with that, and so they wanted to try to separate that out. That's the current ABC control rule, in a nutshell.

DR. SCHMIDTKE: Thanks, Mike. Now were going to be moving into the process of reviewing and discussing the proposed actions and alternatives, and this slide is just showing kind of a format

that we can use to go about this process, and so we'll go through the actions one-by-one, and there are five in total, and, first, I will provide a summary of the proposed action and the alternatives, and then I'll talk through the SSC recommendations to this point, and all of the SSC recommendations on the screen are going to be shown in italics, just so that you all can distinguish what you've said from what's being proposed in the document.

Then, if there's any additional information that has come out since that April 2019 meeting, that will be presented, and some of that will be additional information on ORCS or some of the requested examples, as well as the NMFS guidance on phase-ins and carryovers, and then, finally, we'll pause for you all to discuss whether you want to make any additions or changes to the recommendations that have been made to this point, specifically for that action that's being brought up at that time.

First, I will go into Action 1, and Action 1 is to modify the acceptable biological catch control rules, and the alternative, the first alternative, as will be for all of the actions in this document, is kind of a status-quo option, and so this would maintain the ABC control rules for dolphin wahoo, golden crab, sargassum, and snapper grouper. One thing to note here is that there is no control rule that is applied in the Coral FMP, and so, under Alternative 1, that would still remain the case. Under the other alternatives, 2 and 3, coral would then have a control rule that would be applicable for that FMP.

The control rules for these FMPs are shown in Tables 2.1 and 2.2 of Attachment 16. 2.1 describes the dolphin wahoo, golden crab, and sargassum ABC control rule. The snapper grouper control rule is a little bit different, as it already has an ORCS tier incorporated, and that's shown in Table 2.2. Alternative 2 would categorize assessed stocks based on information that is used to evaluate and characterize assessment uncertainty, and this would remove the tiers language that is used in Alternative 1 and replace it with four categories.

Categories 1 through 3 would use P^* to determine ABC from assessment information, while Category 4 would use kind of the decision tree and expert judgment methodology to determine an OFL and an ABC. Table 3, which is on page 12 of Attachment 16, describes this category method, showing the criteria for each category as well as its methodology for determining ABC. There is also a description of a P^* example that is on page 13 for you all to reference.

Alternative 3 would be essentially the current control rule plus ORCS being applied to all FMPs, and so the snapper grouper control rule would be applied towards the other FMPs as well, and it would also add in a control rule for that Coral FMP that does not currently have one. One other kind of distinguishing factor for Alternative 3 is that it would seek to divide the adjustment factors into kind of what we talked about, the uncertainty considerations, which are addressed by the SSC, and the risk tolerance considerations that are addressed by the council.

Current SSC recommendations are, first of all, to remove stock status from the ABC control rule, as well as remove the PSA, the productivity and susceptibility analysis, score from the uncertainty evaluation. The SSC and council seem to be pretty well in line, in the sense that stock status and PSA analysis can be used in determining management's acceptable risk of overfishing, but not as much in the ABC control rule, in the portions where it's trying to address uncertainty.

The SSC has expressed support for Alternative 2, and the SSC also recommends not including ecosystem component stocks in the ABC control rule provisions. As a reminder, those stocks, ecosystem component stocks, are the ones that have been determined to not be in need of conservation and management. Thus, they are not subject to the full suite of management requirements, such as ACLs, but information from those species is used in management for others. Typically, those species are not heavily targeted, or harvested, and they don't have significant management concerns.

The SSC currently does not support an ABC control rule based on data or assessment types, and so the type of model being used, or the type of data, isn't necessarily the determining factor within the control rule, and that's something that the SSC doesn't support, but, instead, the SSC did express support for using uncertainty that is coming out of assessments, and that's something that Erik touched on in his presentation earlier.

The SSC does support allowing constant three to five-year ABC recommendations, and the SSC recommends addressing the circumstances, rules, and guidelines for ABC remands. Remands are when the council sends an ABC recommendation that they have received from the SSC back to you all for reconsideration or clarification. I think this is a place where we'll move to the new information, and I'm going to pass it over to Mike E., and he can talk through the ORCS approach.

DR. ERRIGO: Okay. We may want to actually take questions on that previous section, because I am going to jump into ORCS, which follows along with this section, and it's part of the ABC control rule, which is what we're talking about, but, if anyone has any questions or comments about what we've just discussed or the SSC recommendations to this point, we may want to take those now.

DR. NESSLAGE: I think that's a great idea, Mike. We'll need the hands-raised thing though, because I can't see. This would be clarifying questions about what we're doing and what we have said about this in the past. With regard to what will be going forward, we can discuss that as the agenda item progresses. Any questions about why we're here and what we're doing or what we've said in the past, especially the new folks, if you have questions about previous recommendations. I am not seeing any hands. You did a great job presenting, Mike and Mike, but thank you for stopping and asking.

DR. ERRIGO: No problem. I'm going to talk a little bit about the ORCS approach, because the SSC has expressed some concerns, and they had some concerns about how we've been applying ORCS, and they wanted to talk a little bit more about it, and so I decided -- We decided to address that here, at this meeting, and so there are -- Let's start with the basics.

There are four components of the ORCS approach. Those include the catch statistics, the uncertainty scalar, the risk of overexploitation, and the risk scaler. The catch statistics is probably the one that the SSC has been having the most concerns about, and that's -- You use the catch statistics, along with the uncertainty scalar, which scales the catch statistic to get what the ORCS method calls the OFL, but which this SSC decided would not be an OFL, because there really isn't enough information to determine the OFL for these species.

It's from that value, the OFL, or what the ORCS methodology called the OFL, is what you would derive the ABC from, and what you use to derive the ABC from is the risk of overexploitation

category and the risk scalar, and those -- The risk overexploitation was assigned on a stock-by-stock basis, through a series of workshops done with the SSC and the council and AP members, and the risk scalar is a council decision, and so the SSC made recommendations about how they think the risk scalar should look, but, ultimately, the council went through and decided what the risk scalar is going to be for this risk category, and here is what the risk scalar is going to be for this risk category, and then you apply that risk scalar to that value that used to be called OFL to get the ABC.

There was a long process that went on to develop the catch statistic, and they looked at all the different kinds of statistics, like the median and the average and things like that, but they felt that the median, or the average, was too restrictive for these stocks, which didn't really have -- Most of the stocks they were looking are unassessed species, and they're rare encounters, and they are typically bycatch species, and they didn't have any issues associated with them, and so they felt that setting the catch statistic at the median was too restrictive, and they would be cutting the catches, or the landings, down, when they didn't really need to restrict landings for these species.

These species tend to have a high uncertainty in their catch, and so there's a lot of variability from year to year, but there really weren't any trends, and so the SSC eventually, after a lot of deliberations, settled on the maximum catch during the time period for ORCS, which was 1986 to 2007.

They wanted to allow landings to be able to fluctuate within the uncertainty bounds without triggering management action, which is why they settled on the max catch in that time period, and then, after that, they applied the uncertainty scalar to the catch statistic, and that ranges between one and two, depending on the risk category, and so you take the max catch and you scale up to get the statistic from which you get the ABC, and then you scale down from that to get the ABC. That is ORCS, in a nutshell, and then I wanted to bring up the Excel spreadsheet and go through that with you all, so that you understand exactly what it's showing and what information you can glean from that. Does anyone have any questions about how ORCS works?

DR. NESSLAGE: Mike, I do have a question, myself. So this is the standard ORCS approach. Are we able to consider or discuss the refined ORCS approach from the Free et al. paper? Is that even an option, or is everything on the table at this point?

DR. ERRIGO: You guys can have everything on the table at this point. If you want to change something, or modify something in a certain way, you can suggest that, recommend that, and then it can go into this ABC control rule, which is why we're discussing it under this, so that it will modify the ORCS approach to be however it is you think that you would like it to be. I don't think I am familiar with this modified ORCS approach.

DR. NESSLAGE: There have been a couple of other papers since the Carruthers paper, which is mentioned in our overview and our action items, and so I was just curious if -- Even with regard to Alternative -- I am forgetting the numbers, but I think it's 3, or even within Alternative 2. If we bring in ORCS, does it have to be the same old original ORCS, or can we -- It sounds like we can make whatever recommendation we would like.

DR. ERRIGO: That's correct. You can make a different recommendation, which is why we're going over this now, and so let's say you just wanted to change the catch statistic for ORCS. You

can do that, or let's say you wanted to change more about ORCS, and you can do that, but what I described was this council's, this SSC's, ORCS approach with the maximum catch as the catch statistic, and that's not always the case. You choose a catch statistic, and you choose your uncertainty scalars, and you assign the risk of overexploitation categories, and those are all part of the base ORCS methods.

DR. NESSLAGE: Right. Thank you for clarifying. Continue, please, because I don't see any other hands raised, and so please continue.

DR. ERRIGO: What these graphs are showing are landings trends, and then the lines are the ABC values, because ABC equals ACL for all of these species, and so they're one and the same, and most of them -- If you see a change like this, it means they did have their ABC using the decision tree in these years, and then it switched to ORCS, when ORCS came into play, when we finally figured out how that would all run in this year here. 2014 to 2015 was the first year that we used ORCS.

In order to figure out how ORCS is working, I did a few calculations here, and I took some averages, and then what you will see is something like recent/ORCS, and that's the most recent ORCS years, and so these years here, 2015, 2016, and 2017, divided by the -- It's the average of those years divided by the average of the ORCS years, and it's 1999 to 2007 are the ORCS years, and so it's the average landings of the ORCS years compared to the average landings of the most recent years, to see how we're doing, how the ORCS method is doing, and so, for Atlantic spadefish, you can see that they've only been around half of the landings from the ORCS period, and so there haven't been any issues with going over the catch statistic. Bar jack is similar, where you will see it's about one, close to one, and so the landings in the recent years are similar to the landings from 1999 to 2007, and so that's what that means.

You can also look at the decision tree, and so look at how that was performing, if you wanted to, and so the landings for the three years that you have the decision tree in place, that average divided by the average of the 1999 to 2007, and it's the same years. For bar jack, it's 0.34, and so they're much lower, but you can see that bar jack is pretty low, and then it's got these bumps, and so that's why the SSC wanted to set the catch statistic high and have the ABCs up here, so that this variance, this natural variance, in the landings, which is probably sampling error, or noise, wouldn't trigger management action. That is what this is showing.

You will see that there are some stocks where there are issues, and these are the jacks. You will see that almaco jack has been trending upward, and it's been going over its ABC. Here is almaco, and so you'll see, for almaco jack, it's not such a pretty picture, but there's a difference in almaco jack. For some reason, in almaco jack, it looks like they started targeting almaco jack, and the landings started to trend upwards quite steeply, more so in the recent years even than back here. You will see there is a pretty steep increase, and so it seems that we may want to reevaluate the ABC for almaco jack, although almaco jack uses the decision tree, because it doesn't have reliable catch time series, but, even if it did use ORCS, I think it would suffer from the same issues, where, with this increasing trend like this, it would -- You would see the same issue.

For most of these stocks, which are incidental catches, for the most part, you will notice that the ORCS years -- The recent years to the ORCS years, the ratio, it's one, or less than one, for most of them. That's all that I had to show you guys. If you have any questions, clarifying questions,

or if you need me to explain something better, or anything like that, I would be more than happy to go over anything with you.

DR. NESSLAGE: Okay, and so let's start with any clarifying questions for Mike about his presentation, and then we'll get into the questions we've been asked to address and any other suggestions we have, and so let's start with Fred Serchuk.

DR. SERCHUK: Thank you. Because, Mike, you indicated that virtually all the species that we've talked about here are incidental catches, why don't we just consider them ecosystem components? I say this because, in this current case, where you talk about, well, gee whiz, it looks like there's a directed fishery going on, because it exceeded the ORCS level, there are only two choices now. Either you need to restrict the fishery or now you ought to consider it in a different vein. I am not really quite sure why we even have the ORCS system for these incidental species when, quite frankly, they have so little information that they might as well be considered ecosystem components. Thank you.

DR. ERRIGO: That is a good question, and it's complicated to get something put into an ecosystem component species, and we're actually looking at that for several of these stocks right now, but there is a list of criteria that allows for ecosystem component species, and you have to make sure that things fit the criteria before they can be designated as ecosystem components. Not all of these make the cut, but, if there are some that you feel should be, we can certainly make that recommendation to the council, and, in fact, there are a bunch of them that we're looking at now, based on SSC recommendations.

DR. NESSLAGE: Thank you. Chris.

DR. DUMAS: I don't have a lot of familiarity, exactly, with how the whole ORCS process has happened over time, but, from what you just said -- So ORCS are species which we only have reliable catch data, and the goal of the ORCS process is to set an ABC, right, but, if we only have reliable catch data, then, if there are changes in catch, we have no idea how that's happening, right, and we don't know if just the species population is doing better and growing or if there's more effort. I mean, we just don't know.

I don't really get what we're trying to do with this ORCS process and what we're basing it on. If all we have is catch trend data, then we can try to estimate the mean or the median of the catch, as part of the distribution of the catch, or we could Bayesian update the distribution of the catch, but are you trying to prevent the ABC -- So prevent the catch from going above a certain level, but, if so, based on what, if we don't have any life history information or population size estimates, or I guess we don't have a population model either, right, for --

DR. ERRIGO: No, and that's true that we don't.

DR. DUMAS: So I'm missing the overall goal here. I'm missing why we're doing this. Thanks.

DR. ERRIGO: For ORCS, one of the key components of what makes it work is this risk of overexploitation, and so it all has to do with risk. The higher the risk of a certain species is to overexploitation, the more conservative you are with your estimate of ABC. The estimate, in the end, is made based on the catch series, because that's all you have. That comes from the catch

statistic, which the SSC settles on, and the uncertainty scalar, and so that's based on the uncertainty in your catch data, and so you scale up based on the amount of uncertainty in your catch, which there is quite a bit for these species.

How much you scale up also depends on your risk, and so, if there's high amounts of risk, you don't scale up from the catch statistic very much, and you scale down a lot more to your ABC. That's how that works, but it's based on just levels of risk, and the risk of overexploitation comes from a large list of fishery characteristics, biological characteristics, and things of that nature, and expert judgement.

DR. NESSLAGE: If I may add to that, Mike, I think part of the concern as well is that, and I think we'll get into this in our discussions, that some of the recent simulation studies have shown this doesn't perform well in many circumstances, and so we need to evaluate whether or not this is an approach that we still want to consider in our suite of tools, right, and am I correct in that characterization, Mike?

DR. ERRIGO: Yes, and there have been papers that show that it doesn't perform well, but I think that the simulations that they are running are -- The assumptions that they're making is that it's a stock with a fishery on it. That's why I calculated the ratio of current catches to the historical catches from the time period of 1999 to 2007, to see if there's any difference, if there's a trend, to show if this methodology would be -- If the catch is trending, which it doesn't for most species.

DR. NESSLAGE: Right, and so we may need to select which sets of species we apply ORCS to, if we keep it in our suite, correct?

DR. ERRIGO: Yes.

DR. NESSLAGE: Okay. There we go. Hopefully that helps, too. Scott.

DR. CROSSON: As one of the people on the SSC that was here when we originally started developing these things over a decade ago, and that's a scary thought, but we learned a lot of these things the hard way, and the ABC control rule developed very much from the bottom up, and sometimes we found out things like why don't you just apply the median catch for something, and, well, then half the catch record is then classified as being over that fishing limit, and so you automatically end up scaling down pretty dramatically without justification that the fishery might actually be in some kind of biological trouble.

The question about what are potential ecosystem species, I don't know the legality of that, but we did go through this process with all of these different tabs when we had the ABC Working Group go through this, a year or two ago, and we spent a lot of time on this, and I think the full SSC signed-off on some of it, and so that documentation is there, and so, if the council wants to move some of these species over to that part of management, then that's going to be, I think, up to the council and the council staff to schedule something along those lines.

My understanding of the reason why these things were in the originally is because they were put in there long before ABCs were ever a concept, back in the 1980s, when things were put into the FMPs, because why not, but, now that we have had to deal with these changes in management since the last revision, or the last major revision, in Magnuson, and there's all kinds of policy

implications that weren't there before, and so, if there are big changes that we do to the ABC control rule, I'm not against that, but I'm just trying to put the perspective in as somebody that watched this thing develop.

It's that there probably are more sensible ways that we could do a lot of these things, and, if there are studies that show that this is not -- At least show that this is a potentially risky course of action, to be doing ORCS or some of the other methodologies that we've been doing, I'm all ears for it, but there's a reason that some of these things developed the way they did.

DR. NESSLAGE: Thank you. We really appreciate the historical perspective. I shouldn't call it "historical", and that makes it sound really old, but we appreciate the perspective. Please chime in, those of you who were involved in that, as we go through these discussions. George, were you involved in those?

DR. SEDBERRY: I was involved in that, and the reason that I raised my hand was getting back to Fred's question, and Scott and Mike kind of addressed it, that we did look at some of these complexes, like the jacks complex and the grunts complex, and I believe it was a year ago, and we assigned some of the species that were in those -- We suggested that they become ecosystem component species, and some of them we suggested that they undergo SEDAR assessments, and that was presented to the council at their December 2019 meeting, and I believe, as Mike said, the council is reviewing those recommendations from the SSC regarding ecosystem component species that we made a year ago, and, if there's additional species that we want to recommend, we can do it, but so, Fred, we are addressing that as we go along. Thanks.

DR. NESSLAGE: Great. Thank you, George. Shep.

DR. SERCHUK: Thanks, George.

MR. GRIMES: Thank you, Madam Chair. I just wanted to follow-up on what Scott said, or kind of respond, and he said he had a question of the legalities of the ecosystem component species, but I think he did a great job of basically summarizing, or encapsulating, what those are, and, ultimately, it's a decision of whether or not the species is in need of conservation and management, and that's ultimately -- That is a management or policy decision, based on the factors that are outlined in the regs, and it's not in the National Standard Guidelines themselves, but it's sort of an introductory section to it.

That is a council decision, and the SSC is free to make recommendations, and certainly the council would consider those, but I think, ultimately, it's firmly a management decision, and my sort of historical perspective on all of this, if you call it that, watching ORCS develop was -- As Scott mentioned, that was a bottom-up thing, and, for all of these stocks, that previously had been managed stocks, but they had never -- We didn't know a lot about exploitation, and I think we generally viewed that they weren't heavily exploited, and they weren't the high-profile things that had ever been assessed, and so we went with the information that we had, and, since they were going to remain managed species, we needed some catch limit that prevented overfishing, and ORCS was developed to do that, and it seems to me that the question now is whether the ORCS actually -- Whether it effectively prevents overfishing and whether it should remain a viable approach in your ABC control rule. Thank you.

DR. NESSLAGE: Thank you. Are there other comments or questions for Mike, based on what he has presented so far? Chris.

DR. DUMAS: For the example that Mike has on his Excel spreadsheet there, we see that maybe there's a trend there in the landings, and so -- The trend seems to be up, and so, in recent years, it's between 100,000 and 600,000 pounds. If the biomass out there is ten-billion pounds, then I'm not really concerned about that trend, but, if the biomass out there is 800,000 pounds, well then I'm super concerned about that trend, because it's about to go extinct. I mean, I think just looking at the trend in the landings isn't telling you anything, if that's all you know, and it's not telling you anything about how needy that species is for catch control, for control of the catch, if you don't have any other information about what's going on.

Now, my understanding is these species were put into risk categories or something, based on knowledge of, I don't know, but their general role in the ecosystem and expert judgement and stuff, and that's fine, and that's great, but how -- That's the information, really, that's driving whether or not you put in a control rule and not really the catch. I mean, just looking at a catch trend, whether it's mean or it's median or it's variance or anything like that, I really don't think it's telling you anything, if you don't have any other information about the stock size or any biological model or anything else, and so do other people feel the same way, or am I missing something? Am I totally missing something? I might be. Thanks.

DR. ERRIGO: Chris, I think you're right. Basically, all the catch is doing in ORCS is scaling your ABC, and that's it. It's the risk that's telling you that we've got to be careful with this stock, because, if we make this decision, or that decision, or we set this too high, it could be overexploited, or, gee, this stocks seems to be really productive, and we don't have to be as careful, and so that's the one that is gauging how well the stock could do. All the catch is doing is giving us a number to scale.

DR. DUMAS: But how do you know the risk, if you don't know anything else about the species other than the catch?

DR. ERRIGO: That risk overexploitation comes from, like you had said, the biological characteristics and characteristics of the fishery, but it's not -- I am not saying that that's perfect and everything works. You're right that these are extremely data poor, and we don't have abundance estimates, and we don't have -- We actually happen to have a CPUE index here for almaco jack, which is kind of broken up, because, from year to year, sometimes they don't get enough samples, but that's one of the only species that we have it for in this suite of species.

DR. NESSLAGE: Which I think you've both made good points. I'm wondering if we could -- Both of those points address the second bullet under our action items for ORCS, and so I'm wondering if we could start pulling up and capturing some of these good thoughts and comments on that second open bullet under ORCS, because it's asking about is there any evidence that stocks managed by ABCs based on ORCS have experienced overfishing, become overfished, or are declining in some fashion, and I think making the point that, for those stocks for which we only have landings trends, they aren't informative about population trends, and so might not be able to answer this question well, I think is what Chris is saying, and would that be an accurate characterization of your concern, Chris?

DR. DUMAS: Yes, and, if your concern is overexploiting the population, then landings trends, with no other information, isn't telling you whether or not you're overexploiting the population, it seems to me.

DR. NESSLAGE: Right, and I want to also capture, if we could, if folks are comfortable, Mike's comment that we do have the one complex for which we do have -- Was it almaco? I forget.

DR. ERRIGO: It was almaco, and there are a couple of other ones. I think white grunt has an index.

DR. NESSLAGE: Maybe we can fill that in later, but say there are some exceptions, and then put in parentheses, but stocks with only landings trends have no -- We can make more detailed comments as we examine this. I just want to capture your ideas. Anne.

MS. LANGE: Thank you, Chair. Back when these were first set up, the original ABCs for the stocks with no real data, aside from catch data, the original ABCs were looked at based on a period of time when each individual stock was considered to be stable, and there were no indications of an increase in fishing, and there had been no indications of a depletion in a particular stock, and so a series of years where it was felt, by expert opinion, that the stocks were healthy, and they weren't being impacted, and the average of those years for the landings could be used as a reasonable preemptive quota, basically, or preemptive level, and that's where the original numbers came from.

After that, we were looking at trying to do something a little more technical, a little more calculable, and so the ORCS group got together to try to add risk analyses and that type of thing, but the baseline was set up based on a period of time when the stocks were fished at a low level, and they seemed to be doing okay. There were no indications that whatever level of fishing was occurring on them during that time period had resulted in a decline in the stock, and so that's just a little background on the baseline for those ABCs.

DR. ERRIGO: Thank you, Anne. That was an important detail that I did not mention.

DR. NESSLAGE: Thank you, Anne. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I'm glad you put in your intervention here, in terms of -- You used the word "landings", because it's not only that we have reliable catch, and we don't have reliable catch. We only have reliable landings data, and so we don't even know what's being discarded, in case they are caught and not brought to port, and so it's a misnomer to call it catch, and the "C" is ORCS is a misnomer, in the cases we're talking about.

DR. NESSLAGE: Good point, Fred.

DR. SERCHUK: Moreover, have there been any cases in the South Atlantic where it was decided that there were signs of overexploitation or signs that the stock was being -- That the catches were being too high, relative to the health of a stock, for any of these stocks under ORCS?

DR. ERRIGO: There was scamp, and we did not use ORCS though. We used a different approach. At first, we used the median landings, and then, the last time we looked at scamp, we used a

different approach, but that was the one where we felt there was overexploitation or that there was a disconcerting trend, and that being ABC needed to be restrictive. There was also a stock, blueline tilefish, at the time, where we were told that the fishery was expanding, and that's why the catches went up, and we used different statistics in order to allow an increase in them.

DR. NESSLAGE: Chip.

DR. COLLIER: Just to build on that, I believe hogfish, prior to it being assessed, was another species where they used a more conservative value than what had come out of ORCS, due to concerns from fishermen stating that the population was not doing well.

DR. NESSLAGE: I wonder if we want to capture some of that history under that second bullet, and I believe that's part of what the question is getting at. Do we have any reason to worry about applying ORCS, based on historical performance? Is that correct, Mike? Something like as was shown for scamp or hogfish or something in the examples of scamp and hogfish. You said scamp wasn't -- Which one wasn't ORCS, and one was maybe third-highest or something like that?

DR. ERRIGO: Scamp was originally done before ORCS was put into place, but, during the most recent go-round, instead of putting it back into ORCS, we used a different methodology, because we felt that it needed to have a restrictive, more restrictive, ABC.

DR. NESSLAGE: Right. Okay. Thanks. Scott.

DR. CROSSON: I guess I would add to it, and, again, not being a biologist, but the stocks that are in here that are known to be -- Some of the groupers and some of the species that are -- What is the word? Is it anadromous, where they change sex, and they're more susceptible to barotrauma, so that the bycatch mortality is somewhat risky, or any of those species in this complex make me worried, and I'm looking at something like black grouper and looking at the trend line and wondering what's going on there, and I don't have any additional information, but that's something that concerns me.

Then there are species in here that we tried to assess and failed, like gray triggerfish, and that's something that we knew that there were pressures on when some of the other fisheries that were co-caught with that species were being shut down, because of going over their ACLs, and so there are a number of species in here that I think we probably would be concerned about, and I would certainly like to know a lot more about some of these things, but I just don't.

DR. NESSLAGE: Right. Would you like to add, to that second bullet, if a stock has a concerning trend or life history --

DR. CROSSON: Exactly, and I'm not worried about mahi.

DR. NESSLAGE: Fishery history or something like that.

DR. CROSSON: I'm not usually worried about something that's pelagic and that has a short life history, like mahi, and there are some questions about localized depletion with the mahi-mahi right now, and that might be a regulatory concern, but I'm not worried about the species being overexploited at the biological level. A species that has a life history that makes them susceptible,

that are longer-lived, that suffer barotrauma, and that raises discard mortality, and that have other life characteristics that make them particularly susceptible to being exploited do concern me.

DR. NESSLAGE: Can we add life history there, Mike? I am not seeing any other hands at the moment, and I want to make sure, before we get too far, and I hate to open a can of worms, but, while we're on this, part of the presentation was about the alternatives for Action 1, modifying the ABC control rules. In the past, we supported Alternative 2, which gives us a lot of flexibility, and so, as I understand it, and correct me if I'm wrong, Mike, if we want to apply ORCS, and we don't have any concerns applying ORCS, we could, correct, but, if we want to apply a different method, based on expert judgement, we could, and is that -- Am I reading that correctly? That would be Slide 8.

DR. ERRIGO: I believe that's correct, because what's happening is, instead of basing it on we have landings, and we don't really have enough for a DCAC, and so we have to use ORCS, you are basing it on uncertainty. We have this level of uncertainty, and we can use this method or this method or this method to get the ABC, and so, yes, you're not limited to we have to use a particular methodology or not, and that was the whole point of that alternative, was not to tie the SSC's hands, like what has happened now. You either have to use the DBSRA, the DCAC, the ORCS, or the decision tree, or it's got to be assessed using a data-rich assessment model.

DR. NESSLAGE: Right. So I guess what I would like to make sure, given we have new members, and maybe people have changed their minds, but I would like to just take people's temperature on if we still support Alternative 2. It sounds like we would, but I just want to put it on the record. Does anyone not support Alternative 2?

Alternative 3 was on the second slide, and that's where it would be -- Everything is the same as it currently is, but we would add ORCS, and so that's the only difference there. Alternative 1 is status quo, and so, if anyone has any concerns and would like us to consider one of the other alternatives, please raise your hand now. I want to make sure we're on the same page, before we get too far down the rabbit hole. Shep.

MR. GRIMES: Thank you, Madam Chair. I don't have any concerns, but I just wanted to throw this out, based on some of the discussion that I just heard. The National Standard Guidelines that create the requirement that every FMP have an ABC control rule talk about that -- The guidelines state that SSCs can deviate from the control rule in making ABC recommendations, but that is not explicitly built into your control rule, and I believe it's built into things like Gulf reef fish and some other control rules that I've worked on, but it's not in the South Atlantic, or at least not in the snapper grouper ABC control rule, and I don't think it's in any of the others either.

I would suggest that it be something that is good to work into the control rule, and I know this SSC has done it, once you've got through your control rule and you didn't like any of the options, and I think, or I believe anyway, that we've relied upon those provisions in the guidelines to support making a different recommendation, but, to me, it would be a good idea to have it in your control rule itself, as well as the guidelines, and that might be something that the SSC might want to recommend. I will make my pitch to the council, when they are making the decision on the control rule, whether this is something they want to add, but, anyway, you might want to add your input on it. Thank you.

DR. NESSLAGE: Shep, when you're saying add, you mean add ORCS specifically to Category 4?

MR. GRIMES: What I was thinking is, regardless of which alternative you would do, you would add language to the control rule, and you could walk through those tiers or categories, or whatever you want to call them, and, if you get to the end, and you don't like where you've ended up, the SSC could develop something else, as long as it articulated the rationale for it and you developed a record and explained what it was doing, and that would allow -- Arguably, that allows us to have the maximum amount of flexibility in the ABC control rule, so that the SSC can make different recommendations, based on data availability or whatever else you want to rely upon.

DR. NESSLAGE: All right, and so the current wording for -- Category 3, I believe, is where it starts to derail to the more -- I am looking at Attachment 16, PDF page 11, which is also the actual page, it looks like, and that convenient, under Alternative 2. Then you go down to the Category 1, and you've got -- You're doing your P* decision tree, and that's all great, and then you --

DR. ERRIGO: I think that's what Shep was talking about.

DR. NESSLAGE: That's already in there though, isn't it?

MR. GRIMES: Actually, if I can, I think, in Alternative 2 there, that, yes, in that -- In Category 4, I would say it certainly arguably encompasses that, because it's based on -- The OFL and ABC are based on expert judgement of the SSC, and so, as long as you explained it, I would read that as essentially making it up and justifying how you did it, which is a variation of those other approaches, I guess.

DR. SCHMIDTKE: There is also direct language addressing that in Alternative 2 within the text on page 5, and it says the SSC may deviate from the ABC control rule, when necessary, due to data or assessment circumstances and so on and so forth, and so there is language in there already for Alternative 2 that encompasses that ability to deviate.

DR. NESSLAGE: Good, and I think that's what Shep was hoping we would make sure is in that. Is that correct, Shep?

MR. GRIMES: Correct, in 2, and I would say, in 3, whatever the preferred alternative ends up being, we'll want it in there, but it seems to me to be applicable across all the alternatives. Thank you.

DR. NESSLAGE: Good. We like the flexibility. Going back to my big question of the SSC, I am not seeing any hands raised, and so I'm going to assume that everyone is still supportive of Alternative 2, just as a base for our discussion. Are there any hands raised from the SSC? Excellent. Okay. I just wanted to make sure, because that would change things. Amy.

DR. SCHUELLER: To get a little clarification, the Table 3 on page 12 of that A16, is that -- That's Alternative 2, but I'm guessing -- Alternative 2 has Option 1 and Option 2, and are we going to talk about that, because those are slightly different, the way I'm interpreting them, and, the Table 3, what does that go with?

DR. NESSLAGE: Staff?

DR. SCHMIDTKE: Table 3 does go with Alternative 2, and there can be discussion of Options 1 and 2 under Alternative 2 as well. I believe -- Option 1 -- It doesn't look like those options, Options 1 and 2 -- They're not exclusionary of one another. They could both be included, but Option 1 would address that possibility of an OFL distribution not being able to be derived, and then Option 2 is kind of a separate discussion, looking more at the timeframe.

DR. NESSLAGE: That's about whether it's constant across years, the ABC, correct? The multiyear ABCs, instead of changing annual ABCs?

DR. SCHMIDTKE: Yes.

DR. NESSLAGE: So that's a different issue, and Option 1 -- I agree, and I'm confused about Option 1, now that Amy has highlighted it.

DR. SCHUELLER: Can I -- It looks like Table 3 goes with Option 1, but I'm not really sure if I understand what the clear end result would be, depending on what gets picked, and I guess I'm okay with Alternative 2, but are we going to discuss -- In particular, I'm not sure that I am totally happy with Category 4 in Table 3, and so I don't know if that's something to be discussed further later, but I wanted to throw that out.

If you scroll down on Table 3 -- I get that Alternative 2 says Category 4, and it has this sort of blank statement of the SSC can use a lot of judgement, but then, in this table, there's a decision tree, and there is ORCS, and there's a bunch of different things in here, and it's unclear to me -- I don't know, and I don't want to be forced into this decision tree, because I don't agree with the decision tree, and so, if that's where we're at, and it tells you to go to ORCS or go to this, I am -- I don't know, and it would be nice to have some clarification about that, please.

DR. NESSLAGE: Staff, is the council asking then for comments on all of this, or are we just --

DR. ERRIGO: You have the option to comment on all of this, yes.

DR. NESSLAGE: Okay.

DR. ERRIGO: Let me just say that Category 4 allows you to use any of these options, and it does not say that you have to use the decision tree. It does not say that you have to use ORCS. These are techniques that may be considered by the SSC, but are not limited to.

DR. NESSLAGE: Amy, does that help make you feel better about it, or do you still have other outstanding concerns?

DR. SCHUELLER: Sure. That does help.

DR. NESSLAGE: Okay. We can come back to that, but I just wanted to -- Because, if you do have any other heartburn, let's return to that, but, Fred Serchuk, let's hear from you.

DR. SERCHUK: I have the same concerns that Amy does with the Category 4 of no acceptable -
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DR. NESSLAGE: We lost you, Fred. Is he still on?

DR. COLLIER: It is showing he's still on, but it looks like --

DR. SERCHUK: I'm here.

DR. NESSLAGE: You're going to have to repeat yourself, Fred. We missed everything.

DR. COLLIER: Hold on. He's coming back, and I will have to unmute him. Go ahead, Fred.

DR. NESSLAGE: While we're trying to get Fred back online, let's hear from John Carmichael, if we could. Did we lose John as well, or is he muted?

DR. COLLIER: John is unmuted, and it's showing that he has unmuted himself.

DR. NESSLAGE: We are not hearing you, John. I wonder what's going on. Well, while we're waiting for Fred and John to come back online -- When they do, hopefully you can -- If you guys can alert me, if they chat to you, or otherwise indicate they're back on, please let me know. I've got them in the queue here.

It sounds like there is general approval for the alternatives, and that would make me feel a lot better, and I didn't want to go down the ORCS rabbit hole if folks weren't supportive anymore, but it looks like we have -- If we could go back, and sorry, Mike, to make you jump around, but to the action items. It looks like we have started to, or have, addressed the second bullet. The first bullet has to do with are we basically -- I'm assuming the background for this question is are we concerned with the questions that have been raised and the simulations that have been one as it applies to ORCS.

DR. ERRIGO: Yes, that's correct.

DR. NESSLAGE: So the question is are these concerns applicable in the South Atlantic, and, if so, do we need to be worried, and, if so, which stocks do we need to be worried about, and I think you mentioned before, Mike, that a number of our stocks are actually very lightly exploited, and so the concerns that are raised, not just with Caruthers, but several other papers, are having to do with more heavily-exploited stocks that we simply only have catch for. I don't know that, today, we'll be able to give them a complete outline and answer, but, if the council is really interested in this, we can initiate some sort of workgroup to dive in deep, but most of those stocks, it looked like, were relatively lightly exploited. What do other folks -- Maybe that's a comment we can have there, and can you start something for us? Thanks.

DR. COLLIER: Genny, I think I have both of them back now.

DR. NESSLAGE: Fabulous. Let's hear from Fred Serchuk first.

DR. SERCHUK: I don't know what happened, but my point was mostly covered by Amy. I think that putting the ORCS in the Category 4 with the decision tree is -- I am not actually happy with it, even though I realize that we're not limited to that, and it's simply because I think that some of the other issues that were brought up, in terms of what sort of information -- When we only have information on landings, and perhaps information on some life history characteristics, we almost have nothing to go on except either expert opinion or some indication from the harvesters that things are not as good or they're better than they were before, but, I mean, you're really at the edge of ignorance here, and I don't think that ORCS has performed very well, and so I think it's given undue space here. I realize that we don't have to use it, but I think it's given more prominence than I would like to see put on it, in terms of the decision tree. Thank you.

DR. NESSLAGE: That's a good point. As a stock assessment person, the one thing I would also raise, to that point, is that, based on some of these simulation studies, some of our other approaches aren't performing well either, the median catch and max -- I don't know that they have evaluated maximum catch, but, if median catch wasn't working well, then maximum surely isn't going to either, and so that's something to keep in mind as well. John Carmichael, you've been waiting, and are you back online?

MR. CARMICHAEL: I think so. To Amy's comment, the table applies to that Alternative 2, and it was intended to clarify some of what could be done with the different tiers, as described in the text, and so the things that are in there for the unassessed stocks, in Section 4, are all the things that have been used in the past and in place in various ways, and so the SSC could use those, or could use something else, and that's certainly not limiting. That was the intent, because the actual text of that doesn't put any limits on there, and I think it would give the SSC flexibility if it, down the road, came up with some other decision tree approach, say, for instance, for dealing with a stock that had its own unique challenges, and I think that would be fine.

The decision tree was going back to when it was recognized that there wasn't information to provide OFLs, and it's okay to not always have an OFL, but the SSC was advised that they couldn't just make a blanket statement like that, and they need to have a process that went through to evaluate the information for each stock and make a case for why the SSC didn't feel, in its judgement, that it could provide an OFL, and the decision tree, at that time, met that need, but the idea is not to be limiting, and that stuff could be changed, or new things brought in in the future, and that's certainly one of the underlying rules, or underlying intents, of why this control rule is worded a bit more simply than before, because we ran into so many issues where the SSC didn't have the flexibility that it felt it needed to deal with each stock.

DR. NESSLAGE: Thank you for that. That makes sense. Amy.

DR. SCHUELLER: I guess I'm going to take issue with the bullet that's up there that says most of the stocks in the South Atlantic are lightly exploited and/or rarely encountered, and I don't agree with that. I think, given the discussion that Chris had just a bit ago about looking at catch and trying to make some assumption about the population based on catch, we can't do that, because there are some of the species that have been in ORCS that clearly probably are being overfished, and others are probably fine, but there are certainly others that are rare species, which, if you catch a few, it probably isn't that great for them either, and so I don't think that we can even make that statement.

I also get a bit concerned -- If you see an increasing catch trend, it could just be switching of the fleet, and so maybe something they would typically catch isn't as available, and so something else is being caught in its stead, and that's just the fact of a multispecies fishery like this, and then I will also just say that I agree with what Fred Serchuk said as well, that I'm not even sure that ORCS should be in this document at all, and so perhaps we should have that discussion before we discuss maybe some of the other pieces of this.

DR. NESSLAGE: That's a good suggestion. Let's hear from the folks whose hands have been raised, and we'll come back to that. Mike S.

DR. SCHMIDTKE: This is on a slightly different topic, but something that Amy had brought up previously on that Option 1, under Alternative 2. Just for some clarification on that, that has to do with stocks that have an assessment, but they don't necessarily have a great depiction of uncertainty that could be used in a P* approach, necessarily, from that, and so that would fall more into somewhere around the bottom of Category 2, into Category 3, and that at least gives a default methodology for coming up with an OFL to use in those cases where there is an assessment, but it's not always the most informative, and so that's all I had for that.

DR. NESSLAGE: Thank you. Jeff.

DR. BUCKEL: Amy addressed the point that I wanted to make. We don't really have any idea about the exploitation level, and so thanks, Amy. Then there are several species that we're doing ORCS on that are directed fisheries for, and I just went through, and there are seven, and there may be more, but I just found seven that there are directed fisheries for that there are millions of pounds that are caught annually, and so they may be rarely -- I think there was some language of it was rarely encountered, but there are definitely some of those species on this list that are just bycatch, but there are others that are directed fisheries with a large catch.

DR. ERRIGO: Yes, and that's definitely true. Gray snapper and white grunt, they're on the schedule to be assessed someday, maybe, but they are on the schedule to be assessed, but, yes, there are some that are targeted fisheries.

DR. BUCKEL: Thanks.

DR. ERRIGO: We shouldn't be using ORCS for that, but --

DR. NESSLAGE: But are we?

DR. ERRIGO: Yes, because we didn't have anything else.

DR. NESSLAGE: I think, just to that point, while we're on it, we need to change the word "most". Some of the stocks being evaluated using ORCS, but not all.

DR. BUCKEL: Yes. Thank you.

DR. NESSLAGE: Maybe another statement could say "others", and we can fill in the details. Thank you. We have -- I would like to return to Amy's comment or suggestion that we deal with

whether ORCS should be in the mix at all, and it looks like we have Nik Mehta, and is it to this point?

DR. MEHTA: It's to the point of having ORCS in or not, and I just wanted to remind the SSC that, during the ABC recommendation with dolphin and wahoo, the SSC expressly pointed out concerns, and more than member pointed out that we shouldn't be using the ORCS approach at all, and so it might behoove the SSC to go down that path. Also, the questions about what was used in the past and the reason and rationale for using ORCS or not using ORCS, there is a table that shows the ABC recommendations for unassessed species that was in one of the SSC reports, and I want to say October of last year, but I could be wrong, and it may be April or October, but Mike E. will know.

DR. NESSLAGE: It's April.

DR. MEHTA: In the table with the ABC recommendations, under the notes section, I think you will find some useful information about median, which approach was used, and the notes that actually specify that let's not use ORCS here, or let's use ORCS here. I just thought that it might be useful to look up those tables.

DR. NESSLAGE: Thank you.

DR. ERRIGO: I did have one -- I just wanted to make the SSC aware that, for the reasons that you think ORCS shouldn't be -- That it may not be appropriate to have in our ABC control rule, that pretty much applies to all the methods in which we're using catch or which we don't have abundance estimates for, which would pretty much apply to all of our unassessed species.

DR. NESSLAGE: I agree with you, Mike, and that goes back to my earlier comment about our other approaches probably aren't performing well either, based on some of the simulation studies that have been done, like the Free et al. paper and the Wiedemann et al. paper, and so that would leave us with, if not ORCS, then what? I don't know it's possible, under the ORCS bullet point here, if we could start capturing some of the SSC discussion and comments on that. It's not a question we were asked, but I think we need to address it. Scott.

DR. CROSSON: If not ORCS, what? I can tell you what it was, because it was like 2011, and what it was was the SSC looking at tab after tab after tab, for several days, going through species, one at a time, that were unassessed and spending two hours trying to read the tea leaves and come up with a number, and so we came up with -- ORCS was a way to get away from that, because it's not a systematic approach, and it's not necessarily clean methodologically, and so it's kind of a gruesome option to get away from it altogether, and so I would like to see something -- Something has to substitute for it, and you don't want to just rely on the discussions from the SSC.

DR. NESSLAGE: Right, and so ORCS provides a way for us to systematically go through some of our thought process, and would you agree with that, Scott?

DR. CROSSON: That's exactly what it was trying to do, and it felt very arbitrary, and, again, also very time consuming, because, again, you have a lot of people that specialize in fisheries and that are from the region, and they're going to be opinionated, and so it would -- I mean, it just wasn't even feasible, and we would spend day after day going through, and you would only get three or

four species done per day, because everything -- No matter how small, people had opinions about how to read what they were looking at, and so you have to have some sort of systematic approach of dealing with it. There's simply too many unassessed species in the South Atlantic.

DR. NESSLAGE: To that point, what I recall from our April, and I believe it was Nik that was referring to the April meeting, where we went through the unassessed species and made some alternative decisions, and, George, you would know best, and correct me if I'm wrong, but some of our decisions about deviating and using alternative ABC approaches had to do with the fact that the -- Whatever approach we were considering was going to trigger management action for a very lowly-exploited species that we thought was either bycatch only or rarely encountered, and that was of concern.

I'm wondering if, perhaps, part of our decision tree could involve something along those lines, where, if there is no other indication that this is a heavily-exploited or directed fishery, if we think all the evidence is that it's a bycatch or rarely-encountered species, that we could stick with one of these very data-poor approaches, whether it be ORCS or third-highest or whatever we decide, but that the reason for deviating to that -- That would only occur for species for which we feel there isn't a directed fishery of reasonable size, and how do folks -- I don't think that's in there anywhere, and we don't explicitly say it.

We had it in our discussions, and what do folks think about -- I think that's the piece that's missing, because, as I recall, the council said, well, why not use ORCS, and it gave a higher -- In some cases, it gave a higher ABC, and we didn't have a very good justification, other than, yes, it doesn't perform well in simulation studies, but maybe that doesn't apply, in this case, for some of these stocks, and so we need better justification for when we either do or don't use ORCS, is what I think is happening here. Thoughts on that? Fred.

DR. SERCHUK: Thank you, Madam Chair. Of course, I agree with Scott that it gave us a framework, but it was a one-way framework, with respect to my interactions with what the SSC has done, and that is, if catches were below the average, or they didn't exceed the average, we weren't concerned, but we never -- Maybe you can correct me if I'm wrong on this, but, if the catches declined, and stayed low, has there ever been a comment of, wait a second, maybe this stock is depleted now, and maybe it's now below the range of variability that it had in the past. If it went from one to ten in the past, but we have never seen it above two in the recent years, has anyone ever said, wait a second, it's time for management actions? It's always a one-way street.

We're looking at like, well, we want to set a cap on it, because we don't want to constrain an incidental-catch fishery, but it really didn't tell us anything about the stock dynamics, and it was only one way, in my mind, and, sure, it gave us a framework to get done with business, but I think it's -- You know, we didn't see the wizard behind the curtain, and there wasn't any informational content in it, and that's my view of it, Chair. Thank you.

DR. NESSLAGE: That's a good point, Fred.

DR. ERRIGO: I can say that there have been stocks with declining landings trends that the SSC thought were concerning, and scamp comes to mind as one of them, where you said we've got to do something different. Yes, you can do that, but it's up to the SSC to keep track, and we can look at these landings trends on a regular basis, and, if you notice a concerning trend, we can readdress

that particular stock at that time. We tried to get on a schedule of doing that, but then we got hit with reviewing assessments so much that we really didn't have the time for it, at that particular time, and so we can get back to doing that, reviewing a small subset of the unassessed stocks each meeting, or once a year, in order to see that, to see if there are concerning trends, and we may want to readdress an ABC for a particular stock.

DR. NESSLAGE: While I am thinking of it, Mike, I would like to change the wording on that first bullet point there. It's in contrast to the Carruthers paper, but the Free et al. paper did include underexploited species, and so I think maybe you can say the Carruthers simulation study and get rid of the last part of the sentence. Then I would suggest, unless the SSC disagrees, that we examine some of the more recent literature, and the Carruthers paper is from 2014, and there is some much more recent papers evaluating data-poor approaches, including a refined ORCS method, and, unless folks disagree, I would suggest we explore some of these, or at least learn more about them, to see if they're applicable. Amy.

DR. SCHUELLER: I like that suggestion, and what I was going to say, before you made your suggestion, was that I agree with Fred's statements about ORCS feeling like it's only one direction, meaning the catch is always higher in some way, and it's never lower, and point taken in Mike's comment about reviewing each of the species, and then we can make those decisions, but it seems like, if we're going to have a framework, such as ORCS, that perhaps that should be in the framework, rather than the framework is always, yes, let's catch more, or we're going to multiply this value by some number bigger than one, and then we're only going to decrement that if we have some huge reason why, and it seems sort of counterintuitive, to me, and it seems like it should be built on a framework, and so I agree that we should -- I think, in my mind, the group should take the time to review the literature and come up with something that makes sense, which will take time, of course.

DR. NESSLAGE: Thank you, Amy. I agree, and I don't think we are going to decide what our final recommendation would be on ORCS at this point, and I hate to keep punting to working groups, but this seems -- Don't cringe, Scott and George and those of you were on the last ORCS working group, but I feel like this is ripe for a little bit of careful consideration of the most recent literature, as well as some strawman suggestions being brought back to the SSC, but I am open to comments and alternative suggestions. Wilson.

DR. LANEY: Thank you, Madam Chairman. This is maybe slightly off-topic, but it still goes to the point of addressing ORCS and maybe a better way of doing business, and would it be useful, at all, for us to try and take a look, and we have a list, and we know what the unassessed stocks are, and we've heard that, in the past, we've had concern about certain stocks, hogfish and scamp both being mentioned, that had maybe certain life history characteristics that made us uncomfortable with setting an ABC based on using ORCS.

My question is, is there a set of life history parameters that we could say would automatically mandate us, using some other approach, in the interest of being precautionary, and characteristics that come to mind would be those that are exhibited by scamp and hogfish, perhaps those that we know undergo a sex change, those that are long-lived, those for which recruitment has been an issue, perhaps, and so would that sort of an exercise be useful, and I think, if it useful, it could fit into the approach that Amy and you are suggesting, which is that we should take a careful look at

existing literature for other methodologies, but we could also maybe take a look at some of the biological characteristics that felt mandated a more precautionary approach, at the same time.

DR. NESSLAGE: Yes, and I think that's a great suggestion, Wilson. We are starting to gel on something here, and can we start to possibly make a recommendation? I'm not sure where it would go, but somewhere under ORCS. Thanks, Mike.

I guess we're recommending a working group carefully explore the most recent literature regarding ORCS and data-poor ABC setting, or I guess catch level recommendation studies and identify, or recommend -- I guess they would recommend potential biological characteristics or characteristics of the fishery that would trigger the use of any of our data-poor approaches in Category 4. That would suggest the use of -- Or something along those lines, but the use of alternative data-poor approaches, or something like that. I wouldn't just say ORCS, and maybe put "ORCS" in parentheses, but there is the refined ORCS, and there's a couple other things that might be useful, and I would hate to just limit us. This would be really catch. I assume that, by data poor, we mean catch only, right? That's kind of what I'm thinking. Hopefully that gets at both Amy and Fred and Wilson's comments, and let's see what Chris has to say.

DR. DUMAS: Quick question. For each of these ORCS species, in addition to the landings estimates, do we also have estimates of commercial and recreational effort, or trips? I guess we have estimates of recreational effort from MRIP, but do we have numbers of trips that landed this catch from trip tickets?

DR. ERRIGO: We do have effort from MRIP, and we also can get like the number of trips that landed a particular species from MRIP, and a lot of these species are heavily recreational, which is what makes the data so variable. In terms of the commercial, yes, we can get trips that landed from these species from the logbooks.

DR. DUMAS: Great. Thanks. That's all.

DR. NESSLAGE: If I could add to what was just written down, before Fred brings it up, because it's a good point, let's say "landings only", if we could. Thanks. Chris, do you think that information should be considered by, for instance, the working group to inform where we might go in these situations, or you were just curious?

DR. DUMAS: I was trying to think of a way -- For alternative methodologies, to think about it from a sampling perspective and trying to estimate -- Doing an estimate of stock size and trying to figure out what type of data we had available to estimate stock size, and so, from a sampling perspective, each trip going out is a sample, and you're bringing back fish, and you're trying to estimate a total, rather than estimate a mean or a median and trying to estimate a total, and I'm trying to think about how that could work, to get some type of estimate of the stock size, or maybe at least an index, and then we could -- If we got that, then we could look at how catch trends compared to that estimate of the stock size, but we might be able to get an estimate of the stock size using sort of a sampling framework to estimate a total, and, if you were able to get that, we would also get a variance around that total, and then we could look at how landings compared to that, and so I just was trying to determine what types of information were available, if we did these ORCS species, and information that we had to work with and think about.

DR. ERRIGO: That might work for some species. For some of them, you're not going to have enough data, even with the effort, but some of them it might work for. Like I was able to construct a CPUE index for dolphin, and there was plenty of information to do that for recreational, but there are some species where I don't think there are enough datapoints to do it.

DR. DUMAS: That might be the case, yes. I also just would say that I support Wilson's comment about kind of following a dual-track process, sort of. As we kind of review the literature and look at possible alternative estimation methods, based on the landings data, and maybe the effort data, and, also, at the same time, looking at the biology and the life history parameters and seeing what we can do with that, and I think that's also a good thing to pursue. Thanks.

DR. NESSLAGE: Great. Thank you. Wally.

DR. BUBLEY: I just wanted to jump in and make you aware of another potential source of information is gathered from these fishery-independent surveys, because we do have available data for some of these species, and, obviously, it's not every one of them, but that's another long-term dataset that we could look at to see trends that would potentially provide some information for these species.

DR. DUMAS: What type of data was that? I couldn't hear. He was cutting out.

DR. NESSLAGE: It sounds like fishery-independent data.

DR. BUBLEY: Fishery-independent, yes. Sorry.

DR. NESSLAGE: I believe, Mike, you have summarized that for some of the species, correct? Was that only for ones that we were interested in, or was that for all the ones that we have available?

DR. ERRIGO: I am not sure if it was for all the ones that we have available, and it might be all the ones we have an available index for, an actual index for, and there might be other information that you can get from the independent survey that's not in there, but I think all the ones that had an index of abundance that could be standardized are in there. There's not a lot. There's not terribly many of them, but there are several that have been there for abundance.

DR. NESSLAGE: Could we add, at the end of this sentence, after "approaches", to say consider, if available, effort and fishery-independent data, something along those lines? Fred Serchuk.

DR. SERCHUK: Thank you. I would agree that, if there are effort data, you look at that, but one has to keep in mind that, in some cases, these are not the targets of the fishery. They are the incidental catches, and so one has to realize that you may be getting estimates for the incidental species catch that are not in the areas reflective of the abundance of the stock, because they're in areas where the fishery is taking place for a targeted species. That doesn't mean we shouldn't look at it, but we have to be careful how to interpret these indices when the species is not the target of the fishery. Thank you.

DR. NESSLAGE: I think that's something, a characteristic, of the fishery that needs to be explored, and so I think we're capturing that, but, just for the record, maybe, in parentheses, so

that we remember what we were talking about, after “fishery characteristics”, put “e.g., bycatch versus directed”, et cetera. Jie.

DR. CAO: I am just curious, and is there any case where the size information of landings is available? I am just thinking about, with that information, we might be able to develop a sort of indirect abundance index.

DR. NESSLAGE: Based on changes in length composition, you mean?

DR. CAO: Yes, and just something like the mean lengths of landings or mean lengths of the catch, yes.

DR. NESSLAGE: Right, and so another indicator of potential impacts of exploitation.

DR. CAO: Right.

DR. ERRIGO: We do get lengths from both the MRIP survey and the TIP program for commercial. How many there are for some of these species is -- There may not be very many, but, depending on the species, yes.

DR. NESSLAGE: Why don't we add “length”, there, because we have consider if it's available and adequate, and we should probably say that. There is plenty of data available, but is it enough to inform this question? We can add “lengths” there, and that's a good suggestion. Thank you, Jie. Did you have something else, or was that your comment?

DR. CAO: No, and that was my comment. Thanks, Genny.

DR. NESSLAGE: It was a good one. Thank you. Amy.

DR. SCHUELLER: I was just going to say that I agree with Jie's comment, and I think some of these species -- I think, for example, tomtate probably has a lot of length information over time, or at least in the fishery-independent stuff, which could also be helpful if there are changes occurring. If we don't have fishery-dependent data, but we do have fishery-independent data, and there is changes in lengths over time, we could also use that. Clearly, for some of these species, we're just not going to, but that's not true for several of them.

DR. NESSLAGE: Very true. I feel like this task is shaping up. Chris, do you have stuff to add, or something different?

DR. DUMAS: We might also want to look at, more formally, in some kind of quantitative way, correlations across species at a given point in time and looking at are those correlations across species -- So if some species have been moving together, if their catches have been moving together over time, but then that pattern breaks down, and looking at that as some type of additional indicator, and we're working that into our thinking. It's not just the pattern in a given species over time that we want to look at, but there's also information looking at what's happening across species at a given point in time.

Obviously, species that are found together, but, also, there are species that might be subject to similar weather or climate factors that occur at a given point in time and affect multiple species, or certain economic conditions that occur at a certain point in time that affect effort, for example, or affect how fisheries are directed or which species are targeted, whether a recession is happening or not in a particular year or something like that, and so those types of factors that would affect multiple species at a given point in time could induce correlations across species, and they're called contemporaneous correlations, and so we might want to look at that for these species as well as the looking at sort of the time series of what's happening to the landings over time.

Then, if there are some correlations like that, then, if we have better data about one species, the better data that are available for that species might also help us understand what's going on with other species, other species that are correlated with that species, but for which we have less data, right, and so, if there are some correlations, we can use them and try to get more information out of the data that we have, or the data that we're collecting, and so that may have already been done, but, if that hasn't been done, looking at sort of correlations across, contemporaneous correlations across the species, that might help us get more information out of data-poor species. Thanks.

DR. NESSLAGE: Thank you. That's a great suggestion. Mike, that hasn't been done, has it?

DR. ERRIGO: Not for everything, but I did look at it for almaco jack and greater amberjack, and they are correlated. When the greater amberjack fishery closes, due to regulation or season or whatever, the almaco jack landings shoot up, and that's been happening more in recent years, as they've been closing early, and that might have something to do with that increasing trend in almaco jack.

DR. DUMAS: Exactly, and so correlations like that can help you get better -- Correlations across species can help you get better estimates of each of the individual species and what's going on, and so that may help us, in combination with the other factors that we've talked about here today, and maybe we can do better with the data that we have available for the ORCS. Thanks.

DR. NESSLAGE: Thank you. Amy.

DR. SCHUELLER: I was just -- I do agree with everything that Chris just said, and so I'll put that out there, but my comment that I was going to make, which is mostly I am being nit-picky, but we put that bullet under ORCS, and, really, we have expanded it beyond that, and it feels like it's just an action item for Category 4 species that are unassessed, and so I guess I am advocating that we move that up, that bullet up, and then it sounds like this is a broader working group than just ORCS, and I think that we should probably specify that this is related to the Category 4 part of the framework.

DR. NESSLAGE: Yes, and so let's say the SSC recommends a, and it sounds like a hurricane, but a Category 4 working group. The formation of a Category 4 working group to carefully explore the most recent literature on landings-only approaches -- Let's refine this a little then. To explore and maybe have some sub-bullets, so they will have specific tasks. While we're wordsmithing, I am going to start looking for volunteers, and so think about this. I assume we can form -- Mike, we can form working groups ad hoc, and is that correct?

DR. ERRIGO: You can form working groups, yes, and it's the purview of the SSC to form an SSC working group.

DR. NESSLAGE: Excellent. Okay. So one of the things would be to explore the most recent literature on landings-only approaches; recommend potential biological and fishery characteristics that would suggest the use of alternative data approaches; consider, if available and adequate, effort, length, and fishery-independent data; and then look at correlations.

Then I think the final wrap-up should be to make a recommendation to the SSC regarding -- Maybe this is the wrong wording, but revised decision tree for Category 4. If not a decision tree, maybe an alternative recommended approach, something along those lines, but I'm open to suggestions there. I am just trying to get some words on the page. As Shep mentioned, it would be good if we could justify why we're making these decisions as we go along. Does anyone have any concerns with what's shown here under Action 1, the wording, what we're tasking the group to do, or any additional suggestions? These have been great so far. I am not seeing any hands raised. That's great. I think the time is right for this exploration. Would it be appropriate, at this point, to ask for volunteers, Mike and council staff?

DR. ERRIGO: Sure.

DR. NESSLAGE: Okay. I think we need a combination of folks with ecological knowledge, folks with assessment knowledge, and folks with socioeconomic knowledge, and so I'm going to ask that folks nominate themselves if they would be interested in working on this group of volunteering themselves for this working group. Wilson Laney.

DR. LANEY: I would volunteer from the ecological perspective, Madam Chair.

DR. NESSLAGE: Thank you. Chris.

DR. DUMAS: I would volunteer from the socioeconomic perspective.

DR. NESSLAGE: Excellent. Thank you. We could use a few more volunteers. I will definitely listen in on this as much as I can. Eric.

DR. JOHNSON: I will join the party. I wear a lot of hats, economics and biology.

DR. NESSLAGE: Yes, and that would be wonderful. Amy.

DR. SCHUELLER: I will volunteer as well.

DR. NESSLAGE: Thank you. This looks like a good group. Is anyone else dying to help out on this working group? Alexei, are you volunteering, or are you volunteering someone else?

DR. SHAROV: I can only volunteer myself.

DR. NESSLAGE: All right. Thank you. That looks like a good group. Small, but powerful. Okay. This was a lot of territory to cover, and I think we've identified the issues that need to be addressed in order for us to make recommendations to the council on how to move forward with

these really data-poor species, and this is going to be great, and we look forward to the report back from this working group, and this will really be important work, and thank you for your volunteering.

I don't know about the rest of you, but I need a biological break, recognizing that we only have about forty-five minutes left, and we'll come back and try to tackle something relatively small, so that we can start fresh with risk analysis in the morning, and so, Chip, I might give you another quick call, and is that all right?

DR. COLLIER: Yes, that will be fine.

DR. NESSLAGE: All right. Let's meet back, if we could, at 4:30, and we'll try to tackle a small agenda item before we end for the day. When you come back, please raise your hand. Amy, do you have a question or a concern?

DR. SCHUELLER: Yes, and did Mike Schmidtke -- I think that he ran a lot of those data-limited methods through that DLM function in R, and I was just wondering if we would appreciate that kind of expertise in this group discussion, and I know he's not on the SSC, and I am volunteering someone who I can't volunteer, but I was thinking we also have people at the Center who are pretty knowledgeable about data-limited methods, and Erik Williams mentioned that we should maybe look to the Gulf or Caribbean or HMS and sort of see what they are doing and consider similarities and differences, and so there might be some other folks that would be good on this workgroup that are outside the SSC, and I don't know if that's a traditional or a non-traditional way to look at it, but it's just a thought.

DR. ERRIGO: Just so you know, it's totally fine to put someone on a working group who is not an SSC member, as long as you have SSC members on the working group.

DR. SCHMIDTKE: I am fine participating in this, and I wasn't sure if I had to be listed on here, since I'm not an SSC member, but I was going to follow-up with Mike and Chip, as far as like me helping staff it.

DR. NESSLAGE: Fantastic. Thank you. Good suggestion, Amy, and thank you, Mike. All right. Quick break and back at 4:30. Thank you, all.

(Whereupon, a recess was taken.)

DR. NESSLAGE: It looks like almost everyone is back. We're back. This is great. Thank you for your prompt return, everyone. I recognize that this has been a brain-draining day, and that we're at the end of the meeting for today, and I wanted to knock a few things off of the agenda that were kind of easier on our brains before we end, and so I'm going to suggest that we move to Agenda Item 8, the Council Workplan Update, and see Attachments 22 and 23, and is this Mike or Chip that is going to walk us through this? Who do we have?

COUNCIL WORKPLAN UPDATE

DR. ERRIGO: Actually, for this item, I was just going to refer you to the attachments and to this table here, which shows you the current amendments that are going on now and who is the lead for those amendments, in case you had any questions or anything, and you could contact those people, and so there really wasn't much to do for this, and it's really just an FYI.

DR. NESSLAGE: Great, and we'll need to update the -- We have new workgroups. The one thing we didn't talk about though was whether the EwE workgroup would remain the same, the membership would remain the same, and we didn't really address that this morning. Our valiant chair, Yan, Eric, Alexei, and Fred Scharf put a lot of work into that, and they may want to be relieved of their duties, or they may want to continue, and it would be good to hear from them, given that we are recommending that we move forward with having an EwE working group of sorts. If Yan is on, I would love to hear from her. You've got to be exhausted, but we also recognize that you're highly knowledgeable, at this point, about the issues.

DR. LI: Thank you, Genny. This standing workgroup, like how long is this workgroup going to last?

DR. NESSLAGE: What a smart question. I am imagining that, as long as the new questions are raised, that we'll want a workgroup to dive into the details on any application of EwE, and I'm sorry. I shouldn't put you guys on the spot, unless you are absolutely eager to stay on, but I would imagine, given the council's questions were very specific about wanting to do something in the next year, by October of 2021, that this -- I will just suggest that this group would commit through October of 2021 and so a year from now, and we can revisit it at the October meeting then, unless someone has another, better suggestion. If folks who are currently on it would like some time to think about it, that's fine too, but, if you know you want to stay on, or if there are other people who are dying to join this group, I would love to hear from you. Alexei.

DR. SHAROV: I would be interested in staying, but I certainly recognize the need of the deeper knowledge of the current model, which essentially requires commitment, in terms of time and learning more, and, ideally, the workgroup members should be able to run this particular model and be familiar with it, because going through this exercise was extremely interesting, and challenging at the same time, because of the complexity and the amount of information.

At least for me, it was impossible, obviously, to like personally review everything, the inputs and the model details, et cetera, and so I assume this would be sort of an evolutionary process, and so I would like to stay for at least the next year, and then we'll see how it goes, but I would ask additional SSC members, or ask for the possibility of non-SSC members who are more knowledgeable in general with, more familiar with, EwE, and, in particular, if they are more familiar with the South Atlantic EwE, and it would be a great addition to this group. In particular, we lost -- I don't see Marcel here, and Marcel is not an SSC member anymore, and so we would really benefit from adding a couple more folks in there with specific knowledge and enthusiasm.

DR. NESSLAGE: Yes. Well said. I am looking to see if Marcel is still on the call, and I don't see him, but we can reach out, if folks think that he would be a good addition as a non-SSC member. Yan, go ahead.

DR. LI: Thank you, Genny, and thank you, Alexei. I think that Alexei just said what's in my mind. Because the model itself is so complicated, and I fully agree that the whole project would

benefit from bringing in more experts, and, for myself, I forgot if I indicated that I am interested in staying on, and, yes, I am interested in staying on this group.

DR. NESSLAGE: Thank you. That's great. You all have invested a lot of brainpower in this and understanding and grappling with the model, and we do appreciate that, and having that continuity will be good. Fred Scharf is not on the call right now, and he had to go teach, I believe, and I don't know -- Alexei and Eric, you're both on the other working group as well, and I don't want to overtask you. Eric Johnson, do you have any opinion on whether you would like to stay or leave this particular working group in the next year?

DR. JOHNSON: I am fine with staying on it, and I didn't contribute as much as I had hoped, and my expertise wasn't quite there, and I missed one of the meetings, but I'm happy to stay on it, if warranted.

DR. NESSLAGE: That would be fantastic. Are there any other suggestions, either from internal within the SSC or folks like Marcel outside the SSC, that we would like to approach them and ask if they would be willing to contribute, especially if they have knowledge in the South Atlantic? Thank you, Mike, for being a great scribe here.

DR. BUCKEL: Genny, it would be great if we could get someone like Dave Chagaris or Andre Buchheister, someone that has intimate knowledge with using these, to help us out, and, with Chagaris, obviously, there's some overlap in the species, so that, even though he may not be as familiar with South Atlantic fishery management issues, certainly a lot of the species are in the Gulf.

DR. NESSLAGE: If we can get him, yes, that would be great. Amy, was that kind of where you were going, too?

DR. SCHUELLER: I agree with that, and I think it's sort of ironic, because I was just going to say that maybe Jeff should be on the group, because he's the one that had requested several different diagnostics. Sorry to throw you out there under the bus, Jeff, but you may want to consider it as well.

DR. BUCKEL: I will consider it. I think the Vice Chair duties are keeping me busy enough.

DR. NESSLAGE: You can only have him for another year. Yan, go ahead.

DR. LI: Amy just said what I was going to say. I was going to suggest, or recommend, Jeff.

DR. NESSLAGE: I think Alexei volunteered as well, Mike, to stay on. Thanks. We'll let Jeff think about it overnight, and we can revisit it tomorrow with a consensus statement. Okay. Thank you. Is that everything then for the council workplan update? Are there any questions or concerns that folks had regarding this agenda item? Yan, is your hand still raised, or is that left over?

DR. LI: Are we also trying to get Marcel to stay on the group?

DR. NESSLAGE: That's right. We had Marcel. Yes. Thank you. We shifted pages, and I missed that. Lauren, go ahead.

MS. GENTRY: I am not sure if this is exactly where he would go, but we also mentioned earlier keeping Howard Townsend, and he was -- Laurent too, and they were both technical input, and I don't know if that's technically where that goes here.

DR. NESSLAGE: Is Howard on -- I don't see Howard on the call or --

MS. GENTRY: I don't either.

DR. NESSLAGE: But we can approach them, right?

MS. GENTRY: I would hope so, yes.

DR. NESSLAGE: If the SSC agrees, I think that seems --

MS. GENTRY: I think George was too, Sedberry, and I don't know --

DR. NESSLAGE: George, were you attending because you were the Chair, or was it because you were passionate about the EwE model?

DR. SEDBERRY: I am interested in the -- I am very interested in the subject and in food chains and in ecology in general, but I am not a modeler, and I was lost most of the time, but I sat in because of the Chair of the SSC, and I just really wanted to keep up with what was going on, so I could understand it a little better, and I'm not sure I accomplished that, but, as an ecologist, I can be on the workgroup, but I'm not sure how much I could contribute to the actual work of it.

DR. NESSLAGE: I could see that being valuable though, George, even more so going forward, because we'll start to tackle, I would think, some specific cases, and you are very knowledgeable about reef fish, in the South Atlantic in particular, or fish in the South Atlantic in particular, and so I don't know how the rest of the group feels, but I would welcome your participation, given where we're going.

DR. SEDBERRY: Then I will participate. I would be happy to, and I just don't want to be just a lump, and so I will try to contribute as much as I can.

DR. NESSLAGE: You are so much more than a lump, George. That's great. Thank you. Any other ideas? This is getting to be a big group here, but I think it's a good one, especially if we can get everyone, including maybe even Jeff Buckel, to agree. I am not seeing any other hands raised. Okay. I will go back and ask one more time here. The council workplan update agenda item, any other issues that we need to discuss, particularly with council staff?

DR. ERRIGO: I don't really have anything else for this item. It's really just an FYI for the SSC, so that you guys know what the council is working on and who is working on it.

DR. NESSLAGE: Okay. Thank you. I realized, with horror, again that I have forgotten any and all public comment pretty much since we broke for lunch, and so I think what I would like to do, in the next few minutes, is see if there's any public comment, and I did not take public comment on the ORCS presentation, and I don't know if anyone has anything on the council workplan

update, but, if you do, this would be the time to speak, and so, if there's any public who is still left with us, we appreciate your tenacity and your interest. If you have anything you would like to comment on about the ORCS presentation and discussion, please do so by raising your hand now. I am not seeing any hands raised. Okay.

We will revisit Agenda Item 7 tomorrow, and so there will be another opportunity, in case folks have left the call. The last thing that I wanted to tackle is Agenda Item 12, the next meetings, and there are a couple of proposed dates for our next SSC meeting. I see it says in Charleston, but I assume that will be TBD. It looks like there is several options the week of April 20, and I guess that's actually the week of April 19, and so it would be Tuesday, Wednesday, and Thursday of that week. Then the following week, which is the last week in April, or the first week in May, and there are different benefits for each, but, if anyone has preferred weeks, this would be the time to mention those preferences or raise any concerns with any particular week. I know, Jeff, you had said you preferred -- I forget which, but the 27th to the 29th, and is that correct?

NEXT MEETINGS

DR. BUCKEL: Yes, that's correct.

DR. NESSLAGE: Based on teaching schedule?

DR. BUCKEL: Yes, but I could make the 20th work, if need be.

DR. NESSLAGE: Gotcha.

DR. ERRIGO: The default week is, if no one else has anything, is April 27 to 29, if no one has any preferences or issues with any of the weeks. That's the preferred week.

DR. NESSLAGE: The earlier week is going to be rough, if we're going to try and do some prep work for red snapper, and the last week would leave very little, or much less, time for the assessment -- For the report writing, and so, unless there are screams of protest, I would like to stick with the 27th to the 29th, and I'm not seeing any hands raised. Okay. Let's consider that the preferred week then, if we could.

Just note as well that there is the upcoming joint SSC meeting with the Gulf on October 30, and you should have all that information already, and then there will be another meeting of the SSC via webinar likely in early January, where we'll be reviewing the snowy grouper assessment, and, as we mentioned earlier, yesterday, the red snapper working group -- The topical working group selectivity report, as well as the working group's recommendations for data inclusion, and so that will be at least one day's worth of meeting, or possibly a day-and-a-half or two, and we'll have to talk about that, but just know that the doodle poll -- Mike, you will send that out at some point?

DR. ERRIGO: Yes.

DR. NESSLAGE: Okay. The council meetings have been set, and the dates for that have been set, and please note those. Is there anything else that we need to discuss with regard to meetings, Mike?

DR. ERRIGO: No, and that was it.

DR. NESSLAGE: Okay. Is there -- You probably aren't ready to cover the Other Business decision tree approach to allocations, are you, by any chance? Would that take ten minutes or less, and are you ready, staff, or no?

DR. ERRIGO: Brian, I just unmuted you.

OTHER BUSINESS - DECISION TREE APPROACH TO ALLOCATIONS

DR. CHEUVRONT: Sure, and that's really pretty quick. Thanks. I just wanted to give you all an update, and this is something that the council is just starting. One of the things that all of the councils are dealing with, and our council in particular, as a result of the Modern Fish Act that was passed at the very end of 2018 is having to deal with how the councils can go about making allocation decisions, and it's a really daunting task. There are so many different variables and things that the council needs to consider, and so what the council staff has been working on is trying to come up with ways to help the council get through some of the decision-making aspects that are related to making decisions.

Now, what we're proposing that the council consider is a decision tree approach, not unlike what's been used with ORCS and all that in the past, and it's going to be a multi-decision-tree process. We presented the idea to the council at the September meeting, to see if they were willing to devote staff time to pursuing this, and they voted that, yes, they were interested in this, and this is only a tool.

It is not going to make the decisions for them, but what we're proposing is that, over the course of the next nine months or so, that a series of decision trees, based on things like landings and stock assessment results and biological and ecological issues, as well as economic and social concerns for each species, be considered when looking at how they would go about potentially making -- What factors to consider when making allocation decisions, because there are so many different things that they could consider when looking at an allocation for any given species.

What this tool ultimately will probably do will be to help narrow down the information that the council really needs to consider, and so we're just now doing is putting together a statement of work, and we're trying to put together a team, at this point, of folks, and we're going to be recruiting some folk with the Southeast Regional Office, and we'll get a couple of folks from there, as well as from the Southeast Science Center, and it will be led by the council staff, and we're going to try to see if we can develop a process.

Now, the reason why we're bringing it all up to you at this point is, as this goes on, we expect that this is going to come back to you in your spring meeting, and that's also the time when the SEP meets, and there is a fairly big component of this that's going to need some SEP input, and so we just wanted to put the bug in your ear and let you know that this is an ongoing initiative that the council is considering, and there's no guarantee that it's going to work, and we just want to get it out there, and we want to test it, and we want to see if it's going to fly and if we can make a

recommendation to the council with some decision trees for them to look at and try, hopefully with a dry run next June.

We're trying to put together sort of a blueprint for them of what they can try, and then the idea would be that, at their September meeting next year, if all goes well, they would have a working model that they could now, at that point, start applying to help them make allocation decisions, or use as a tool to look at the allocation decision-making process for the future.

Right now, it's a difficult thing, and I don't know how many of you have been involved in looking at the allocation decision-making process that the councils have to go through, but it's a tough, tough situation, with so many floating variables out there, and we're trying to help them figure out how to hone-in on what's most important for each individual species, and that's kind of where we're going with this. We don't have a lot of details at this point, and we think we know what kind of decision trees we want to start with, but we wanted to go from there, and that's about it.

DR. NESSLAGE: Thank you, Brian. Any questions or comments? Wilson.

DR. LANEY: I just will pass along, to Brian in particular, that there has already been interest from the academic community in the council's approach, and I have passed along the documents from the briefing book of that discussion to certain faculty members at the UNC Institute of Marine Sciences, who are working on development of a similar process for the State of North Carolina, they tell me, and so I just pass that on to you, Brian, for what it's worth. I have indicated to them that they should talk to staff if they had questions, and you may get some inquiries from them.

DR. CHEUVRONT: Perfect. Thanks, Wilson. I appreciate that. We've done a lot of literature review in this, and there really -- Most of our allocation decisions are between the commercial and recreational sectors, and there is very, very little research out there that has been done on that type of sector allocation, and almost all of the sector allocation literature that's out there is gear sector allocations within the commercial fisheries, and there is almost no literature that involves recreational fisheries, and so we don't have a whole lot to go on as a backdrop to this.

DR. NESSLAGE: Chris.

DR. DUMAS: There is literature outside the fisheries literature in the social choice literature, social choice and social welfare literature, welfare in the broad sense of sort of society and economic welfare, on the issues of efficient and fair allocation of resource, in general, and fair division, and so I would recommend -- There is books by Steven Brams on fair division, and so, in general, these are different allocation methods that seek to allocate a resource in a way that's both efficient and fair, and there are different ways of defining what is fair and what is equitable. There has been a lot of work on that.

Another name is -- It's French, and I'm bad with pronouncing French names, and it looks like Harvey Hervemoulin, and I can forward those names and the references for two recent, last ten or fifteen years, books, and that could sort of be an introduction to the literature. Also, I have made some presentations at the AFS meetings on a particular fair division algorithm that looks at -- With an application to fisheries that looks at allocating a fishery resource among several stakeholder groups, defined in whatever way, recreational versus commercial or different gear types or

whatever, and that achieves both efficiency and fairness in practical, implementable sort of algorithm that can be used with stakeholders to implement.

Those are just sort of some places, other places, to check outside the fisheries literature on -- There has been research done on allocation mechanisms that try to allocate resources fairly and efficiently, and so there's a lot more that you could potentially access on that. Thanks.

DR. CHEUVRONT: Chris, if you could send me some of that stuff, particularly if you've got anything on your own presentation, and that would be great.

DR. DUMAS: Sure. Will do.

DR. NESSLAGE: Thank you, Chris. Eric.

DR. JOHNSON: That was a vestigial hand-raise. That was left over from the ORCS workgroup. I apologize.

DR. NESSLAGE: A vestigial hand-raise. I love it. We are evolving as we speak. Any other questions or comments on the decision tree approach to allocations? All right. Seeing none, I thank council staff for their presentations and discussions here at the end of the day. We will reconvene tomorrow at 9:00. I thank you all very much for your energy and enthusiasm for today's discussions, and I think we came up with some good information and feedback for the council. Are there any parting comments or questions? No hands raised, vestigial or otherwise. All right. Thank you all for your participation, and we'll see you back here at nine o'clock tomorrow morning. Have a great night.

(Whereupon, the meeting recessed on October 14, 2020.)

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OCTOBER 15, 2020

THURSDAY MORNING SESSION

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The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened via webinar on October 15, 2020 and was called to order by Chairman Genny Nesslage.

DR. NESSLAGE: Good morning, everyone. I hope you had a restful evening. We will start this morning revisiting Agenda Item Number 7, the Comprehensive ABC Control Rule Amendment, and we're going to hear first -- We'll talk a little bit about the risk analysis portion of the agenda. Our notetakers for this are Jie, Yan, Amy, George, Alexei, and Tracy. I will bring your attention in particular not just to Attachment 16, but I believe, Mike, Attachments 18 and 19 will help us extensively, and you will be referring to those as well?

DR. ERRIGO: Yes.

DR. NESSLAGE: We're going to hear first from Mike S., and we'll let you guys take it away. Thank you.

COMPREHENSIVE ABC CONTROL RULE AMENDMENT - CONTINUED

DR. SCHMIDTKE: Thank you, Madam Chair. I think, for today, we're just going to have Mike E. navigate through the slides, so that he can switch back and forth when he needs to, when we get into the analyses. Mike E., I think we're only Slide 15.

Coming back to the ABC control rule amendment, we're looking at Action 2 now. For Action 2, the purpose is to specify an approach for determining the acceptable risk of overfishing. Under Alternative 1, that status quo option, that would point back to the current ABC control rule method, and that includes the risk of overfishing being determined by the ABC control rule criteria evaluated by the SSC.

Under Alternative 2, the council would specify a risk tolerance for overfishing that would provide a P* adjustment of zero to 20 percent, and this would be added to an uncertainty adjustment that would be brought forward by the SSC, and the council would have, at their disposal -- When choosing that zero to 20 percent value, they would have, at their disposal, advice from the SSC, as well as the AP.

Under Alternative 3, the council would specify an acceptable risk of overfishing based on three stock biomass levels and three stock risk ratings. The table that you see is on page 18 of Attachment 16, and you see, in that left column, the risk rating, and that's based on a risk analysis and the council's judgment. The risk analysis has input from the SSC, and the SSC will run through the risk analysis for a species each time it is assessed, to see if the recommended risk score changes. That recommendation would then go to the council, and the council would make the final decision on what that risk rating would be, ranging from high to low.

In the columns to the right, you would also have a risk tolerance that would be determined by the council, and this is based on the biomass and the risk rating. What you see on the screen are default levels, but there are deviations that are possible, and these are discussed in Options 1 through 3, which I will get to in a second.

One thing to note, when looking at these values, is that, for the biomass categories of high, moderate, and low, they are divided up based on BMSY, initially, and there is an option, Option 1, which we'll get to momentarily, where basically they are based off of 110 percent of BMSY, rather than BMSY itself, and so those are two values that could switch, and that 110 percent BMSY value, under Option 1, would apply wherever BMSY is applied initially right here in this table.

The accepted risk of overfishing would be the values that you see corresponding to a risk rating and a biomass level. For example, a high-risk stock with low biomass would correspond to the bottom-right-hand corner, and management would default to a 20 percent probability of overfishing.

The additional options under Alternative 3, Option 1 that I just referenced would change the boundaries between the biomass levels from BMSY to 110 percent of BMSY. Option 2 would allow the council to deviate from default risk levels by 0.10, or 10 percent, for an individual stock, based on expert judgement, new information, or advice from the SSC or other experts, with the provision that risk tolerance may not exceed 0.50 at any time. Finally, Option 3 addresses the default biomass for unassessed stocks, and these would default to the moderate biomass level, unless recommended differently by the SSC. Similar to I think some of the options that we saw before, Options 1 through 3 are not exclusionary of one another, and they can, all or none or anything in between, be incorporated into this.

The final alternative is Alternative 4, the risk tolerance of no more than 0.50 is specified for each stock directly, considering advice from the SSC and AP, and so what you see from these different options is Alternative 3 seems to be the most prescriptive, and Alternatives 2 and 4 provide a bit more flexibility, but that also leads to more specificity of the council addressing each specific stock and needing advice from the SSC and AP in order to do so. A little bit more guidance in Alternative 2, but not a whole lot of parameters, other than that 0.50 value, for Alternative 4.

The current recommendations from the SSC include support of varying the risk tolerance by biomass and considering the PSA, the productivity and susceptibility analysis, risk categories in the stock risk ratings. The SSC recommends including preliminary risk ratings in the draft amendment and finalizing these risk ratings in the approved amendment, and that's one of the things that I believe we have some discussion of today, and there will be discussion of moving forward, are those initial risk ratings.

The SSC recommends the council consider basing risk tolerance on the expected biomass at the end of a fixed ABC period, if necessary, and you also recommended evaluating the risk ratings as a part of each stock assessment and, when necessary, to address new stock information, potentially considering these as included in the terms of reference for stock assessments, or when the SSC reviews stock assessments, rather. Then the SSC recommended considering social and economic considerations when evaluating risk tolerance as well. We have a couple of additional analyses that have come out since then, and I will pass it back to Mike E. to walk through those.

DR. ERRIGO: I think we'll take any questions about that section now, before I jump into the spreadsheet for the risk tolerance analysis and the P* examples, if anyone has any.

DR. NESSLAGE: Does anyone have any questions for Mike S. before we go on? Chris.

DR. DUMAS: Can you go back to Alternative 3, the table for Alternative 3? Great. In the first column, risk rating, who chooses the risk rating, the council?

DR. ERRIGO: The council chooses the final risk rating, but that's done with input from the SSC, including this risk analysis that we're going to go over.

DR. DUMAS: Okay, and so the column of the table is determined by the biology, determined by the biomass, and the row of the table is determined by the council, with input from the SSC and the risk analysis. In that first column, the risk rating, that risk includes risk to the fish species, biological risk of being overfished, and, also, does it include economic and social risk? Are all types of risk included, or assumed to be included, in that risk rating that is listed in the first column?

DR. ERRIGO: Yes, and it includes biological characteristics that look at productivity, and it includes characteristics of the fishery, and it includes social and economic characteristics, as well as environmental characteristics.

DR. DUMAS: Okay, right, and so I think that's potentially problematic, not just for Alternative 3, but for any alternative where a risk rating includes both sort of biological aspects of risk and socioeconomic aspects of risk, because it might well be that those move in opposite directions with respect to any particular council action or any council choice of P^* value. For example, if you raise P^* , then you're raising the accepted risk of overfishing, and that might be bad for the biology, potentially. Raising the risk of overfishing is potentially bad for the biology, but it could be good for the economics, at least in the short-run, if it allows more fish, and so it might increase -- Raising P^* might increase biological risk, but it might decrease economic risk, or social risk, at least in the short-run.

I think, for that first column, in any of these alternatives, we need to sort of clearly separate biological risk from economic and social risk, because those two types of risk might move in opposite directions, with respect to a choice of a level of P^* or any other council choice.

Then, second, within social and economic risk, we might need to separate short-run and medium-run risks from long-run risks, because, if you increase P^* , and so you have a higher risk of overfishing, in the short run, that might allow the fishermen to catch more fish, which is good for the economics, but, in the long run, if the fishery is actually overfished, and so the fishery gets shut down, then that's bad for the economics in the long run, and so, just in general, with the Alternative 3 table, but for any of the alternatives, I think we really need to separate the risk biology from economics.

Then, within economics, separate the short run from the long run, because, otherwise, I think it's going to -- People will misinterpret -- Different stakeholder groups will have different interpretations of what risk is, and environmental groups might see the risk rating as biological risk, but fishermen groups might see the risk rating as risk to them, economic risk, and council members might see both of those, plus political risk, if there's political risks, and not to the council members themselves, but in general, to some other constituents or stakeholders, and so I think we just need to be more -- I like the idea of having a table like this, Alternative 3, but we just might need to be more specific in defining what exactly that risk rating -- Which types of risks are included in that risk rating and which are not, and we might need to have different categories of the risk rating. Thanks.

DR. ERRIGO: Those are actually excellent points. We actually went round and round and struggled with that specific idea of the socioeconomic risks of the short term versus the long-term risks in the risk analysis itself. We actually decided on looking at long-term socioeconomic risks in the risk analysis and not the short-term socioeconomic risks and benefits.

DR. DUMAS: I think that's fine, as long as it's made clear to everyone.

DR. ERRIGO: Yes, and that's the one thing, is that the risk analysis is a little complex in how much it goes through, and we've tried to break it down for people, to try to make it as clear as we can.

DR. DUMAS: I understand. I think though that, also, the short-run economic risk needs to be addressed in some way, because, if it's not, I think that's to the political peril of everyone involved, if the short-run economic risk is not addressed in some way, because I think that's going to be important to a lot of stakeholder groups. Thanks.

DR. NESSLAGE: Thank you very much, Chris. Excellent comments and suggestions. Anyone else with questions or comments at this point? I am not seeing anyone, and so please continue, Mike, whichever Mike is going to take the reins here.

DR. ERRIGO: That's me. One second. I will start here, on this read-me tab. This read-me tab actually hopefully explains how this analysis works, and it explains each of the characteristics that we use, each of these traits that are used in the analysis, and there are biological traits, the one we call human dimension, or biological attributes, what we call human dimension attributes, and then environmental attributes are here at the bottom.

Biological attributes are mostly measuring productivity of the stock, and the human dimension attributes are measuring things close to susceptibility, and so things having to do with the fishery itself, how the fishery is prosecuted, and the worth, the value, of the stock to a fishery and the desirability and then social concerns, and then the environmental attributes have things like ecosystem importance and climate change.

I have actually, since you guys have seen this, have added other environmental variables which I think pertain to some of our stocks, environmental attributes that let's say are causing recruitment issues and things like that, that we're not sure what's causing them, but we know that it's some kind of environmental -- It might be some kind of environmental effect, and it doesn't seem to be a fishing effect, and so I did add this column here, and so those are the attributes, and we fill out each of them for each stock.

Here is what the matrix looks like that we fill out for each stock, and not every stock has something in each of the attribute columns, because we just don't know what the answer is. There is a column here that has all the species, all the stocks, in it, from top to bottom, and then across here are the attributes, including there's a weight column, and so you can weight different attributes differently, and then the score for each of the attribute columns, and then we average the scores together, and so we get a score for the biological attributes, a score for the human dimension attributes, and a score for the environmental attributes, and we average them together to get the final risk score. Then there are different ways of doing the scoring to assign the category, which I wanted to talk to you guys about. I see we have a hand up.

DR. NESSLAGE: Before we go there, can you just explain the difference between -- Maybe you already did and I missed it, but the species scores default mod and default high, the two tabs?

DR. ERRIGO: Yes, and the general idea is, if you don't know what -- Here, if you have nothing filled in for a species, and so let's say, for blackfin snapper here, there is nothing in the biological attributes column, and it defaults to moderate. In default high, if you don't know what is there -- Like, for almaco jack, it defaults to high, which is a score of one, and so, the lower the score, the higher the risk.

DR. NESSLAGE: That's right. I remember us discussing that. Thank you very much. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I am wondering whether there is another dimension that we might possibly also want to consider, and that is the expected time between assessment updates. It seems to me that some stocks may be taken on a three-year basis, and some may be on a five-year basis, and our understanding of the stock dynamics obviously will be better, in terms of any misconceptions that we had in the previous assessment on stock status or stock dynamics or natural mortality or any of the biological characteristics, if we look at these in a relatively short time, maybe three or four years.

Some stocks go much longer than that, and, therefore, the basis for probability of an error occurring, and let's say it's misspecification of recruitment in the out years, or some other attribute, which suggests that we might want to be a little bit more conservative in our risk tolerance if we have a longer period between assessments. I just wonder whether that's been discussed in the past. Thank you.

DR. ERRIGO: We did talk about attributes like that, and the thing is that there are no set time periods between assessments, and so it's hard to judge that. What we thought of is that this analysis could help determine the time between assessments for the future, and so having it as an attribute would be counterintuitive, and so a stock that has a higher risk of overexploitation, or a higher risk of overfishing, should have a shorter time period between assessments, instead of the other way around, but that's -- I mean, if you guys feel that it shouldn't be that way, that's fine, but we thought it worked more in the vein of, if this came out that the risk of overfishing was high, then perhaps the time period between assessments should be shorter. Does that make sense?

DR. SERCHUK: That's what I was getting at. Thank you.

DR. NESSLAGE: Thank you, Fred. Chris.

DR. DUMAS: I have a question about how to interpret some of the numbers in the tables, and let's take an example. Let's take golden tilefish, sort of the top row that's showing in the table, and let's go over to the annual commercial value column for tilefish, and there's a Number 1 there, and so the low number means high risk, right? A lower number means higher risk, and so that Number 1 for golden tilefish means that there is high risk of what happening? Is it a high risk of golden tilefish ex-vessel revenues being affected if P^* is increased? A low number means high risk, and so that means there's a high risk to what, ex-vessel revenues, if golden tilefish is overfished?

DR. ERRIGO: Yes.

DR. DUMAS: So these numbers are indicating the risk to the column category if overfishing occurs?

DR. ERRIGO: Yes.

DR. DUMAS: Or are they indicating the risk -- Or are they indicating how the column category affects the risk of overfishing?

DR. ERRIGO: Well, for the biological characteristics, it's that. It's how those characteristics affect -- Being that let's say you have a very high natural mortality means you're highly productive, and so that means you have a low risk of overfishing. Here, in the value, it means -- It doesn't mean that there's a -- There's a high value. It means it has a high value to the fishery; therefore, a high risk of being overfished, because it has a high value to the fishery.

DR. DUMAS: So a low number means a high -- In the social and economic categories, a low number means a high economic value, and, because it has a high economic value, it increases the risk of overfishing occurring.

DR. ERRIGO: Yes.

DR. DUMAS: So, because of that, we would want to maybe set a more conservative value for P^* .

DR. ERRIGO: Yes.

DR. DUMAS: So, for the human dimensions attributes, a low number in the category is indicating that we should decrease P^* .

DR. ERRIGO: Yes. In all the categories, that's how it works, yes.

DR. DUMAS: Okay. Thanks.

DR. NESSLAGE: So, if I can jump in then, Chris, is that counterintuitive, because, if it's a high-value fishery, and there are human impacts to a lower P^* , wouldn't you want a higher P^* ?

DR. ERRIGO: That's where the short-term versus long-term impacts come into play.

DR. DUMAS: Right, and those are the kind of questions that I'm getting at, and I think this kind of table is excellent, and I think this really helps lay out and make clear what all the assumptions are behind the determination of the risk assessment and the P^* . I just think that we might need to be very clear about how the different attributes are defined and sort of the direction of causality that's assumed between a high or a low value of a column attribute. Anywhere that column attribute is high or low, how does it affect the number in that column? How does it affect the risk rating in that column, and then how does that number affect the risk, and then the risk to what? Is it the risk to the stock, biological risk, or risk to the economics, and, if it's risk to the economics, is it short run or long run? Then, based on how the risk is affected, what does that imply for the direction that P^* should be moved?

Maybe it's clear in the minds of the people who set up this table, but that's a pretty complicated chain of logic, and so we're trying to explain this to stakeholder groups, and we'll have to be really, really clear in what high numbers mean versus what low numbers mean to which stakeholder groups and what high numbers and low numbers mean to the council, in terms of where they should move P^* , or where they might want to move P^* . Thanks.

DR. NESSLAGE: Thank you. That's well said, Chris. So, Mike, with regard to what I was talking about with the short-term socioeconomic impacts, the council can still -- They can look at this

recommendation that comes out of the table and is reviewed by the SSC, but then they could still bump that up or down, based on their prioritization of short versus long-term socioeconomic impacts, right?

DR. ERRIGO: Yes, and they can either change the risk category, which, if they feel that the risk category is not appropriate, they can change that, or they can finagle the P* adjustment. If they feel that the adjustment is not where they want it to be, they can increase or decrease the P* adjustment.

DR. NESSLAGE: Great. Thank you. Shep.

MR. GRIMES: Thank you, Madam Chair. I just wanted to note that we need to explain how we walked through this table somewhere in writing, and I'm just thinking that, if we ever end up in litigation over our ABC control rule, or over our application of the ABC control rule, and we're trying to explain how we go through this process, just the table is not self-explanatory, and so we need to make sure that, somewhere, we have written out, as clearly as we can, how we walk through this table, so it's documented somewhere, and then we need to be thinking, each time we do it, that we do it consistently and document how we walk through it for each particular stock. Thank you.

DR. ERRIGO: Actually, before we stopped work on this, I did draft up a paper that did exactly that, that walked through this, and I can get that out to the SSC, so that they can go through that and have that.

DR. NESSLAGE: That will be very helpful, Mike, and it sounds like it would be very valuable to accompany this. Christina.

MS. WIEGAND: Briefly, to address what Chris is talking about, when we went over the human dimension attributes with the SEP, back in April of 2019, and so over a year ago, and so we're testing my memory a little bit, but I believe the terminology that we landed on was that these -- It was the risk of negative impact to X, and so, in terms of social concern, we're looking at the risk of impact to a number of communities, and Scott and Tracy would have been there for that conversation, if you want to elaborate, or if I'm remembering incorrectly, but that was sort of the terminology, or thought process, we were using when talking about the direction of impact or what we really meant by risk, and it was the risk of impact.

DR. NESSLAGE: Risk of long-term negative impact, correct?

MS. WIEGAND: Correct.

DR. NESSLAGE: Excellent. That helps. Scott, did you want to add anything? Go ahead, Chris.

DR. DUMAS: So a low number in the annual commercial value column of golden tilefish -- A low number means there's a high risk of negative impact to the commercial fishery for golden tilefish. A high risk of negative impact, if what happens? Is it if P* is -- It's risk tolerance, and so, if P* is --

DR. ERRIGO: A high risk of negative impact if overexploitation occurs.

MS. WIEGAND: Correct, and that's my thought process as well.

DR. ERRIGO: So if P^* is set too high.

DR. DUMAS: Yes. Okay. Thanks.

DR. NESSLAGE: I have a question, Mike, and forgive me if we've already rehashed this, or if it's a stupid question, but the Alternative 3 is based on biomass relative to $BMSY$, the columns, right?

DR. ERRIGO: Yes.

DR. NESSLAGE: But we're trying to establish an acceptable risk of overfishing, which is different from being overfished, and I recognize that -- Well, they're two different things, and they don't always go together. I know where we're going with this, but I'm wondering if you can walk me through the decision to go with biomass?

DR. ERRIGO: The idea is that, if your biomass -- If you're well above your $BMSY$, if you're above $BMSY$, then the risk to the stock of overfishing is not as -- It's not as detrimental to the stock as if you are close to $MSST$, in which case you are likely to enter an overfished state, and the stock would be at a low SSB condition, and so the risks of overfishing are higher when you're at a lower biomass, the biological risks to the stock.

DR. NESSLAGE: Got it. Okay. Thank you for that.

DR. ERRIGO: That was the thinking.

DR. NESSLAGE: Yes, and that's really helpful. Thank you for jogging my memory. Okay. Are there other questions or comments or suggestions while we're on this table?

DR. DUMAS: I just want to sort of continue the -- I want to make one more comment, because I think this is going to be important to stakeholder groups, and so let's go back to the golden tilefish commercial value column and that number one, and so that's a low number, and so it indicates high economic value, and that means there's a high risk of a negative impact to the fishery community if overfishing occurs. Therefore, we don't want overfishing to occur. Therefore, we're going to decrease P^* , and we want to decrease our risk tolerance.

If we decrease our risk tolerance, then we're going to tighten regulations, potentially. In order to go along with that decreased risk tolerance, tighten regulations, and so that's going to -- If we tighten regulations, that's going to increase the short-run economic risk to the fishery, but decrease the long-run economic risk to the fishery, and so I think that needs to be made clear, because, if you're a commercial fishing stakeholder group, and you see a low number in that column, that low number indicates high economic value and indicates a high risk of negative impact to the fishery, and so you see your fishery's high economic value, and that's telling the council to decrease their P^* , which is going to tighten regulations on my fishery, and my fishery is a high-economic-value fishery, and so why are you tightening the regulations on me?

That's going to increase the short-run economic impacts on me, negative impacts. Now, it might be better for me in the long run, because you decrease the risk of overfishing, and so it might be better for me in the long run, in terms of economics, that you tightened the regulations, but, in the short run, it's going to hurt my economics and my fishery, and so I think sort of that train of logic, that train of causality, needs to be clear, and, if we're going to do something -- If the council is going to decrease a P^* and tighten regulations, and the point of that is to improve the long-run economics of the fishery, but there's going to be some short-run pain, that that needs to be made clear, and that economic argument needs to be made clear, and some assessment of the short-run and long-run economic tradeoff, even if it's a very simple assessment, needs to be made clear.

Maybe it will be clear to the stakeholder groups, when they look at this table, but I'm not sure that it is, and this is not an argument against the table, and this is not an argument against the method, necessarily, and I think having all the information laid out like this is fantastic, and I recognize the huge amount of work that went into making this table, and I think it does help organize all the information really well, but those short-run versus long-run effects -- I think that's going to be important to stakeholder groups, and an important determinant of whether or not this whole thing ends up in litigation will be whether the stakeholder groups understand the implications of this table and understand the effects on them of different values of the numbers in this table and how that affects the council's decisions on P^* . Thanks.

DR. NESSLAGE: Thank you, Chris. I feel like everyone should have this table in front of them on their own screens, and could we go to -- We've had a number of excellent suggestions so far, and I would like to start putting them on paper, or digital paper. Sorry, Mike, and you're trying to juggle a whole bunch of stuff, but I think -- I have heard so far -- We can just put placeholders, and then folks can suggest wording, but there's been a suggestion that we need to be very clear in our communication that the human dimension aspects are long term and not short term, that this is a risk of long-term impact to communities. We can wordsmith, but --

DR. DUMAS: But the short-term impacts should not be swept under the rug, because that's where you're going to get a lot of pushback from stakeholder groups, and that's what's going to cause issues to arise, and so it's not to say that all negative short-term economic impacts should be avoided. Sometimes, potentially, some negative economic impacts in the short run are worth it, in terms of the long-run economic benefits that are going to occur, but I think that should be made clear, so that folks don't think that various impacts are being swept under the rug, because I think that would decrease trust in the overall process and increase opposition to a process that might very well improve the management of the fishery. Thanks.

DR. NESSLAGE: Thank you, and I wonder if we can add a suggestion that, when the P^* is revealed, if you will, or set, wherever it is communicated to the public, that the short-term impacts should be -- Not ignored, but should be specified, or at least described. The potential short-term economic impacts should be described.

DR. DUMAS: They should be distinguished from the long-term impacts.

DR. NESSLAGE: Yes.

DR. DUMAS: And assessed, at least qualitatively.

DR. NESSLAGE: Right. We might not be able to do formal socioeconomic impacts on everything, but at least acknowledged, formally. Okay. I also want to put a placeholder for Fred's suggestion about incorporating time between assessments, if we could, and I don't know if that's under the first or the second bullet, wherever you feel that fits, and folks can chime in with regard to how they feel about all of these bullets, but I just want to get them on paper, so that we have something to talk about. Then the last one that was brought up is that there needs to -- We recommend that there be clear written explanation and documentation provided with this table, to accompany this table, with specific details for each species, as to how those determinations were achieved. I will stop talking, and let's go to Fred Serchuk.

DR. SERCHUK: Thank you, Chair. I am a little bit fuzzy about the time period between a long-term impact and a short-term impact and when those evaluations will occur. Typically, when we do assessments, and we do assessments, for example, in 2021, and probably the last year of data might be two years before that, 2019, and, if we're lucky, it's 2020, and we're providing advice probably beginning in 2023 or 2024, for most of the assessments that I'm familiar with that we've done.

I think we ought to be mindful of how we can parameterize short-term versus long-term relative to the assumptions that we make in our model for the years in which we have no information, and I don't mean to dismiss it all, and I think the idea about looking at impacts, either on a short-term basis or a long-term basis, but we need to quantify what that means, particularly in our ability to do the gut-checks and the updates to monitoring to see whether our understanding of what stock conditions are, based on the assessment, still prevail in the intervening years between assessments, but I think they're all tied together, quite frankly, Chair.

DR. NESSLAGE: Well said. Let's put an idea down there about -- We can work on the wording, something about we need to clarify what we mean by short versus long-term. That would be great. Scott, please, go ahead.

DR. CROSSON: Just following-up on what Chris has put up there, and there's a magical phrase that we like to use in economics, and that is all other things being equal, and my point in mentioning that is that not all things are equal here. This is just one variable in the middle of a bunch of other ones, and so, for a stock that has biological attributes that are going to make it less susceptible to overfishing, that is going to help counteract what is written down right here as a cost, and it's just going to -- There are some species that are certainly going to be more productive than others, and so, those, we're not as worried about, and so maintaining the length of that benefit is something that we're trying to do over the long term, but it's not unrelated to other factors, and economics is just one of them, and so that's all.

DR. NESSLAGE: Well said. Thanks, Scott. Chris.

DR. DUMAS: I think Fred Serchuk's point about how to define long run and short run is -- I agree that's a very important point. One possibility is short run might be defined as the time until the reference point is achieved, and the long run is after reference points are achieved, at least with respect to maybe regulatory changes, and I'm just throwing that out there as a strawman definition, but, if you think of one reason why the council might be considering taking an action, it's because a reference point is not achieved, and so we've got to take some action until we achieve that reference point, and so we're going to implement some actions until we achieve that reference

point, or implement stricter regulations until we achieve that reference point. Short run might be the time until the reference point is achieved, and then the long run could be after that, but I know there are other ways to define it, but I'm just throwing that out there.

DR. NESSLAGE: So we don't have target reference points, and maybe I am misunderstanding. If they're not actually overfishing or overfished, there wouldn't be a time -- Am I misunderstanding? There wouldn't be a time until the reference point is achieved. Chris, can you clarify, or am I just misunderstanding?

DR. DUMAS: Right, and so my last comment was just for those stocks that are either overfished or experiencing overfishing, or both, and so, for stocks that are not overfished, and they are not experiencing overfishing, then that definition that I proposed would not be relevant, and you would need some other definition of short run or long run.

DR. NESSLAGE: Okay. Can you put that in parentheses, Mike? That would be helpful. Thank you, Chris. Wilson.

DR. LANEY: Thank you, Madam Chairman. I just have a very general question, and I definitely agree with Shep that the complexity of this table is daunting to a non-technical stakeholder, for sure, and my question has to do with the biology, I guess, and it sort of relates to the discussion that we were just having about short term and long term, and I am thinking, and this is, I guess, a question for Mike E., and we would have to look at how all those P* came out, possibly, to answer it, but is there any sort of -- This gets to maybe helping to explain the table to folks, but is there any clear pattern that emerges, Mike, that shows the difference between a species with a short generation time that is highly fecund and likely to recover from overfishing in a shorter timeframe than those species that are very long-lived, and perhaps not as fecund, that are going to take a long time period to recover? Hopefully that question made sense, but I was just wondering if there was any sort of a pattern there that would help to clarify this whole process as well. Thank you, Madam Chairman.

DR. ERRIGO: That does make sense. Normally, what you would see -- First of all, in the biological attributes, you would see a very low risk to overfishing for those highly-fecund, fast-growing species, which oftentimes will offset the human dimension attributes, even if it's a highly-sought-after species that is difficult to regulate, let's say, and so, most of the time, they would come out as being fairly risk tolerant, or low risk of overfishing, compared to the long-lived species, in general. Like bar jack is very -- It comes out to be low risk, and Atlantic spadefish comes out to be low risk.

DR. LANEY: Okay, and that's what I was asking, and so then I would expect the groupers -- Let's see. How does snowy -- Does snowy come out to be a higher-risk species?

DR. ERRIGO: Yes, it does.

DR. LANEY: That's what I would expect, and, Madam Chair, I was just thinking that that -- Pointing out that pattern might be helpful to our stakeholders, as they try to understand how this process works.

DR. NESSLAGE: Absolutely, and maybe -- The actual control rule amendment is quite extensive, and I would have to go back and look and see, and is that explained somewhere in the document? Wilson, maybe you can take a peek and see if you think the language that's in there is adequate, and, if not, we can suggest something. While we're looking at that, Chip, would you like to say something?

DR. COLLIER: I did want to speak a little bit about the short term and long term. When staff were working on this, we were thinking and focused on the long-term impacts, and the reason for that is the short-term are also reviewed during the development of any amendment that we do, and so we're going to look at the last three years and really analyze the economic, the social, and the biological impacts, and that's going to be included in any NEPA analysis, as we develop the amendment.

DR. NESSLAGE: That's helpful. That is explained to stakeholders, I assume, at public meetings, when the amendments, or FMPs, are amended.

DR. COLLIER: Yes, and so that's a required section for each amendment that we do.

DR. NESSLAGE: Okay. Excellent. Thank you. I took note of a couple of things that we should probably comment on, Mike, and tell me if you think there's more, other than general comments and feedback, which have been excellent so far. The default high versus moderate issue, as well as the standard versus alternate scoring issue, are there other things that we should be commenting on, and do we want to take those in whichever order you think is most important?

DR. ERRIGO: The scoring issue and the default issue are the two that I wanted to talk about. We can do the default issue first, and that's actually pretty easy to look at, and, in fact it doesn't actually make that much of a difference. Here is default moderate and default high with no penalty and default moderate and default high with a penalty for the unknown stocks, stocks that -- I should alter this a little more.

DR. NESSLAGE: Thanks.

DR. ERRIGO: No unknown penalty and unknown penalty, what that means is, in this table, not for environmental attributes, but for everything else, if you don't know -- Let's say, right here, we don't know the potential for discard losses for Atlantic spadefish, and it was left blank. In the no-penalty situation, it just doesn't count in the calculation of the score. In the penalty situation, it calculates a penalty for not knowing what this attribute is, and so it decreases the score each time you don't know something, unless you don't know the entire -- Like, for bar jack, we don't know anything about the biological attributes, and then it just defaults to something.

DR. NESSLAGE: I vaguely remember us discussing this in the past, and I thought we had gone with the no-penalty, and is that correct, just because we have so many data-poor species, or am I misremembering? Does anyone remember?

DR. ERRIGO: Well, we went with -- The SSC actually went with the penalty version, but that caused everything to come out either moderate or high risk, which I was worried about, but then what I did was I re-jiggered the scoring to break everything up into thirds again, and it recalculated -- It redid things so that the scoring was one-third low and one-third moderate and one-third high,

a third of the new scoring, because the scoring changes when you add a penalty, and it doesn't go from one to three anymore.

DR. NESSLAGE: So, if they end up being similar, I am going to be a strawman suggestion out there that we go with no penalty, because that just sounds like stakeholders are being penalized for us not having information on a lot of data-poor stocks, if it ends up being very similar, but I would -- Again, that's a strawman suggestion, and I would love to hear what the rest of the SSC says.

DR. ERRIGO: It actually comes out more realistic with the no-penalty situation.

DR. NESSLAGE: How so? What do you mean by "realistic"?

DR. ERRIGO: What I mean is there is more -- There is less moderates and more highs and -- There is less moderates and lows, and more highs, and it looks more like what you think it should look like, and like hogfish comes out as high, and blueline tilefish comes out as high, and black grouper comes out as high, and snowy grouper comes out as high, whereas they all came out as moderate in the other one.

DR. NESSLAGE: Excellent. Okay. What do folks think? Let's take this one issue at a time, if you don't mind.

DR. ERRIGO: Okay, and so why don't we do it this way.

DR. NESSLAGE: Is that okay, and then we can go to Alexei's hand, and let's go with the penalty versus no-penalty issue. Raise your hand if you have an opinion, and I know you do. Don't be shy. Anne Lange.

MS. LANGE: I think I agree with you, Genny, that no penalty for those stocks that we don't know, at this point at least, that we don't have the information for.

DR. NESSLAGE: Thank you. Wilson.

DR. LANEY: Me too, Madam Chair, simply for the reason that if, as Mike points out -- To me, it's realistic to expect that species like hogfish and snowy grouper should come out as higher risk, and so, if no penalty makes that happen, then I support it.

DR. NESSLAGE: Excellent. Thank you. Are there others, folks we haven't heard from? This is a pretty big decision. Chris.

DR. DUMAS: So, if we accept the no penalty for unknown, that's equivalent to going with the default value for that category, which is two?

DR. ERRIGO: No, and that's a little different. What happens is that category -- That attribute -- Let's say, for here, Atlantic spadefish, we don't know what the potential for discard losses is, and that category isn't used to calculate the final score. It just drops out. The default score is a little different. That's when -- Let's say, for biological attributes here for bar jack, we don't know any of the biological attributes, and we give a default score to the biological attributes category. We

need something there, because we're averaging the scores of these overall attribute categories in order to get the final score, and so, if there's nothing there, it doesn't really work.

DR. DUMAS: So, if all the attribute numbers are unknown for a given category, then the score for that category defaults to one?

DR. ERRIGO: Or two, and that's what we have to decide.

DR. DUMAS: Okay, and it defaults to something. If it defaults to one, then it's defaulting to the highest risk category, which is implying that no information means high risk, if we choose one as the default.

DR. ERRIGO: Yes.

DR. DUMAS: So, if we decide to go with -- At the far-right of the table, if we go to the far, far right, I guess, if we go to the use an unknown penalty versus not use an unknown penalty columns that we were looking at a minute ago --

DR. ERRIGO: Yes.

DR. DUMAS: If we choose the no unknown penalty, then that means that, for categories like for the biology category, if all the attributes are unknown, then, in the no unknown penalty category, we're accepting the default number there, and so, if we choose the no unknown penalty option here, then choosing the default number is important, because the default number becomes the numbers that's used. If we have no information for that species for that category, then the default number is going to be used in the no unknown penalty.

DR. ERRIGO: Yes, but the same would happen if there was a penalty, because you can't penalize and then have a score -- Not have a score, and you would still have to have a default score.

DR. DUMAS: Yes, but I'm just saying that, in the no unknown penalty category, there is a penalty for unknown, and that is whatever we choose the default number to be.

DR. ERRIGO: Yes, and you can see it does make a difference for some stocks. Like, here, for bar jack, if you default to moderate, it comes out as a low risk. If you default to high, it comes out as a moderate risk, and so there are some changes, but there are only a handful of stocks that we don't know anything about, and it's mostly in the biological category, because there are only two attributes there.

DR. DUMAS: Thanks.

DR. ERRIGO: Yes.

DR. NESSLAGE: Thank you. Jeff.

DR. BUCKEL: Chris made the point about this is just -- We need to focus on that default value now, because that's going to -- If we go with the no unknown penalty, which I'm in agreement with, given that these do seem more realistic, and, Genny, maybe I misinterpreted what you said

before, but I think, when you were talking about, if we went with the penalty, that would penalize the fishermen, but I think it penalizes the fish stock, right, because --

DR. NESSLAGE: I was trying to say that it was a communication problem.

DR. BUCKEL: Yes, because going with the no unknown is going to -- It's a higher risk, and so lower P^* , just to make that clear. Thanks.

DR. NESSLAGE: Okay, and so I'm not hearing any -- Unless -- We'll go to Tracy next, but I'm not hearing a lot of pushback on supporting the no unknown penalty, and so we're looking at Columns B, C, and D here and having to decide whether we want to default to moderate or high or an alternative number. Tracy.

DR. YANDLE: Just a bigger-picture question here, and, if we go with no, or minimal, penalty on the unknown, do we risk creating perverse incentives around data gathering and analysis and that it becomes attractive, for people who want to keep fishing at a higher level, to not want to enter scientific data?

DR. ERRIGO: That is actually a dangerous game to play, because let's say, here in the human dimension attributes, you can't answer most of them, but you have like one column left that you could answer, and, if it comes out as a three, then you are automatically high risk, and there's nothing else in there. I mean, if it comes out as a one. I'm sorry. If it comes out as a one, you're automatically high risk, like blueline tilefish or blackfin snapper, and that's it. There's nothing else you can do about it. The more attributes you have, the more things can average out.

DR. YANDLE: I am not actually specifically trying to argue one way or the other on this, but I am just trying to figure out what the incentive structures are that we're setting up here, and we do not want to unintentionally create some perverse incentives here, and that's all I really was wanting to flag and make sure we have thought through this.

DR. NESSLAGE: That's a good point, Tracy. I wonder if we want to capture that for the council's consideration, as a piece of advice? We will have opportunities to continue -- Both the council and the SSC, as I understand, will have opportunities to continue to think about this as the control rule amendment continues to be considered by both groups, and so, if we want to think more on this, we can provide additional advice as we go along, and is that correct, Chip and Mike?

DR. ERRIGO: Yes.

DR. NESSLAGE: So that will give them some food for thought. Thank you, Tracy. Are there other thoughts on default high versus moderate, in particular?

DR. ERRIGO: What you can see is it makes some difference for those stocks -- There are only a few stocks where the default is used, and like, for bar jack, it changes. Blackfin snapper, it's moderate under default moderate, and it's high under default high. Sand tilefish is low under default moderate, and it's moderate under default high. Lesser amberjack changes, and that's it. Those are all of the species that it makes a difference for.

DR. NESSLAGE: Thanks. Does anyone have any comments on, in particular, the impacts of those species, if it were -- If we were to select moderate versus high? As I understand it, Mike, if we were -- For instance, as a strawman suggestion, if we were to pick, or suggest, or recommend, I guess, moderate, but the council always has the purview to be more conservative, correct?

DR. ERRIGO: Yes.

DR. NESSLAGE: So if they're like, wow, we are so worried about bar jack, we can always make our P* lower, but they just can't be higher than what -- Okay. Just to be clear. Jeff.

DR. BUCKEL: Just using kind of the gut feeling that we did between unknown penalty and no unknown penalty, I think going with the default high for lesser amberjack -- That doesn't seem quite right to me, and then the other one was bar jack from low to moderate, and so I would be in favor of the not going with default high, because of that change to something that doesn't seem quite right for the biology.

DR. NESSLAGE: Thank you, Jeff. Let's put a -- Unless I hear alternative viewpoints, let's see if we can make a note about recommending default moderate, and, if folks disagree, this would be the time to raise your hand, and, if you don't disagree, then we'll go to the standard versus alternate scoring. This is the type of feedback you're looking for, right, Mike?

DR. ERRIGO: Yes.

DR. NESSLAGE: Cool. I am not seeing any hands raised, and so can you walk us through this alternate scoring issue then, please?

DR. ERRIGO: Yes, and I think you can see it best here. The alternate scoring, what it is is it's more closer to how the scoring was done for the NMFS PSA scoring, and what it does is it takes things from this here, this distribution here, which has the high risk, the moderate risk, and the low risk, and that's the number of stocks, and it basically changes it to this, and so there are more high-risk stocks and more low-risk stocks and less moderate-risk stocks, and so it more evens out the number of stocks in each category.

I don't know if that's a viable alternative, really, or not, or any better than -- What the current scoring does is it takes the range of scores, which goes from one to three, and it just divides it into thirds, and one-third of that is high, one-third of that is moderate, and one-third of the scoring is low. They are not equal thirds.

DR. NESSLAGE: How are they broken up then? Can you walk me through that?

DR. ERRIGO: How they were broken out, actually, I don't know exactly. This scoring was done based on the PSA analysis from NMFS, but I think it has to do with -- It looks like it has to do with the number of stocks that fell in each category, and they tried to even them out.

DR. NESSLAGE: I see. Right. From the stock assessment prioritization process, right, and that was part of that whole thing, when they were trying to identify --

DR. ERRIGO: It was during the -- NMFS developed a PSA analysis, which looks a lot like this.

DR. NESSLAGE: Okay. Is it separate from --

DR. ERRIGO: Yes. It's separate from MRAG.

DR. NESSLAGE: Okay. Have we reviewed that?

DR. ERRIGO: Not exactly, and this looked a lot more like in the past, and then it morphed and modified into what you see in front of you.

DR. NESSLAGE: I don't know about anyone else, but I feel like I don't know enough about how they came up with that to really comment. Does anyone disagree?

DR. ERRIGO: I just put it as an alternative, but, honestly, I am not married to it, to be honest with you.

DR. NESSLAGE: Does anyone know more about this NMFS PSA scoring and can elaborate? Scott.

DR. CROSSON: I am not one of the authors, but I do remember the paper. I know at least one of the authors was from the Southeast Fisheries Science Center, and I think Todd Gedamke was on it, and so there is documentation, and I think it was intended to be a pretty national look at this, and it came out, again, about the same time as MRAG did, and it was published in a journal too, I believe, and I don't know if anybody else remembers more.

DR. NESSLAGE: I am wondering, Mike, if we could -- Did you provide that with the briefing book materials? Forgive me, but there's so much.

DR. ERRIGO: No, I didn't. I'm sorry. I didn't think of it.

DR. NESSLAGE: Don't apologize, but I'm thinking we might want to table this until we've had a chance to look at -- To educate ourselves on this scoring approach.

DR. CROSSON: If I can find it on my computer in the next few minutes, I will send it, and I think I have a copy of it on here.

DR. NESSLAGE: Great. Has the council expressed any interest in that, using that approach, or is this something you had just brainstormed because it's out there as an option?

DR. ERRIGO: No, and I just thought of putting it out there as an option, because they used it, and it went through a whole process and was vetted, and so I thought, well, if they used this scoring breakdown, and their methodology is very similar to ours, then perhaps it's applicable.

DR. NESSLAGE: Right. Chris, go ahead.

DR. DUMAS: Another possibility would just be to calculate the standard deviation of the R scores and define high risk as a certain number of standard deviations away from the mean R score, and low risk is a certain number of standard deviations away on the other side. That's more statistical,

and I don't know if that's what we would want to do, especially if, over time, all our management works and all fisheries become lower risk over time. I don't know if that would be -- That would be maybe a more sort of objective way of defining three risk categories, maybe one standard deviation above and below the mean, but then, as things change over time, I'm not sure, and I would have to think about that some more, and so I'm just going to throw that out there as a strawman to consider.

DR. ERRIGO: Chris, that's an interesting point, as things change over time, and that's one of the reasons why I thought that I didn't like this one as much, because, to me, it looks what they did was they evenly broke out the species into high, moderate, and low in that other analysis, and, obviously, it didn't come out perfectly like that in this one, but, if you're trying to move stocks over -- You would think it would look more like this, and then, as you move stocks over, high would go into moderate, and moderate would go into low, and low would start getting larger, but I could certainly look at the standard deviation issue and see how that looks.

DR. NESSLAGE: Would you be willing to try that and bring it back to us?

DR. ERRIGO: Sure.

DR. NESSLAGE: Thank you, Mike. Good suggestion, Chris. Other comments or questions? I am not seeing any hands raised. Given we're going issue-by-issue, I would like to see if there's any public comment on risk analysis at this point. If you do have public comment, please raise your hand. I am not seeing any hands, and there's no one on the phone, right, Chip, the phone only?

DR. COLLIER: I am not seeing anyone with just a number.

DR. NESSLAGE: Great. Okay. Thank you. Okay. SSC members, looking at the notes we've taken so far, and we can do some wordsmithing offline, especially those of you who are taking notes, but is there anything here though that we need to flesh out a little bit more before we -- I think we seem to be wrapping up risk analysis, and am I correct, Mike, that these are the main issues that we've addressed here?

DR. ERRIGO: Well, what I would like to do is go over the P* comparison examples.

DR. NESSLAGE: Okay. Could we take a quick break?

DR. ERRIGO: Yes.

DR. NESSLAGE: All right. Could we all be back at 10:30 then? We'll take a quick coffee and bathroom break, and, when you come back, if you could raise your hand, that would be great. Thank you.

(Whereupon, a recess was taken.)

DR. NESSLAGE: It looks like we have most people back. Mike, you were going to go through the P*, and so this is Attachment 18, and is that correct?

DR. ERRIGO: Yes, that's correct.

DR. NESSLAGE: Great. This is a breakdown of the original P* analysis and the new proposed one from Action 2, Alternative 3, because the other parts of the P* analysis were to go through each species individually and come up with a P* value, and so I wasn't going to do that, and so this follows that biomass trend stuff, the biomass trend and the scores from the risk analysis.

As you can see, here is the final P*, here and here, this column and this column, and you can see that some of them match up pretty well, and some of them don't. Like vermilion and yellowtail are exactly the same. Some of them are off by so much, 5 percent or so, and black sea bass is off by quite a bit, and that has to do with the terminal biomass being below the median level here. As you can see, it falls into this category.

DR. NESSLAGE: So that really has nothing to do with the scoring sheet we saw, and that mostly has to do with the column in the original table.

DR. ERRIGO: Yes.

DR. NESSLAGE: Okay.

DR. ERRIGO: It was a low biomass, and it was a moderate risk, and so the adjustment was 20 percent for that, and 25 percent total, because another 5 percent was for the SSC's adjustment, as you can see. Because it was down there, it was here, an adjustment of 20 percent.

DR. NESSLAGE: Mike, with the exception of blueline tilefish, all of the P* went down, and is that correct, in these -- Well, except vermilion and yellowtail stayed the same, correct?

DR. ERRIGO: Yes. They stayed the same, and these P* went down by some.

DR. NESSLAGE: But this is a -- You selected these because they have very different, I assume, situations and life histories and considerations, just to give us a sampling, correct?

DR. ERRIGO: Well, yes, and I also selected these because they were done fairly recently, and they have P* values, and so I didn't have much to choose from, but these were done fairly recently, and they had recent P* values that I could go to and find all the scorings for fairly easily, but they do happen to have very different life histories and very different situations, in terms of their biomass.

DR. NESSLAGE: This is assuming that the human dimensions scorings that you or whoever have brainstormed as placeholders would be what the council would agree with, correct?

DR. ERRIGO: Yes, and so the risk -- This assumes the risk rating, or, actually, for these species, it didn't really matter. Almost all the risk ratings for these species were the same across-the-board. The assessed species had so much information that it didn't matter, and there was no penalty for unknowns, because there were no unknowns, and there were no default scores, because there were no categories that were completely empty or anything like that, and so I just used the -- I used the original scoring and not the alternate scoring.

DR. NESSLAGE: What do folks think? Well, first of all, thank you, Mike. What do folks think about these examples and how the proposed P* setting approach here would actually pan out? Are there concerns or comments or suggestions? Is this playing out the way you might anticipate that it would?

DR. ERRIGO: By the way, bluefin tilefish is the only one that went up, and that's because here is the biomass, and here is BMSY.

DR. NESSLAGE: So it's in the B column here.

DR. ERRIGO: It's like way over here, and, even though it was high, it still only had a penalty of minus 10 percent.

DR. NESSLAGE: I can hear Church in the back of my brain saying that you can fish down tilefish pretty fast, but maybe that was just goldens.

DR. ERRIGO: The risk of overexploitation was high for bluefin tilefish, but the current biomass was high, and that is only for the southern portion of the stock. We didn't have the same kind of information for the northern portion, and there is no way to put them together, and so we did the P* analysis for that, and that's what I took the -- Actually, that might have been from SEDAR 32. That might have been from the previous SEDAR and not SEDAR 50, just to give an example. I don't remember which one I did, but, either way, it doesn't take the separated portion north of Hatteras, like separated out.

DR. NESSLAGE: Okay. Well, I am not seeing any hands, and so I'm guessing that folks are comfortable with what they're seeing. Unless I see hands in the next few seconds, perhaps we could go -- Is there something else that you wanted to show us on this spreadsheet, first of all, Mike?

DR. ERRIGO: No, and I just wanted to show you that, and then the only real action item is just to look at that comparison and provide any feedback that you might have on that, or if you agree with that, or if you like that, for that particular action. If that's your preferred alternative, if you like that one, let me know.

DR. NESSLAGE: I think we could say -- I will just put some strawman wording out there that the SSC -- Perhaps we can -- Because we haven't quite decided on our recommendations on everything yet, perhaps we can say that the SSC thinks that this approach appears reasonable, or is performing as we anticipated, something along those lines. What do people think? Does that capture the sentiment? I am not seeing any hands raised, and so I'm going to assume yes.

In the interest of time, I don't want to spend too much time wordsmithing right now, and I'm going to lean heavily on my notetakers and everyone to edit the report when we receive the -- When I send you the draft, but is there anything in the risk analysis section here where the sentiment -- Where you might disagree with the sentiment or the statement, or is there anything you would like to definitely wordsmith for content right now? Chris.

DR. DUMAS: To that, I would like to maybe say the SSC thinks this methodology is reasonable and is performing as anticipated.

DR. NESSLAGE: Good suggestion.

DR. DUMAS: Then I would like to make a quick comment on the last spreadsheet table that we were looking at. At the top of this somewhere, I think it needs to be clearly said, if anyone ever looks at this table, that the default P^* is 0.50, and these tables are calculating adjustments to the default of -- The default is 50 percent, or 0.50, and these are calculating adjustments to that.

Then I think it needs to be clear that the bottom table on this sheet -- The bottom table of this sheet, which numbers, the numbers in parentheses, feed into Column K in the top table, right, and so the numbers from the bottom table -- The numbers in parentheses in the bottom table feed into Column K in the top table, if I am reading everything correctly.

DR. ERRIGO: Yes, you are.

DR. DUMAS: So the default P^* is 0.50, and maybe make that in red, and I know it's an obvious point, to those who work with this table all the time, but, if you're somebody else, what is the default, and so I think that's clear. Then somewhere a note that the numbers in parentheses in the bottom table feed into Column K in the top table. Thanks.

DR. NESSLAGE: Thank you. Amy.

DR. SCHUELLER: To further clarify this, I also think the numbers in parentheses should just be in percentage points in that bottom table. For example, we talked about black sea bass has a 20 percent adjustment, because it's in low biomass and medium risk rating, but it says negative-0.20, and I think that that could be confusing to folks, and it should just be 20 percent.

DR. DUMAS: Also, one last point on the bottom table in that previous spreadsheet, and there should be a note that the row of that table is selected by the huge risk analysis spreadsheet that we looked at in the previous presentation, Mike's previous presentation, and that's what ties together that previous humongous spreadsheet with this spreadsheet. Thanks.

DR. NESSLAGE: Thank you, and thank you for making those changes, Mike.

DR. ERRIGO: You're welcome.

DR. NESSLAGE: Shep.

MR. GRIMES: Thank you, Madam Chair. I just wanted to note that, Mike, when you're drafting up that other document that says, in written format, how we walk through the other table, I presume you would include some instruction on this, which I think really is just what Chris just mentioned, that a row is selected based on that risk tolerance analysis, but maybe I don't fully understand. Thank you.

DR. ERRIGO: Yes.

DR. NESSLAGE: Great. Could we go back to our consensus statements one more time here? Are folks comfortable with the first bullet, to review the P^* comparison, and the SSC thinks the

methodology is reasonable and performing as anticipated. The numbers in the council table should be in percent and not decimal, and maybe add another bullet that we explain -- Just to make sure that this is in the documentation, that these tables are in the documentation, or clearly explained in the documentation.

DR. DUMAS: Specifically, how the numbers from one table -- Where they feed into the next table.

DR. NESSLAGE: Yes, how the calculations and mapping occur.

DR. DUMAS: And that these tables are calculating adjustments to the default P^* of 0.5.

DR. NESSLAGE: Moving to the next bullet point, to review the document, I just want to briefly go through these again, content wordsmithing only, and I'm thinking that we want to change the "may want to incorporate time between assessments" to -- Do we want to suggest that, make that wording stronger, or do we want to see how it impacts the spreadsheet and make a decision at a later time, and I would particularly like to hear from Fred, as to your intention.

DR. ERRIGO: One thing I wanted to say about that is that, if we use the risk analysis to help us inform the time between assessments, then I don't think it would be appropriate to put the time between assessments into the risk analysis.

DR. NESSLAGE: Chicken or egg.

DR. ERRIGO: Yes. That was my thought.

DR. NESSLAGE: Right. Anne.

MS. LANGE: I agree with Mike's comments, if in fact this is going to be used to inform when assessments should be done.

DR. NESSLAGE: Fred Serchuk, how do you feel about that? You were the proposer here. Have we lost Fred, or is he muted? He might have stepped away, and here I am calling on him.

DR. SERCHUK: I was muted by the organizer, and I agree with that.

DR. NESSLAGE: Okay, and so maybe we can remove that, for the moment here.

DR. ERRIGO: Sure.

DR. NESSLAGE: I am not sure what to do about the need to clarify what we mean by short versus long term, and I think we have a proposition here for overfished and overfishing stocks, and do we need or want to think more about it or make a suggestion now for the stocks that are in good shape? I will look to Chris, since he brought up this suggestion, or others who have ideas.

DR. DUMAS: I don't understand what you're asking. Could you ask that again?

DR. NESSLAGE: This bullet point on the short and long-term bit, the need to clarify, that specifically, right now, has a strawman suggestion for what to do with overfished or overfishing stocks, but what do we do -- How do we define short versus long term for those that are not overfished or overfishing? There is no reference point to be achieved, because there are no targets.

DR. DUMAS: That's a good point. I need help from my fellow panel members.

DR. NESSLAGE: Someone has got to have a good idea, or we can mull this over and think about what that might mean, and we don't have to answer it today, and this is just a suggestion for some of our stocks, but we need to -- This is something that needs to be clarified, clearly. Yan, help us out.

DR. LI: I will try. Myself, it would be because I like this suggestion here, but, in terms of like -- I agree that we need to clarify what we mean by short versus long term, either-- Sooner or later, we need to define that, if we want to separate those two impacts out, but, at this moment, for now, I don't think we -- I don't feel that we have enough time and information to make a suggestion for those definitions, at this moment, and so I would suggest -- We can say something like we suggest to clarify -- We feel it's important, or necessary, to clarify, or define, the short term versus long term. However, given the information, what we have at this moment, we cannot make the definition right now.

DR. NESSLAGE: Good suggestion.

DR. LI: Something like that.

DR. DUMAS: I agree.

DR. NESSLAGE: Wilson.

DR. LANEY: I agree too, but, as food for thought, given that we don't have a reference point for stocks that aren't being overfished, or where overfishing is occurring, is this -- This is directed at Chris, I guess, and Yan, but could the short and long-term -- Would the short and long-term socioeconomic impacts have any relationship whatsoever back to the biology of the species again? If a species is not being overfished, and it's not overfishing, but it's a short-lived, highly-fecund species, are the impacts more or less likely to be short or long term, and then the same for a long-lived species, and does that make any sense? Is that useful at all?

DR. DUMAS: Maybe, or we could just define short term as the period of time that some -- A particular regime of regulations is in place, and long term is the time after that.

DR. NESSLAGE: We do have ABCs for everything for typically three to five years, and so that could be a compromise, regardless of the status of the stock. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I was going to make that point, that I think short term refers to the period in which we provide ABCs from the assessment, and, generally, that's four or five years sometimes. For overfished stocks, that means you have to have a rebuilding plan, and that would essentially mean around a ten-year period, and that would be the longer term.

DR. NESSLAGE: I am wondering if we can -- Can we grab Yan's suggested text there and tack it on beyond "long term" above and then say something like "may want to consider" -- Keep going. Up above. We need to clarify what we mean by short versus long term, given the information, and then say considerations may include -- Or possible definitions might include, and then time until reference point is -- These two can be on the same bullet, the short and long term for overfished and overfishing stocks and, for non-overfishing stocks, that would be the second bullet, and it would be based on the time period for which the ABC applies, and so we can mull this over, and see what the council thinks as well, and consider it a future time. Jeff.

DR. BUCKEL: Since these are socioeconomic impacts, I am wondering if going to the stakeholders and asking -- Surveying them on what short term and long term means to them. When I teach my marine fisheries ecology class, and I have to talk about discount rate, I have actually had to reach out to the SSC socioeconomic people for help in that, and the stakeholders have different discount rates, versus the natural resource managers, and so it seems like we would want to go to the stakeholders and ask them what's that time period look like for a short-term impact, or what do they consider a socioeconomic impact, and that's going to be a shorter term than the managers, that are thinking longer term.

DR. NESSLAGE: Can we suggest then another bullet that the council consult stakeholders regarding -- Or to obtain feedback on their perception of short versus long term, and would that address your thoughts, Jeff?

DR. BUCKEL: I guess mine was a question to the socioeconomic folks on the SSC, if they think that that's a legit thing to do.

DR. NESSLAGE: Yan, is it to that point, or can we go to the socioeconomic folks? Can you wait a second?

DR. LI: I can wait.

DR. NESSLAGE: Okay. I will come back to you, I promise. Scott.

DR. CROSSON: I don't mean to be pessimistic, but I haven't encountered a lot of fishermen that tend to think about the very long term, and they're usually just trying to make enough payments to cover their expenses and earn some profitability, and so there are a few exceptions, and I think maybe the wreckfish guys are the other ones that have a -- They are more highly-vested in a particular fishery, and that might be a concern, but, beyond that, I don't know.

DR. BUCKEL: I think that was my point, that the short term for the stakeholders might be a year, a fishing season, and so, instead of this "until a reference point is achieved", if it's a socioeconomic impact for the stakeholders, it's maybe much shorter than that.

DR. CROSSON: I guess the way I would think about it is that -- Maybe Tracy can chip in here a little bit too, but, if you have a very small number of participants, and they have a fairly profitable fishery, then they're probably the ones that are most likely to be thinking about the long-term prospects to the fishery, because they are less worried about a race to the bottom. Now, the ones that I would think that would come to mind in our area would be the golden tilefish longline guys, the ones that have those endorsements, and maybe the black sea bass potters too, to a lesser extent,

and then golden crab and wreckfish, because all of those fisheries have really small fleets that tend to specialize for at least a portion of the year, and so they can coordinate more easily.

DR. DUMAS: You can tie those things together. A really short-term perspective for the fishermen is, if the fishermen think the short run is really short, that would correspond to a high discount rate, and so you can tie that to what Jeff was saying, and so they're just two different ways of looking at the same thing, sort of a short-term perspective and high discount rate, and the discount rate is tied to a formula that tells you what the present value of a future stream of benefits would be, and at what point in time in the future does the benefit essentially become zero, that particular year's benefit, in terms of its present value.

When that year is, out in the future, depends on your discount rate, and so, from an economics perspective, we could tie all these things together, if we wanted to, but, practically speaking, as Scott says, if you just ask the fishermen how far out into the future do you think is the short run, then, from the answer to that question, we could -- You could drive the discount rate, if you want to make it sort of consistent with economic theory. That's all. Thanks.

DR. NESSLAGE: Thank you. Tracy.

DR. YANDLE: I'm just going to pile on with everyone else here, and I think Scott hit something really important, that the discount rate -- You can't say there is one discount rate across the board, and it's going to depend by the fishery, the size of it, the institutional structures, what their incentives are, and that -- We can't just put a single variable on it, and it's really going to change, depending on these characteristics of the individual fisheries.

Again, this is one of the things that, in my perspective, that -- When I research, what I try to do is figure out how do we adjust the regulatory structures to try and drive, in the economics language, that discount rate out longer. How do we make it so that the short term -- The definition of short term expands and they are more vested in the longer term viability of the fishery? I agree with Scott that the smaller fisheries are going to be, and the fisheries where they have more control, are going to be more likely to have a longer short term.

Then the other thing I just wanted to add in is that this doesn't mean they have -- That it ever goes down to zero. I talk with a bunch of guys, even in pretty much derby fisheries, and they still want to see their -- They still want to see the fishing traditions continue beyond their relatively short immediate time horizon. There absolutely is that longer-term interest as well, but it just often will get overwhelmed by the economic data.

DR. NESSLAGE: Thank you for that. Perhaps, instead of suggesting something, we can just alert the council that we essentially have had this discussion and that the definition may vary by fishery, based on stakeholder perspectives, or something -- Maybe the SEP folks can help me wordsmith this, preferably later, but --

DR. YANDLE: I would say it varies by fishery, depending on the fishery size and incentives.

DR. NESSLAGE: Well said. That will give us food for thought. I am looking at the time, and I would like to start to wrap this up, if we feel like we're getting close. Anything else on this bullet

point? If not, I'm going to go to Yan. This is all good discussion. Okay. Yan, please go ahead. Thank you for waiting.

DR. LI: Sure. Thank you, Genny. I just have a general question for the SSC. In terms of the SSC's role here, is this SSC's role to define these terms or is the SSC just making recommendations on how to define these terms and the council will decide whether to set it or not or, if yes, how to define them.

DR. NESSLAGE: That's a great question, and I think this was all having to do with the socioeconomic portion of the table, which we haven't really said, and can we add to that to the need to clarify what we mean by short versus long-term socioeconomic impacts? Does that get at the --

DR. LI: I just feel like, as we have been discussing regarding how to define these two terms, it seems like it's more complicated than I originally thought, and so, again, given the information we have at this time, I feel we are unable to define, or make recommendations, and, here, I am looking at the wording. The SSC is unable to define or unable to make recommendations on the definitions of these terms, and so that's why I was asking about the role of the SSC.

Is the SSC the party who defines those terms or just makes recommendations? Then continue the sentence, on the definition of these terms, for stocks not overfished or undergoing overfishing, and I feel like the point is not just for the stocks not overfished or undergoing overfishing, and it's for all the stocks, regardless of their stock status at this point. Given the information, we are unable to make recommendations on the definitions on these two terms for all the stocks, for either overfished or overfishing or those stocks not undergoing overfishing or overfished.

DR. NESSLAGE: Just get rid of the second part there, Mike, is what she's saying.

DR. LI: Yes, and I'm saying like "definitions of these terms" and that's it.

DR. NESSLAGE: Take out the "for stocks not overfished or undergoing overfishing".

DR. LI: Yes, and I like the possible definition that Mike included, and I like this language here. After this, then we can list all of our possible recommendations and thoughts there. Thank you.

DR. NESSLAGE: Thank you. I think what we can do, if you all are comfortable, is I can get clarification from the council on how they would like us to proceed regarding this issue. We're alerting them to the issue that there needs to be more clarification, whether they want to do it from a socioeconomic perspective, with input from the SEP that way, or the APs, or however they want to do it, or if they want to bring it back to us for more suggestions, but alerting them to the issue is really important.

It's 11:07, and there is clearly some wordsmithing that needs to happen here, and I think we're at the point where we can do this through the editing process offline. If anyone has any last-minute major concerns about content of our consensus statements here, please speak now, or raise your hand, please. Help me out and raise your hand. No hands raised. Okay.

This was excellent discussion, and you all brought up some wonderful points. If it's possible for us to switch over and start to cover some of the phase-in presentation, and is that what's next, Mike?

DR. ERRIGO: Sure.

DR. NESSLAGE: Thank you. Let's switch gears.

DR. SCHMIDTKE: There is one action, before getting into the phase-in, and it's more council oriented, and so I'm not sure that there will be huge discussion generated, but there was Action 3, before we get into phase-in and carryovers.

DR. NESSLAGE: Do we actually have to comment on --

DR. ERRIGO: We can probably skip that one for today, since we're running short on time.

DR. SCHMIDTKE: Okay.

DR. NESSLAGE: Thanks.

DR. SCHMIDTKE: In that case, slide down to Slide 23, Mike. There were go. Action 4 is where the amendment addresses phase-ins, and Sub-Action 4.1 is to establish criteria specifying when a phase-in would be allowed. Alternative 1 is no phase-ins for ABC changes, and that's more due to phase-ins not being incorporated up to this point and not specific actions or arguments against phase-in to this point, but they just aren't a part of the ABC control rule and the process there, or not the control rule, but the management there.

The next Alternative 2 would allow a phase-in when a new ABC is less than X percent of the existing ABC, and there are options underneath Alternative 2, and, for these, you would pick one of the three options, but you would set that X at 70 percent or 80 percent or 90 percent. Then Alternative 3 would allow phase-in when stock biomass exceeds a specific level, and the options associated with that would be the biomass exceeding the MSST, and so the stock is not overfished, and Option 2 sets that threshold a bit higher, with the midpoint between BMSY and MSST.

Then the second sub-action under Action 4 would specify an approach for the phase-in of ABC changes. Alternative 1 doesn't have phase-ins included, but, in Alternatives 2 through 4, it would allowed. For Alternative 2, it's three years, Alternative 3 is two years, and Alternative 4 is one year, and so this is the time period over which a phase-in can occur.

This slide is mistitled, and this is the SSC, and this is addressing the SSC recommendations to this point, and the SSC has recommended to allow for stocks above MSST, and so those that are not overfished, to be eligible for phase-ins if their ABC changes, and the SSC has also recommended that assessment frequency be considered in evaluating the time period that is used.

Economic analyses and management strategy evaluations may be useful in evaluating these time periods as well, and so there are a couple of questions that kind of arose out of the NMFS guidance, and I will give a brief slide on that in the next one, but some of those that were apparent were should increases be phased in, as well as ABC decreases, and that's a point of discussion, and how

should harvest uncertainty be considered when bringing up a stock for phase-in? Are there thresholds of harvest uncertainty or any guidance that the SSC could give when there is uncertainty to harvest estimates and there would be uncertainty in evaluating those against a change in the ABC, with regard to phasing-in that change?

There is no additional analyses in regard to phase-ins, but there is additional information since the last time you all took up this discussion, and that was in the release of the NMFS guidance on carryovers and phase-ins, and I am sorry that is one was mislabeled as well, and this is phase-in guidance and not carryover guidance, but this phase-in guidance is summarized in Box 2 of Attachment 20, and that's on page 26, and the requirements for developing phase-in provisions -- There are four requirements there.

First of all, it's to describe, in the FMP, when the phase-in provision can and cannot be used and how the provision prevents overfishing, based off of analysis. Next is the phase-in time periods are not allowed to exceed three years. You can set shorter time periods within the FMP, and that's one of the discussions of the sub-actions that are in there right now. Phase-ins must prevent overfishing each year, i.e., the phased-in catch level cannot exceed the OFL. Then there should be some evaluation of the appropriateness of phase-ins for stocks that are overfished and/or rebuilding. They're not necessarily excluded by this guidance, but there does need to be some explanation of, if they would be eligible for phase-ins, what circumstances would allow that.

Then there's a whole list of other considerations and guidance that is listed in that Box 2, and, if we need to, we can pull up Attachment 2, for you all's reference. If the SSC would recommend that any of that guidance kind of rise to the level of being specified within the amendment itself for this eligibility, or that the council consider looking at any of those specific aspects, and I do think that it would be useful for there to be -- We plan to reference this guidance within the amendment itself and point to that, so that, when stocks are being evaluated for phase-in, there is that document to look at back for the council and for the SSC in deciding eligibility when those situations arise. That's all I have for Action 4, and so I can pass it back to you, Madam Chair.

DR. NESSLAGE: Thank you. First of all, are there any questions, clarifying questions, for Mike regarding phase-in? Your presentation was so clear that no one has clarifying questions. I am not seeing any hands.

DR. CROSSON: The tech memo was just so well written, in addition.

DR. NESSLAGE: Yes. There were some excellent authors there. Okay. I would like to take a moment to see if there's any public comment on this then. If you have public comment, please raise your hand. No hands raised. Okay. Then we have been asked to comment and to review our previous recommendations and provide any further feedback we might have on when phase-ins should or should not be allowed, taking into consideration recent guidance from NMFS. Does anyone have any suggestions for any changes to our previous recommendations or modifications?

So we stand by our highlighted statements here that stocks above MSST that are not overfished should be allowed to have phase-ins, and the assessment frequency should be considered in evaluating that time period in which the phase-in would occur, and management strategy evaluation and economic analyses may inform that. Folks are comfortable with that, it sounds like.

If that's the case, then perhaps we could look at the second bullet, which addresses some of these questions that Mike has brought up, and should allowable phase-in time periods be tied to relative biomass levels, uncertainty, or stock characteristics? We didn't really comment on anything other than is it above MSST, or maybe we've done an MSE or an economic study, but this has to do with biomass levels, uncertainty, or stock characteristics. Should biology inform the phase-in time period? Scott.

DR. CROSSON: Yes.

DR. NESSLAGE: Our answer is yes.

DR. CROSSON: For all three of them, obviously.

DR. NESSLAGE: Then, Mike, either Mike, whoever is most appropriate, would we be asked to make suggestions on how that would occur, or would someone bring us a strawman and we would comment on it? What's the thought regarding this question?

DR. SCHMIDTKE: I think the process, as I understand it, that would happen is, if an ABC change occurred, that would likely come in the aftermath of an assessment that necessitated that change, but, in the discussions of the council setting that change, there would also be the topic coming up of, well, is this change under our phase-in rules, and is this change eligible for phase-in, and what type of phase-in would be applicable for this change?

Depending on what options are selected, if up to three years of phase-in is allowed by this amendment, then there would be some discussion of the timeframe, as well as the levels of phased-in ABC over that timeframe, and that's something that the council would look to the SSC for advice on, and the SSC would be able to recommend that, based off of stock information, information from the assessment, things of that nature, and so, if anybody knows different than that, please correct that.

DR. NESSLAGE: This would be on a case-by-case basis then and not part of the amendment, and is that what you're suggesting?

DR. SCHMIDTKE: The amendment frames the process, and it outlines a framework for a process to occur, but, as it gets applied to individual stock, yes, it would be evaluated on a case-by-case basis, but the framework needs to be established, so that that process can happen.

DR. NESSLAGE: And our comment here would help the council understand that we think these considerations should be part of that process, correct?

DR. SCHMIDTKE: Right. I think, right here, we're basically setting the base parameters that need to be considered in a phase-in. If there is some alarming biomass level, other than setting that line at stocks that are overfished should not be considered for this, if there's any prior level that you all would recommend to go into these considerations, off the bat, then that's something that can be passed onto the council. If that dividing line is fine, or if there are certain stock characteristics that, across the board, shouldn't be eligible for phase-in, that's kind of what we're

looking at. What are some of the things that would exclude, that would generally exclude, stocks from phase-ins?

DR. NESSLAGE: That's helpful. Okay. Thank you. Fred Serchuk, please, go ahead.

DR. SERCHUK: Thank you, Chair. I think I agree that all three characteristics should be considered. We also need to consider, if we phase-in a decrease, but we're most certain about the first year of our ABC projection, and we say, okay, we really should take a 20 percent decrease, but you can phase-in that 10 percent decrease, and then we find out that the outer years -- Let's say it was a heavily recruitment-dependent fishery, and recruitment was assumed was going to be lower, and there's going to be some problems with that.

I think we have to take it on a case-by-case basis. In some cases, we know what the recruitment might be for many years before they actually enter the fishery, and we have some pre-recruit indices, and our ABC projections are based on knowing that recruitment will be coming in next year and the year after that and year after that, and we're pretty sure of that. In some cases, we don't have that uncertainty, and so any reduction that's taken in an ABC reduction in the first year may ask that to be greater in the second year, because the stock may not be as abundant. This is just a scenario, but I'm thinking that we ought to be very careful about allowing a phase-in reduction when there is considerable uncertainty in our projections. Thank you.

DR. NESSLAGE: Great. I would -- I see that Mike is trying to capture that sentiment under the first bullet, and I'm wondering if we want to start brainstorming some of the considerations for the second bullet as well, and I hear you saying recruitment uncertainty, or variability, might be something that is considered. While we're letting Mike catch up, Scott.

DR. CROSSON: The flip side of it works as well. I think, if you are phasing-in increases, when you have biomass levels that are coming back from an assessment that are exceptionally high -- I remember, back when I was -- It's been a long time since I've been on the Mid-Atlantic SSC, and John Boreman, of course, is not on this committee anymore, but I think Fred was still the liaison from the Northeast there at that point, but the scup assessment came back, and B was four-times BMSY, or even larger than that.

The industry representatives that were in the room immediately, of course, wanted to have this huge increase in the ABC recommendation, and, instead, the Mid-Atlantic SSC decided to phase it in, and so this is long before we had any guidance on this, but, when you have a number coming back that just seems very -- It's not doubting the stock assessment scientists, but, when it comes back with something that's going to be quite an increase, I definitely think that this is something that should be phased in, and I'm trying to think of some examples from the South Atlantic, and nothing is coming to mind, of course.

DR. NESSLAGE: So you're speaking specifically to the relative biomass levels?

DR. CROSSON: Yes, and I think, when we do see a jump in biomass levels from a new assessment that's a substantial -- I think that's in some of the language that they showed us in the previous slides, but, I mean, if you see a very, very large increase in the biomass between assessments, I think that's certainly something to be cautious of, an increase in the ABC, rapidly.

The second factor is an economic factor, and that's the elasticity of price. The shift between price and supply for a lot of the fisheries in the Southeast is not that strong, and there are two exceptions, and most of these fisheries compete with international imports for similar stocks from other regions, or other things that consumers might choose to purchase, instead of purchasing fish at all, but there are some fisheries, and I know that yellowtail snapper is one in south Florida that we've done regressions on and noticed a fair amount of responsiveness to increase, and I guess part of that is going to be something the council will have to think about, and they will need to carefully pull that apart, but there is certainly risk with large increases in market supply for a few of the fisheries in our region, and I don't know how we pull that apart, but that might just be a council consideration and not one that we should be thinking about.

DR. NESSLAGE: We can suggest they think about it. Can we say something like the council may wish to consider?

DR. CROSSON: Yes, and I think that's probably appropriate.

DR. NESSLAGE: I'm going to let you fill in the blanks, because you said it so well.

DR. CROSSON: Consider the elasticity of price for fisheries, large increases in supply -- Actually, large increases or decreases in supply may affect market price and the profitability of the fleet. The council may also consider that when setting the buffer between ABC and the ACL.

DR. NESSLAGE: Great. Thank you, Scott. Mike.

DR. ERRIGO: What was that last part there? I'm sorry about the -- Large increases or decreases in supply may affect --

DR. CROSSON: The price and profitability.

DR. ERRIGO: Thank you.

DR. CROSSON: Then a new sentence, and the council may also wish to consider that when setting a buffer between ABC and ACL.

DR. NESSLAGE: Great. Thank you. Mike S.

DR. SCHMIDTKE: Thank you, Madam Chair. I just wanted to point out, and I think that Scott's comments are leading in this direction, but I would just point out to the SSC that, right now, increases, depending on alternatives selected, increases are not included in these phase-in options, and Alternative 2, for example, only considers a phase-in when the new ABC is less than a certain percentage, and so, obviously, greater than would not be applicable in that case, and so either there would need to be some language inserted into Alternative 3, or Alternative 2 would have to be adjusted as a two-way option, something like that, but that would need to be something -- I think it would be -- If that's the direction that the SSC would like to recommend, then kind of that overt the SSC recommends phased-in increases, or something along those lines, may be helpful.

DR. NESSLAGE: So that would be our third sub-bullet? Is that where we say a substantial increase?

DR. SCHMIDTKE: Yes, I think so, and I was just noting that it's not in the current alternatives, and so that would be something that -- Those would need to be altered, if the council wants to use that recommendation.

DR. NESSLAGE: So maybe we need to flesh this out, and you're saying to be more clear that -- Pull it up there, yes. Thank you. While Mike is typing, Wally.

DR. BUBLEY: Thank you. I just wanted to point out that I agree with Scott with saying that the phase-ins with these higher levels, based on the economic front, but you also have to take into account the life history of some of these species, and so, if it's a relatively short generation time, and the latest assessment says that there's this high population, it could be some year class that's rolling through, and so that would limit the opportunity of fishermen to actually catch that year class as it's going through.

DR. NESSLAGE: That's a good point, and I wonder if we should make that more clear, under the second bullet regarding the phase-in time period, that lifespan or generation time be considered. Wally, does that capture your thoughts, or can you say it a little better?

DR. BUBLEY: Probably at some point, but, right now, I think that's good for -- That gets the gist of it.

DR. NESSLAGE: All right. I will let you hack at it when you see the draft report. Thank you. Fred Serchuk.

DR. SERCHUK: Thank you, Madam Chair. I am thinking now to the points that I raised, and, as it's written there, that it may be necessary to phase-in more of the decrease in the second year than the first, I think the statement may be misread. That is to say that, well, take a little bit -- We don't have to go as much in the first year, but we have to take more in the second year, and my point was that our knowledge of the stock is most certain for probably the first year of the projection, because we probably have some idea of what recruitment is, because it's -- The fish may not have recruited to the fishery, but we may have an understanding of recruitment.

I would not want the statement to be interpreted as, well, we could take less in the first year, because we're going to take more in the second year, because we don't know what would have to happen in the second. You may actually not need to take as much. What we know is that, if we're recommending a decrease in the ABC, we have a reason to decrease the ABC, and we're most certain that that decrease will occur -- We're most certain that the stock will have to decline in the first year, for example, or recruitment will have to decline. After that, we're more dependent on our assumptions about recruitment, and do you understand why I'm a little bit concerned about the way the statement could be misinterpreted now?

DR. ERRIGO: Yes, I am.

DR. SERCHUK: Okay. I just wanted to clarify, because I think it could be misconstrued.

DR. NESSLAGE: Do we want to -- Would it help to add another sentence the phase-in period should be -- The length of the phase-in period should be considered relative to the number of years

in the projection, and, in other words, something along those lines? Does that get at what you're thinking, Fred, that, if the ABC is based on a three-year versus a five-year set of projections, for instance, or a seven-year set of -- You're getting more uncertainty the farther out you go, and would that help clarify something? I am just trying to put --

DR. SERCHUK: I guess what my basic concern is let's take an assessment, and we basically say, okay, we have an understanding of what recruitment will be in 2023. After that, we're either using a stock-recruitment curve or we're using an assumed recruitment, and, therefore, if the reduction that is required is because recruitment is going to be lower in the first year, it's more likely to be realized in the first year, relative to whatever the stock decline is that we anticipate. After that, there may be increases or decreases, but we're more uncertain about whether that's the case, and I think that's true for most of our assessments. That's all I'm trying to get at, Chair. Thank you.

DR. NESSLAGE: That's good. Thank you, Fred. Chris.

DR. DUMAS: In the second bullet below phase-in, below the phase-in heading, in the second bullet, I suggest changing that to the SSC recommends allowing the use of phase-ins for ABC increases, because we're not suggesting that they all would -- Necessarily that phase-ins always be used for ABC increases, but we're just allowing the possibility. That's my understanding of the gist of our earlier discussion. Thanks.

DR. NESSLAGE: Thank you. Fred Scharf.

DR. SCHARF: I am just echoing some of the comments that other people have said, and I agree with what Fred was saying, and what Scott was saying, and so I think just broadly trying to make sure we capture that these phase-ins, whether they are an increase or a decrease in the ABC, are really complicated, and it's important that we sort of reserve the ability to look at these on a case-by-case basis, and, in terms of some of the biomass levels and uncertainty and stock characteristics, thinking about looking at trends in relative biomass levels, and is this is a species that tends to show large fluctuations in biomass, or has there been a lot of stability over the last decade in biomass, and their relative susceptibility, or vulnerability, based of life history traits and recruitment uncertainty, as Fred just brought up. I think just lots of things for us to consider when we make a recommendation about these kinds of phase-ins, and so just, I think, making sure that our recommendations kind of capture that.

DR. NESSLAGE: Mike, I think you're reading my mind, and I think Fred just answered the last bullet for us, as being, yes, we would appreciate the opportunity to provide biological and socioeconomic advice on phase-ins on a case-by-case basis. Does that summarize what you were saying there, Fred?

DR. SCHARF: Yes. Thanks, Genny.

DR. NESSLAGE: I like some of what you said, and I'm wondering, regarding the second bullet -- We probably need to flesh out that the SSC also recommends considering recruitment, and we might want say things like biomass trends, uncertainty in biomass, et cetera. Would that capture what you were saying?

DR. SCHARF: Yes, and I think there's just lots of things that we've looked at over the years that we would look at when we recommended phase-in and the timing of the phase-in and how it would function.

DR. NESSLAGE: Yes. Great. Thank you. Chip.

DR. COLLIER: Thank you. Looking under that bullet, I see that you guys have listed substantial increase in biomass, and I was wondering if you could maybe put a range there. Is it a 10 percent increase, or is it 100,000 pounds? Some kind of a level there, I think, would be beneficial in the development of the amendment.

DR. NESSLAGE: You just opened up a can of worms, and I'm not sure we would be able to answer that, but that's my personal opinion. Is it the -- You're talking -- This was with regard to a switch between assessments, correct? This was Scott's point, I believe, where maybe one assessment says the terminal year biomass is 1,000 pounds and the next one says, no, it's 100,000 pounds, because the magnitude of the stock assessment estimates change, and is that -- Am I interpreting that correctly, Scott?

DR. CROSSON: Yes, and that was my concern, and this is more the realm of biology, but I would think that that would -- If I ran two different models, and I came up with hugely different numbers in a relatively short time period, I would be concerned about that, and I would take my recommendations -- I would give my recommendations more cautiously.

DR. NESSLAGE: Right, because there is assessment uncertainty, which hopefully has gone down and not up, but we don't always know, because we don't know the truth, correct?

DR. CROSSON: Exactly.

DR. NESSLAGE: I hear you, Chip, but I'm just not sure that we have -- That's a long discussion, and I guess I would turn back to you, to say would you like us to flesh that out right now, or maybe folks can consider that as we start to -- As we revisit this in the future, because I think we might need to brainstorm some creative ways to inform the council on that, and we're running short on time, and so I am kind of watching the clock. Chip, what do you -- I would appreciate your feedback on that.

DR. COLLIER: Yes, that will be fine. I mean, this is going to take some time to develop, and so just be thinking about it for the future.

DR. NESSLAGE: Right. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. I just want to share a couple of experiences that I've had with these phase-ins. When I was heavily involved with the Committee on Fishery Management, there was a standard rule that anything more than 20 percent reductions in catch levels would not be advised, and it would simply mean that that would cause economic hardship, and so, if you were recommending a reduction -- If the stock required a larger reduction than that, the only reduction that you -- The maximum reduction would be 20 percent, because it would cause economic dissonance. That was one way.

When I was first involved with assessments, back in the Northeast, when they implemented the groundfish management plan, there were significant reductions that needed to take place in fishing mortality, and the industry said that let's -- We'll phase those in, and the phase-in never worked, and the stock declined, and, when the time came around for trying to get things back in order, the economic emergencies were put in place, and so the industry experienced an economic emergency.

The lesson there was that, in some cases, it's better to take the medicine upfront, because you may never take the medicine after that, and you will go a different route, and so I think we need to be very careful about the phase-in process, because it requires an understanding of economic and social impacts, and we've heard some of that, and it also requires a commitment to conservation, and those are tradeoffs, in some cases. I just thought I would share some of those experiences, because they have actually happened. Thank you.

DR. NESSLAGE: Thank you, Fred. All good food for thought.

DR. CROSSON: In answer to your question about where the -- Where the increase is in biomass, we're giving this document to the council for consideration and for them to consider incorporating some of these elements into the ABC control rule revisions, and that's my understanding, and so I think we can put this as a placeholder in there, about increases in biomass, and, if they want to put it into the document, then, at that point, we have plenty of time. NOAA and the Regional Office and the council staff have plenty of time to bring in consideration of different options, and I just think, right now, it's important for us to put it in as a placeholder and then consider it, especially since, as Mike S. pointed out, it's not currently in there at all.

DR. NESSLAGE: Great. Thank you.

DR. ERRIGO: Also, this document, this amendment, has a lot of time to develop, and it's not like it's going out to final approval in December or anything like that, and there is still quite a lot of time, and it will come back to you guys.

DR. NESSLAGE: Great, which brings me to my next question. It's quarter of noon, and we still haven't covered carryovers. Is it possible that we can carry over carryovers to our next meeting? I am looking to council staff for this, because we still need to review our consensus statements before we break, and a couple of other small business items. I am looking at -- There's a whole other set of questions here that we might not make in time, but will we have the opportunity to review these at our next meeting, as in April?

DR. ERRIGO: I wouldn't say your next meeting, and I don't think you'll have time, but, at some meeting in the future, I would say probably, yes. Yes, you will, and I think we can probably be done with that for today. Mike S., are you -- Do you agree?

DR. SCHMIDTKE: I think so. With my newness to this project, I am not sure that I have all the knowledge of the steps to make that decision, but I think so. I might need some of my colleagues to help me out with that.

DR. COLLIER: Brian, if you want to chime in, you're more than welcome to, but I think just -- If the SSC just wants to provide guidance on whether or not it should be included, that would be

good, and just avoid the rest of the questions for now, and just indicate that you're going to address it at a later meeting.

DR. NESSLAGE: So that would require us to look briefly at our previous recommendations, correct?

DR. COLLIER: Yes.

DR. NESSLAGE: Before we do that, real quick, Fred Serchuk, is this to phase-ins or carryovers?

DR. SERCHUK: This is to say, Chair, that I would be willing to stay another hour or so, if that would be helpful in completing our remit. Thank you.

DR. NESSLAGE: I appreciate your enthusiasm, but I also recognize that there's a lot of people with families, and, during this COVID crisis, we need to -- I am going to do the Chair's prerogative and say we need to stick to our schedule, and so to be respectful of the stresses that people are under and balancing work and home responsibilities, and so, unless it's absolutely critical, I am going to suggest we try -- We will go over a little here, and we'll probably end up going to about 12:30, but I don't want to push it much beyond that, but I do appreciate your enthusiasm, Fred. Could we just pull up the slide with our previous recommendations on carryovers? Mike S., can you just walk us through this real quick?

DR. SCHMIDTKE: Sure. The slide before in the document shows kind of the options that are laid out, as they are right now, but the recommendations that have been made to this point are that stocks that are neither overfished, nor experiencing overfishing, and have catch that is close to the ACL, would be eligible for carryovers. There is a -- The BMSY-MSST midpoint threshold, that is referenced there. Sorry, but I have to reorient myself to these. I apologize.

I kind of like got out-of-sorts from that, and so I'm going to skip that point for now, but there was a recommendation for adding terms of reference to assessment reviews and ABC recommendations that would evaluate whether that stock is eligible for a carryover. There were considerations for species biology and catch estimate precision, and then there was a recommendation to request updated projections that would evaluate the carryover amount, as well as the basis for the ABC, after the carryover has occurred.

Just for context of the NMFS guidance, one thing that was pointed out within that NMFS guidance is that carryovers can be gone about in really one of two ways. You either use the buffer between the ACL and the ABC, and you increase the ACL under the same ABC, or you would increase the ABC value itself. If there no buffer between ABC and ACL, there would be an increase to the ABC itself, in which case the ABC could still be constrained by the OFL.

DR. NESSLAGE: Great. Thanks, Mike. Chip had asked if we could at least consider our previous recommendations regarding carryovers, and we can provide more feedback later, but I am looking at -- Given what we have previously recommended, some of this is already covered, unless folks have changed their minds, and so let's hear from Scott.

DR. CROSSON: I am just not saying I'm changing my mind one way or the other, but I'm just going to comment that this council has often chosen not to put a buffer between ACL and ABC, and so this is likely to come at us more than once with actual fisheries, and this is not an abstract.

DR. NESSLAGE: Good point. Churchill.

DR. GRIMES: Thanks, Genny. The NMFS guidance on this recommends that in-season adjustments to catch be used to deal with this issue of not harvesting all the allowed harvest, and so should we put in a -- Should we recommend that ourselves? I mean, that seems reasonable.

DR. ERRIGO: I didn't quite catch that, Church. Is that an in-season adjustment to the ABC?

DR. GRIMES: That in-season adjustment to the catch be used to deal with issues about not harvesting all the allowed harvest. Instead of carrying it over to the following year, use in-season adjustments to catch, when all of the allowable catch is not being taken. That doesn't make sense?

DR. ERRIGO: So you're saying to like increase the bag limit or the vessel limits or things like that, to try to get them to catch the limit?

DR. GRIMES: Yes, and increase the -- Make in-season adjustments to allowable harvest.

DR. ERRIGO: That's where I don't follow you, because, in a season, if they can't catch what they're allowed to catch, increasing the harvest isn't going to help them catch it.

DR. GRIMES: Well, I guess maybe only in situations where it would be closed when they -- In any case, that was upfront in the NMFS guidance on this, I think.

DR. SCHMIDTKE: I guess I hadn't interpreted the guidance in the same way, just because I had -- Within there, there is discussion about carryover provisions being easier to implement, rather than making in-season adjustments, and one of the concerns that is talked about is uncertainty of in-season harvest data, and so this may lead to a whole discussion that would need to get carried over, carried over to the next meeting, and forgive the pun, but I guess I hadn't interpreted that in the same way that Church did.

DR. GRIMES: Well, I mean, I'm not arguing for it, necessarily for it or against it, but it was -- I was just putting it out there as it's in the NMFS guidance, and maybe I didn't interpret it the right way as well, and I think your point about uncertainty about catch levels in-season would make that kind of tricky.

DR. NESSLAGE: Okay. Let's hear from Chris.

DR. DUMAS: Thanks. My understanding of what Church was suggesting is that we could use adjustments within the fishing year, say changes in the fishing season length, either increasing it or decreasing it or changes in the bag limits, recreational or whatever, to avoid the need for carryovers, and so that adjusting fishery regulation parameters within the fishing year could reduce, or eliminate, the need for carryovers, but, if that's the case, then, if we chose to do that, then we would have increased variance in, for example, fishing season length from year to year and increased variance, potentially, in the other regulations, and so you would have your fishing

seasons varying in length a lot more from year to year, and your bag limits might be varying a lot more from year to year, and there could be negative feedback from the fishermen on -- Like, for example, charter fishermen. If the season length is being adjusted within the year a lot more frequently, it makes it more difficult for them to schedule their charter trips in advance and things like that.

Commercial fishermen, if their season length is varying much more often, it makes it perhaps more difficult to plan business planning decisions, and so that would be a negative aspect of using adjustments within the fishing year to sort of substitute for carryovers, realizing that there are, of course, also negative aspects to carryovers, and so there are pros and cons each way. Thanks.

DR. NESSLAGE: Thank you. Nik.

DR. MEHTA: To Church's comment, we do have in-season adjustments currently for some species, like vermilion snapper, and we have two seasons. If the ACL in Season 1 is not harvested, then it carries over into Season 2, and so we do have that kind of flexibility for more than one species. Also, there is guidance in NS 1 that we do have to be careful about using both phase-in and carryover. As you all know, there are tradeoffs with each one, and so that's all I had to say. Thank you.

DR. NESSLAGE: Thank you.

DR. ERRIGO: I just wanted to add that the council currently has the ability to use in-season measures, and I think this is just giving them another tool. This would allow them another tool, carryovers, and so the idea is just to comment on the idea of using carryovers. They can avoid carryovers by using in-season measures, and we already have that, and so I think, here, we're just asking you to please just comment on the carryover itself.

DR. NESSLAGE: So, in other words, are we still supportive of carryovers, with caveats?

DR. ERRIGO: Yes.

DR. NESSLAGE: Okay. Church.

DR. GRIMES: My hand is down. I don't know that --

DR. NESSLAGE: A vestigial hand-raise. Shep, go ahead.

MR. GRIMES: Thank you, Madam Chair. I would just follow-up a little bit on what Mike E. said and reiterate that this is being addressed, or the whole issue is being visited, in the context of the changes to the NS 1 Guidelines, and clearly I think carryover, in that context, is envisioned as unused ABC, or unused ACL, and you couldn't harvest it, because, clearly, all of our accountability measures, to the extent the South Atlantic has in-season accountability measures -- If we prematurely close it, based on a projection, and then have time in the season to reopen it, the agency can do that, and, to the extent that occurs, then we do reopen it, and so this, I think, is focused on the case where it really isn't the management constraints that are preventing the harvest of the ACL, at least in many instances, and that's how I view it. Thank you.

DR. NESSLAGE: Thank you. To capture a little bit of this, can we just have a quick note, under review previous recommendations, that we would like an opportunity to review this more carefully at a future meeting, but that -- Because I'm not hearing anyone say that they -- I think I'm not hearing anyone say they disagree with our previous recommendations, that they still stand, and that we would like -- This is noting that we would have the opportunity to elaborate on them at a future meeting, and does anyone disagree with that? I can explain to the council that we simply ran out of time. I am not seeing any hands raised. Is that correct, Chip?

DR. COLLIER: That's correct.

CONSENSUS STATEMENTS AND RECOMMENDATIONS REVIEW

DR. NESSLAGE: Thank you. In the interest of time, I would like to see if there's any public comment on carryover, because I realize I don't think I did that, since we're doing this very quickly, but, if anyone has anything to say, this would be the time. Okay. Great.

In the last few minutes here, and I recognize that we're already at noon, but if we could take a few minutes to briefly run through our consensus statements, and hopefully folks spoke up when we were going through, but, if there's anything that anyone sees that is a red flag, with regard to content, and I absolutely do not want to wordsmith minor wording here at this point, and you will have an opportunity to do that in the next few weeks, but, if there's anything here that gives you major heartburn, that you don't believe captures the consensus feeling, please speak up now, and so we'll start with our review of the terms of reference for bluefin tilefish. We had a number of recommendations, particularly with regard to the terminal year and COVID.

DR. ERRIGO: Some of the changes are in the TORs document, and I will pull those out and put them in here, just the changes.

DR. NESSLAGE: Yes. No hands raised. Okay. Red grouper, it's similar modifications, with a few additions regarding the full suite of projections, and I'm just noting that. The change for steepness. No hands. Vermilion snapper. Ditto. No hands. Excellent. Let's keep moving. Those were the easier ones.

This is with regard to the king mackerel length estimation, length distribution estimation FISHstory project. Take a look and see if anything gives you heartburn, and, if so, raise your hand. Great. No hands raised. I'm not sure if you could see everything on there, and so give it another quick look. All right. Thank you.

EwE, and this was a tougher one, and we spent quite a bit of time on this. Please let me know if you have major concerns with the content of our consensus statement. Just a caveat, for those who had to bop in and out of this part of this conversation, those rankings were provided by the modeling team, based on their understanding of the feasibility of doing these things in the next year, and we'll make sure that's clear in the report, and we did not get to answering the rest of that question or the questions below. All right. Anything on EwE? Last call. No hands. Thank you. Now the ABC control rule, starting with ORCS, or general comments and then ORCS, I guess. We will wordsmith this a bit, to flesh it out. Chip.

DR. COLLIER: There was some discussion in EwE about the workgroup and who was going to be on that, and I didn't know if -- Is that right?

DR. NESSLAGE: Yes, and you know what? Did you have a particular comment or question?

DR. COLLIER: No, I did not.

DR. NESSLAGE: I did have a couple other suggestions, now that I think about it. Overnight, I was thinking about two other people from outside of the SSC that we might want to consider, if we can't get Dave or Marcel or Howard or Laurent, but is anyone familiar with -- I never say her name right, but Kim de Mutsert, and also Kristy Lewis? Kim de Mutsert is at George Mason, and Kristy Lewis, I believe, is at UCF, the University of Central Florida.

DR. SCHUELLER: Kristy Lewis worked for Kim de Mutsert as a post-doc, and I'm not sure if maybe even as a -- I think she did as a post-doc.

DR. NESSLAGE: If folks don't agree with those suggestions, I am happy to rescind them. I don't hear any screams of protest, and they have extensive EwE modeling experience, mostly in the Gulf, but that should -- They might be able to provide some good feedback to the group, and do you know the work, Amy? Is that a good suggestion, or should we leave them out?

DR. SCHUELLER: They're really knowledgeable, and they have extensive experience.

DR. NESSLAGE: Okay. Hearing no one disagreeing, then thank you for considering that. Let's keep scrolling down. So general ABC control rule responses, followed by ORCS. All right. Thank you. Let's see all the ORCS. Thank you. All right. Risk analysis. Amy.

DR. SCHUELLER: Can we go back to the working group for the Category 4? Since we're adding potentials, I think that it might be worth seeing if we could get somebody from the Center, or talk to somebody, about looking at some of the other ways that people might handle data-limited stuff, and I don't know if we want to make a note of that or not, but that's just something that I had been thinking about, and I think it would be helpful to the workgroup.

DR. NESSLAGE: You're right, Amy, and I wonder if it would be -- I don't know if they would be able to commit to the entire workgroup participation, but maybe get them to advise and educate the group, perhaps John Weidman or Olaf Jensen, folks who have been on the more recent papers for these evaluations. At least getting them to present to the group might be really informative, and would you agree?

DR. SCHUELLER: Yes.

DR. NESSLAGE: Scott.

DR. CROSSON: I don't want to expand the working group's charge too much, but, when they're exploring the literature on only reliable landings species, we might also look at how -- We might ask them to also look at how other SSC's deal with it, since we're one of eight, and it's good to try to learn from others mistakes or victories.

DR. NESSLAGE: Yes. Good suggestion. Maybe the most recent literature and other SSC approaches to landings only.

DR. CROSSON: Right. I would put in that first bullet and saying the most recent literature and other SSC procedures.

DR. NESSLAGE: That sounds good. Thank you for that. Good additions. Let's go back down to ORCS then, if there's nothing else on Action 1. No hands. Let's move down to risk analysis. Okay. I am not seeing any comments. Phase-ins, any comments or suggestions on the content? No hands. Let's look at the brief bit we have for carryover, if we could. Okay.

What else do we have below, anything? We have the preferred date. For those of you -- If any of you weren't available last evening, and you have a different opinion on the preferred date, let us know, but we did settle on the April 27 to 29 period. If that gives you great heartburn, speak now.

While folks are looking at their calendars, my plan is that I would really like folks to provide any notes that they have taken, if they could, by next Tuesday, and so that would be the 20th. If you need more time, let me know, but hopefully that would give you some time to look them over, but then still send them to me. I will draft -- I will work with Mike E. to draft a report and get that back out to you all for editing, and our briefing book deadline is November 13, and so, when I send out the draft, I will give you feedback on when I would like comments back, so that we have time to fully incorporate all of your edits and suggestions. Are there any questions on that? So notes to me by next Tuesday. Are there concerns regarding that? Anne.

MS. LANGE: Not regarding that, but other business relative to the new payment system.

DR. NESSLAGE: Yes, and we'll get to that in one moment. Anything about the report or the consensus statement? Great. Yes, and let's go back to Other Business. What council staff have offered is that they will take the video clip from the council's briefing on the new payment system and circulate that, and I would ask that, when you do that, if you could give us the contact information for the person in your office that we should directly contact if we're having problems and need to be walked through that, and that would be really helpful, given we won't have time today to receive that briefing, and, if you have further questions, we can always schedule a -- I would hope we could schedule an impromptu training session for the group, as needed. Does that address your concern, Anne?

MS. LANGE: Actually, I didn't have a concern, because it's been working for me, the last month or so, but I just didn't know if other people had issues.

DR. NESSLAGE: I know Wilson did, and he brought that up yesterday.

MS. LANGE: That's why I was reminding you, before we closed.

DR. NESSLAGE: Yes. Wilson, will that hopefully get you closer to fixing your problem, and, if it's still a major problem, we'll revisit, and people will let me know. Wilson, go ahead.

DR. LANEY: I am good, Madam Chairman. I will just work it out with Suzanna, and I don't know that I have a problem yet, but my -- I will work it out with Suzanna offline.

DR. NESSLAGE: Okay, but, folks, if you are having major issues, and we do need to have a comprehensive training session, please let me know. Just email me. Before we close, I would like to take public -- First of all, is there any other Other Business that we didn't cover last night? No other business.

OTHER BUSINESS

DR. CROSSON: I just wanted to say one thing. He's not here, and I don't see him on the list anymore of attendees, but Brian Cheuvront is retiring in December, and Brian has been an SSC member, and he's been a council member, including being the council member who was the liaison to the SSC, and he's been a staff economist and then Deputy Director, and so we have a long history with Brian, and so I think this is our last full meeting as this SSC and not a joint, and so Brian is not here, but I wanted to -- I hope the SSC agrees with me that we wish to commend him for all of his work, and we wish him well in retirement.

DR. NESSLAGE: Absolutely. Brian is here. Brian.

DR. CHEUVRONT: I am here.

DR. NESSLAGE: Thank you so much for your service.

DR. CHEUVRONT: Thanks, and thanks, Scott. I appreciate that.

DR. NESSLAGE: We wish you well, and I hope you have something fun planned.

DR. CHEUVRONT: It's called retirement.

DR. NESSLAGE: Tell us how it is, will you? Thank you. Thank you, Scott, for bringing that up. Thank you, Brian, for all of your hard work. Scott, did you have anything else that you wanted to bring up under Other Business?

DR. CROSSON: There is the item, and it will only take a minute or two, and I'm still not sure what this is going to be, but I have been talking with Tracy Yandle, and also with Genny, about whether it is time to consider the SSC's operating procedures and looking at potential ways that we can increase our efficiency, and I don't know if this going to end up as a publication or if as a report to the SSC or both, but I was thinking of forming a working group to look at how the different SSCs handle their sub-committee structure and other factors and ways that we can -- We only meet twice a year, and so I'm always worried when we get bogged-down into discussions too far, and so I'm wondering if that's something that other people might be interested in.

The people right now that I'm thinking about are Tracy, and she's not here, but she's willing to be on it, myself, Genny, or Jeff, if Genny is not available, and maybe Steve Poland, since he is our liaison to the council, and I guess the charge would be just looking at the different operating procedures of other SSCs and bringing back just sort of an overview, so that this SSC could consider ways that we can increase our efficiency, and I don't know if there's any support for that or not.

DR. NESSLAGE: I would personally love to increase our efficiency, and I would be happy to serve on that, and I would welcome Jeff, if you would be willing to do that, but this would need to -- It would be good to hear from the broader SSC if there is interest in this. Anne.

MS. LANGE: I think it would be appropriate, especially with given what's happened in this past year, with being forced to do more webinars than we have in the past, but trying to evaluate whether there are times when we should be doing webinars, even if we could meet in-person, and I think it's appropriate at this time.

DR. NESSLAGE: Yes. Definitely, looking at the judicious and effective use of webinars, and that's something that we should add to that list. Wilson.

DR. LANEY: I am just chiming in, Madam Chairman, to say that I would support it too, and I would be interested to know what the other SSCs are doing, and, also, I think I would be interested in hearing from staff as well, and I know the council has discussed the fact that meeting by webinar certainly appears to save a whole lot of travel dollars, but I would be interested in hearing from staff whether or not they think it saves operating expenses overall, and, obviously, there are some pros and cons to webinar-based meetings, and so, yes, I think it's a good time to delve into it. Let's see, Scott, and I'm looking at the list that you mentioned, and should somebody from the staff be on that workgroup, too? I think that would be logical, to have someone from the staff on that group.

DR. ERRIGO: There is always staff support for an SSC working group, and so I will definitely be there, and then, if anyone else -- Like, if Chip is interested, he can always come onboard, too.

DR. NESSLAGE: Great. We mentioned myself. Jeff Buckel, would you like to be involved, given that this will impact you in the near term?

DR. BUCKEL: Yes.

DR. NESSLAGE: It's a self-defense mechanism here.

DR. BUCKEL: Right.

DR. NESSLAGE: Brian, go ahead.

DR. CHEUVRONT: This is to address Wilson's question about cost-effectiveness and everything of webinars, and one of the things that senior leadership and the council is concerned about is how council budgets are going to be affected in the future, particularly as it relates to the federal government's response to COVID-19, and, as we all know, a lot of money has gone out from the government, but nobody has seen yet, at least down at our level we haven't seen yet, how that's going to affect our budget as a council.

One thing that we do know is that a saving grace for us this year really has been switching over to so many more webinar meetings, because such a huge part of the council's budget goes to travel, and I think the thing that may be helping us out, as far as expected budget cuts are going to go for

the future, is the fact that we have been able to reduce our travel expenses and been able to hold on to some of that money.

So, in terms of cost-effectiveness, webinars really are very, very effective, and one of the things that we do know is that webinars are a great way to meet to discuss a few issues at a time, and sometimes it's harder to have multiday meetings like this, and it's tough on our council members to have weeklong council meetings, and we go four full days right now, and normally we would do five days, if we were in-person, and it's very, very draining, as you all know.

If you all want to consider webinars as an approach, I mean, that's probably something I think the council would probably be interested in hearing what you all think about that, but, also, you might want to include the idea of thinking about the frequency of which you meet, because, for maybe some of the SSC members, it might be easier to meet for a one-day meeting more frequently than it is to give up three days in a row, and I don't know, but those are the kinds of things that I think, if you wanted to discuss that sort of thing, and you could be a little more timely in some of your discussions, and it may be less of a burden on people as well, but, anyway, those are some things that I just wanted to throw out there in response to some of the questions that Wilson brought up and just to let you know what we've already been talking about internally about the use of webinars.

DR. NESSLAGE: Thank you. That's very helpful, and I wonder if we might want to -- The group might want to consider polling the SSC regarding the latter part of your statement there about how we think things are working relative to our shorter versus longer -- Shorter and more frequent, or longer and more draining, but we can set aside a big chunk of time. Wilson.

DR. LANEY: Yes, ma'am, and I was just going to say what you said, and I would certainly welcome hearing from all the SSC members about their thoughts relative to meeting by webinar versus in-person and frequency and length of agenda and all that sort of thing, and so a poll would be good. Thank you.

DR. NESSLAGE: Great. It sounds like there is support. Is there anyone else would like to serve on this group, this working group, or ideas of things you would like us to cover? If you think of something after that's a burning question, feel free to contact us, and we'll reach out to Steve Poland, and I think he's in North Dakota this week. Is he on? I see him at the top. Steve, would you -- If you're listening, would you be willing to join us? If not, we'll just reach out to you after. George, go ahead, while we're waiting to see if Steve is on.

DR. SEDBERRY: I would be willing to help out with this as well.

DR. NESSLAGE: Having the Past Chair would be fabulous.

DR. SEDBERRY: Okay.

DR. NESSLAGE: Thank you. Let's add George's name to the list. All right. Anything else on Other Business? I am not seeing any hands raised. Is that right, Chip? No hands raised. Thank you. Then I would like to take public comment. If there is anything folks from the public would like to comment on regarding what we've discussed this week, or other burning concerns, please raise your hand. No hands raised. All right.

Is there any other business to come before the SSC for this meeting? I am not seeing any hands raised. I am not hearing anything from council staff, and thank you, all, for sticking with us these last two-and-a-half days and for your contributions and for your careful review of the materials and your thoughtful responses, particularly the working group's hard work and all the time that you have put into these agenda items outside of our meeting time, and so thank you all. Well said, Chip. Thank you for a great meeting, and we look forward to seeing you on October 30 for our joint SSC meeting for yellowtail. Thank you, all, very much. Have a great day.

(Whereupon, the meeting adjourned on October 15, 2020.)

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Transcribed By
Amanda Thomas
December 15, 2020

Scientific & Statistical

Attendee Report: Committee Meeting

Report Generated:

10/20/2020 08:16 AM EDT

Webinar ID

430-373-203

Actual Start Date/Time

10/13/2020 08:48 AM EDT

Duration

8 hours 26 minutes

Last Name	First Name
Addis	Dustin
Allen	Shanae
BYRD	01JULIA
Bianchi	Alan
Brouwer	01Myra
Bubley	Walter
Buckel	Jeff
Cao	Jie
Carmichael	01John
Cheshire	Rob
Cheuvront	01Brian
DeVictor	Rick
Dumas	Christopher
Errigo	01Michael
Finch	Margaret
Fitzpatrick	Eric
Flowers	Jared
Gamboa-Salazar	Keilin
Gentry	Lauren
Glasgow	Dawn
Grimes	Shepherd
Grimes	Churchill
Griner	Tim
Hadley	01John
Helies	Frank
Howington	02Kathleen
Hudson	Rusty
Iberle	Allie
Iverson	Kim
Jepson	Michael
Johnson	Eric
Laney	Wilson
Lange	Anne
Li	Yan
Long	Stephen
McEachron	Luke
Mehta	Nikhil

Neer	Julie
Nesslage	Genny
Pugliese	01Roger
Ralston	Kellie
Reichert	Marcel
Rhodes	01Cameron
Runde	Brendan
Scharf	Fred
Schmidtke	01Michael
Schueller	Amy
Sedberry	George
Serchuk	Fred
Sharov	Alexei
Sinkus	Wiley
Smart	Tracey
Waters	James
Wiegand	01Christina
Williams	Erik
Willis	Michelle
Wyanski	David
Yandle	Tracy
collier	01chip
crosson	scott
poland	00steve

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10/20/2020 08:16 AM EDT

Webinar ID

430-373-203

Actual Start Date/Time

10/14/2020 08:17 AM EDT

Duration

8 hours 44 minutes

Last Name	First Name
Addis	Dustin
Allen	Shanae
BYRD	01JULIA
Bianchi	Alan
Brouwer	01Myra
Bubley	Walter
Buckel	Jeff
Cao	Jie
Carmichael	01John
Cheuvront	01Brian
DeVictor	Rick
Dumas	Christopher
Finch	Margaret
Fitzpatrick	Eric
Flowers	Jared
Gamboa-Salazar	Keilin
Gamboa-Salazar	Keilin
Gentry	Lauren
Glasgow	Dawn
Grimes	Churchill
Grimes	Shepherd
Griner	Tim
Helies	Frank
Howington	02Kathleen
Hudson	Rusty
Johnson	Eric
Lambert	Debra
Laney	Wilson
Lange	Anne
Li	Yan
Long	Stephen
McEachron	Luke
Mehta	Nikhil
Neer	Julie
Nesslage	Genny
Pugliese	01Roger
Reichert	Marcel

Rhodes	01Cameron
Schmidtke	01Michael
Schueller	Amy
Sedberry	George
Serchuk	Fred
Sharov	Alexei
Sinkus	Wiley
Smart	Tracey
Vara	Mary
Wiegand	01Christina
Williams	Erik
Yandle	Tracy
collier	01chip
crosson	scott
poland	00steve
sminkey	thomas

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10/20/2020 08:16 AM EDT

Webinar ID

430-373-203

Actual Start Date/Time

10/15/2020 08:20 AM EDT

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4 hours 12 minutes

Last Name

Addis
BYRD
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Dumas
Finch
Fitzpatrick
Flowers
Gamboa-Salazar
Gentry
Glasgow
Grimes
Grimes
Hadley
Helies
Hiers
Howington
Johnson
Lambert
Laney
Lange
Li
Mehta
Nesslage
Pugliese
Reichert
Rhodes
Scharf
Schmidtke
Schueller
Sedberry
Serchuk
Sharov

First Name

Dustin
01JULIA
Alan
Walter
Jeff
Jie
01Brian
Rick
Christopher
Margaret
Eric
Jared
Keilin
Lauren
Dawn
Shepherd
Churchill
01John
Frank
Homer
02Kathleen
Eric
Debra
Wilson
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Yan
Nikhil
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01Roger
Marcel
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