SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

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TRANSCRIPT

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Dr. Todd Kellison
Dr. Tracey Smart
Shep Grimes
Dr. Patterson
Dr. Erik Williams

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened at the Town and Country Inn in Charleston, South Carolina on April 26, 2022, and was called to order by Dr. Genny Nesslage.

INTRODUCTIONS

(Not all introductions are audible on the recording.)

DR. CURTIS: Fred, you're unmuted on our end, and you're self-muted on your end.

DR. SCHARF: Yes, Judd, and can you hear me okay?

DR. NESSLAGE: All right. We'll come back, hopefully, to Yan and Eric at a later time. Before we go any farther, we should introduce, for the first time in person as well, at the table, Judd.

DR. CURTIS: Hi. It's good to see you all in person. Judd Curtis, South Atlantic staff. I just started here last July, and it's a pleasure to be working with you all so far, and it's great to see you in person.

DR. NESSLAGE: It's fabulous to have you with us, and then I just also wanted to introduce three people who we may have coming to the table to answer questions throughout the meeting. Carolyn, would you mind coming forward? This is our council liaison, Carolyn Belcher, and many of you, if not all of you, know her well.

DR. BELCHER: Greetings again, fellow alum. I know it's been a little while. I'm Carolyn Belcher, Georgia DNR, and currently Vice Chair for the council. I'm here to help the interface between you all and the council, and so, questions that you might have, I will do my best to answer for you as to what the council is looking for specifics from you guys back to help guide us, and, similarly, if there's things that you need me to take back to the council, feel free to come and talk with me.

DR. NESSLAGE: Thank you very much, Carolyn. Then, also, I wanted to have come to the table Erik Williams from the Southeast Center.

DR. WILLIAMS: Erik Williams, Southeast Fisheries Science Center, and I'm charge of the stock assessment branch for the South Atlantic.

DR. NESSLAGE: Thank you, and, Shep, do you mind introducing yourself too, real quick? Yes, I'm putting you on the spot.

MR. GRIMES: Shepherd Grimes, NOAA Office of General Counsel in the Southeast, and I just observe these meetings. Thank you.

DR. NESSLAGE: And answer all of our questions. Thank you. All right. I think that's introductions, did we get everyone? I believe so, and no one snuck in at the last minute? Okay. Great. All right, and then we'll move on to reviewing and approving the agenda, and so please see -- I guess it's not the attachment, and it's just the agenda and the overview. There is a couple of

changes to the agenda, and I think you may have gotten an email saying that we're postponing Item 5, the interim analysis discussion, to a later meeting, but we are going to replace that in the schedule with Item Number 7 right up there, or it's 6 now, the release mortality reduction framework, and so we'll do that fresh tomorrow morning, when we've had a good night's sleep, and then we'll go to the red snapper count overview around 11:00 tomorrow, and so that's the plan.

If you were on the hook to basically keep an eye on Agenda Item 5, the interim analysis, you are now off the hook, but I would ask that you maybe pick another agenda item to pay particular attention to, and I trust you on the honor system to pick a second one, so that everyone has equal amounts of work, and, just randomly -- You will randomly pick useful agenda items to report on, I'm sure. Anything else for changes to the agenda? Are there other suggestions? If not, we'll consider it approved. All right. Agenda approved.

Moving on to meeting minutes, if you could see Attachment Number 1, these are minutes of our February 2022 meeting. Are there any edits to the February meeting minutes? I know you all read them word-for-word, to relive the glory. I am not seeing any, in which case those minutes stand approved. Thank you, all. All right. Then I think that's it for Introduction. If there's nothing else, then we'll move on to general public comment, and I would invite anyone who has public comment in the room to raise your hand. We don't have a lot of public here. I am not seeing any hands. Is there anyone online?

DR. CURTIS: No hands raised online.

DR. NESSLAGE: No hands raised. All right. Then we'll just keep breezing through the agenda.

DR. CURTIS: Genny, there is no entries found for the online public comment form yet either.

DR. NESSLAGE: Okay. Excellent. Thank you, but we'll keep an eye on that, and, at the end of the meeting, there will be another opportunity for public comment, wrapping up on Thursday morning, as well as after each of the presentations on our agenda, and we'll have a moment for public comment as well, and I would ask you to feel free to comment at that time. All right. Then I think we'll move on to our first big agenda item for the day, which is Catch Level Projections Workgroup Report.

We're going to hear a little bit about the workgroup, which was tasked with reviewing our most recent SSC decisions and available literature on the issue of how to make recruitment assumptions and catch level projections, and they developed some recommendations for us to consider about how to incorporate recruitment in our projections that are used to set catch level recommendations. We will hear from our illustrious working group chair, Amy Schueller, but I would also call out our working group members, Jie, Scott, Chris, Fred Scharf, Eric, and Chip and Judd all contributed as well, and so thank you all for that. I will hand it over to Amy.

CATCH LEVEL PROJECTIONS WORKGROUP

DR. SCHUELLER: I get the wonderful task of walking through the Catch Levels Projections Workgroup report. The group met several times over the past eight or nine months and put together

a report, which I hope that all of you read in detail, and so, basically, we're going to go through and look at the recommendations that are put forth from the group and then have a discussion. The group was fantastic, and so I would like to thank all of the group members. If there's anything that you want to add to the discussion, if I misspeak in some way, please just let me know, and we'll go from there.

Basically, I'm going to walk through why was this group even created, and so background, statement of work, review of the topic and literature, and then I'm going to walk through recommendations, and so some general observations from the reviews, some recommendations for short-term forecasts, long-term forecasts, and then talk about basically the uncertainty and observations related to that and then go ahead and make some other recommendations for things that we would like to see in the assessment reports in the future that would help us make these decisions, and then, also, some prioritized research recommendations for things that we would like to see accomplished over the next few years that would help with some of the discussion and questions surrounding this topic as well.

One of the appendices in the report was the statement of work for this group, and I think it was the first appendix, Appendix 1, and, basically, I want everybody to just review what it is the group was doing, and you did hear a summary of what we were working on at the last meeting, but we hadn't made it too far at that point, and so the justification was that, basically, the SSC has recommended different recruitment assumptions in the catch level projections for different stocks, and we've -- You have sat at the table, and you've been a part of these discussions, and we've sort of gone round-and-round, quite a few times, about how to project recruitment for these catch level projections.

The workgroup wanted an opportunity to review those recent decisions and review the literature that was available to us, in order to help maybe guide some recommendations, and so the main thrust was to develop recommendations on robust recruitment assumptions, so that we could provide those recommendations for the catch level projections.

There were four tasks in the statement of work. The first was to review recent literature on the recruitment assumptions and summarize key findings for the SSC. This was completed, and we reviewed -- I don't know the exact number of papers, but there's an annotated bibliography, which is Appendix 2 on the report, and so it lists every single paper that we reviewed and gives some bullets as to what the main findings of that paper were, and so, if you're interested in any of the particular pieces of work that we went through, you can go ahead and consult that annotated bibliography and get some information there.

Two was summarize recent SSC decisions regarding recruitment assumptions, and we laid out several species that we were interested in. There were a couple of additional species that were added in the report, things that we talked about after we had set up this statement of work, and so those are in the report as well, and summarized in a paragraph, and it's sort of a -- Lots of different decisions have been made in the past over each species, and so you can take a look at that in that section of the report.

The third one was explore the performance of alternative recruitment assumptions and how that might impact catch level advice, and we approached that through the use of the -- There is a couple of tables in the report looking at differences in the catch advice based on different recruitment

assumptions, and then draft recommendations for SSC consideration, and so these are the four tasks that we worked through. Some of them seem pretty straightforward, but sort of, once you get into the meat of it, you kind of realize that these aren't necessarily super straightforward, given there are sort of short-term projections and long-term projections, and how are they related, and the available literature doesn't necessarily point to one direction for making the best assumptions.

Many of our federally-managed South Atlantic stocks have recruitment estimates that are perceived to be below long-term averages during the most recent decade, and that's really what has brought about a lot of this, and so recruitment can be impacted by a number of different things, and that is summarized in the intro of the report.

It can be impacted by recruitment overfishing, with a reduction of the spawning stock biomass, changes in key environmental traits, as a result of things like climate change, changes in biotic and abiotic factors that could lead to a regime shift, and then possibly some misspecification in the assessment model and/or differences in quantity and quality of input data over time.

These are all things that could impact the results of assessments and could impact the productivity of a stock over the long-term, and we have highlighted in here this Klaer et al. 2015 paper, and it was part of the materials for this meeting, along with the Van Beveren paper. The Klaer et al. paper basically lays out some criteria for determining, or defining, when a regime shift would, or could, occur, and so, if you haven't looked at that paper, it's pretty short, and I highly recommend you read it.

It gives a table in there where you can score a species based on attributes that then gives you a point value, which suggests whether or not it may or may not be considered as having a regime shift, and there is some example species in that paper, and so we put that up there just because we think it's important. Oftentimes, we get in these situations, and that's one of the considerations, that maybe a regime shift has occurred, but we can't just assume that, and we should have some sort of metric for moving forward, and so take a peek at the paper, if you haven't already.

The main thrust of this is, generally, the decisions that have been made for the South Atlantic species have not been consistent, even when there's been similar trajectories in the stock status and similar trajectories in the estimated recruitment levels, and so, basically, this group is just hoping to provide some recommendations, so that we are being more consistent in our advice to the council.

One of the things we wondered about, when we first started, was how are other SSCs, or councils, handling this question, and what are they doing, and so Chip was able to gather some information for us on what other regions are doing, and the basic summary is that most regions really have a limited ability to adjust based on environmental conditions, and they generally have adjusted when recruitment deviated from historic patterns, but they use that as part of the scientific uncertainty, but there was really no consistent method, no consistent time period, and so there wasn't anything generally -- There was no general approach that was being applied in any of the other SSCs, or areas, that we could find.

If there had been adjustments made, it typically had been adjusting the ABC downward, associated with a decrease in recruitment, which is one that we've discussed many times here, but we've also discussed a case like red snapper, where we had increased recruitment, and we're just noting here

that few stocks have had increased recruitment, and so, generally, when this is being discussed in other areas of the country, it's because of declines in recruitment and not increases.

This is where -- The other paper that was provided in the materials for this meeting is the Van Beveren et al. paper from 2021. If you haven't taken a look at this paper, please do so. A lot of the guidance that is provided in this working group report is based on work that was done by Van Beveren. We did contact her, and we got some additional information from her, and Genny did that, and so thank you, and it's -- We spent much time interpreting and looking at this paper and trying to make recommendations based on it, because it was the most comprehensive paper looking at different ways to project recruitment and then the overall outcomes of how well they did.

Recruitment is clearly -- We've discussed this over and over again, and it's fundamental to assess the status of the stock, and it's fundamental for guiding management recommendations, and so it's often difficult to project recruitment, and there's many approaches that have been used. Some of the approaches that were tested in Van Beveren include a functional stock-recruitment relationship, and so, for example, a Beverton-Holt relationship, sampling methods, which is pulling individual recruitment values, or deviations from, and empirical dynamic modeling, which is using internal consistency of the recruitment time series to project forward. Time series analyses, which are very specifically defined in Van Beveren and do not include empirical dynamic modeling or the sampling methods, and then, also, the paper did look at incorporation of environmental effects.

Just generally, when we're doing projections, we're using assumptions about fish population dynamics, and we're using assumptions such as populations experience short-term fluctuations, and possibly long-term shifts, and we're using an assumption that the tendency is for ecosystem stability, or some sort of equilibrium, and so we're basically saying, with reference points and with our recruitment projections, that there is some internal attraction point, or some place, where the population is going, and it's at equilibrium, and so those pieces played into this discussion quite a bit, and so I have up here that we've seen situations in our stocks where short-term, or recent, population dynamics differ from the longer-term dynamics, and the question becomes what, if anything, do you do about that?

We do make a few statements in the report, where we were trying to make general statements. The first one is, when it comes to immediate future ABC determinations, the most recent dynamics are likely the most relevant, but we do go on to say a few other things, and so long-term dynamics and fish populations do tend to cycle around a central tendency, and so that's sort of getting at this push-and-play of long versus short-term and the expectations for those two different types of projections.

Some evidence for this long-term dynamics, or the central tendency, are things like where we have fish stocks that are reaching low levels, but then have some sort of recovery, and, basically, we're making the point here that there is probably some central tendency, or some productivity level, that we should expect, and we should acknowledge that in our long-term forecasts, but that may differ from what we're doing in pour short-term forecasts.

This is where we get to the meat of the recommendations that this group is making, and so this first section is on short-term forecasts for ABC determination, and the very first recommendation is that short-term forecasts for ABC determination should be limited to five years. We actually talked about this for a really long time, because five years -- We got into the question of what does

five years mean, and so we've made this modification, and it says post-terminal year of the assessment, including any interim years before any management has taken effect, and so we're often projecting several, you know a couple, years beyond the terminal year of an assessment, and we're basically making the statement that short-term projections need to be five years, and that means, if management is going in two or three years after the fact, you're still only getting two or three years of projection, because these short-term projections really should be short, instead of extending them out.

We also, along with that, made the recommendation that assessments should be done more frequently, because of that, and we also stated that, if an analysis finds that projections are accurate and performing well for a given species, and so say we've done projections year-after-year, and we can show that we're actually hitting the target, right, and things seem to be going well, then we can probably lengthen the projection timeframe, but we need to do the work to make sure that we're actually doing a good job and we're actually hitting the target correctly and the population looks good, and so we did caveat it, saying that it could be extended, but here's how that would work.

Then we also made a statement about adjusting the P* when projections go beyond the recommended years, and so, if you're going beyond five years, there needs to be some sort of decrement, which we suggested using the P* in order to do that, and so those are the first set of recommendations for short-term forecasts for ABC determination, and they're not even how to deal with recruitment.

Here's the second major recommendation, and it is that short-term forecasts should use recent mean recruitment, and so we made a statement, earlier in the report, saying that the most recent dynamics likely reflect those dynamics we should expect in the near-term future, and that's where this is coming from, and we're recommending this default method for the short-term forecasts, and this is a lot based on the Van Beveren et al. paper. It does not define recent recruitment, and so the workgroup did leave open sort of this recommendation that recent mean recruitment be defined for each species on a case-by-case basis.

We do note that, in the Van Beveren paper, that group looks at three, five, and ten years, and so that is sort of the timeframe that we're looking at, and we're kind of leaving it for the analysts to recommend a time period based on an analyses of the data for the species, and so, later in the recommendations, there is some stock assessment report recommendations that we're looking for for species, and that should help, hopefully, answer some of the questions about how long should the mean be based on if we're using recent mean recruitment.

That was short-term catch level projection recommendations, and this is longer-term forecast recommendations, and we tried to divide this out, because there are two different things addressing two different questions, and so the long-term forecasts are divided into types, and so there's Types A, B, and C. The first one is recommend using average recruitment and historic variability, and, for the long-term forecast, we're recommending the whole time series be used as the default condition.

We did caveat it, saying that, if there was evidence of a regime shift, then you could apply that condition, and we're recommending relying on that Klaer et al. paper, which is why we included it with our materials. Again, take a look at the table. It's pretty -- I don't know, and I found it

helpful to be able to score some of the species and see in your mind where they would actually fall out. If you're running an assessment, and you're doing long-term projections, and you don't have anything else, we're basically saying use the mean recruitment over the long time series.

Type B1 goes from there and says, okay, a forecast using a stock-recruitment relationship and historic variability, provided you have a significant stock-recruitment curve, and so well-estimated parameters and data to inform the curve, and we've left it to analysts and review bodies to determine the level of significance required, and we've also made the statement that the stock-recruitment curve can be fitted either internally or externally to the assessment model. Part of this discussion for this group was like allowing for some guidance, but also flexibility, based on what the data show, and so it was sort of a line that I guess we had to stand on.

The next two types are the final two, and so Type B2 is forecast using time series properties or environmental correlates, and that is provided there is a significant time series of correlates that affect longer-term processes, and, of course, the analysts, or review bodies, will have to determine the level of significance required here, but we did want to note that literature and past experience suggest that these relationships often break down over time, and so we're basically saying, if you go this route, please take caution, because the relationships may not hold up over time, and then you might end up somewhere that you didn't necessarily want to be.

Then Type C is similar, and so forecast using a stock-recruitment curve with time series or environmental corelates that affect longer-term processes, and this has the same statements under it, and we say analysts and review bodies can determine the level of significance, and we say it's a rarity for stocks to follow this type of a predictive model, and caution should be applied, because these relationships can break down and become invalid over time.

Some things that we wanted to just make statements about, or sort of caveat, with these recommendations, or I guess maybe expectations out of people, are, one, it's likely that short and long-term forecasts do not necessarily agree. That's okay, and, basically, short-term dynamics may not be reflective of long-term shifts, changes, or equilibrium tendencies, and it doesn't mean that either of the forecasts is necessarily wrong. It's that they're expressing different types of risks, and so we're trying to make that clear in the document, that you can do different things with these forecasts, and they might not necessarily match up the way that some people might expect them to, but that doesn't mean that either of them are necessarily wrong.

That being said, we wanted to make it clear that managers need to be aware of the risks and how their decisions affect the goals for the fishery, both short and long-term, the fish stock, and then the ecosystem in general, and so I think it behooves the SSC, when we're having these discussions, to make sure we're very clear about the risks that are being taken, both short and long-term, when they're using different types of forecast methods.

Then we made a couple of statements about uncertainties within the forecast models, and so there's several uncertainties in these types of models, which we discuss, and you're all aware, and we need to make sure that we're very clear about reflecting on unknowns, assumptions, and uncertainties within these forecasts, and we gave some examples of some uncertainties, which we're all well aware of, which are recruitment, which is why we're talking about this, natural mortality, the stock-recruitment relationship in and of itself, and, in addition to that though, discards and discard mortality, abundance indices, and ageing accuracy, and so all of these things

play into the uncertainty related to these forecasts, and I think, in the report, we make a statement about the Monte Carlo bootstrap ensemble modeling that we do in this region and that we think it's a good strategy to acknowledge the uncertainties that are in the forecasts that we're providing.

That leads me to -- So those were the recommendations for short-term forecasts, long-term forecasts, and sort of a few caveats, or discussion points, and then I am at the section now we're I'm going to talk about assessment report recommendations, and so these are the things that the group thought would be useful for the SSC when we're having discussions about how to project recruitment and how to move forward with providing management advice.

The first thing is a full description of the recruitment variance assumptions within the model, including an inclusion of the analyses of autocorrelation in recruitment, and so looking at whether or not the time series of recruitment has any autocorrelation in it, and then providing a graph of the distribution of recruitment, and what we're looking for here is just a very clear description of how recruitment is being parameterized within the model. Sometimes that's hard to find.

The next recommendation is a full description of the data informing the estimation of recruitment deviations over time. Specifically, we're looking for are there things that are changing in the data which might inform, or differentially inform over time, the estimation of recruitment deviations, meaning is there a change in the sampling frame of some data source over the time, you know spatially or temporally, that would give recruitment estimates, and they might be better, or more robust, in one part of the time series than another, or, if there is changes in species compositions in the fishery -- There were several examples of types of data changes that we thought may or may not inform recruitment deviation estimation and how that might change over time, and so we're just asking for a better description sort of of the data quality and quantity over time.

The next recommendation is a very specific recommendation for the inclusion of a sensitivity run removing the stock-recruitment curve. This comes from the Maunder and Thorson paper. We also requested the inclusion of a sensitivity run including ageing error, with the thought that that would give us some indication of how well recruitment is being estimated, given the acknowledgement of some error in the ageing, and so there is two particular sensitivity runs that we're looking for to be added to the reports.

Personally, I have run the ageing error one most of the time anyway, and so I don't think it's too big of a lift, and we're also asking for a couple of graphs to be included from the Monte Carlo bootstrap ensemble modeling, and so the first one is a graph of the recruitment time series envelope of uncertainty with the base run recruitment overlaid, and so, basically, if you think about the assessment reports that you've seen, the MCBE graphs have a gray envelope, and then there's a median line and a base run line in there, and what we're asking for is to include the recruitment time series in those figures, and so usually we see it for reference points or things like that, but we don't necessarily get the recruitment time series, and so the question was, if we plot that recruitment time series, is it within the envelope of uncertainty that we're projecting?

The second graph recommendation up here, which is the third bullet, is a recommendation of the recruitment deviations time series, and so, basically, we want a time series looking at recruitment itself, but then also at the deviations, and that is also with the envelope of uncertainty from the MCBE runs, just to look at whether or not those values do fall within our uncertainty expectations or not.

Then there's two more recommendations here, and there is inclusion of hindcasting, as described in Kell et al. 2016, in order to assess and improve the forecasting ability of assessments, and so, basically, having us look at are we doing a good job forecasting or not, and then the research track assessments provide an age-structured production model, and so this isn't for every single type of assessment, but this will help with recruitment and index diagnosis.

Thanks for bearing with me on this text-heavy presentation. My number-one comment was put pictures in, and the good stock assessment scientist that I am had a difficult time with that, and so this next section is the prioritized research recommendations, and so we did spend some time talking about what it is that we would like -- What kind of work would we like to come from this report that would help us in our decision-making processes in the future, and so this is the first one on the list.

It is explore autocorrelation, proportional variability, and correlation in age at 50 percent maturity across species in the South Atlantic. This particular recommendation comes directly from the Van Beveren et al. paper, and it basically would be useful in order to help determine the best methods for projections based on the actual characteristics of the given species that we're working with, and so one of the things that we're pointing out here is that this would help us provide examples of the benefits and payoffs to things like increased or decreased catches, responsive management, and then management more tailored to the specific species in our area.

The second prioritized research recommendation is something that has already -- Work that has already started, and so there is a group working on some components of this, and it's basically doing an analysis of the recruitment patterns across multiple species in the South Atlantic, including time series analyses, trend analyses, looking at correlations between the recruitment time series of two or more species, and it's looking at answering questions about whether or not these recruitment dynamics are happening only within species, or across species, whether there's a systematic pattern, and whether or not, if there is a pattern, whether they're moving jointly or not, and so there's some specific examples here, where we're pointing out places where you could look at correlations across species or across recruitments. Hopefully we will be seeing some of this work coming out in the near -- Well, near, to me, is the next two years, and so I guess I will say the near future.

After that, there is a few more recommendations, and so the next one here is the analysis of the performance of projections in current assessment models, and so we basically are making the point that we have over two decades of stock assessments in the South Atlantic region that have produced forecasts and projections, and so the question really is, now that we have lived those years, and we have experienced them, and we have data on them, how well did we do? How well did those forecasts perform, what are our biggest sources of error, and how should we move forward from that? That's Number 3 of like what I considered the big three recommendations coming out of this and those big three things are all things that hopefully we should be able to address at some point in the future.

The next ones are maybe more -- A little bit more long-term, or we don't necessarily have the data, and so the next one is implementation of collection surveys for independent sources of data, to provide estimates of recruitment, and so a lot of the species we work on do not have recruitment indices, and it would be nice if we had some information in the model to inform what those

recruitment estimates should be. However, we would actually need to start collecting those data in real time.

The next one is analyze the value of investing in pre-recruit surveys, such as ECOMON and MARMAP data. Analysis of the best leading indicators of recruitment to use after the stock assessment terminal year for forecasting recruitment, and so this is sort of that interim analysis discussion, which we're not having later in this meeting, and then any analysis of possible environmental corelates, and so I'm not going to belabor those last ones, but they're in there, and all of these are important, but, of course, we've prioritized them, and we hope that the ones nearer to the top would be addressed more quickly than the others, although, if someone is going to start a survey for recruitment, that would be great, and that's it.

I put this -- Chip made us this lovely graphic for the front of our report. As we said, we needed a picture, and so I have used this for the questions section of this discussion, and so I guess I will open the floor for questions. Thank you again to the workgroup, who spent months working on this and reviewing all the literature and thoroughly discussing the recommendations. There is more details in the report, if you want to look at more of the nitty-gritty, and, anybody who is on the committee, please feel free to speak up and help answer questions as we have this discussion.

DR. NESSLAGE: Excellent. Thank you so much, Amy, and thank you for your leadership of this group. They did a ton of work, and they were very dedicated, and as you can see from the report. I would like to, at this point, open the floor for questions. The one thing that I forgot to mention is that, yes, do please raise your hand, if you are here in person. If you are online, use the little turkey hand, and we will get to you as soon as I see -- I am going to look in that direction, but I'm looking at Chip, and sorry, Kai and Wally, because he's going to raise the flag, if you do raise your hands online.

Then, also, there have been some issues with getting our names right on the transcript, and so, if you could -- If you remember, I will call on you by first name, and the Freds will get their full names, but if you can remember to repeat your name, that would be great, and it will just really help the folks doing the transcript, and I know we won't all remember, but hopefully you can remember as we go along, and so please raise your hand if you have questions for Amy and the crew. Wilson.

DR. LANEY: Thank you, Madam Chair. Amy, I know we're not going to have the presentation now, but -- I looked in the papers for the answer to this question, and I probably should know it, but is there a standard metric that we use for measuring recruitment? What do we normally use for a time series? Are we looking at age-ones for some species, where we have a time series of juveniles, or do we look at recruitment to the fishery as the metric? I mean, how do we -- Is there a standard, at all, that cuts across species?

DR. SCHUELLER: My perception is that there's not necessarily a standard. I mean, I've worked on assessments where we have age-zero indices, and then others don't, and they're not really tracking the fish until they hit age-five, and so I think it's variable.

DR. LANEY: I guess that's one thing that the other group is going to look into, is what would be the recommended indicator for recruitment.

DR. SCHUELLER: A lot of the South Atlantic species are, what, age-one-plus, and so, I mean, it's -- I guess, if we were going to be very specific about the South Atlantic, age-one is typically the age, but it's not a guarantee.

DR. NESSLAGE: All right. Thank you. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. I want to echo the Chair's comments, and I think the group has done an excellent job, and we all benefit from that, and so I want to thank each and every member of the committee. A couple of things that occur to me, and, in terms of uncertainties, and in terms of patterns of bias, I am always concerned that one thing that isn't looked at is how well the catches in the interim years -- If it's a five-year projection, for example, in the short-term, typically we have two years in which we assume the quotas will be caught, or the management specifications will be met.

That needs to be looked at, I think, in terms of each and every assessment, because, if the catches are lower or higher, then, quite frankly, that's management uncertainty that's coming in to impact the assessment uncertainties of stock status.

The other thing, in my mind, that is more important, or as important, is that I think we need, as a committee, to decide additional terms of reference for each and every assessment that take into account many of the points that you've raised, in terms of, one, looking at a post-hoc analysis of the previous assessment and seeing whether it was on target or non on target, and was the realized recruitment met or not met, and these types of things that could go into performing the new assessment.

I know, for example, many assessments have retrospective patterns, both in terms of fishing mortality and stock size, and, if that is a pattern, I think that should be included in a sort of term of reference for the assessment, so that it's taken into account as a source of uncertainty in the new assessments, and so I think operationalizing many of the things that you have mentioned -- I think you've done a great job, both in the short-term and the long-term, and we need, as a committee, when it comes to terms of reference for each and every assessment, to operationalize those, in terms of terms of reference for the oncoming assessment. Thank you.

DR. NESSLAGE: Thank you, Fred. I believe we have Yan on the line. Hopefully we can hear her this time, and go ahead and introduce yourself now. Sorry for the earlier disruption.

DR. LI: This is Yan Li. Thank you, Genny. I am with the NC Division of Marine Fisheries. I would like to echo what everyone just discussed and agreed on, and this is great work, and I really appreciate the tremendous amount of work that the workgroup put together and gave us a very nice picture to look at of what has been done and what needs to be done for the better projections for the future.

There is one thing. As I listened to the presentation, there is one question that kept coming back to my mind, and that is has the workgroup found any recommendations for, for example, like what kind of methods would be recommended for short-lived species versus long-lived species and for those species of high management priorities, for example those species where the current stock status is overfished or overfishing is occurring, and whether those species would be of lower management priority. I feel like I am trying to link -- I noticed this whole work is recommending

the methods based on long-term forecasts versus short-term forecasts, and so I am trying to think of a way to link those recommendations to the specific species. Thank you.

DR. SCHUELLER: That's something that we talked about quite a bit, is linking these general recommendations to specific species, which is why we made Research Recommendation Number 1, which was basically looking at the different attributes of the different species and analyzing those, to compare them to what's in the Van Beveren paper, so that we can maybe pick out some more specific recommendations based on their look at how well recruitment projections perform, and we did have a bit of discussion in the group, and the reason why we ended up with short-term and long-term recommendations is because we had discussions about things like what about species that are in rebuilding plans, and we made statements about they should be using the longer-term forecasts.

We did acknowledge that, but do we have the answer for that right now? No, and I guess it's sort of a to-be-continued, and hopefully we will still keep working on this and striving towards figuring out exactly what the recommendations are going to be as we move forward, based on some of those species' attributes and those research recommendations.

DR. NESSLAGE: If I may add to that, the one thing that we did point out, and I think you pointed out in the report, that's in the Van Beveren paper, is that the age at maturity was a big predictor of recruitment forecast success, and so maybe it's not short-lived versus long-lived, per se, but age at maturity, and so we have some fish, like tilefish, that live forever, but they mature early, versus some of the shorter-lived species that, obviously, mature early relative to others, and so maybe -- I think, probably until we can identify a new pattern, like Amy was saying, we would stick with what is recommended in the literature, and I think that's in the assessment recommendations, right, to look at age at maturity? Okay, and so hopefully that helps. Does that address your question, Yan?

DR. LI: Yes. Wonderful. Thank you.

DR. NESSLAGE: Kai, go ahead.

DR. LORENZEN: Thank you very much. That is a very interesting presentation and work. I have one question that is really a question because I don't know your practices, and that is, while interim assessments and the use of management procedures, because the Gulf has gone down that route quite a bit, and it seems there's a bit of an alternative, right, and you can put more effort into your projections of recruitment or you can not put a lot of effort into that and adapt with new information, and I was wondering whether that is something that this council does on a regular basis, or do you basically stick with your projections until there is another full assessment?

DR. NESSLAGE: Go ahead, Amy, if you want to address that.

DR. SCHUELLER: I mean, we tend to stick with the projections until there is another full assessment, and we have been discussing the interim analysis. It was one of the research recommendations here, is to look at whether there is any indicators that could be used to give an indication of recruitment, in order to use that for the interim analysis, but I feel like -- Well, I don't know where they are exactly in the Gulf, but I feel like the place we're in right now is we're acknowledging that it's a possible method that could be used, but it needs to be researched and

analyzed before we sort of roll forward with it, given that we don't know how well it will perform. Does anybody else want to add to that or correct that? That's my viewpoint on it.

DR. NESSLAGE: Wilson, go right ahead.

DR. LANEY: Thank you, Madam Chairman. I echo what everybody else said, Amy, about the excellent job that you all did. It's just a huge amount of work, and I especially appreciate the annotated bibliography. I wanted to ask Fred Serchuk, in particular, if -- The one future research, or prioritized research, recommendation that jumped out to me, that I would love to see, sooner rather than later, is the analysis of the performance of projections in current assessment models.

It seems to me that Dr. Serchuk recommended that multiple times during the course of our South Atlantic gag assessment, since we have that long time series that we could really go back and look and see, well, did we hit the mark or not, and so I think that's a very important one to do. On my list, I would put that -- I would raise it in priority even.

DR. NESSLAGE: Scott.

DR. CROSSON: One thing from the workgroup that really stuck out for me as having potential implications is the emphasis on -- We went around and talked about whether we should be using recent patterns of recruitment, or long-term patterns of recruitment, in terms of doing the projections and the ABC setting, and we came -- Other than red snapper, most of those have been pretty negative, and I think the rebuilding plans, for a lot of the major species, have not lived up to expectations.

I think, for setting future ABCs, that's something that this workgroup felt very strongly should be incorporated into setting new catch level recommendations that need to be conservative, because a lot of the management measures have failed to rebuild the stocks that are of importance in the South Atlantic, and I think the snapper grouper fishery, overall, with some exceptions, is increasingly kind of veering into a crisis on a lot of these things, and so I am hopeful that we are going to be bringing that into our ABC setting in the future.

Just one addition, and I know that I have been told by stock assessment scientists that I tend to oversimply things, but, to my mind, I always think of recruitment as a dependent variable that's showing how well management is responding or not responding to -- I'm sorry. How well the species are responding or not responding to management measures. It's something you can't see, and it, to some extent, reflects on what's both happening out there biologically, I recognize, but also what we're doing to the species, and so, if recruitment is failing, that means management is failing.

DR. NESSLAGE: Thank you, Scott. Wilson.

DR. LANEY: Or, Scott, does it mean that there is some environmental variable that we're not taking into consideration that could be overriding the benefit of whatever management measures we put into place?

DR. CROSSON: I absolutely believe that may be the case. In fact, years ago, in my experience working at DMF, I remember we had a big battle over speckled seatrout and the impact of freeze

mortality, and the answer -- There was a lot of real evidence, and that's a relatively simple relationship, and you can see when you have a hard freeze, and you can see the dead trout floating up, but the main thing that I brought out of this was that, if those happen, you still need to account for that in terms of management.

I'm sorry that it happened, but that means you need to be more conservative to conserve the remaining stock, and so I don't doubt that, given both the global changes that we're witnessing with species moving and different climate shifts going on, as well as the continued pressure for development that we have seen on the South Atlantic coast that is eating into the habitat that a lot of these species depend on for having a healthy recruitment, and all of those things -- We can't affect all of those things with this SSC, but it certainly means that we have to be more careful with conserving what we do have, so that they can account for those additional environmental pressures.

DR. NESSLAGE: Wilson.

DR. LANEY: Thank you, Madam Chair. Yes, I certainly agree with you, and the spotted seatrout and cold winters I would say is a relatively easy one. I mean, you can see the impact of that one, and North Carolina has, from my perception, taken appropriate management measures to try and protect the stock, when that occurs.

I think that there are a lot of other variables that we, as yet, don't completely understand, in terms of how they affect the biology of these species, and one of the tools that this council has that might enable us to do some exploration on some of those, at some point in time, and I don't think it's ready yet, but Yan and the workgroup may correct me on that, is our Ecopath model. To the extent that we can modify that, or refine it, to include environmental variables that we think may be having a biological impact, that would be a good thing, I think, maybe, and so that might be a recommendation that we want to make at some point.

DR. NESSLAGE: Thank you, Wilson. Kai.

DR. LORENZEN: I wanted to come back, briefly, to the interim analysis, and I would really encourage the SSC, and also the Science Center here, to look a little more into the potential for management procedures, because not only -- I mean, good predictions are good, but recruitment predictions are always going to be not all that good, and so it's good to be able to sort of update that with actual information, and one of the nice things is, with the interim analysis, and also because it's typically -- In the Gulf, it's typically based on indices that cover not just recruits, but they are more indices of the adult biomass, and those also, of course, account for effects that don't happen at the recruitment stage, and so we have things like red tides and cold kills and so on that don't necessarily affect the size or age of the recruits, but later on, and those interim analyses capture that as well.

That's one thing, and I also wanted to comment a little bit on Wilson's question about when -- When is a fish recruited, really, and Ed Camp and I actually wrote a little paper about that, a couple of years ago, and it was exactly that question, when is a fish recruited, and we looked at it on a length basis, and we looked at where does most of the density dependence happen, and we have a simple rule-of-thumb that says mostly it happens when fish are less than 10 percent of the asymptotic length, and then there is a little bit between 10 and 20, and we really didn't find anything above that, and so that's your very simple rule-of-thumb.

Now, for most species here, even a one-year-old fish would be bigger than the 10 percent, and typically bigger than the 20, and so there's not really a problem there, but, when you get to smaller fish, and so, if you say have some young-of-the-year index of recruitment, it's quite possible that that's not really an index of recruitment, but it's an index of something that happens before recruitment, and we're doing more work to look at that with the fisheries-independent monitoring data in Florida, and we can actually see more patterns there of size dependence, or density dependence, and so we may have some updates on that, but there is a sort of simple rule-of-thumb that can help us decide whether, you know, a juvenile index is probably an index of recruitment or is probably more of an index of settlement. Thanks.

DR. NESSLAGE: All right. I don't see any hands raised, and so I think we're wrapping up with questions and starting to transition into discussion now, and I would like to take a moment for public comment, if we could. Is there anyone from the public who has a comment or a question for us? No online hands, and no one in the back of the room. Okay. All right. Thank you.

Then I would like to at least start -- Well, let's see if there's any continued discussion, and then we can maybe, depending on where that takes us, take a break, or we can launch into our recommendations for adopting and/or revising the specific workgroup recommendations in the report, and so is there any continued discussion, points that people would like to make, thoughts you've had, based on the report and the presentation that Amy gave? Is there anything missing that we need to be discussing? Alexei.

DR. SHAROV: Thank you, Madam Chair. I have a couple, or maybe one, question and a more general discussion point, maybe. First, the short-term projections recommended do not go beyond five years, and I assume that's based on the paper, the 2021, and I'm sorry that I can't remember the last name of the primary author, but beyond five is probably -- Is indeed not the short-term, right, by definition, but, still, is there a little bit more, maybe, in terms of the recruitment dynamics and the ability to detect the trends and react to this, in terms of management? Why not three or not four? Is there any biological or other meaning in that recommendation?

DR. SCHUELLER: The short answer is no. I mean, the problem with all of the -- Before we did the workgroup, I thought there would be more research to sort of point you in the right direction, as far as what would be the most robust recruitment projection methods, but it's a bit more complicated, I guess, than I anticipated at first, and so, yes, there isn't any specific reason why it isn't three or four, and the five comes, yes, out of the Van Beveren, with that three, five, and ten, and I don't remember how they chose those years.

DR. SHAROV: Thank you, Amy. Going to more general, first, related to -- Just based on the discussion of the recruitment age and how do we define it, I think it's -- Well, in terms of the density dependence and the moment when we can conclude that the formation of a year class has happened, right, and I think I would probably agree with what Kai was talking about, and not that I agree, but I totally follow, and certainly I agree with his logic and information, but, with respect to more like management application, stock assessment application, I think we could allow ourselves a little bit more freedom with respect to the fact of the strong year class, if it's strong or whatever, the year class, one it's formed, and whether this will have an effect on the projected population biomass and spawning stock biomass.

Therefore, the period of projection, where it's important how far your goal is, the age at maturity and the growth rate that is -- At what age the year class reaches the peak of the biomass, right, and so, for some, by age-three, they are already significant contributors to the population biomass and the spawning biomass. For others, it could be five or six or seven, and, therefore, if you're doing a three-year projection, for example, the effect is not significant, and it probably won't be detected, or at least the projections will not show any substantial effect on the changes in the population size, and therefore OFL and ABC, et cetera, and so I think the needed time of projection should be related certainly to the biology of the species here.

The last point is there are lots of very, very, very good things that have been covered here, and I think this is a great report, and it was so much effort for them to -- Observing all the available reviews, et cetera, and lots of things that I mentioned were essentially used in the stock assessments that the SSC reviewed, but not simultaneously.

Elements of them were present, but they were not necessarily overlapping, and so there are lots of good recommendations here, and what I would like to ask is whether the sub-group, and then whether the whole SSC, would recommend developing some sort of standard list of things that any assessment has to go -- That would be quite lengthy, actually, and, if we are to do a checkmark for each of the recommendations, but whether the specifics of particular species, because I think what many individual assessments did, and we didn't do such a bad job, but those elements that seemed particularly important by the lead assessors -- They were addressed in those particular assessments, and the others were neglected, or not ever mentioned.

The question is do we do one whole big book by which every analyst will have to go to address all the checkmarks, or do we allow for the division and sort of doing the subsets of these recommendations, depending on what type of information is available, and so that's a question, I guess, for Amy and the team.

DR. SCHUELLER: I think the workgroup acknowledges that there's a lot of work already provided in those assessment reports, and we appreciate that work, and we were using all of that work, and we don't wish for any of that to disappear, but I do think we are making very pointed recommendations here to include these additional things into the report to help us in our decision-making processes, and I don't see a reason why any of them might be optional, really.

I mean, they're sort of standard -- In my mind, they're straightforward things, and some of them are things that are already produced, and they're just not in a graph in the report, and I know we're not trying to make two-thousand-page volumes, but sometimes you do need that graph, just that one extra graph, to help you, and so I guess my comment is keep doing what we're doing, but we just want this one little extra set of pieces, so we can hopefully finish our puzzle a bit better, and I don't know if anybody else on the workgroup wants to chime-in on that, but that's my opinion.

DR. NESSLAGE: Thank you, Amy, and, I don't know, and I would just add that it would be nice, perhaps, and maybe not a checklist, but some suggestion that, in the projections section of the report -- Most of the reports from the Southeast Center are very standardized, and that it could address each of these topics, so it's clear to the SSC where to look for each of the graphs, or the points that are made, just to help guide our discussion, and that would really help, because it's often buried in several layers, or it's in an assessment report, but not in the -- It's in the data report, but not the assessment report, depending on the type of assessment, and so maybe a

recommendation to synthesize it in a short paragraph would be great. If there is a question, or an issue, that doesn't apply, they can just say "NA", and that's fine. Does that address your -- I like your recommendation, Alexei, but let's see what everyone else thinks.

Are there thoughts on -- I guess we're jumping to Dot Number 3, which is stock assessment report recommendations, and so is there -- There is a list of recommended elements to be included, or highlighted, I guess, in each assessment, and some are already automatically generated and some we would like to make sure we see, that don't slip through the cracks, and are highlighted, perhaps, in the projections section of the report, and does anyone disagree with anything that the working group suggested be in there? Is there anything else we need to add or subtract? Can we pull up that slide, or it's multiple slides? It's report page -- Someone help me out. It's PDF page 16.

With regard to adding them to the TORs, which I think Fred Serchuk was recommending, I think we can reference this report and say please address the projection recruitment assumption description requests in our report page blah, blah, blah. Amy.

DR. SCHUELLER: I was just going to say, as an assessment analyst, some of these things were already -- I mean, sometimes -- Many of you have participated in stock assessment committees, and sometimes you run sensitivity runs that don't actually end up in the report, and so some of these things might actually already just be in the queue of stuff that's already been done, and it's sort of sitting in a folder. All we're saying is pull it out of the folder and put it in the report, and, I mean, I think the Center has said that they would be able to do this, or add this, if we're making this recommendation, and especially if it would be helpful.

I just wanted to put that on the table, that stuff of this stuff is done and there, or they ran the MCBs already, but they just have to pull out the recruitments and the deviations and plot them, and I was going to also say that I like the recommendation that Fred made about being preemptive, on our part, and adding some of these things more explicitly to the terms of reference, and so I agree with that recommendation.

DR. NESSLAGE: Fred Serchuk.

DR. SERCHUK: Thank you, Chair. It is a truism that short-term assessments -- Stock assessments should be done more frequently, but there are a lot of elements that mitigate against stock assessments being done more frequently, and so, while this is a truism, I think we need to be a little bit more practical, and it would seem to me that, given the fact that the people that generate the stock assessments and people that generate the data are working as efficiently as they can, given they have multiple stock assessment responsibilities, in many cases, and given that the data flow takes a certain amount of time to get done, are we talking about stock assessments need to be done more frequently or there needs to be a way that we can assess the timeliness, or the accuracy, of the stock assessment that has been done and before another one is done?

Is there some indicator that we might be able to look at, to see whether the stock assessment is on track, given what's been projected? I mean, we have to be realistic about it, and the stock assessment schedule is a compromise. It's a compromise between the responsibilities that the stock assessment people have, with respect to their abilities to generate a stock assessment more frequently than is possible, or it could be a workload problem, or it could be that there are other things going on that mitigate against that, and so I don't think -- While it sounds easy to say that

stock assessments should be done more frequently, the reality of that, in my experience, is that there are many other factors that mitigate against stock assessments being done more rapidly than they have been that are simply concerns that we need to think about.

If there was some way to say, oh, I have a ruler now, and I'm just going to measure what the projections said and it's on target, some index, then we would need to do it more frequently, because we would be assured that, after the time period of the assessment and the time period of the projection, things seem to be going according to plan. Does that make sense? Have I made my point, Chair?

DR. NESSLAGE: You have, and I actually looked to Erik to comment on that a little bit, but if, Amy, you have something you would like to throw in -- if you don't mind, Erik, let's just go with Amy first.

DR. SCHUELLER: I think that the workgroup tried to acknowledge those points, meaning, if you look at that Recommendation Number 1, we're saying five years, and we're giving specifics, but we're also putting some caveats in there, and so we're saying things like, if an analysis is done that finds projections are accurate and performing well for a given species, then lengthening the projection timeframe can be considered.

We're making statements that would allow for increased amounts of time if we can show that we're actually doing a robust job, and then, if we can't show that, we're making statements about adjustment of P* should occur when projections go beyond the recommended years, if uncertainties haven't been fully accounted for or new uncertainties would arise after the forecast time period, and so I guess I'm -- My viewpoint was, as a group, I feel like we did discuss that, but we're still making the recommendation, and then we're providing these sort of additional caveats that we think we can agree to and live with, and maybe that doesn't fully address what your comments are, but, if it doesn't, any recommendations you would have would be appreciated.

DR. NESSLAGE: I would like Erik to chime-in too, if you would, please.

DR. WILLIAMS: Fred's comments actually are very on point with what Kai was bringing up earlier too about interim analysis, and so interim analysis is where you essentially are taking those interim metrics, whatever they are, and you're formally acting on them, but what you were suggesting is an intermediate step, looking at those metrics and maybe just at least judging -- Making some judgment calls about the quality of the assessment. All of those are great ideas, and the question is how far do we take that? What does it take to get that information?

I will say, right now, one of the challenges for the South Atlantic is -- You know, you think about some of the primary data sources we would want to look at to judge the performance of a stock is the catch, the discards, and an index, right? Well, the catch is an easy one. Discards are difficult for the South Atlantic, very difficult, and the index -- We're just now getting to the point where hopefully we can start to update those more regularly, and we are just now expanding survey programs to the point where we are incorporating more species, and so we're at the cusp of that, and we want to head in that direction. It's a great idea, and that's I think where we're headed, and it's just a matter of how far we can go and what the workload is associated with it and all that good stuff.

DR. BUCKEL: Just to that point, I think there are times when the delay between the assessment and our recommendations and then the management regulations is multiple years, and, by that time, management hits the street, and the industry is going, but that good recruitment, or good year class, has moved through, and we should be -- Instead of increasing the bag limit, it should be decreasing, based on what's being seen on the water, and so I think trying to get some interim analysis would be helpful, back to Scott's point of it looks like we haven't done a good job, right, and maybe that's -- There is some of that there.

To that point, this historic analysis that is in the report and that Fred has brought up about, well, how have we done, and we've got the twenty years of data, and, if that could be part of that, looking not only at how the projections -- What the projections look like and what the reality was, and also looking at the regulations and the timing of that, to see that, wow, we could have improved if we had looked at the MARMAP index, and we would have seen this, and that could have helped us prevent this reduction in spawning stock biomass, or reduction in recruitment, and so if that could -- I guess the timing of regulations be part of that analysis, and that might be helpful, if possible.

DR. NESSLAGE: Alexei, do you still have your hand raised? Then we'll go to Chris.

DR. SHAROV: If I could go back, for a second still to my original question, or the last question, what I was asking is I was looking at the stock assessment report recommendations, which I generally agree, but I probably would note that it's very much standard, probably, on the BAM model, understandably, and that's the principal tool that is used for most of the stock assessments, but there are other elements that are described earlier.

For example, for the long-term projections, the group recommends sort of a hierarchy of the possible methods used to forecast recruitment, starting with the average recruitment and historic variability, but it looks more like a continuation of the more simple method for the short-term, using the average, and, well, I guess, of course, you would apply some sort of variability there.

Then the stock-recruitment relationship, and then you would try a time series. If there are environmental corelates, or if there is an autocorrelation, then you would do a mix of stock recruitment with the environmental covariates. My question is, again, since we're trying to sort of standardize the approach, is this going to be, again, the recommendation at least of the checkmark points that we -- All right. Here is five, and we looked at them, and we picked Type A or Type B1, because -- Then you have your logic of why you did only this, but do you have to address the others, that they were not considered because, and then you have a list of your reasoning, and so I'm just trying to get you back to the cookbook that is probably where we'll end up developing.

DR. NESSLAGE: I like the cookbook analogy. We'll revise it as recipes get handed down and tried by variation generations.

DR. SHAROV: There's always availability for the individual flavor, right?

DR. NESSLAGE: Absolutely. Chocolate chip. Let's go to Chris.

DR. DUMAS: Thank you, Chair. Referring back to Kai's earlier comments about what to do in the interim, interim years, and I am thinking of it as a more sort of adaptative management

approach, and one thing we could do would be to sort of have a -- Think of this in a Bayesian framework, and kind of, optimally, a Bayesian update, as new information comes in in each time period in the interim years, if the data are amenable to that, and, if we did that, then the Bayesian updating would take into account the level of uncertainty in each new bit of information that was coming in and could help us, you know, maybe optimally update.

We talked about a similar thing when we were looking at updating the season length for short season fishing seasons, when we were working on the MRIP study that we did, Kai, and that was a similar type of model, and so that's something that we could maybe look at, if the data are amenable, for optimally updating projections in interim time periods between stock assessments, and that's one comment.

A second comment is referring back to some comments that people made about choosing the number of years to average over, five years versus three years versus four years. To help make that decision, we could look at the autocorrelation function and the partial autocorrelation function for the recruitment time series, and those are two specific things that could be included in the stock assessment report recommendations, and we may have -- The committee may have had those two specific things in mind under inclusion of analyses of autocorrelation in recruitment, and so under that general heading, the sort of first bullet, Item i under that, and two specific things could be the autocorrelation function and the partial autocorrelation function, because those things can specifically help you determine what's the best lag length to include.

If you're basing recruitment projections on a mean number of years, help you choose the number of years, or, if you've got a time series model, and you're trying to decide what number of years to include in your time series model, to help you project forward. Thanks.

DR. NESSLAGE: Thank you. All right. We are coming up on 3:00, and I feel like we're starting to get into some detailed recommendations for some either modifications or augments to the report, and so I would like to take, since we're about halfway through the afternoon, a ten-minute break, and we'll come back, and we will start putting words to paper here, and so think -- Especially folks who are assigned this one, and I have some ideas to throw on the board, but then I would like your help in fleshing out our recommendations here, and so a ten-minute break. Please come back and be ready to go at 3:10.

(Whereupon, a recess was taken.)

DR. NESSLAGE: All right. If everyone could take their seats, and the cookies just arrived. I missed them. I will go get one at the next break, which I guess is dinner.

DR. BUCKEL: Go ahead and get one.

DR. NESSLAGE: Okay. I think it's time we start putting pen to virtual paper here and start putting down some of the ideas that people -- We've got a couple of reoccurring ideas and comments that we keep circling around, and so maybe let's try to put some bullet points down here. One thing that keeps coming up is adding -- Chip takes care of me. For those online, I just got a chocolate chip cookie delivered by Chip Collier. Thank you. Now we'll make it through the afternoon.

The first one that I noted was the TORs, and we should be adding -- Is that in the report, Amy? I am going to look to you. That we specifically say let's add these stock assessment additions to the TORs, as a checklist of do what you can, and I don't think it's in there explicitly.

DR. SCHUELLER: I don't think we explicitly mention the TORs at all.

DR. NESSLAGE: All right. Does anyone object to adding that as a recommendation, that we develop a TOR -- Chip has got not a cookie this time.

DR. COLLIER: Not necessarily an objection, but maybe it would be better to put it as a statement of work, because that's in the initial negotiations with the Science Center.

DR. NESSLAGE: Excellent, and that's where you can really flesh out what is doable, versus what is not, for the stock, and does anyone disagree with that modification? All right. I am not seeing any protests. The other thing that we've discussed a lot is the use of, potential use of, interim analyses, which we aren't going to hear too much about -- Well, we won't hear it at this meeting, but we will be hearing a lot about over the next few meetings, as I understand, and so perhaps something along the lines of a recommendation explicitly to use interim analyses when the performance evaluation indicates it performs well, something along those lines, and that is not worded well, but let's go to Kai.

DR. LORENZEN: I mean, you have to do the interim analysis, and, basically, you have to construct the index, right, and then that's most of the work, and so, once you've done that, you might as well use it, but you wouldn't know whether it's performing well before you've done that.

DR. NESSLAGE: Well, I guess the -- What they were going to be providing was an MSE for several species, indicating the performance of those, at least in simulations the performance of those types of analyses, in which case that might help inform our use of those, and so maybe use interim analyses when indicated, or develop interim analyses, something along those lines. Someone help me out. Conduct the analyses is what Kai was saying, and, if possible, simulation test them through the Center's MSE, and I am looking to Erik to help me with this.

DR. LORENZEN: I mean, if the recommendation is to do simulation testing of interim analyses, or management procedures, that sounds good.

DR. NESSLAGE: Thanks, Kai. Erik.

DR. WILLIAMS: The reason we haven't done an interim analysis, up to this point, is we don't have the interim data, and so I would actually recommend the more important recommendation is let's work on getting the interim data in place in a timely manner that we can do something with it.

DR. NESSLAGE: I am seeing heads nod, and so maybe that bullet gets up above, when you get done typing there, Judd. Thank you. We'll go back to the other ones in a moment, but, while we're on a roll here, let's stick with the stock assessment report recommendations.

I think what I heard several times as well was the emphasis on conducting that post-hoc analysis of performance of previous forecasts, and that keeps being echoed again and again, and so maybe

we can make a specific point that emphasizes the importance of that, and so, in the statement of work, the Center and the council going back and forth, maybe we can say the SSC would really like to see this. If nothing else, let's see this, or prioritize this, towards the top of your statement of work. Does anyone disagree with that? I am seeing heads shaking, which is great.

Then the other thing I want to get down on paper, really quick, was that Chris had recommended that we be a little more specific in Item i about providing a little bit more guidance on what we would like to see in the justification for three versus five-year projections, using the autocorrelation function and the partial autocorrelation function, and does anyone disagree with that recommendation? Under Item i, use autocorrelation, and partial autocorrelation, functions to justify three versus five-year projection timeframes, and does that sound right? We will wordsmith later, but let's get the ideas on paper. While Judd is furiously typing, I would like to open the floor to other recommendations. Dustin.

MR. ADDIS: In the stock assessment report recommendations, there's a lot of recommendation of MCBE analysis. There is some assessments for South Atlantic species that don't use BAM as a primary model, and some of them use Stock Synthesis or ASAP, which doesn't incorporate MCBE, the Monte Carlo Bootstrap Ensemble, and I just wanted to mention that.

DR. NESSLAGE: Thank you, Dustin, and that's a great point. We didn't really talk about that. Do we have any specific analyses that we know the SS software framework can handle that would be equivalent? I know this has come up under like mackerel assessments and whatnot, where we've said basically the second step in our decision tree for the ABC Control Rule -- That they get a lower score because of that, and do we want to use this opportunity to emphasize the development of something similar?

I know the FIMS group is talking about incorporating different modules in the next gen of what would be NOAA's new stock assessment modeling framework that would be an amalgam of the best of Synthesis, BAM, ASAP, WAM, and Amy is giving me a dirty look. In theory, that might be a module that could be turned on and off, but we're not there yet, and what do we do in the meantime? I will look to the people who are giving me dirty looks, maybe. What do we do with SS-based or ASAP-based?

MR. ADDIS: For Stock Synthesis models, we will run Monte Carlo or bootstrap, but we do not do an ensemble approach.

DR. NESSLAGE: But do you get recruitment uncertainty envelopes there that you could then throw your recruitment projections in?

MR. ADDIS: I believe so, or we could configure it that way anyway.

DR. NESSLAGE: Let's go to Amy.

DR. SCHUELLER: I wasn't giving a dirty look. It was just a look of confusion about exactly what FIMS will and will not include and what the modularization of that will look like. Anyway, for SS, yes, they can run MC, and we have run MCMC and MCBE comparisons for an assessment that I work on, and, I mean, it plays out as expected.

The uncertainty bounds are smaller than the uncertainty bounds for the MCBE, but you can still produce something like that, and so I would expect to be able to see something like that, but maybe we should change -- Maybe the language should have been a bit more inclusive, and so I definitely agree with that when you said that, and so I think we can make a comment about providing graphs of recruitment time series uncertainty envelopes and maybe just not necessarily say MCBE, and let that be dependent upon whatever platform, or tool, is being used.

DR. NESSLAGE: So what Amy is suggesting is let's generalize our recommendations regarding the uncertainty of recruitment in some sort of envelope graph presentation of the uncertainty in recruitment for each assessment, whatever the package might be. Is that -- Help me with wording here, Amy, has he puts stuff on the board.

DR. SCHUELLER: Yes, and, I mean, I can help with wording on that. I do think that we probably should make a statement saying that, a qualitative statement of the comparability of the risks and uncertainty, given the type of analysis that's being used, meaning I want the council to know that MCBE is going to more fully encompass the true uncertainties, as we've specified them, and we can have discussions all day about whether or not those could be bigger or smaller or what, and that the MCMC has a different type of uncertainty than the MCBE and, those differences, I just want to make sure that we're clear to the council about what those things are accounting for, and they're not the same, if that makes sense.

DR. NESSLAGE: That does make sense. Let's see what Judd puts down here. Uncertainty characterization from -- Yes. Maybe provide context, given the modeling framework adopted, something like that, or used? That's what I think Amy is saying, is that, if you're using BAM, and you're doing MCBE, the council is getting a certain characterization of uncertainty, versus SS with Monte Carlo or however they decide to approach it.

I want to, just before we go to Yan, and I see your hand, and Fred, and I just want to -- I think that bullet point of generalize recommendations regarding -- I think what we're saying there, and correct me if I'm wrong, folks, is that we want to make sure, in the recommendations, that there's an explicit characterization of uncertainty in recruitment, regardless of the platform used to do the stock assessment, and is that -- I am looking to Dustin and Amy.

DR. BUCKEL: Yes, I think that captures what you just said, about for each assessment model type, e.g., BAM and SS, something like that.

DR. NESSLAGE: Actually, I believe Fred Serchuk had his hand raised first, and then we'll go to Yan.

DR. SERCHUK: Thank you, Chair. I am not sure what -- I am not sure, in the fourth bullet there, which has Sub-Bullet i, why we've taken three and five-year timeframes and whether that includes the interim years as well, and I'm just -- I think we need to be very clear in our words here, because it maybe even clear to us, but it's not clear to me, but it certainly won't be clear to people that are unfamiliar with the process, and those are council members that will read our report, and so I think, if we can make it much more lucid and transparent, we would understand what was going on, but also the people that would read our report would understand what's going on.

I don't know how we could make that clearer, but I am concerned about these interim years. Generally, we have at least two years in which we project forward, giving the catches in those years, and so am I correct? I think that that needs to be a little bit clearer to people, and, if I'm wrong, I stand corrected.

DR. NESSLAGE: Chris, to that point?

DR. DUMAS: One suggestion would be just to delete either three and five-year, and just leave it as timeframes, and that would be a little bit more general. Does that help, Fred? The point was just to use the tools of the autocorrelation and the partial autocorrelation function, just use those two tools to help inform choice of timeframe, and so those are just two tools, two specific tools, that can be used to help inform the choice of timeframes for recruitment projections, and that was my point.

DR. NESSLAGE: I think, and correct me if I'm wrong, Amy, the suggestion in the report was that it be short, if not three and five, but three to five, and so basically giving the analysts a framework. When you say "short", what do you mean by "short", and so they don't need to be locked into three versus five, per se, but what Fred's outstanding concern though -- Is does that include the years where we're waiting for management?

DR. SERCHUK: Chair, I'm concerned that we have a management specification for a number of years, and then we'll look at the management, and we'll come back and say, okay, we set the management regulations, and maybe it's a quota, or a catch level, and clearly it should be -- That uncertainty should either apply to that period, or, at the end of the period, we expect a new assessment, and that's why I want to make this very clear. Are we talking about -- If a three-year timeframe is set, does that mean that we're going to get either an interim analysis, so that we can check on what the management specifications would be after that, or -- I just don't see the link with the management system of using the data that we present in the assessment in the short-term projection. I hope I haven't mucked it up.

DR. NESSLAGE: You might have. I guess --

DR. SERCHUK: For example, if an interim analysis says we're wrong, that recruitment is much worse or much better, what might be a single one way or another to the management system that says, okay, you were proactive in evaluating the efficacy of your projections, and, if things are better, then maybe we have more room to reset some of the management specifications one way or the other, and that really depends on the time period, whether it's three or five, particularly when two of the years that we normally project forward -- We generally have management measures in place that we have to take account of, and so generally it's a catch level, and we apply whatever dynamic we have in the stock, of recruitment for example, to those catch levels. I am trying to link up our projection period with the management specification period, so that people really understand what we'll be doing. You look puzzled, but I think this is a real problem.

DR. NESSLAGE: It is, and I think it's addressed in the report, but maybe not well enough. Amy.

DR. SCHUELLER: My feeling is it's addressed in the report, meaning we're saying do these five-year projections, and let's say there is two years where they haven't done anything, and then the last three years there is management, and then you're saying what happens after that. Well, I think

there's some leverage in here, and so, if we're finding that they're doing a good job projecting, they can lengthen the projections.

If we don't know, they can lengthen the projections and have a decrement on the P*, right, or they can do an assessment, and so I feel like there's sort of -- An assessment might mean an interim analysis, and I don't know that we say that necessarily, but, I mean, we do recommend some research recommendations for the interim analysis. I feel like the interim analysis wasn't necessarily pointedly recommended, because we know we're waiting on some analyses for that, and so that's my take on what's in the report, but, if that's not clear, we should, as a group, figure out how to clarify that.

DR. NESSLAGE: Okay. While folks are thinking about what needs to be clarified, either in their minds or in the report, or in this report, I want to go to Yan, because she's been waiting very patiently.

DR. LI: Thank you, Genny. First, I cannot see Judd typing, and so, when you refer to Number 3 or 4, I couldn't see it on my screen.

DR. NESSLAGE: I think Fred was -- We had been talking about Bullet 4, where I think it was Chris's suggestion about the autocorrelation analysis, and I think someone, or maybe it was me, suggested wording that it be three to five years.

DR. LI: I cannot see that screen. I don't know if it's just me.

DR. CURTIS: Yan, the way we're operating it live is we've got two screens, where the one you're seeing on the webinar is showing the presentation, and then the overview notes are being taken on a separate screen that's not on the webinar, but you'll a chance to review and then comment after the meeting is done.

DR. LI: Okay. Thank you. If that's the way, but I was just making sure there is nothing wrong from my end, and I just wanted to make a comment regarding our discussion back to the MCBE versus SS, because I couldn't see the bullet, the sentence, exactly the wording, and I just want to make a point that either MCMC or MCBE is a way of incorporating the uncertainty, and so I feel, to me, the central message is to make sure there is some method, either MCBE or MCMC, to incorporate the recruitment uncertainty into the whole analysis.

DR. NESSLAGE: In which analysis? The interim analysis that we're talking about?

DR. LI: No, not the interim, but in general when we discuss MCBE.

DR. NESSLAGE: Yes, and I'm sorry you can't see the screen, and you just gave us an idea though. I think that tomorrow what we'll do is we'll have a Google doc, and we'll give you a link, and so you'll be able to see what Judd is writing live, but we're not going to switch to that right now, and so I apologize.

DR. LI: Okay. Don't worry. Okay. Great. Thank you.

DR. NESSLAGE: I think we've got that, but you'll have a chance to make it more explicit later. All right. Are there other -- Kai, go ahead.

DR. LORENZEN: I'm just wondering, and, I mean, the report, the way you wrote it and the workgroup considered the problem, did not include consideration of the interim analysis, right, because that wasn't on the table, basically, but I think it would be useful, maybe, to include a little conceptual thing about that in the report, because, I mean, it seems those are coming in the near future, and, if we don't mention it in the report now, a year down the line, we'll constantly be in conflict between the suggestions in this report and whatever might happen with the interim analyses, and it shouldn't be too hard to just conceptually include something about that.

DR. NESSLAGE: Yes, and I think we would flesh out that Bullet 3 a little more, and is that what you're thinking, Kai, where it's further develop and conduct interim analyses?

DR. LORENZEN: Right, and to basically, in the report on the recruitment projections, say a bit about how that would interact with the recruitment projections and the timeframe, the recommendation, how long the projections should be, because I think there was some confusion about it.

DR. NESSLAGE: I don't think -- We usually don't modify the working group report, and so what we would do, if you want to make it more explicit, would be to add to this comment, and so, if you think we need to add phrasing like to inform the timeframe for analysis, this interim -- The timeframe for projections, use that interim analysis, when possible, to -- Yes, that's it. Is that what you're saying?

DR. LORENZEN: That works.

DR. NESSLAGE: Okay. Cool.

DR. LORENZEN: It seems that the workgroup report has a recommendation for a timeline for projections, right?

DR. NESSLAGE: I think it's more of a don't go beyond.

DR. LORENZEN: Okay, but my concern was that that recommendation may change if we switch to doing regular interim analyses.

DR. NESSLAGE: Which I think Amy was saying earlier. If there is evidence that you can extend it, then --

DR. LORENZEN: Yes.

DR. SCHUELLER: I was just wondering if it might be worth scrolling up to the short-term forecast for ABC determination, that sort of Number 1, and there is those bullets underneath there, and one talks about, if the projections are accurate and performing well, you can extend the length of the projection timeframe, and then the other one talks about P* adjustments, and, I mean, I think this is the piece where we're sort of allowing some flexibility, or not necessarily maybe being

exactly on the management timeframe, but making recommendations, if we're not, what should happen, and so -- If this is unclear, we should make a statement in our SSC report clarifying that.

DR. NESSLAGE: It seems like there is some confusion. Can you just make a note, and I will try to provide a brief summary in the report, just something to the effect of summarize, briefly, the working group recommendations regarding -- Then I will try to flesh that out later, as a bookmark. All right. I feel like we've done justice to the stock assessment report recommendations, unless -- I am not seeing any hands, and it would be good --

DR. BUCKEL: I think we missed -- There was one that was the forensic -- We talked about it, but I don't think it made it in here, because we got Judd onto the next one, and that was one of Fred Serchuk's -- It was the comparisons -- How the catches related to ABC, and so like a forensics of how things went, but that would be in the --

DR. NESSLAGE: To emphasize the post-hoc analysis of previous projection performance.

DR. BUCKEL: Correct. Much better said.

DR. NESSLAGE: Can you add that under stock assessment recommendations? What did I just say? Emphasize -- The SSC emphasizes the importance of conducting post-hoc -- Is it post-hoc? Analyses of previous performance, previous projection performance. That's the cookie talking. We need to use the terms "forensics" and "cookbook" in the final report somewhere. We'll spice this report up a little. Are there other thoughts on this? I do want to save a little bit of time here for the other short, long-term, and future research recommendations sections as well, and we were kind of transitioning to short-term recommendations. I'm wondering, and can we pull up the summary bullet points for the short-term recommendations, and folks can look at them?

The primary recommendation was that, unless there is evidence to the contrary, forecasts should be short-term to determine the ABC, no more than five years. Obviously, we would love assessments to be done more frequently, but that's pie-in-the-sky, perhaps, and so we also talked about doing -- I think that's the projection accuracy, is that second point, and that's where Amy was saying that, if it turns out that the projections are great, you can lengthen the projection timeframe beyond five years, if there's evidence for that, and then adjustment of the P* should occur if the projections go beyond the recommended number of years, and so we would lower the P*. Does anyone disagree with that set of recommendations or want to modify it in any way? Alexei.

DR. SHAROV: Well, if the analysis finds the projections accurate and performing well, I don't know, and can you give me an example of at least one species where we had a situation like this? I mean, it sounds good, and I understand, but practically, and I don't think that this provides as much to the process, and sorry for being pessimistic.

DR. NESSLAGE: You were optimistic earlier in the day, Alexei, but I think, if it happens, why not? It's in there, kind of like we didn't expect red snapper to come back, but --

DR. SHAROV: Yes, I agree.

DR. NESSLAGE: Amy.

DR. SCHUELLER: I mean, my viewpoint is maybe we're not going to meet that criterion, but then maybe we fall to the next one, which is that P* decrement. The other reason that we don't know if we're performing well is because we haven't looked at it, which is something we've talked about a number of times, not just at this meeting, but it's been brought up over and over and over again over the years, and that's why it's one of the research recommendations in this report. It is a good idea, if only we had more infinite time.

DR. NESSLAGE: Wally.

DR. BUBLEY: Correct me if I'm wrong, but didn't -- Wasn't something along the lines of black sea bass, back like ten years ago, and isn't that sort of what happened, is looking at -- We didn't have tools like this, per se, but we were looking at some trends from indices of abundance and from fishermen, things like that, where we were seeing this huge spike, and so they decided, at that point, that we need to bump this assessment up, and so it kind of worked that way, I think, but I think it can be done, if we have the correct data to look at, to go forward with this process, but that's my recollection.

DR. NESSLAGE: Anne.

MS. LANGE: Not to be a negative, but I don't think three years is possible. Five years might, but it takes a year or longer to get the data from the previous year, and so, by the time you actually have any data to do any interim analysis at all, you're already beyond your three-year window, and so I guess -- Again, not being pessimistic, but five years potentially is doable for the last year, but I don't see where three years would be -- It's a good goal, but --

DR. NESSLAGE: Do we want to then emphasize five years or less, if possible, but not practical?

MS. LANGE: I want to just say skip the three years, but I think it would be worth noting that the data may not be available in time to be able to implement anything within three years.

DR. NESSLAGE: Is that capturing your thoughts, Anne? Yan, go ahead.

DR. LI: Thank you, Genny. I really like Anne's point on this, and so I would like to suggest -- I cannot see the exact wording, but I would suggest something like three to five years, depending on data availability, because the major constraint is how soon we can have the data ready for the interim analysis. It currently reads five years or less should be the target, if possible, and the availability of data may hinder timeframes shorter than five years. Does that at least come close to capturing your thoughts as well?

DR. LI: Sure. Better. Thank you, Genny.

DR. NESSLAGE: Excellent. We'll get this fixed for tomorrow. Anything else on this slide? There is another set of recommendations that I just want to make sure we look at on the next slide. Short-term forecasts should use recent mean recruitment, and this is the biggie.

This is what formed the working group to begin with, and so I would like to spend some time on this, unless you are 100 percent onboard with the recommendation, basically, that we move

forward with short-term forecasts using recent mean recruitment, with that short-term being defined basically by the set of analyses that is recommended later in the report, and the analysts can recommend that time period based on those analyses. This is a deviation from what we've been doing, sometimes. Does anyone have heartburn over this? Remember this is just the short-term forecast, and this is not for rebuilding projections, et cetera, et cetera, and it's just short-term for setting ABCs. Fred Serchuk.

DR. SERCHUK: There can be some dissonance created by using one set of recruitments for the short-term for ABC setting and using long-term for rebuilding, and that's the issue I have. They can be very different, depending on the estimates of recruitment, the long-term -- Depending on whether the long-term is higher or lower than the most recent, and that can create some problems in trying to reach goals, and so I think we need to be very careful, because there's a linkage between what happens in the short-term, particularly if you have a rebuilding plan and the rebuilding plan is based on a different recruitment stream than you're using over the next five years, for example, if you have a ten-year rebuilding horizon, and so we need to think about this, particularly because it has huge management implications. Thank you, Chair.

DR. NESSLAGE: Personally, I agree with you, and, the more I think about it, this would -- In the case of a rebuilding stock only, I think is what we're talking, what I would be focusing on with this comment, if we use short-term to set short-term mean recruitment to set the ABC, that's going to be -- Maybe I am mischaracterizing things. Amy.

DR. SCHUELLER: I think the workgroup's recommendation was that, if it's on a rebuilding plan, we are using the long-term forecasting methods, that we're not going to do this, because we could basically never get to that equilibrium point if there was any bump-up, and does that make sense in recruitment, because we would basically -- That would go into the mean, and then we would harvest it, and then it would -- Not never, but it would take a lot longer.

My understanding was, if you're on rebuilding, we're not doing this. I feel like this is for assessments where the stock seems to be doing well, and we're in a good place, and we're going to basically say, okay, they had a good recruitment, and so we're going to harvest that recruitment coming in, and maybe that's not clear enough in the report, and we just need to say short-term forecasting recommendations do not apply to species on a rebuilding plan. Maybe we need that in the SSC report, unless everyone disagrees, but that was my interpretation.

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

DR. SERCHUK: Just let me be the devil's advocate for a second. Suppose we have a rebuilding plan and we've come to the end of it, ten years, and we find out we haven't gotten there yet, and so now we're going to do either of two things. We're going to take another ten years, because -- And we're going to use a different recruitment estimate for those ten years than we would for the short-term, and is that how you see it unfolding, or we could be using a different recruitment estimate?

DR. SCHUELLER: If we're on a rebuilding plan, and we get to the end, and we still haven't rebuilt, isn't there a new rebuilding plan that goes into place? I mean, technically, if the assessment was consistent and robustly estimating recruitment dynamics, we would have the same recruitments, right, like the same -- Let's say there's a stock-recruitment curve. It should be the

same over time. Now, I know that doesn't always happen, but, I mean, that's the way I view it. It isn't necessarily that we would change the recruitment, unless we're, you know, meeting some other set of criterion that we've kind of laid out here for how you would do that, for example the Klaer et al. paper. Does that --

DR. SERCHUK: It may be clear to you, and that's fine, but I am just thinking about -- I've been in cases where the stock hasn't been rebuilt, and I am just thinking that let's put ourselves into that situation. We need a new rebuilding plan, and so, based on what we have here, a rebuilding now would be based on recruitment from -- I'm going to say the mean of the long-term time series we have. We put that in place and say, okay, we can rebuild in ten years, with this mean recruitment. Then we have a short-term that says, wait a second, and that's -- We've put out short-term forecasts for -- Maybe I am confused.

DR. NESSLAGE: Basically, if I can jump in to clarify, this would only apply to stocks that are not under a rebuilding plan. If they're in a rebuilding plan, you do your ten-year projections, long-term average recruitment, stock-recruitment curve, whatever is used. Only for ones that are not in a rebuilding plan would we set the ABC using recent mean recruitment, right, because, otherwise, you might be in a situation where you would never rebuild. Erik Williams.

DR. WILLIAMS: Fred is right, and you guys are getting offtrack a little, but we do short-term forecasts under species that are rebuilt. How else do you set an ABC, and that is the issue that brought us to this table, is the fact that we were using short-term forecasts that assumed a low recruitment when we had a rebuilding plan that assumed a stock-recruit curve, and so, yes, we do do that, but, to answer the question, remember what long-term projections are used for. They are not for setting ABC determinations.

They're for setting a point in time that you're trying to achieve. How you get there is entirely up to management, and that's where the short-term forecast can differ from the long-term, because we don't care about what the long-term is telling us on the year-to-year. What we really care about for the long-term is what is that endpoint that we're trying to achieve, and then it's up to management's prerogative to get there anyway they want to, really, but what our prerogative is is to provide the most accurate short-term forecasts, in the next three to five years, which is what we're talking about here, and that's where we might have what would appear to be a separation between, or a --

What was the term that Fred used, a dissonance or whatever it was, between the long-term and the short-term, but we don't -- That doesn't matter. We're telling management this is your best forecast for the next five years, what recruitment is going to be. Whether they want to be aggressive or not is their choice, in a sense, as long as they have some checkpoints and they get to that endpoint, and that's how I rationalize it. Maybe I'm off on that.

DR. NESSLAGE: To that point, Scott, and then Kai.

DR. CROSSON: Just real quick, Erik, refresh my memory, and so, if a stock is in a rebuilding plan, is there a set point at which -- I know there is ten years or a twenty-year rebuilding plan or whatever we have, but is there a set point that -- Obviously, it usually gets reassessed, or a new assessment happens at some point in that interim, and is there a set time that we normally do that, or is that just up to the SEDAR Steering Committee?

DR. WILLIAMS: That's where Shep can come in and probably talk to us about how we monitor adequate progress for rebuilding plans, and then also what are the legal ramifications, as Fred pointed out, if we don't rebuild at the time schedule that we had specified, and I don't know the answer to those.

DR. NESSLAGE: Thank you, Erik, for reminding us. Kai.

DR. LORENZEN: Sort of a question for confirmation, and so I think we do the short-term predictions with the F rebuild that comes out of the long-term analysis, right?

DR. NESSLAGE: So, to summarize, and correct me if I'm wrong, we currently do make different short-term versus rebuilding projections, and we have -- Are we -- If the reality is that, to achieve the F rebuild, we need the best estimate of recruitment in the near-term, shouldn't we be using short-term forecasts to set the ABC, even if that recruitment is different than what is used in the rebuilding projections? That's a question to the committee. Who wants to jump in? What else would we do? Amy.

DR. SCHUELLER: Sorry, and I've been spinning this in my brain. I guess, to Fred's point, if we're doing the short-term projection to make an ABC determination, if recruitment is decreasing, right, and it's going lower, then, if we use the recent mean, it's going lower, and so hopefully it would have a better chance at rebuilding, but it might not. I mean, there is lots of circumstances where that's the case.

DR. SERCHUK: Sorry to interrupt, but my point was that suppose you're fortunate to have a long time series, and let's say it's thirty years, and you say we're going to use a thirty-year mean, but the last five or six years, five years, are 40 percent below that. Then what's going to happen is, if you set your ten-year rebuilding schedule based on the long-term thing, after five years, you're going to be deeper in the hole, because you have set the catch levels, the actual, from the short-term mean, and recruitment is going to be so much lower, and the catch levels are going to be so much lower, that you're not going to get there in ten years, and there is a big dissonance, depending on the difference between a long-term mean and the short-term mean.

I mean, we're having so much conversation about it, and I think we need to maybe think about this overnight, because, if we can't explain it to ourselves, quite frankly, and this has huge management implications, and this is not a trivial thing that we're talking to ourselves about parameterizing uncertainty, and we can all understand that, but this has things about, well, wait a second, and quotas are going to go up, and quota are going to go down, and we followed what you said, but we still haven't gotten there, and, I mean, if I were on the management side, I would basically say get your act together, boys and girls.

DR. NESSLAGE: Okay, and so, to that point about timing, I think we're going to move goliath to tomorrow morning and put Mike's discussion back where it was originally, if you're available for tomorrow afternoon.

DR. SCHMIDTKE: I'm here all week.

DR. NESSLAGE: You're here the whole week? Good man. Thank you. Then I am looking to Fred Serchuk then. What would you recommend then? If this isn't going to achieve our goals, what are you recommending instead? I am putting him on the spot.

DR. SERCHUK: I think the short-term forecasts should have some expectation -- First of all, you could evaluate the difference where you would be after five years under one recruitment scenario versus the other recruitment scenario, that as a minimum, and then, based on that, one might say what is the probability of the stock being rebuilt, if it's in a rebuilding plan, by the time the rebuilding period is over, because it has implications to the management about what should we do now.

If you set a rebuilding schedule, and you had lower-than-expected recruitment, then you would go to the management and say, wait a second, we either can't get there in the next few years, unless recruitment improves, or we have to use a different recruitment strategy. I mean, these things have real implications, and I can tell you that nobody that -- Nobody wants to fail. Managers don't want to set a rebuilding plan and not achieve it in ten years, unless there is some issue that occurred, ecosystem shift, changes in species distribution, or some other thing. They will blame it on the science.

DR. NESSLAGE: Kai, did you have your hand raised, or are you just thinking? Then we'll go to Alexei.

DR. LORENZEN: A little of both. I was thinking so you fix the F rebuild, right, when you do the rebuilding plan, and then you use that for that period, but you apply it to update your assessment, and you can do short-term projections and so on, but you always use the F rebuild, as opposed to the F of MSY or proxy, but so, if the recruitment really goes wrong, you will still -- With that old F rebuild, you will not rebuild, and so you would have to update your F rebuild at some stage. No amount of recruitment projections will do that for you.

DR. NESSLAGE: I think we've seen that in real life. Alexei and then Wally.

DR. SHAROV: I think the answer to Fred's question would be we need to go to Hogwarts School of Magic tonight to be able to learn how to predict recruitment for a five-year period and a fifteen-year period, and it's just not possible, and, because it's not possible, that doesn't mean that we cannot make reasonable assumptions about our expectations as to where the productivity of the stock is relative to all known history of its performance.

In other words, I think what Fred is asking -- It's an important question, but I think, and correct me if I'm wrong, but you were referring probably to the situation that we've seen quite a lot, where, in the recent period, five or seven or ten-year period, we have low recruitment compared to the longer history, and then so, for the short-term projections, logically, we say we have reason to expect that the system is such that it continues to be low, but a long-term --

That's where we need to make a decision, whether we're looking at the recruitment variability in the wider scope, as to the sort of normal variability within the ecosystem that consists of the shorter time periods and whether one shorter period is more consistent low recruitment or more consistent medium recruitment, or sometimes consistent high recruitment, but, for the rebuilding schedule especially, if it is a long-term expected rebuilding schedule, you are selecting a range of

recruitment beyond just a recent period, to essentially say we're sampling from the longer time period, which includes a higher and lower and different range of recruitment levels, or use the stock-recruitment relationship, if we have reason to believe that we have some reasonable parametrization of that.

I think, as long as the analyst makes a reasonable decision, based on everything that we know, we can allow for disconnect. We don't have to go consistently with most recent recruitment, the last five years, and, just for us to be sure, we will continue this into the next thirty years with a rebuilding plan.

Of course, from the probabilistic term, we can say let's make sure that we're at least -- Well, there is at least 80 percent probability of recovery, given the level of recruitment, and, essentially, we can hedge our bets against the low recruitment level in the rebuilding period, which would require significantly lower exploitation rates, right, and, betting against low recruitment, we will -- In order to make sure that we rebuild, we'll have to go with such a low F that it might be even a closure of the fishery, and that's another option too, but that's a risk policy decision, and so, anyway, long story short, I think it is reasonable to have separate -- In some cases, to have separate assumptions on how variable is recruitment and what level it will be within the short-term period and the longer-term period, and so, if you disagree, that's totally fine.

DR. NESSLAGE: In short, Alexei approves of this slide. I love to read the meeting minutes sometimes. I guess my reaction to Fred Serchuk's concerns is that we need to be able -- If we're going to deviate, or not deviate, but have different recruitment assumptions in the short-term forecasts used to set ABCs for a rebuilding stock, versus the recruitment assumptions that we would use for the rebuilding projections, we need to be able to explain why and what the repercussions are when we do that.

Not necessarily -- I am not hearing you saying that it's a bad thing, per se, but we better be very clear what we're doing and why, which is why I think the working group recommended that this needs to be -- That the assessments, when we see them, need to have a bit more fleshed-out and thorough analysis of recruitment and the uncertainties regarding recruitment, to help us make that informed decision. Otherwise, we're shooting in the dark again, right? I am looking to Fred Serchuk.

DR. SERCHUK: Absolutely correct, Chairman. You recall, the last time we got into this discussion, which I think prompted this working group, we were talking about a rebuilding schedule, and I can't remember the stock, in 2047, and then we saw that the recruitment that went into that projection, whatever it was when it was established, we saw the last five or six or seven or ten years was much higher than that, and we did the analysis both ways and said, wait a second, you can rebuild the stock not by 2047, but by 2027, because none of the people on the council are going to be around in 2047, and so they won't suffer the consequences of it, but the fact is the stock is in better shape now, and so you might want to think about it. It can work both ways, is what I'm saying, but I think you're absolutely correct that we have to be very clear what the implications are using whatever recruitment series we're using.

DR. NESSLAGE: Yes. Let's get that on paper. I think we can all get behind that. I am seeing nodding heads. Does anyone disagree? We need to be very explicit about our assumptions and the implications and that they need to be -- That decision to have different short versus long-term

recruitment assumptions needs to be justified with whatever analyses are available for that stock, right, which is what someone else said, and I forget who now. Wally has got his hand raised.

DR. BUBLEY: Going along with all of this is one of the -- In the report, they discuss evidence of a regime shift, and I think that's where this plays into a lot, where you're talking about long-term or short-term. If you're talking about short-term, you're looking at a regime shift, but you don't see any evidence of it, and you can have some differences, because that short-term is just for those few years, and it's expected to bounce to some other level over the long-term, versus, if you do happen to have evidence of a regime shift, that's where you have to be really careful about having different short-term and long-term, because they might be one in the same, and you have to take that into account.

I think, if you do have different short-term versus long-term projections, you need to pay -- Looking at a regime shift is something very important to look at, because, if you don't see any evidence of it, you have some backing to go forward with that. If you do have some evidence of it, then you need to reconsider if you should have a different short-term versus long-term.

DR. NESSLAGE: That is a brilliant segue into the next slide, because that is what the next slide talks about, right, that you might end up with a decision about the long-term recruitment that might suddenly differ, but you need to have -- I think what the working group recommended is you need to have evidence for that, and that needs to be documented using -- We have suggested that Klaer et al. framework, unless someone has a better suggestion. Does anyone -- I am going to move us to this, but we can circle back, if we need to, to short-term.

What do folks think about these -- Remember there is these four types of long-term forecasts, and they're kind of graded, or hierarchical, if you will, based on what sort of data and analyses are available, and the smallest -- The shortest one, or not shortest, but the simplest one, Type A forecast, using average recruitment and historic variability, using the whole time series as the default, but this is where what Wally is talking about -- If you think that you've got a regime shift, there needs to be some evidence for it.

You need to be documenting that clearly, and that's where you might start seeing some of these big differences between short versus long-term recruitment assumptions. What do folks think about the Type A recommendation? Jeff Buckel gives it a thumbs-up, for those online. I am not seeing anyone disagreeing. I won't belabor it.

Type B1, the next one, would be forecasts using stock-recruit relationship and historic variability, assuming that you've got a significant decent stock-recruitment curve, and then the analysts would determine basically -- The review bodies, if it's a full assessment, they would determine the significance required, and, in other words, how good is that relationship, and then it could fit internally or externally to the assessment model. We have some stocks that do this and others that we can't get a good stock-recruitment relationship, but, for those that do, are folks comfortable with that then, for Type B1? It seems reasonable. Alexei.

DR. SHAROV: I am comfortable with both, actually with all of them, but -- Well, what I would like to understand better is why specifically -- It's a hierarchical range, and so Type A is the preferred, right, and then Type B is sort of less preferred or whatever, and that is the Type A --

You use it always, because you -- Well, you can use it always, because you do have estimates of recruitment for your full time series from stock assessments.

Then B1 is that you have to actually prove that there is a stock-recruitment relationship on some statistical grounds, and then on we go, and so is this sort of the preferred range, or recommended range, or like doing Step 1 and Step 2, and are they equal or not, as recommended at this point, and that's what I would like to ask.

DR. NESSLAGE: Amy.

DR. SCHUELLER: I mean, I think the point was everything can be Type A, right, because we can do that for everything, but, if you can move to Type B1, B2, or C, then you can do so with evidence, meaning I think it is like a key, almost. Like you're going to do this, and then you can do these things if you have the data, and then you can do this thing if you have even more data kind of thing.

DR. SHAROV: Right, and so it's like you pass the Stage A, and so first you have to pass this level, and then you pass on the following level and on the following level, until you actually can no more progress, and that's the idea, right?

DR. SCHUELLER: Yes.

DR. SHAROV: Okay. Thank you. Yes, I would recommend -- I would agree with that.

DR. NESSLAGE: Excellent. All right, and so then the next type would be the B2, forecast using time series properties or environmental correlates, assuming that you can actually detect such a thing with the -- Obviously everyone weighing-in with lots of evidence that there's something significant that can be done here and that the warning that these relationships often break down, and so it better be -- You want to monitor that closely for when it does, because it will at some point, and the environment is not static.

Then Type C is forecast using a stock-recruitment model with time series or environmental corelates that affect longer-term processes. That's kind of the -- That would be great, if you can do it, to get to Alexei's point. It's basically the more evidence needed for each one of these types, as you progress along, but, Amy, go ahead.

DR. SCHUELLER: I mean, B1 and B2 are -- C is a combination of B1 and B2, because B1 and B2 are two separate things, right, and maybe you have a stock-recruitment relationship, or maybe you don't, but you have some time series of environmental data that can help you predict recruitment better, and so that's why B2 and B1 are separate, and then say you hit the jackpot and you have both. Then you can do C.

DR. NESSLAGE: Thank you, Amy. It seems like no one has any major heartburn with the long-term forecast recommendations, and is that correct? This would be the time to speak up if you are having issues, and I am not seeing anyone, and so I would like to then, in the last little bit here, take a look at jumping down to the research recommendations, because we haven't -- We talked a lot about the report recommendations, but not necessarily the research recommendations, and so there is some big, overarching research that should, and could, be done to help us get out of this

hole, when we get into it, and I would like the SSC to comment on the working group's recommendations regarding prioritization of these recommendations and is there anything missing that you think we should be adding, or anything you think is superfluous that we need to take out, and so we'll just kind of give you a chance to look at the PowerPoint and the report. Alexei.

DR. SHAROV: I don't think that I understand the first sentence in the first bullet, explore autocorrelation, proportional variability, and correlation in age at 50 percent maturity across species. Correlation with what? It's not -- What is meant here? It's not clear what is recommended.

DR. NESSLAGE: We might need to go to the report for the details.

DR. SHAROV: Page 15, at the bottom.

DR. NESSLAGE: Chris.

DR. DUMAS: A change in the word order of that sentence might make it clearer. I think what that sentence was referring to -- If you show the sentence again on the left-hand screen, the top bullet is explore autocorrelation and proportional variability and correlation across species in age at 50 percent maturity in the South Atlantic, and I think that was the intent of that sentence, to look at correlations across species, to see if we could use any correlations across species specifically, and age at 50 percent maturity, whether those are similar across species, but, also, look at correlations across species and other biological parameters of those species, to see then if we can use those correlations to help us forecast better, or predict better.

DR. NESSLAGE: Thank you, Chris. Amy.

DR. SCHUELLER: I guess we don't want to conflate this one with the next one, and so this particular research recommendation was written by Fred Scharf, and I don't know if he's on, but it's very much addressing the characteristics of the species in the South Atlantic with respect to the characteristics that Van Beveren et al. explored, meaning Van Beveren et al. looked at different aspects of a species and made some statements about projection methods and robustness related to that, and so the point of this was specifically to say we have this information for our species, and let's look at it and then compare it to what's in Van Beveren, where the second recommendation in the list is more about general broad spectrum relationships between species within our area, I guess, and looking at correlations and looking at recruitment time series and whether or not they're moving together in sync or if they're disjointed, and then what that might mean for management, and so I'm just hopefully clarifying that these are sort of two separate things, based on sort of two separate ideas, one related to the Van Beveren paper and one related to more general exploration of recruitment dynamics in the region.

DR. NESSLAGE: Fred, go ahead.

DR. SCHARF: Just to clarify what Amy said, I'm not sure -- I'm not sure, and that may be a typo, to have "correlation" in there. You know, the point is that, in the Van Beveren paper, the recent sort of level of autocorrelation in the recruitment time series, the proportional variability in recruitment across the entire time series, and then certain life history traits, and age at 50 percent maturity, or generation time, being a key one, where each were found to be important predictors

for how much sort of bias there was in their recruitment projections and the level of precision in their recruitment projections.

Species that had high levels of autocorrelation and low amounts of proportional variability across the time series, and tended to have later age-at-maturity, performed better, and they were not as sensitive, whereas species that showed very poor autocorrelation, and had a lot of proportional variability, and were early maturing, there was very little optimism in projecting recruitment for those kind of stocks, and so this recommendation is really just to look at those three traits, and so not necessarily correlation in age at 50 percent maturity, but just those three traits for the species in the South Atlantic that are under our management purview, and that's different than the recommendation down below, like Amy said, which is a broader look at lots of other relationships, in terms of how recruitment is trending among the species in the South Atlantic.

DR. NESSLAGE: Alexei, does that answer your question?

DR. SHAROV: Possibly. Maybe for many others.

DR. NESSLAGE: Well, what do we need to do to -- Well, A, do people understand and what Fred just said? If not, what do we need to do to clarify, because, again, as Fred Serchuk mentioned, if we don't understand what's being recommended, no one else will either, and so, Amy, would you like to clarify?

DR. SCHUELLER: I'm just wondering if we can -- I know we're not supposed to change the workgroup report, but can we delete out that "correlation in" right there, in the report, before it goes more live than being at the SSC?

DR. NESSLAGE: Because it really doesn't get to the meaning of the sentence or it's a mistake?

DR. SCHUELLER: Yes.

DR. NESSLAGE: I am looking to staff. Can we do that? It's correcting a mistake, really. We'll have a revised version with a new date in late materials, and that seems reasonable. Would that help folks clarify? Okay.

DR. NESSLAGE: Just to make sure, that sentence is going to say, "explore autocorrelation, proportional variability, and age at 50 percent maturity", and so that's -- Okay.

DR. DUMAS: "For species", instead of "across species".

DR. NESSLAGE: "For South Atlantic species". Jeff.

DR. BUCKEL: Amy, do we need to -- Or Fred Scharf online, one of you, do we need "recruitment", and so explore -- The autocorrelation is in the recruitment time series, correct, and the proportional variability is in the recruitment time series, and so is that -- So "explore recruitment autocorrelation, proportional variability in recruitment, and age at 50 percent maturity", and would that be -- Just so what we know what the autocorrelation is -- Thanks.

DR. SCHARF: Jeff, if I can just follow-up on that, I might say that, to be most accurate, we should say "explore autocorrelation in recent recruitment and proportional variability in the full recruitment time series".

DR. NESSLAGE: That would align it with the Van Beveren analysis, to see if our stocks are behaving the same way as the stocks that were analyzed in that paper, in which case, if they are, then we're justified in using what would come from their recommendations from their simulation study. If not, we need to reconsider. I am seeing thumbs-up. I don't see any thumbs-down. Does anyone have a thumbs-down? No. All right.

Are there other bits on the research -- Thank you for this clarification, and this is important. We'll hear more, I assume, from some of the work that's been done on recruitment patterns, when that actually comes out, and I would love -- I am looking to the back of the room, and maybe the SSC could receive a briefing on --

DR. SCHUELLER: It was Brendan, but he's taken another position, and so I'm not sure who it is.

DR. NESSLAGE: Whoever completes that work and publishes it, we would like to hear from you in the future.

DR. SCHUELLER: I think Kevin Craig and Kyle Shertzer would be the contact folks at the Science Center for that.

DR. NESSLAGE: Maybe we can make a recommendation, and I would like, as a placeholder, if you don't remind, just to remind future chairs, to follow-up with them, to make sure that gets on the agenda, because that will help us make decisions, moving forward, and they're doing quite a bit of work on that, or at least Brendan did. Anything else missing?

There's a couple of other things in the report, and I know you all have it in front of you, and is there anything else we think that folks should be doing, broad-scale research, to support our decision-making, in addition to what we're asking the analysts to include in their stock assessments and these broader research projects, if they can be prioritized by the Center or another group? I am not seeing any. Okay. I am going to open up the floor one more time, and how do folks feel? Is there anything else that we need to hash out regarding this working group report?

Otherwise, with the exception of the exceptions we've put on the board and the augmentations that we've listed, we're accepting the rest of the report then, by default, and so this is your chance to protest, with justification, any part of the report. Otherwise, we're going to -- Basically, moving forward, we'll be trialing this, as we -- This will be our new best practices that we're asking the Center to help us with and that we'll reference when we make ABC decisions. I know it's late, but -- Alexei.

DR. SHAROV: I just wanted to check that the rest of the report for the priority research recommendations will just automatically follow into here, right, from what we have in the group's report for the prioritized research recommendations.

DR. NESSLAGE: Yes.

DR. SHAROV: It's not all covered in the existing text.

DR. NESSLAGE: Yes, and we wouldn't reiterate everything. Unless we're going to deviate from or augment what's in the report, we'll say, yes, what they said in the report.

DR. SHAROV: Right, and so I just wanted to understand that I understood you correctly that this is the chance to say, no, I object to whatever is recommended or agree. Okay. All right. Thank you. I agree.

DR. NESSLAGE: All right. I just want to -- Given that there doesn't seem to be any other thoughts from the group, I would like to, once again, reiterate my thanks, I think our thanks, to Amy and the rest of the working group for an outstanding job. Thank you. Bravo. We are at 4:30. I would like to take a five-minute break, if we could, and then we'll hopefully knock one of the smaller items off, in the last ten or fifteen or twenty minutes we have today, so that we can leave more time for great discussion in the rest of the meeting on bigger agenda items, and so let's do a quick five-minute break. Thank you.

(Whereupon, a recess was taken.)

DR. NESSLAGE: All right. We are going to try and tackle a few items from Other Business that are largely informational, but you may have questions and be interested in these topics, and so SEDAR staff are here, and Kathleen is going to start us off. Kathleen, where are we in the agenda?

DR. CURTIS: We're down in Other Business, on Agenda Item 14, and we're going to handle some SEDAR business in these last couple of minutes of this evening. Thanks.

OTHER BUSINESS

MS. HOWINGTON: All right, and so, like they said, my name is Kathleen Howington. Hi, everyone, and I am a SEDAR Coordinator for the South Atlantic, and I'm going to give you a short update on SEDAR 78, the Spanish mackerel operational assessment. The final comments were due this Monday, and so the report should be available to the public by May 9, at the latest. I have it on pretty good authority that we're going to be getting it out earlier than that. Unfortunately, not in time for the meeting that we are currently in, and so, unfortunately, we won't be able to get it out by then, but you all will be receiving it very, very soon, and that's it. Madam Chair, can we call up Julie for the other two?

DR. NESSLAGE: Are there any questions about Spanish, before Kathleen takes off? Chip has something.

DR. COLLIER: While we're talking Spanish, the council would like to get this moving, and we were hoping to have it for this meeting, but it would be good to get it moving beforehand, and so what we would like to do is have a special webinar to talk about the Spanish mackerel assessment over the summer, and we were wondering, and are there certain dates that would work for the SSC, in order to do this review, and maybe -- I don't know if we want to have that discussion now or

later on in the meeting, and I just wanted to make sure that we brought it up, as Kathleen had brought up the stock assessment.

DR. NESSLAGE: So you're thinking -- I guess I would ask folks, and we will talk about the next meeting dates, and July is on the agenda, and so please look at your calendars, and let's come back to that and make sure folks have some advice to staff on that. Judd.

DR. CURTIS: One thing to consider, and Julie is going to talk about yellowtail snapper interim analysis coming up, but that is going to be jointly reviewed by the Gulf SSC and the South Atlantic, and so we were hoping to add that to the agenda of our July webinar, where the Gulf would join us for the beginning, and then drop off, and we would cover the other business that the South Atlantic needs to cover, but we're looking at possibly the second to third or fourth week of July for this webinar, and so, if you want to look at your calendars, and we'll talk about that later, when we talk about next meetings. Thanks.

DR. NESSLAGE: Excellent. Thank you, Kathleen, and thank you, Judd, and now Julie.

DR. NEER: Thank you. Hi. My name is Julie Neer, and I'm the SEDAR Program Manager. I mostly work with the Gulf and Caribbean assessments, but I lurk in the background at all things SEDAR, and so I'm going to talk real quickly, and I am the coordinator who manages the Florida-run assessments. The State of Florida does several assessments for us. Thank you to them, or else we would probably never get them, because it would never make it on the overburdened Science Center schedule as well.

Yellowtail snapper, SEDAR 64, was completed a few years back. It took a bit to get it done and reviewed and to the councils, and then the councils realized that, oh look, the projections are going to be five years old before we even act on this, and they were concerned about that, and rightly so, and both the Gulf and South Atlantic SSCs have expressed concerns of moving forward with things that are five-plus years old, as you have all been discussing, and so both councils jointly requested that the State of Florida do an interim analysis type approach, and it's a catch analysis, and we're updating the catches.

The State of Florida said, sure, we're happy to do it, but it means that we're going to have to slide mutton back a bit to make that happen, and that is what has happened, and so Dustin's team is working hard on getting yellowtail done, and it should be done by the end of May and available for review sometime in July of this summer, is the plan, and I know the Gulf SSC is meeting July 7 and 8, and so I don't know if we would make that timeline or if you guys wanted to do the joint for you guys, and you all figure that out, and that's fine, but it will be available for summer as well for review.

Then, as far as mutton snapper, that was supposed to start in February of this year, with the data workshop, and it got initially postponed until this July, because of this request for yellowtail. However, additional discussions with the people at Florida, and looking at the data terminal year was 2020 for that assessment, and it was decided that we wanted to push that assessment back a full year. The reason is, if start in 2023 -- Instead of July of this year, it will be July of next year, and it would allow us to get the 2022 terminal year, and so, again, it will help with that issue of having a terminal year that's four years behind by the time it gets to management.

The other issue, if anyone has been following in the Gulf, you might know there is this little thing about state surveys and trying to use those state surveys in the assessment process, and the transition teams are still doing their work, and so, in order to be able to make sure that that is completed in time, so we can actually consider using the State of Florida's data for the recreational landings stream for the assessment, as opposed to MRIP in the State of Florida, for mutton, and we want to give the transition team time to get that work done, and so it was determined to postpone mutton all the way back to starting in the summer of next year, instead of the summer of this year.

We will be circling back, because I know some of you had volunteered, for two-some years now, to serve on various portions of that assessment, and we're going to circle back, once we update a new schedule, and we're working with Dustin and his team on that right now, and we will be coming back and making sure if you're still interested, are you still available, based on the new schedule, and that sort of thing, and so that is the update there with mutton, and it is going to take a little bit longer to get it done, but I think, overall, it's going to be a much better product. You guys will have more things to look at than you would if we pushed forward and got it done this year, and that's what I've got for Florida's assessments coming up in the next couple of years.

DR. NESSLAGE: Are there questions for Julie or Dustin? He is right here. Chris.

DR. DUMAS: I've got a quick question, and so they're working on combining the state survey data and the MRIP data, as part of that?

DR. NEER: No, and there's not a combination of the data. What is happening now is each state is submitting their information to a transition team, and they're working with S&T to find ways to convert, transition, switch between, whatever words you want to use, and I don't like "calibrate", because it's not really calibrating, and it's a conversion, so that we can flip between the two, because the states are all monitoring in the state-set data.

Because Florida -- Because mutton is 99.99 percent of the landings are in the State of Florida, we could probably just use that data, but the transition team, and the MRIP review teams, have determined that there are a few things they want still tweaked at each individual state surveys to make them useful for assessments. They are useful for monitoring at this point, but they're not ready for primetime, with regard to being incorporated into assessments, and, because it's basically the Florida assessment, we only need to finish the transition for the Florida survey to use it in the assessment, whereas, to use any of the other ones in the Gulf, we would need to finish the transition team for all the states, to be able to go forward, and so this would be one of the first ones we might be able to do it for, the SRFS survey.

DR. DUMAS: Thank you.

DR. NESSLAGE: I just had a question. Last time we had a joint meeting on yellowtail, we were setting the ABC. Are we going to be doing that this July for both then?

DR. NEER: Yes, and, I mean, you guys need to review the updated assessment provided, which is just basically -- Like I said, it's just the catches that are being updated to update the terminal year, and then provide new OFL and ABC values, if you deem them appropriate.

DR. NESSLAGE: The same for Spanish, and we'll be setting ABCs there. There was some angst, last time, about how we set ABCs jointly, and I know the councils, I thought, were going to have a chat about that, and is there any update on how that might go down this time, more smoothly, perhaps?

DR. COLLIER: We have talked about it. Ryan Rindone and myself have talked about it, and what we've worked out is we would try to fit it in the most appropriate SSC's agenda, and so it might bounce back and forth, depending on who has time, and I think we're talking about trying to do it within the South Atlantic's SSC meeting, because there was some concern of whether or not it would be available for that early July SSC meeting in the Gulf, and, therefore, we were thinking that the South Atlantic might be the better approach for that one, and, therefore, we would start off with our control rule, to see if it fits there. If it doesn't fit with ours, we might have to adjust and go with the Gulf's, and so we might look at both.

The other thing that we would like to do is have kind of a preemptive meeting between the SSC chairs, just to make sure we have open discussions and we're clear who is going to be leading the meeting and who is going to take the lead, as far as developing the ABCs and start.

DR. NESSLAGE: That is fabulous. Thank you.

DR. NEER: Because, in the past, it has sometimes been whoever has the lead administrative lead for that assessment for that species was the one who their SSC led it, but that's not necessarily the best way to go forward, and so I like the conversations in advance. I know the Gulf has had the same concerns sometimes.

DR. NESSLAGE: And rightly so. Thank you. Any other questions regarding these joint assessments and our July meeting? If not, we will go to Chip, and I assume you're going to update us, and thank you, Julie, on EwE.

DR. COLLIER: Just a brief update on the Ecopath with Ecosim model. The State of Florida is still working on that. If you remember back, I guess maybe a year-and-a-half ago, we kind of developed some recommendations to carry forward with the EwE model. You guys saw the first presentation with the red snapper and what would happen with high recruitment levels of red snapper, and so they're working on the second phase. It had adjusted from what was recommended, and one of the recommendations was looking at the impacts of best fishing practices, and they said the EwE model was probably not going to be all that informative for using that, in answering that question.

What they recommended, or what we came up with as an interim approach, was to really look at a reduced model, maybe ten to fifteen species, and really focus on those and make the EwE model a little bit more nimble than it was. It was a monster of a model to get to run, and they were having to use super computers and different things like that, and, essentially, the -- I guess they're calling it a model with intermediate complexity for ecosystems, and I guess that's the term that's going for some of these more simplified EwE models, and so they're going to be -- They are in the process of working on that, and they're going to be reaching out to some of the SSC members that have been involved with EwE in the past to set up a meeting, a webinar meeting, to discuss it with them. If anybody has any concerns with that, please just let me know, and we can potentially put another member on that committee.

DR. NESSLAGE: That was actually a recommendation of our SSC, correct, to explore a reduced model?

DR. COLLIER: It was a recommendation coming from -- It was after the red snapper model, yes.

DR. NESSLAGE: Great. Thank you, Chip. Chris, go ahead.

DR. DUMAS: I can't remember, and can you -- In the full model, can you pull out recruitment for each species from that model, if you run it forward over time? What's the version of EwE that's dynamic over time? Is that what you guys have?

DR. COLLIER: Yes, and that's the Ecosim approach with the spatial dynamics and all that. They can do it, and I don't think it's been parameterized to do that, and it's very different from the age-structured models that we've been using.

DR. DUMAS: But you could get, you know, numbers of animals coming into the species box every time period or whatever, some measure of recruitment, and the reason, I guess -- Right? The reason why I ask is it would be interesting to see what the -- If you could get recruitment for each species out of the EwE model, it would be interesting to see what the correlations are across species, or between species, in recruitment that come out of the EwE model and compare that with what the correlations are in our recruitment time series data from other sources, and we could use that in the stock assessment, just to see what the correlations are across species, or help to see if it could be useful in helping us with the recruitment, or guiding us at which species might be related to each other. Thanks.

DR. COLLIER: Yes, and I know they were going to separate the data out into stanzas, and so some of these fish might have different stanzas, to potentially look at some changes in that population, and I can't remember if it was going to be age-one or age-at-maturity that they were going to use for the definition of the stanza.

DR. NESSLAGE: Do we want to make a note in our report that that might be something that would be useful to -- I am seeing heads nodding, if you don't mind, Judd, jotting down a note there about exploring -- It's the Ecosim forecasting simulated -- Essentially, recruitment and the correlation among the species in the MICE model for comparison with assessment-based and/or data-driven estimates of -- Or estimates of recruitment in the South Atlantic. While Judd is catching up, Wilson.

DR. LANEY: To Chip, do you remember what the stanzas they were going to be looking at were? When you used that term, do you mean just the time series of the different species that might match up, and is that what you mean by "stanza"?

DR. COLLIER: "Stanza" is referring to some life history parameters, and so EwE is a bit different than what we typically get here in the South Atlantic, which is an age-structured model, and EwE is, in its basis, a biomass model, but it's able to have some stanzas put into it, based on the life history of the fish.

DR. BUCKEL: I will just add to it, and so you could have a -- Instead of having one box for red snapper, you could have an age-zero functional group and then an age-one-plus functional group.

DR. LANEY: So, in other words, "stanza" equates to life stage, basically?

DR. COLLIER: Sure. It depends on your definition of it.

DR. NESSLAGE: Great. Other questions for Chip, or suggestions? Do you want to address MSE next, since we have four minutes remaining? Can you do it in four? All right. Thanks, Chip.

DR. COLLIER: The next issue is management strategy evaluation, and I am completely lost if I have talked to this group about it, and I don't know if I have, but, in December, we presented a proposal to the South Atlantic Council, in regard to a management strategy evaluation for the snapper grouper fishery, and what they're looking at is -- What we're going to be looking at is potentially how to best address the recreational fishery and trying to see what some of the goals and objectives are for the recreational fishermen, making sure that, as we're developing management measures, that this is going to match what their objectives are, and really trying to evaluate the recreational fishery.

This is going to be a two-year project, and we're still finalizing the details on who is going to be the lead for developing the MSE, but we have reviewed the proposals, and we've sent it through the recommendation stage, and so we should be making an announcement within the next few days on who is going to be the lead for it, but just not a lot of details on that right now, but we are going to, hopefully, get the SSC involved in this.

We recognize that this is going to be a complex analysis, and so that would put it under that complex analysis group, and what we would like to do is, for complex analysis, the SSC has requested that they have an SSC member kind of be the point person for involvement in those, and so, if there's anybody within the SSC that would like to be the point person for contacting in regard to this MSE, I think that would be good to get us to know now, and not wait until October, because I think we're going to get started in July, is the ideal time period for that.

DR. NESSLAGE: So are you looking for a volunteer at this moment, or we can return later? Do we have a volunteer? Fred Serchuk, or were you raising your hand with a question? A question, Fred Serchuk?

DR. SERCHUK: It goes back to the terminology we use in our report, Chair. I have no idea what a MICE model is, and maybe some other people might not have it, and is there any other way we can characterize that?

DR. NESSLAGE: Yes, and we can flesh that out. If you leave a note, I will write it out later, Judd. Thank you. I promise. When you see it next, it will be written out. It's Models of Intermediate Complexities for Ecosystem something, something. Right? Any other questions about acronyms that I can't remember? Does anyone want to volunteer, or you can think about it, and we'll come back to it in Other Business in two days. Jie, is that a volunteer hand or a question?

DR. CAO: I just want to mention that we have a kind of similar project going on, and we're doing that MSE to look at the basically tradeoff between the management objective of recreational fisheries and commercial fisheries.

DR. NESSLAGE: So you would be an excellent point person? I nominate Jie. Is there a second? Wait, we don't vote, but we'll go with it. Jie, will that work? Anything else on that agenda item? All right. Well, we are at exactly 5:00. Thank you all for your hard work this afternoon, and this was great discussion. I know everyone is tired from travel, but we will reconvene tomorrow morning at 8:00, and so get a good night's rest. Have a great night, everyone. Online, thank you.

(Whereupon, the meeting recessed on April 26, 2022.)

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APRIL 27, 2022

WEDNESDAY MORNING SESSION

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The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Town and Country Inn in Charleston, South Carolina on April 27, 2022, and was called to order by Dr. Genny Nesslage.

DR. NESSLAGE: Good morning, everyone. Thank you for coming back today and being here at 8:00, bright and early. We would like to start this morning, if we could, with introductions one more time, a quick round, because we didn't get that in the recording, and that's really important for our verbatim minute folks, who do all of that transcription, and so, if we could, very quickly, go around the room and just give us your name and affiliation, and then we'll go to the folks online. My name is Genny Nesslage, and I am faculty at the University of Maryland Center for Environmental Science Chesapeake Biological Lab and Chair of the SSC.

DR. BUCKEL: Jeff Buckel, faculty with North Carolina State University.

DR. CROSSON: Scott Crosson, economist at the NOAA Southeast Fisheries Science Center.

DR. SWEENEY-TOOKES: Jennifer Sweeney-Tookes, Georgia Southern University.

MR. ADDIS: Dustin Addis, Florida FWC, stock assessment.

DR. LANEY: Wilson Laney, North Carolina State University, adjunct faculty in the Department of Applied Ecology.

DR. DUMAS: Chris Dumas, faculty at the University of North Carolina Wilmington, natural resource economics.

DR. SHAROV: Alexei Sharov, Maryland Department of Natural Resources, stock assessment program.

DR. SERCHUK: Fred Serchuk, South Atlantic SSC.

MS. LANGE: Anne Lange, South Atlantic SSC, retired NMFS.

DR. CAO: Jie Cao, NC State University, faculty member.

DR. SEDBERRY: George Sedberry, South Atlantic SSC.

DR. JARED FLOWERS: Jared Flowers, Georgia DNR, Research and Surveys Unit Lead.

DR. SCHUELLER: Amy Schueller, NOAA Fisheries, Southeast Fisheries Science Center.

DR. LORENZEN: Kai Lorenzen, University of Florida faculty.

DR. BUBLEY: Wally Bubley, South Carolina Department of Natural Resources, Marine Resources Division.

DR. NESSLAGE: Thank you. Let's go to Yan online.

DR. LI: My name is Yan Li, and I'm with the North Carolina Division of Marine Fisheries.

DR. NESSLAGE: Thank you. Eric Johnson, if you could.

DR. JOHNSON: Eric Johnson, University of North Florida, Department of Biology.

DR. NESSLAGE: Thank you. Judd, do you want to --

DR. CURTIS: Judd Curtis, South Atlantic Council staff.

DR. NESSLAGE: All right. Then I believe the first item on our agenda this morning is Agenda Item 4, Goliath Grouper ABC Review Plan. I would draw your attention to Attachment 4. Basically, what has happened is that, at the March 2022, this past council meeting, the council passed a motion to request that the SSC reconsider the current ABC, which is set at zero, for goliath grouper in the region, in federal waters.

The request to consider the ABC was made following Florida FWC's approval of a limited, highly-regulated recreational harvest for the species in Florida state waters. We will be hearing from our own Judd Curtis here, who will give us a presentation, and then we'll have some questions, public comment, and discussion of our action items, and so I will turn it over to Judd.

GOLIATH GROUPER ABC REVIEW PLAN

DR. CURTIS: Thanks, Genny. Genny gave a great intro, and I'm just going to talk a little bit about some of the background from how the ABC was initially constructed, before goliath grouper, as Genny had talked about, where we need to go from, where the SSC needs to go from here, as a scientific committee.

As Genny mentioned, in March of 2022, the Florida FWC passed a limited, highly-regulated harvest of goliath grouper in state waters, to start next year. Following that, the council, at the March 2022 meeting, made a request that the SSC reconsider the acceptable biological catch for goliath grouper.

Initially, the ABC was developed kind of a moratorium since 1990, where the species has been prohibited from harvest. In April of 2011, the SSC made the following recommendation, following the SEDAR 23 review panel, which concluded that the stock status was unknown for both biomass and exploitation levels, and, because of that moratorium, to continue the current regulations with no directed fishery, i.e., no removals, and this resulted in setting the OFL as an unknown and the ABC equal to zero.

SEDAR 47 was the last stock assessment conducted by the Florida Fish and Wildlife Commission. It was completed in 2016, and it had a terminal year of 2014. Unlike the previous models, or the previous SEDARs, this had two age-structured assessment models employed for SEDAR 47. Initially, it was just the catch-free model. This SEDAR introduced a second model, the Stochastic Stock Reduction Analysis, or SSRA, and both of these models indicated spawning stock biomass likely exceeded the management reference targets, and so the spawning stock biomass at F 50 percent SPR, in the more recent years. Both models also did suggest that goliath is no longer in the overfished condition.

As part of SEDAR, we have the review panel from independent reviewers, and they had two areas of concern, main areas of concern, and that was available data, treatment, high uncertainty of the landings, in this case catch, and the indices of relative abundance and the structure of these chosen assessment models, and concluding that it was not adequate to support stock status inferences, and, as a result, should not be used for management advice. However, the general increase in abundance did seem to be a reliable signal since the moratorium was instituted in 1990.

The SSC then reviewed this assessment in October of 2016, and again they accepted the recommendations of the review panel, mainly that it was not adequate to support stock status inferences or fishing level recommendations, and they maintained the OFL is unknown and the ABC equals zero, which remained unchanged from previous recommendations. They also noted, however, that it is unlikely that overfishing is occurring, based on the existing moratorium, and there is some survey-based evidence of increasing stock abundance, and, overall, there was some evidence that the stock is recovering. That is just a basic kind of history of the review process for goliath so far.

Today, what we're trying to do is, as far as our action items are concerned, is just consider some new data streams and updated indices since this last stock assessment, and we're not going to delve too deep into the data, and we just want to identify some of these sources and compile these and then come up with a plan for review of these data, possibly at a later SSC meeting, potentially in October, and then also determining what analysis would be needed to revisit this ABC that was currently set equal to zero, and that's my presentation, Genny.

DR. NESSLAGE: Thank you very much, Judd. I will open the floor for any -- Let's start with questions for Judd. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. If there were any recommendations made by the SEDAR 47 panel, or as a result of that, in terms of items that should be considered, with respect to getting a better handle on the condition of the resource, could you remind us what those were, so we would be in a position to not be redundant, because, typically, they do make research recommendations. They do make recommendations, and it would be silly for us not to be cognizant of that. Thank you.

DR. NESSLAGE: I agree. I'm not sure we're poised to review that assessment review, and is that correct?

DR. CURTIS: Fred, I don't have those handy, but there is the stock assessment that's provided in the background materials that would have those research recommendations for the committee to review.

DR. NESSLAGE: I guess, to Fred's question though, are we -- We're not taking -- The whole idea today is not to necessarily re-review the review, per se, but I think Fred's suggestion that whoever is doing the -- Perhaps you're suggesting, and correct me if I'm wrong, but that we take a close look in the future, and not today, but in the future, at those research recommendations, and is that correct?

DR. CURTIS: Absolutely, and so, as part of this process, looking at those review recommendations and identifying some of these new data for a later, more thorough review of that information.

DR. NESSLAGE: Chip, to that point?

DR. COLLIER: Sure. Thank you. If you go to the SEDAR website, there's a great research recommendations tool, and each stock assessment has that, and it's a clickable link, and so, if you just look at the SEDAR tool, it's going to be under -- It's the second tab over from the top, and I'm forgetting the name of it. Kathleen, do you remember?

MS. HOWINGTON: (Ms. Howington's response is not audible on the recording.)

DR. NESSLAGE: Fred Serchuk.

DR. SERCHUK: I know it exists, and the question is, when you have research recommendations, you wonder have they been acted on, why haven't they been acted on, and there hasn't been progress, and so I don't want us to reinvent the wheel here, and, normally, when we get a SEDAR report, we look at those recommendations, and we may embrace them, and we may say, well, we reprioritize them, but I'm just trying to make the process that we have, with the SEDAR and with the review by the SSC, more coherent, possibly. That's all. Thank you.

DR. NESSLAGE: No, that's a great suggestion, and I think Judd is already capturing it, and perhaps it would be good if there could be some sort of summary response to the list of research recommendations provided by whoever is in charge of this assessment or this -- We won't call it an assessment, but what are we calling it? This interim -- We don't want to call it that, but this goliath project, that a summary response to each of the bulleted points, the research recommendations, from SEDAR 47, to see what progress has been made, would be really

informative for the SSC and the council, I would think. Thank you, Fred. Are there other questions for Judd? Alexei.

DR. SHAROV: I honestly expected to see the new data, some data streams and updated indices, and, I mean, that's what the final slide says, and there is no new data, and I looked for it, but I couldn't see it.

DR. NESSLAGE: Not provided in the briefing book, but I guess -- I think what you guys are asking is do we know of any new data sources, and I'm looking at folks who collect data in the region. Kai.

DR. LORENZEN: I don't collect data in the region, but my impression is that -- I mean, there is nothing fundamentally new, and, really the situation is no different from what it was at the time of the last stock assessment, and the fact that there now is a small harvest, a very, very controlled and very, very small harvest, in Florida is really a policy decision by the FWC, and it's not based on some new data that we have available or anything. I would say it's -- You know, they carefully considered the data that were available, and the limits that they've set are very low, but I don't see anything there that would necessarily allow us to revisit the ABC determination under the normal procedures that we operate under.

DR. NESSLAGE: So I don't want to get into too much of the final discussions here, and I want to stick with any questions that you might have, and we'll go to public comment, and then we'll open the -- Not that -- Your questions, or your comments, are fine, but I just want to try and make sure we get some public comment before we start making final decision points. Wally.

DR. BUBLEY: In terms of new data, the SEFIS component of SERFS has been collecting those video, trap videos, for ten-plus years now at this point, and I know we see goliath grouper on it, but no one, to my knowledge, has really explored that at all, and so that might be some information that's available that hasn't really been looked at.

DR. NESSLAGE: Thank you, and I'm sorry that I went out of order. Alexei.

DR. SHAROV: Is there any information from FWC? Was there any background prepared by either the biologists or the stock assessment scientists in support of the reopening of the small and controlled fishery? That is, I understand there was a council decision, but you would expect that some reasoning was provided, and I wonder if there any quantitative, or qualitative, information presented there.

DR. NESSLAGE: Let's go to Dustin, to that point.

MR. ADDIS: This decision wasn't based on any recent stock assessment or anything the stock assessment group put together, any analyses or anything like that. You can see the presentations during that commission meeting, and I believe they're posted online, and so you can review those, if you like.

DR. NESSLAGE: Thank you, Dustin. Chris next and then Wilson, I believe.

DR. DUMAS: In the slide presentation that we just saw, it said that there is evidence of increasing abundance, and that was one of the points, and what is the evidence based on? Is that based on just bycatch, because there's no directed fishery, and so is it just an increase in the goliath grouper counts and bycatch of general snapper grouper fishing? Is that what that's based on?

DR. NESSLAGE: Do you know, Dustin?

MR. ADDIS: I'm sorry, but I only heard about half of that. Sorry. I was busy doing something else.

DR. DUMAS: In the slide presentation we just saw, it said that -- One of the bullets was that there was evidence of increasing abundance, and so is that just increasing bycatch of goliath grouper in the general snapper grouper fishery, because there's no directed fishery, right, for goliath grouper.

MR. ADDIS: That's correct. We do have MRIP discards, and we also look at the Everglades National Park survey, which is -- We use that as a general recruitment index, and I believe there's an uptick in recent years, and maybe that's what it's referring to.

DR. DUMAS: Okay. Thank you, and so I'm just wondering if there are those kinds of data, and with this relatively low sort of incidence species, if they're thinking about using like inverse sampling methods to help work with those data, to maybe get some type of index that might have abundance, and that might be helpful in that kind of situation, going forward, and that's all. Thanks.

DR. NESSLAGE: Thank you, Chris. Wilson.

DR. LANEY: Thank you, Madam Chair. I downloaded a whole bunch of goliath grouper stuff last night, and I haven't had a chance to read it all yet, and I think, somewhere in there, and I haven't found it yet, and Dustin referred to the fact that there wasn't a formal assessment, but there is some kind of a presentation that was given to the Florida FWCC, which members might find useful.

Then I had a -- Well, I certainly liked Chris's suggestion that it would be interesting to explore the possibility for developing some sort of an index that would document the population increase, although, if you go online and Google "goliath grouper angling", you can see that the number of YouTube videos and reports and so forth and so on might be another way to track increasing abundance of that species.

I just have a question, for those of you who know goliath grouper biology better than me, and so it looks like, from what I read about the Florida proposal, they are proposing a very, very limited harvest of what, for goliath grouper, are very small fish, like twenty-five or thirty-pounders, I think, Dustin, and so, from a biological perspective, it sounds like an extremely minimal impact.

I know that the decision was a controversial one, because of the dichotomy between those who want to harvest and consume goliath grouper and those who feel that they should be retained, because they have a whole lot more value alive than they do dead, but, from a biological perspective, is my thinking correct there, in that this would be an extremely small impact on that population, and then the other question, and I do have one more, is how does Florida propose to

monitor that? Are they proposing a tag system, and so you would have to have a tag for it, and all the catches would be reported?

DR. NESSLAGE: Dustin.

MR. ADDIS: Yes, there's a maximum of 200 harvest permits and tags that are to be awarded via a random draw lottery. You pay a lottery application fee, and you pay a permit fee if you're awarded. They're non-transferable, and you're only limited to one harvest permit and one goliath tag per person. You know, I don't know all the details, but this is just a general -- I believe it's limited to state waters within certain counties within a certain time of the year, and it's a slot. It's twenty-four to thirty-six inches total length, things like that, and there's a lot of stipulations.

DR. NESSLAGE: Do you know the answer to the question about monitoring? Will the animals harvested then be checked in some way?

MR. ADDIS: I believe they are required to be biologically sampled, and I don't know all the details about that, and I'm kind of looking through this information here.

DR. NESSLAGE: I guess the -- George, please.

DR. SEDBERRY: It was my understanding that the tags would be awarded on a lottery system, and they would know who is going to be fishing for them to begin with, and so it would be relatively simple to monitor and find out what they caught and to sample those fish.

MR. ADDIS: The anglers must attach a tag immediately upon harvest, and then they must report their harvest information and submit a biological sample. I don't know the details on the biological sample, but equipment and instructions for taking the biological sample will be included in the permit package.

DR. NESSLAGE: Thank you. I appreciate that. Sorry to put you on the spot. Anne, go ahead.

MS. LANGE: When is the Florida fishery supposed to open? Is it next year? I am just wondering if using that data, any data collected for monitoring for that, would better inform any decision for federal waters.

DR. NESSLAGE: That's a good suggestion, and maybe we can put that down in our -- As a bullet point for when we start fleshing out our recommendations. I am not seeing any other questions at the moment, and so I think, while folks are mulling this over, it might be a good time to go to public comment, and then we'll return to our discussion and consensus recommendations, and sorry that you're typing, Judd, and trying to do a million different things, but, in a moment, we'll go to public comment, and so folks online -- Is there anyone in the room that has public comment? I don't see anyone, and so, folks online, if you do have public comment, please use the raise-hand function, the little turkey, and it will go from -- I forget. Is it red to green? Derek Cox, if you would please unmute yourself and go ahead and provide public comment.

MR. COX: Hi. This is Derek Cox, and I'm with FWC's Division of Marine Fisheries Management, and I'm just able to answer a couple of questions that I heard about the harvest, if you would like.

DR. NESSLAGE: Absolutely. Please go ahead.

MR. COX: I am just trying to remember the ones that kind of were discussed there, and I know, towards the end, there was one about which information would be collected and would that better inform future management, and so part of the biological sampling that Dustin mentioned there will be they will be required to submit a fin clip for genetic analysis, and part of the kind of alternative metrics that FWC has developed for monitoring goliath, in lieu of the difficulties of the stock assessment, is to monitor the genetic diversity and then the effective population size through some of these fin clip samples that researchers and anglers are currently collecting, but also would be provided as a requirement for utilizing this permit, at the time of harvest.

DR. NESSLAGE: Thank you, and do you know if there will be any information on like length, weight, et cetera collected?

MR. COX: Yes, and so we're still developing the official reporting requirements, as far as what data they need to provide, but, at minimum, it would likely be the date and location of harvest and length of the fish, and then we're currently kind of figuring out what would additionally be a required metric, if any, to report, and what would be maybe optional, things like weight or possible voluntary -- Giving the carcass essentially to staff, if available, to take further samples, and things like that could also be an option, but at least required would likely be location, date, length, and then that fin clip for genetic sampling.

DR. NESSLAGE: Thank you. That's very helpful. It looks like George Sedberry has a question for follow-up for you.

DR. SEDBERRY: Can we ask the --

DR. NESSLAGE: Yes, we can.

DR. SEDBERRY: I was wondering if the genetic analysis would include determining age genetically.

MR. COX: I do not have the answer for that question. I know that they are focusing on kind of a next-of-kin analysis, to get an effective population size, as well as looking at the genetic diversity of the population, to look at kind of the inbreeding likelihood and impacts from small population rebuilding, but I do not know about that ageing from genetics, but we can get back to whoever with that information in the future.

DR. NESSLAGE: Wilson.

DR. LANEY: Thank you. Mr. Cox, is the budget there to analyze those genetic samples as they are collected each year, and the reason I ask is because one of the things that I do on the side is collect genetic tissue for the North Carolina State Museum of Natural Sciences, and those are just archived in ethanol for analysis at some future point, as the budget allows, and so I just wondered if you all are planning to analyze those as they are collected each year. Thank you.

MR. COX: Yes, and I'm not sure exactly if they're going to be analyzed every single year, or how that would work, and that would be our FWRI, our research institute, handling that, but the cost of the tag is designed to cover the cost of running those samples and analyses, as well as other incidentals for running the program, essentially, the purchasing of tags and putting together these kind of permit packages that we'll be doing, things like that.

DR. LANEY: Okay. Thank you. That's great that you all included that in the cost of the permit.

DR. NESSLAGE: Jeff Buckel has a question for you, Derek.

DR. BUCKEL: Derek, thanks for providing this information. This is helpful. In the research recommendations from SEDAR 47, there was a motion of getting fin -- I think it was spine samples and otoliths, and I think there was work being done to develop a relationship between maybe fin clip ageing or -- I don't know if that was either genetic ageing or looking at spines and counting rings, and so is that -- Is that part of this sampling process, and, if not, maybe that's something to consider as a requirement, to get otoliths and spines. Thanks.

MR. COX: Currently, our researchers are looking at that, but it's not going to be a requirement at this point in time for the harvest, mostly due to logistics of getting a scientist out there when they come back from their trip in a timely manner to get that sample, and we thought it would just be a little bit too much of a burden to try and make that happen, when a fin clip is much more easy to instruct the angler and to have a take and then submit, and so it's something that we can look into for the future, potentially, but there are difficulties with requiring it from everyone.

DR. NESSLAGE: Thank you, Derek. Fred Serchuk has a question for you.

DR. SERCHUK: Thank you, Madam Chair. I am not very familiar with the biology of this species, but I am just wondering if the inferences that will be made from the Florida water sampling -- Will they be able to be extrapolated to beyond, into federal waters, and I'm not really quite sure what the movements of these fish are, whether there is changes in size distribution between Florida waters, and I'm just wondering. It's great to see that there's a data collection program, but I am just wondering how far that information could be used to generalize to the larger population. Thank you.

DR. NESSLAGE: Derek, is that a question that you feel comfortable answering?

MR. COX: I was going to say that I don't really know that I know the answer to that question. These are going to be focusing just on the juveniles, which are inshore, and then they'll go offshore as they mature, as adults, and so there's likely some relationships, maybe, that could be established, or extrapolated, but I don't know that I can speak to that.

DR. NESSLAGE: To that point, I had Kai and then Wilson, and we will get to the rest of the public comment, I promise. Please be patient.

DR. LORENZEN: As has been mentioned, it's very restricted, in terms of size, and it's juveniles that occur nearshore, and it also excludes some areas, which it excludes, I think, the whole of southeast Florida, because that's where the diving industry is mostly based, and so I think it would be hard to extrapolate this too far.

DR. NESSLAGE: Wilson and then Dustin.

DR. LANEY: I was going to ask Wally, because he mentioned the SEFIS video data, and do any juveniles at all show up on that, or is that all large adults, and that's to Kai's point that he thought it would probably be difficult to translate offshore, and I know SEFIS has got, from a geographical standpoint, a very broad range in the South Atlantic, and I was just curious if you all had looked at it at all, to see whether there are juveniles and adults or it's just adults showing up in the video data.

DR. BUBLEY: With the videos, unfortunately, we haven't had the stereo cameras around nearly as long, and so we don't have length measurements, but there are definitely some larger fish, and we can tell, based on some of the other fish around, and we have caught two goliath grouper, maybe, in the traps, in the entire time series, and so they're obviously not the really big ones that are there, and so it's kind of a mix, I think, of what's on the video.

DR. NESSLAGE: Dustin.

MR. ADDIS: So goliath grouper recruit to these estuarine mangrove areas, and they remain there for I believe up to five to six years, and then they move offshore to reef habitat, and so they disperse offshore, and so that corresponds with this slide of twenty-four to thirty-six inches, and these are young goliath that are still in these inshore, estuarine, mangrove habitats, and so these are young fish that haven't moved off yet.

DR. NESSLAGE: Great. Thank you. Chip, to this point?

DR. COLLIER: Sure, and so what I'm trying to do is making sure that we're talking about reconsidering the ABC, because, currently, it's zero, and so what I'm hearing you guys say is we need some fishery-independent data on juvenile goliath grouper. If there is an independent index on goliath grouper, potentially, from SRFS, look into that, to try to get some information, any information we can glean from that. Is there any additional information that can be used that would be useful for you guys to consider an ABC that's not equal to zero, because, going back and looking at when the SSC originally made this recommendation, it was kind of a default.

There was a prohibition going on in 2010, and there was also a stock assessment, and so, when they set it at zero, it was because the regulation was zero. It wasn't based on the best available science. It was based on we have a stock assessment that's going to be coming up in just a few months, and that stock assessment never provided catch level recommendations, because it was not accepted, and so it's been twelve years since then, and should we still continue to keep it zero, and what do we need to do in order to get it off of zero, I guess is the consideration for the group.

DR. NESSLAGE: Thank you for the clarification, Chip, and we will definitely get to that, but I think we have strayed a bit from public comment, and I want to make sure we get everyone who is online. First of all, thank you, Derek, for providing all that information. We really appreciate it. Did you have anything else that you wanted to add?

MR. COX: No, not at this time, but, if there is further questions, I will try and stick around and be available.

DR. NESSLAGE: That's fantastic. Thank you. I think, next on our list, we have Julie Neer.

DR. NEER: Good morning. It's not really public comment, but it's just to let everyone know that I reached out to Luiz Barbieri and got a copy of the presentation that was presented to the commission in March, and I have emailed that to Chip and Judd, so they can get that out to you, and, on Slide 4, there are some graphs of juvenile indices and adult indices, looking at MRIP and REEF observer and Everglades National Park angler survey data, that you may wish to take a look at. There's no details, other than the figures, but it might add to your discussions, and so Judd and Chip can get that out to you guys, because I don't have an SSC distribution list. Thank you.

DR. NESSLAGE: Fabulous. Thank you. Is there any other public comment? This is your chance, and raise your hand, please, if you have something to share. All right. Thank you. Let's return to our discussion, and so I really see this -- As Chip mentioned, there is kind of two aspects, remembering that we're talking about the federal ABC, right, and so there is the first aspect of what sort of data do we think we would need to inform any sort of decision about an ABC for this stock, and then the second would be what sort of analyses would be needed to basically inform an ABC that would be other than zero, or any ABC, practically, and we really haven't had an assessment that has passed, and I would invite you all to think more broadly as well.

Take this opportunity to think more broadly, because we have, as I understand it, and someone correct me if I'm wrong, but two other species where the ABC is set to zero, speckled hind and warsaw, and so we may be in this situation for other species as well, beyond goliath, where the ABC is set to zero, and the stock may start to recover, but we have no catches, and so we can't do a traditional stock assessment.

We're not going to run BAM, and we're not going to run SS, and so this is a situation we may find ourselves in for not just goliath, and so perhaps think more broadly about a process that we might want to consider in cases where we might be lucky enough where a stock like this would rebuild, and how would we go about assessing, essentially, a stock with no catch, because clearly the catch-free analyses -- It wasn't DBSRA, and what was it? It was -- The alternative analysis from the last assessment didn't pass muster, and it probably wouldn't in the future either, I'm guessing, and so -- Or not, and so this is the discussion we need to have, and so let's go to Amy.

DR. SCHUELLER: Didn't we just form some ABC sub-committee for this type of situation?

DR. NESSLAGE: Our unassessed stocks?

DR. SCHUELLER: That sub-committee has not met yet, but that's one avenue that could be used to move forward with this.

DR. NESSLAGE: So Amy is referring to our working group on determining what to do with unassessed stocks, and I'm going to look to Chip, perhaps, to update on us on whether we got the approval to move forward, and there was some concern about when and if and what species we should concentrate on, or at least that was the discussion at the last meeting, and has there been any movement on that from the council? I see a head shaking, which typically means no.

DR. COLLIER: It was shaking left to right and not up and down, and so, yes, the council has been considering some of these unassessed stocks, and what they're trying to do is work through the allocation first, because, with the unassessed stocks, they're going through that change from CHTS to FES, and so dealing with allocation first is going to be one of the items that they want to get through, and they are finalizing their approach to the allocation decision tree, and so, once that gets done, then we can move forward with some of these unassessed species.

DR. NESSLAGE: Thank you. Sorry to put you on the spot, but perhaps that would be a good recommendation from the group. Let's see what everyone else thinks. Did I see Wilson flash a hand?

DR. LANEY: Yes, ma'am. It was an unrelated question, and is anybody familiar with -- I am thinking about other possible databases that may be useful, and Florida may have already looked at it, Dustin, but I know there is this REEF program that's like a volunteer -- It's a citizen science program, I believe, that counts fishes on reefs, and I don't know whether that extends -- I see Kai nodding, and does that extend into federal waters, and might that be a possible additional source of data for goliath grouper?

DR. LORENZEN: I am not 100 percent sure. It's done by volunteer divers relatively nearshore, and so I don't think it extends into federal waters, but it might, and it's relatively localized, and so it's heavily concentrated in southwest Florida, although they are trying to expand it.

DR. NESSLAGE: Thank you. While we're taking notes, Judd, would it be possible to group the data that we're discussing into kind of nearshore state waters versus federal, because I think that will help guide our discussion, based on what I've heard people -- The concerns that people have raised so far. Did I see -- Dustin, go ahead.

MR. ADDIS: Some of the recent data sources we've used in the past for our assessments have been the Everglades National Park index, the REEF dive index, which Kai just mentioned, but that's -- The REEF dive index is a volunteer dive survey, and the divers choose their reef sites, and so it doesn't have like a rigid experimental design, and the data are categorical, and it's not necessarily directed towards goliath, but a supplement to REEF has been the great goliath grouper count, and, for more information on that, you may want to contact Angela Collins, but I believe that is directed for goliath. Then some other data sources are we looked at MRIP, and I believe RVC, and so that's all the data sources we've used, I think, in the past.

DR. NESSLAGE: Thank you. Kai.

DR. LORENZEN: You asked for bigger-picture thoughts, and one thing I'm thinking about is so, in the federal framework, ABC is meant to correspond somehow to MSY, right, and so even if it's not directly based on that, and we think about it as something that is sort of indicative of what the MSY would be, and that's very different from say that harvest level that the Florida FWC determined, but, really, the objective was to have something that is not zero, and it's fine to have -- Because the interest there is not so much to develop a big fishery, but there was -- I would describe it as almost a philosophical point that some of the commissioners felt that, if it's not endangered, if it's recovered, the harvest should not be zero, and so they're happy with something that is just marginally more than zero.

That's a very different philosophy, I think. You know, if we answer the question for the unassessed stocks here, can we come up with an ABC that is just marginally above zero, say at a thousand pounds of grouper or something, and that's a different question from can we determine an ABC that somehow corresponds to MSY.

DR. NESSLAGE: Good point. Jeff, go ahead.

DR. BUCKEL: Dustin, you were mentioning the different surveys, and does the University of Miami still have a reef fish sort of visual survey of some kind, at some point, and others might know about this, but I'm just curious if that was examined.

MR. ADDIS: You're referring to the RVC, the Reef Visual Census?

DR. BUCKEL: I didn't know what RVC -- So that could be.

MR. ADDIS: I believe that's what you're referring to, and that's still ongoing. I believe it happens every other year in certain places, and it's not like a yearly thing. I will have to look more into it.

DR. BUCKEL: Okay, and then I guess another question on the biological sampling, and these discards that are occurring -- Has there been any effort to get genetic vials to the folks that -- Maybe some of the charter boats that regularly encounter these, to get a larger sample size of genetic fin clips, and I think Derek mentioned a close-kin mark-recapture analysis, to try to estimate abundance, just trying to increase the sample size of genetic samples so that could be done.

MR. ADDIS: Yes, they're continuing to collect more genetic samples. I don't know what their sample size is yet, and I talked about this with Luiz I think months ago, but it's flown out of my brain, but I can get you more information about that, or everybody, about the close-kin analysis.

DR. BUCKEL: Thanks, Dustin.

DR. NESSLAGE: Thank you. Let's go to Fred Scharf.

DR. SCHARF: I was looking at the research recommendations, and so this was probably a question for Dustin, but one of them was about the location of additional spawning aggregations, and, in that research recommendation document, it said this was a work in progress, and the idea was to see, using some sonar work, to see if there was any expansion in the number of spawning aggregations, which would be an indicator of a growing population, if you were starting to see them aggregate in more areas than you had in the past, and so one question was whether that work has continued since 2016, to see if there has been an identification of additional spawning aggregation areas from the historical ones.

Then the other was sort of an expansion of this, potential expansion, of the drop-cam video work that the fishery-independent program in Florida does, but it would have to expand to some of the artificial reefs and wrecks, and has there been any progress on that front, or any more discussion about that?

DR. NESSLAGE: Dustin, do you know?

MR. ADDIS: I do not. I don't have a good answer for that, but I can get you an answer for that, if I contact the right people, and so sorry.

DR. NESSLAGE: Per chance is Derek online now?

MR. COX: No, I do not for sure, and so sorry.

DR. NESSLAGE: No. Thank you. I appreciate your response. Luiz, do you want to respond to that, if you can hear us?

DR. BARBIERI: Thank you, Genny, and good morning, everyone. I was trying to stay in the background and not be interfering too much with this discussion, but that question that Fred Scharf asked, I think I have some information there, Fred, that can help you understand where we are with that.

Yes, there has been some work continued, since that last assessment, in identifying the areas where spawning aggregations occur, expanding from that historical database that we know was there for the spawning aggregation areas. Now, combined with some telemetry work, there has been also an evaluation of populating goliath of different sizes, populating different areas, and aggregating in different times of year, and so an expansion of the original areas where spawning aggregations were reported, but we don't really have any quantification of that, as yet, and that is work that is progressing, but it hasn't been conclusively completed yet.

Then, on the drop-camera survey, the fishery-independent survey, yes, there has been an expansion of that, but mostly in the Gulf and not in the South Atlantic. It's just been difficult for us to secure consistent funding to expand that work in the South Atlantic area, and so we would rely primarily on working with SEFIS and SERFS in getting that information. Fred, does that address your question?

DR. SCHARF: Yes, and thank you, Luiz, because I'm just thinking about those surveys, and I'm just wondering about SEFIS and just thinking, and maybe Wally could comment on this, but just thinking about the framework of SEFIS and the experimental survey design for SEFIS, and would we expect that, if we were seeing sort of an expansion in biomass of goliath grouper, through numbers and increases in size or age structure, would that be detected? Would we expect to detect that in the SEFIS survey, or is the SEFIS survey always going to be sort of on the fringe of being capable of detecting changes for this particular species?

If the answer is no, that SEFIS may not be set up to where it would detect those changes in goliath grouper, then thinking about some of these alternate sort of indices, things that may not maybe get us to an abundance estimate, or even a relative abundance estimate, but just even triggers of where we're seeing either just the occurrence of older, larger fish or increases in juvenile fish in some of the nursery areas or expansion of spawning aggregations may be sort of the best that we have, in terms of just making some considerations about where the stock is, and that was all I was thinking.

DR. BARBIERI: Right, and, Genny, to that point, real briefly, if I may?

DR. NESSLAGE: Yes. Please go ahead, Luiz.

DR. BARBIERI: Fred, that's a very good point, and, I mean, in the Gulf, we have fairly broad and intense fishery-independent monitoring program that uses different types of cameras and a combination of multiple gears, and still the biological characteristics of goliath grouper do not deem them really suitable for those types of surveys, and so, just like what Wally described for the number of goliath that they have reported, some pictures, some videos, perhaps capture a few individuals in the traps, but, in general, you don't pick up the signal of abundance for goliath that would make us consider that those surveys are actually, you know, properly reflecting increases in abundance.

This has been one of the main challenges in addressing assessment and management of goliath, is these peculiarities of their biology that makes them difficult to survey, but, to your point, in terms of looking at other data sources, sure, we could, through Dustin, bring you, in October, a combination of multiple projects, results from multiple projects, or at least an update on data collection that is going on and try and put in front of you whatever we can to help you address that question.

DR. NESSLAGE: Thank you. Does anyone else have their hand raised? Okay. I am not seeing any other hands raised at the table. I would like to go through what we have on the board so far and kind of, at least for the data part of our recommendations -- I think we need to be careful about how we present this in our report. We haven't really inspected these data sources, right, and we haven't had an opportunity to look at them in light of -- Thoroughly in light of the last review and assessment, and so perhaps our -- What I heard you guys saying is that our first recommendation is for the data portion of our action section of the report would be basically to request a comprehensive response, and do we have that down there, to the SEDAR 47 research recommendations, some sort of summary.

Let's grab that and put it down -- I think that's kind of step number one, is what has been recommended in the past, and have we made progress there, and it would be good to see that, because those are folks who were deep into these previous assessments and have thought about how those data could be used. Then we had some ideas for -- Perhaps if we could list that as potential new data sources, or new sources to consider, if they haven't been already, I guess, because we're not as well-versed in this as we should be to make any solid recommendation. Wilson, go ahead.

DR. LANEY: Thank you, Madam Chair. Maybe it would be good to say new or updated, because some of them may have been looked at in the past, and we now have additional years of data to add to those datasets.

DR. NESSLAGE: Absolutely. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. The SEDAR 47 assessment had a terminal year of 2014, even though it was done in 2016. From my viewpoint, I see the Florida activity as more or less a data collection program to provide more information on the status of inshore, and, typically, we wouldn't wait ten years for any stock assessment to be reviewed again, and so I'm wondering, and would it be appropriate for us to recommend that, in addition to whatever new data collection programs we have, that there be another assessment, maybe in 2024, to assimilate whatever new

information has been collected in a holistic fashion, to provide better insight, in addition to any of the recommendations we're providing here? Is that sort of the way the process should work?

DR. NESSLAGE: That's a good suggestion. I think the trick is that the approaches that have been applied before were using largely the same -- We have the same data, and so we're likely to stumble on the same stumbling blocks, and Dustin has his hand raised, and so I'm going to go to him.

MR. ADDIS: We do not have a long time series of landings, reliable landings, and that's very important for a stock assessment, as we all know. The last assessment was rejected by the review panel, because of issues with data, issues with treatment of data, issues with the model, the catch-free model, lots of issues.

DR. NESSLAGE: I guess I'm seeing you think are probably not going to be resolved in the next assessment easily?

MR. ADDIS: I don't believe so, not easily.

DR. NESSLAGE: So I guess the -- I think that's where Amy was going with her recommendation that the unassessed stock working group come up with some new approaches, because the same old assessment approaches probably are not going to get us there, and so I think that's -- We need to get that -- If we don't have that down on paper, we need to make sure that's very clear, unless folks disagree. This is the time to disagree. That's perfectly fine, but let's see. Alexei.

DR. SHAROV: I think Fred's idea was a good one, and I thought it was pretty much what was in the second action item here, determine what analysis would be needed to revise an ABC currently set at zero. While I understand the principal sources of data are the same, but the analytical approach could be different, definitely. I mean, for example, let's consider that this is an index-based method workshop that has been completed by NMFS recently and reviewed and accepted for use.

There are many other alternatives that could be tried, and, to be honest, given the review panel might have a different opinion, and you all know, each of you, whenever you are looking at a difficult stock with lots of uncertainty, it's a toss of the coin. You have individuals that have their own opinions, and, if you have ten review panels, you could have ended up 50/50, five in favor of the usefulness of the analysis and the others would say no.

I think that there are opportunities for the assessment, and we should not discount this, but is it practically, in terms of the scheduling, et cetera, possible, and that's the second question, but then the alternative is what Amy is suggesting, because, obviously, there is a logical approach, and, as we were saying, the marginal increase in removals, from non-existent to different from zero, obviously, by all logic, would be accepted as the non-zero, 99 percent, chance of exceeding the OFL, even though we don't know it, but that requires to develop a methodology that we would agree to.

DR. NESSLAGE: Perhaps a compromise would -- See what you all think of this. Is that we recommend the unassessed stocks working group brainstorm alternative approaches. They wouldn't be the ones to do it, necessarily, but to really try to get a fresh opinion with the context

of setting an ABC, right, and this isn't just random people from around the world coming in for a review, and we have a real understanding of the management need here.

They can do the brainstorming and allow that brainstorming to inform a statement of work that could then be used to guide the development of a new assessment that would be used to set an ABC. What do folks think of that? Rather than just say, hey, we need a new assessment, and let people go off and come up with ideas that we may not be onboard with, have some guidance upfront, very out-of-the-box thinking, and we can get that kind of wording in there, of new approaches that are non-traditional age-based, landings-based assessments for consideration in developing the statement of work for a future assessment, and would that -- I am looking to folks who had commented on this or new folks. Do you have -- Kai, go ahead.

DR. LORENZEN: I think the unassessed stocks working group is a good idea. Like Dustin, I don't see much value in just doing another assessment, because the fundamental problem is the absence of a catch time series, because there isn't really one for before the fishery was closed, because a lot of the data collection then just wasn't very good, and, since then, obviously, there really isn't one, because there is not a lot of catching going on, and even those 200 fish will not greatly change that, and so there is a really, really fundamental reason why these assessments get rejected, because remember we learn about the abundance of the stock from observing its response to fishing, and that's really not happening in this case, and so we wouldn't be able to come up with actual ABC recommendations based on -- Even if the assessment gave us some idea of stock status, it wouldn't allow us to make a catch level determination.

DR. NESSLAGE: Wilson and then Alexei.

DR. LANEY: Thank you, Madam Chair. I know we're not going to have a catch time series, but, going back to Chris's recommendation earlier that we look to see if it might be possible to construct some sort of index of abundance, is there any way that goliath grouper encounters could serve as a surrogate for catch? I mean, they're one step before landings, and so is there a -- The question would be is there a reliable time series of goliath grouper encounters that could substitute for a catch time series, and I don't know the answer to that question.

DR. NESSLAGE: While folks are pondering the answer, if anyone -- Dustin, do you know?

MR. ADDIS: I mean, the longest time series we have for the past assessments has been this Everglades National Park creel survey, which serves as our recruitment index. The REEF dive index, which I already listed some issues with that dataset, that's been happening since the early 1990s, and so after the moratorium. This great goliath grouper count I believe started in 2010, and, of course, MRIP since the 1980s.

DR. NESSLAGE: Thank you. Alexei.

DR. SHAROV: The last assessment used several indices of relative abundance, which also included several options, or variations, that are based on MRIP, that the offshore, or above three miles distance in state waters, I believe the frequency of occurrence -- It's been massaged substantially, and there are six or seven variations of indices based on MRIP, and there is -- Then there was an attempt also to -- Not an attempt, and they did, and they generated the standardized index for the time series, which did seem to provide a very strong signal on the change in growth

and the populations, and so I think that the information is there, and certainly it could be used, should be used, and I certainly would support Genny's idea to create this sub-group of people to come up with a recommendation, and so the best course now is not specifically what methods could be useful, but rather create a sub-group that would do it and then generate recommendations.

DR. NESSLAGE: So we do have a sub-group already assigned, and we're just waiting for authority to proceed. That being said, I guess what I am hearing is there is some tension here between a traditional assessment, which is designed to generate estimates of abundance and biomass, which then can help you generate estimates, or proxies, for MSY, which give you your ABC, right, which was Kai's original point.

However, I guess where I was going with this is that, if we use the working group's recommendations to develop essentially a very different set of statement of work than what we would traditionally have for a traditional stock assessment -- We don't want to set this up to completely fail. We need to be thinking about it for not just goliath, but the other two stocks where we have zero ABCs, where we need to be able to come up with a way to reconsider how you would set an ABC without a landings stream, because all of our other unassessed stocks at least have some landings, but, to be honest, we've looked at some of those landings, and to think that they are representative of MSY is -- For many of them is probably a fallacy as well.

We're doing for ones that have at least minimal landings, using the catch, but, if you don't have catch, what do you do? You can't be stuck in this rut forever. We need to think about this, and perhaps that assessment is not your traditional assessment, and the statement of work needs to be very carefully crafted, so that we don't set it up to fail in a traditional stock assessment fashion, and it would need to be very carefully thought through. Kai.

DR. LORENZEN: I am all in favor of the working group having a look at that, and I am just not in favor of the idea of just requesting a new goliath assessment, because the answer will be the same that we had before.

DR. NESSLAGE: We don't need an exercise in futility. We need something creative and productive to inform management. Fred Serchuk.

DR. SERCHUK: Thank you, Chair. I recall, when Florida was having its public hearings about goliath grouper, I mean, they received a lot of input at that time, and now they've made a decision to move ahead, mostly with this data collection program, but there must have been some thought, in terms of what types of data and how much data would be collected to move to the next stage, and I am just wondering, from a Florida point of view, what the thinking was, in terms of timeframes, in terms of getting the index sufficient, so that it might provide some insight to the next stage.

Again, we're looking at probably recruitment indices that might give an indication of whether the stock is increasing or decreasing based on reproductive activity, and I think that would be helpful to us, because, if I recall, there was a very carefully nuanced program about saying we're not going to go wild here, and we're going to have a program that will provide us some information that we can move ahead on, and so any background on that I think would be helpful to us in going to the next step. Thank you.

DR. NESSLAGE: Thank you, and that came from public hearings, and so perhaps we could get a -- I think what Fred is requesting is a summary of the recommendations from those public hearings regarding what sort of information on juvenile production -- Help me with the wording here, Fred.

DR. SERCHUK: As I understood it, and I could be wrong, and so, if I'm wrong, please correct me, for those people that are more familiar with it, but, the first time it went out, they were talking about a data collection program to enhance our knowledge, and there were hearings, as I recall, through Florida to get people that were either involved with it, and I also recall that there was not only people who might be involved with harvest, but they also talked to people that were involved with just observing these things, because there's a dive industry that is very much interested in viewing goliath grouper, but it was basically to say, okay, we're going to collect data to better inform us, so that we could -- I want to know what the -- So we could what? What was the purpose of the program? Thank you.

DR. NESSLAGE: Thank you. Kai.

DR. LORENZEN: Maybe, and I think our FWC colleagues can correct me if I'm wrong, but my impression was the main objective was to have a very small, very controlled harvest, so that it wasn't zero, and then collect some data along the way, and it wasn't designed to be primarily a data collection program, and I think you would have designed something different, probably, if that had been the objective.

DR. NESSLAGE: Okay. I would like to -- There's a couple of things that are standing out in the wording here, and I don't want to wordsmith too much, but I want to make sure the committee is onboard with some of these things. I think, under outline and approach for review, we say -- I think we want to recommend the unassessed stocks working group brainstorm -- Like, really, let's be stronger with this. We need to get some new ideas here about alternative approaches.

I think we need to make a bold statement, or at least I will suggest we make a bold statement, and you all can shoot me down, basically that traditional stock assessment approaches are unlikely to result in a change in the ABC. We need to tell the council straight up, and I think that would be Bullet Point Number 1, and we'll be honest, and we have our council liaison, Carolyn Belcher, coming to the table.

DR. BELCHER: Thanks, Genny. One recommendation that I have is just -- This is me speaking to you all, and I just kind of talked with Chip a little bit off-mic, but focusing on the assessment I think is a good point to put forward, but I think, also, the fact that, as you drill down through your ABC Control Rule, and this thing doesn't meet any of the thresholds in the ABC Control Rule, and so the fact that you're falling off of that map probably needs to be stated, as well as opposed to focusing on, well, we just don't have a stock assessment, because it's saying that you have other tools that you've used to look at those things that we can't run through stock assessments either. This thing just doesn't happen to pass muster with anything else either, and I think it's a good point that you all need to make, because then that at least gives you more of that strength behind why your workgroup needs to be there.

DR. NESSLAGE: Right, and so some wording, if folks agree with Carolyn, about how our ABC Control Rule does not accommodate stocks with no catches, or does not have a process for dealing with stocks with no catches, and so we're stuck, without some new way to move forward. Alexei.

DR. SHAROV: I am sorry to be coming back to this, but I am not 100 percent following, or accepting, the argument that we don't have catch information. All right, and we don't have catch information for some period, and there was some catch registered all the way through 2014, I believe, based on the assessment report, but, even so, when we do a form of some assessment or the catch information is available, in most cases, we have indices of abundance.

We are, in analyzing the data, we are assuming that those indices are representative of changes in abundance, biomass, et cetera, or by groups in total, and that doesn't change when -- If we think that they are, that doesn't change when we stop fishing and/or we do not collect information on removals, and so why is it that the presence of a series of different indices will stop us from doing an analysis and evaluating the stock of the stock? Maybe you would not be able to come up with an absolute estimate of the OFL, or the FMSY or MSY, but you definitely can connect it to the historical part, where you had the history of the exploitation, and you had indices, and you had the catch, and you had sometimes a size frequency or age frequency information.

I am not obstructing the idea of attempting a different path, instead of trying to redo the assessment with one of the existing methods, but, honestly, I still think that it's possible, but, if the intent is, or if the belief of the group is, that it would be better to take another path, that's fine as well, and I guess my only point was that the absence of the catch information for recent years is not necessarily an obstacle to the assessment process. Thanks.

DR. NESSLAGE: I think I understand what you're saying, Alexei. Because we have historical catches, and assuming that we have a survey that expands the catch period and the non-catch period, theoretically, we could get some -- If those surveys, or indices, are proportional abundance, you could then project forward essentially what the abundance is.

Maybe we need to, if folks are onboard with this, have the group also take a look at the appropriateness -- Not the appropriateness, but the adequacy of those data sources, to see if such an assessment could be done and if they would then recommend it under the working group, and I would ask -- Since they're going to be diving into all of the data and what's available, it makes sense to have them take a look and see if that sort of approach is possible, and I saw two hands flash. Kai, and then we'll go to Chris and Wilson.

DR. LORENZEN: I think, Alexei, I don't fundamentally disagree, and I think the -- As you pointed out, the issue is that you may be able to get some sort of stock status determination, but you wouldn't be able to estimate an ABC, because you can't scale the assessment without a catch time series of some sort, and we know that the catch time series -- We have some, but, right now, the catches are very small, and, in the past, when they were larger, the data aren't very good, and that's, I think, where we are stuck, and so you might be able to get a reasonable idea of stock status, but it would still be difficult to estimate an ABC.

Also, I mean, fundamentally, the data available haven't changed from the last assessment, and so we've added a very more years of very sparse data, and so, if the conclusion at the last assessment was that it wasn't sufficient for a status determination, it seems very unlikely, to me, that that has fundamentally changed. I'm not saying we can't try again, but it doesn't strike me as a very fruitful thing to propose.

DR. NESSLAGE: All right. Let's hear from -- Chris is next, and then Wilson.

DR. DUMAS: I just wanted to say that I think a lot of the data that Alexei was talking about is the SEDAR 47 review workshop data and methods presentation 1 from the SEDAR website, and I just downloaded that and emailed it to everybody, as an attachment, and, on Slide 20 of that presentation, there's a summary table that summarizes all the different data streams that were used in that assessment and the review workshop.

Of those, it seems like several of those data streams would have continued since then, the Everglades National Park one for example, and I think Dustin mentioned that's still going on, and then also the MRIP/MRFSS data streams would still be going on, and maybe some of the others, and I'm just not sure, and so those would provide some of the data that Alexei was talking about, and maybe we could analyze, although I agree with Kai that, if the same methods that were used in the past are used to analyze the same data streams, we might not get very far, but maybe we could -- Maybe there would be some alternative analysis methods that we -- Alternative, non-traditional, brainstormed methods that we might be able to identify that might help us analyze the data streams better, get more information of it, and I'm not sure, and that's to be determined, but that's a possibility. Thanks.

DR. NESSLAGE: Thank you, Chris. Wilson.

DR. LANEY: Thank you, Madam Chair. I agree with everything everyone has said so far, but there's this nagging question in my brain, because I pointed out, as did Dustin, that we have this disconnect between the juveniles inshore and the adults offshore, and so, even if we have a time series of data that we can update to something close to the current year, how do we get around that disconnect? Do we have some indication of -- This goes back to our discussion yesterday about recruitment, Kai, I guess, and do we have some way to connect --

Let's just say we have really good time series of juveniles inshore, and we have some sort of an idea of adult abundance offshore, and is there some way to transition the juvenile survival into offshore recruitment? I am still thinking of the fact that we've got to find some way to come up with an ABC. I am certainly supportive of our suggestion that we send that to the working group, but how do we connect these two different life stages, in order to achieve our desired goal here?

DR. NESSLAGE: That's a good point that has kind of been coming up in various comments throughout, and perhaps we need to make a statement that we're concerned that many of the data sources are nearshore and that we're not sure what the connectivity between juvenile inshore and adult offshore federal water stocks is and how that would translate to our understanding of stock dynamics, something along those lines. Fred is giving me a scowl, but you're going to have to get in line, because Kai had his hand raised next.

DR. LORENZEN: I actually forgot what I wanted to say, and so I will hand it over.

DR. NESSLAGE: Fred.

DR. SERCHUK: I don't mean to be critical about this, but I don't see that passing this off to another group and talking about brainstorming is going to be able to get us out of a situation where we have some data, but not sufficient data, to understand what an appropriate catch level would

be, and I simply don't see it. That's why the research recommendations were put in before, to provide us with it.

I have no reservation whatsoever about saying, okay, let's have an experimental fishery to get more information on the entire thing, as a scientific endeavor to get us to the next step, but I know there are a lot of people here that are much more familiar with the methods, and maybe more familiar with the fisheries, that may be able to shed light on this, but we weren't able to provide an ABC last time, and I don't see how, in the absence of information in a broader sense -- I think the recruitment index may be fine, but I don't see it, and I don't understand whether we even have the legal responsibility, under Magnuson, to get an ABC in the absence of sufficient data to do that.

That may be a legal question, but, you know, I certainly think the idea of let's collect information, which I think was behind what I think the Florida initiative was, to shed better light on it, and I don't know whether it would be sufficient, but it was a step in the right direction, and so I'm a little bit skeptical about this, because I think, even though we have lots of helpful suggestions here, I'm not sure we're going to be in a better position to have a legitimate scientific basis on which to move away from zero to an ABC which represents the best scientific information available and is consistent with the applicable law. I mean, I'm sorry to be a Debbie downer about this, but that's how I see the situation from my little corner of the universe. Thank you.

DR. NESSLAGE: I don't think you're the only one, and perhaps we need to be clear in the report that we can explore these alternatives, but, at the end of the day, we might find the data are inadequate for setting an ABC, and we need to be honest upfront that any work to this task may result in -- There is no change, and just say that straight upfront, and that might need to be at the top of the list somewhere in our report. Anne.

MS. LANGE: Fred made a good suggestion of doing an experimental fishery. I mean, that's an option that could be recommended to the council, and I think it was a -- I mean, that addresses doing something, and I don't know exactly how that would be designed, and, I mean, Fred indicated that it might be difficult to do, but some sort of recommendation along that line I think might be more appropriate, from the perspective of the SSC and our role.

DR. NESSLAGE: So a carefully designed data collection program, through the implementation of an experimental fishery, and how do folks feel about that? I think we need to be very clear that this isn't just open up a fishery and hope for the best with MRIP collecting some data. This would need to be -- I am looking at faces, and I think this would need to be a very carefully designed -- If we go with that, and we'll just get some wording on the board, and then we'll start hashing it out. Jeff Buckel.

DR. BUCKEL: There was -- In SEDAR 47, in the research recommendations, there was a description of an experimental fishery and how that could be done, and so, when Kai mentioned how the fishery -- The discussion and what developed with the 200 fish, it was disappointing here that that wasn't put into place, and it was more let's just get some -- It's not the recommendation in the research recommendations that you need to get samples of all sizes, and so we can look to that research recommendation for guidance on that experimental fishery, but I agree that, if the methodology that folks want to see is an assessment approach that needs catch, then we need to move in that direction of the experimental fishery, but there were other approaches, right, the close-kin mark-recapture, to get at abundance, or, in the research recommendations, it said there was, I

think, 800 tagged fish out there, and also telemetry-tagged fish, those approaches to estimate abundance from traditional tagging, and so those could get you to abundance, and I don't know how close a close-kin mark-recapture is to being able to do that, but maybe you don't need to get catch, right, and there's these other approaches that you may get there sooner.

I guess a question to the assessment folks is, if you've just got an estimate of abundance, could you do something with that? I guess you would use some rule-of-thumb for an exploitation rate, given that fishery, or is that difficult?

DR. NESSLAGE: I have Kai and then Alexei.

DR. LORENZEN: I mean, Jeff's point is right that there are new methods, in particular close-kin mark-recapture, that will allow us, and the tagging approaches that would allow us, to get a better handle on absolute abundance, and you would have to sample quite a lot to get a good handle on absolute abundance, but, in principle, there are more of those methods out there now than there were ten years ago or so. As far as the experimental fishery goes, I think, in principle, that route is available through an exempted fishing permit, right, if someone were to make a proposal to do that.

DR. COLLIER: If your ABC is set to zero, that means your federal fishery is set to zero, and you cannot have harvest.

DR. LORENZEN: You cannot have an exempted fishing permit?

DR. COLLIER: If your ABC is zero, that means harvest is zero, and so, when you think about the exempted fishing permits that go on in other areas, or how a research set-aside is developed, they decrement from the ABC to start off with.

DR. LORENZEN: Okay, and so you can't. Okay. I learned something new. Thanks.

DR. NESSLAGE: Chip, while you have the mic, did you want to make a comment, and then we'll go to Alexei, if you don't mind waiting, Alexei.

DR. COLLIER: That was one of my comments, was, if you want to have fishing in federal waters, the ABC cannot be zero. The other part of it was, for all these federal stocks, we do have to have ABCs, and it doesn't necessarily have to be different from zero, but we have to have one that's based on the best scientific information available.

DR. NESSLAGE: So then the question on the table is would we consider a non-zero ABC is there was an experimental fishery that was designed to our satisfaction for data collection to inform management, and I will go to Alexei next.

DR. SHAROV: Thank you. If you open an experimental fishery to collect information, you have to decide how many fish you expect to catch, or how many fish you would allow to catch, and so one fish is safe, and that catch will not result in overfishing. Ten? Yes. A thousand? Yes. 10,000? We don't know. All right. You will have to come up with some analysis and some limit for that experimental fishery where you would think, or you would argue, that it will not have a detrimental effect on the population, yet you will collect some information that you think you need.

You are eventually dancing around the ABC estimation, and the ABC accounts for uncertainty, right, and so, equally reasonable, you can come up with different levels of ABC that will have a presumably like 99 percent probability that we're not overfishing, even though we don't have a formal estimate of the OFL.

There is more scientific uncertainty, and there is still -- There will still be quite a range of the removals that would lie on the very long tail of the distribution of the potential OFL that is safe, and that could be done sort of analysis could be done semi-quantitatively, or a qualitative evaluation of the past level of removals, past estimates of the fishing mortality rates or stock size, et cetera, and, I mean, I don't want to engage into the analysis right now, but we will have to come up with the estimate for either the number of the fish for the experimental fishery or the ABC itself, and so probably this, as an example, for the group that we talked about, would be the best approach to try.

DR. NESSLAGE: What I hear Alexei saying is that, before an experimental fishery would be implemented, we would still need to figure out what that ABC would be, based on some at least ad hoc -- I hate to use -- Well, the council hates it when I use the word "ad hoc", and so I'm going to say based on best -- Some sort of analysis to get at what our rough guesstimate of a sustainable, at least, yield would be, and I think we have Fred Serchuk and then Kai and then Amy.

DR. SERCHUK: Would it may any difference if the experimental fishery was a non-retention fishery, that is if it's really a sampling regimen, where you basically say, okay, we want to get more information, and we want to use anglers to do it, but we don't allow any retention, and, essentially, that's what's happening with red snapper.

If you catch a red snapper, you have to throw it back, and we go to great lengths to say, wait a second, make sure we reduce any incidental mortality from it, but it would be a scientific program that would engage harvesters, but in a non-retention fashion, and would that get around this ABC? I am not really quite sure, because you're returning the fish to the ocean, and hopefully with very low incidental mortality, and so we would have to come up -- I am asking a legal question now.

DR. NESSLAGE: Shep, do you know? Can you hazard a guess at that answer?

MR. GRIMES: I was looking, and there are provisions in the Magnuson Act that talk about a catch-and-release only fishery, right, but not in the research context, and I will think about that a little more and try to get back to you, but I was scrambling to find the text and the statute and think sort of how it would play out, but, I mean, if it's a managed fishery, a managed stock, you still have all of the, you know, overfished and overfishing and MSY and OY, and we'll have to develop all those parameters.

It's a managed stock now, and we have all those things, but, when there is zero harvest, there is less focus on those things, and they're not as -- They're not of the same significance, let's say, but, once we move down the road of opening it up, then you would revisit all of it, and, even if it is a research fishery, and it's catch-and-release only, you would expect some level of mortality, and you would have to figure that out and how you would address it, it seems to me.

DR. NESSLAGE: Thank you. I appreciate that. Kai.

DR. LORENZEN: Sort of following on from things we discussed earlier, about the sort of philosophy of the ABC as being associated with MSY, versus something that Alexei also brought up now some very precautionary -- Something where it's possible to harvest this level in a way that is almost certainly of no real impact on the stock, and so that's philosophically quite different, and it's kind of a bit more similar to what we do with marine mammal bycatch and so on, and so there are methods to do that, but my question, and this is for Shep, partly, and maybe for the council rep here, and so is it consistent with Magnuson to have an ABC that is set on that basis, rather than something that aims to be based around MSY, and so something that is just, you know, a no risk, very low risk, very low ABC, and the other question is what is that worth to the council, to have a very low, non-zero ABC for those species, where we can't set a traditional sort of more MSY-based ABC, because I think one could find ways of doing that, but the question is, is it consistent with Magnuson, and is it worthwhile doing that?

DR. NESSLAGE: I think you're referring to PBR, the potential biological removals, which take into account an estimate, the abundance estimate, uncertainty around that, and whether any removals of any sort, human-caused mortality, would result in a decline in the stock, basically, and so that's different than maximum sustainable yield, and so that would be an MSY-based approach, and can we do that for a fish stock under Magnuson?

MR. GRIMES: Well, first, I would say I think I would have to see it, right, and, as I've said before, everything we do in the federal regulatory context is on the record, right, and so, when we get sued, or when we have to justify it, then it depends on that written record that's there, and it's not just how you did it, but how you explained it and all the other stuff that goes along with it, and so, a lot of times, it's hard to see, and you may be able to do something, but you have to develop the record in support of it, and so I will preface my statements with that.

I think, off the cuff, I don't know why you couldn't, and, now, you have to have MSY, or a proxy for it, and that is one of the -- Like you go through Magnuson Act, Section 303A, and there is a list of things you have to have, right, and, for every one of those, it's maximum sustainable yield, right, optimum yield, objective and measurable criteria for when it's overfished, and the agency defines overfished in two ways that are not addressed in the statute, and that gives you the "ing" and the "ed", right, and so it's overfished and overfishing, and you need objective and measurable criteria for both of those, but they don't necessarily -- I would say, and in looking at how you guys set ABC, and, I mean, you use historic catch and other things that don't seem to be there, and I don't see any direct tie to MSY for those, and so I think you can divorce that slightly from your ABC setting process, right?

When you work down through the control rule, there are various tiers of information, and the control rules -- There is sort of the out, right, and the SSC can do something different than is articulated in the control rule, again so long as they articulate, on the record, the basis for doing it all, and so I think, if you explained it, right, and you had a rational explanation for how it all squared together, how it prevented overfishing, and you didn't think it was overfished, right, and rebuilding wasn't an issue, then it's certainly not beyond the realm of possibility, I would say. Is that a sufficiently amorphous answer?

DR. NESSLAGE: Perfect. A well-crafted answer, but I'm glad to see there's potential for this. I want to go quickly to George, to that point, and then we'll come to Amy.

DR. SEDBERRY: I was thinking about the sargassum management plan, and it seems to me that there's an ABC set to zero, and, in the past, there's been experimental fisheries in sargassum, and it may be the same thing with the coral management plan, that the ABC is set to zero for some species, maybe, and if that was relevant to this at all, particularly sargassum.

MR. GRIMES: I wasn't heavily involved in sargassum, and my understanding is it's not a good example to follow. It is an unusual thing, and it's not our bread-and-butter, and so I wouldn't encourage doing so, but I wouldn't -- I mean, maybe that is something you could look into, and my understanding with sargassum was you do have -- There is some allowable level of harvest of sargassum, and there is one person who had done it historically who has not done it, but maybe Chip is --

DR. NESSLAGE: Is this to the sargassum?

DR. COLLIER: This is to sargassum, and so when -- The ACL, or ABC, for sargassum has always been zero, and so the fishery was never really open for that, and so there was some harvest prior to us developing the ABCs, but it hasn't been allowed since ABCs have been developed.

DR. NESSLAGE: All right. Thank you. Let's go to Amy. She's been very patient.

DR. SCHUELLER: I don't have anything new to add to this discussion, and I think it's a good discussion. What I wanted to do is voice my support for sort of that first bullet at the top of our report, which basically says is there any legitimate basis for changing ABC set to zero, given the scientific information and uncertainty, and I would also like to voice support to what Kai basically just said, which was the council needs to understand that we can lay out this plan, and we may spend the next three years working on the plan, and they might end up with a zero still, and is that really worth it to them? It may be worth it, but the -- I mean, that's my question, is the ultimate answer may end up being exactly the same, and so, in the priority of species, and given what has been said about why Florida has put this 200 value out there, you know, what is the council's take on that, I guess?

DR. NESSLAGE: Carolyn, to that point?

DR. BELCHER: I think the answer would be yes, because it's not just this particular one, but you have other species that are in this same realm, and, if there is a changeout in the snapper grouper fishery, the warsaw, the speckled, all of that, there still needs to be that discussion about what do we do for these fisheries if there's a potential release, and we don't have that right now. If it's zero, it's zero, and how do we fix it? If the data is not there, what do we do?

I do think it's a worthwhile exercise. I mean, yes, I don't think the council wants it to be one of these things that we ruminate and kick around for a number of years, but I think it's that idea of, again, what do we do when we fall out of the decision tree? I mean, that's still a reality that can happen down the road. If you fall out of the ABC Control Rule, out of the decision tree, what do we do with it?

DR. SCHUELLER: That helps a lot, Carolyn, and so, to me, goliath grouper is just an example of a bigger question that we're actually answering, and so I guess -- I think it's important for us to

respond to that bigger question, more so than necessarily the case study in and of itself, and that's my viewpoint on it.

DR. NESSLAGE: All right, and so we need to carefully craft the report to make sure we're talking more generally about methodologies and approaches to getting out of this hole, as opposed to -- How that might help goliath, but it might also help some of our other species. Let's go to Kai.

DR. LORENZEN: This is to follow up, and so you're saying that something that is marginally more than zero would be valuable to you, if that was the outcome, because I think that's what we're talking about, is sort of something that would move us away from zero, but it wouldn't be, practically, much more than zero.

DR. BELCHER: I don't think the magnitude -- I think it's, again, the revisit of what do you do with a zero species, and, okay, so we wait some time, and it might be -- I will pull a shark species that the trajectory is relatively low and slow, and we check it, and it's not quite a huge amount, and so you're not going to go and open a fishery, or do a change there, but, over time, it would be good to know that there's still that ability to check it, in those situations where, again, you fall out of the ABC Control Rule.

DR. LORENZEN: Okay. That's helpful. Based on what Shep said, my sense is that, if you had a very conservative sort of approach to sort of allow the low, very low, risk of take, almost by definition, that would mean -- Well, no. I am getting ahead of myself. I was going to say, most likely, that would satisfy the requirement of not overfishing and it not being overfished, because you would apply it to a stock where there is minimal harvest to start with, but it's the MSY -- It's the MSY sort of requirement that may be very difficult to get around, because, if you have to define something that is an MSY or a proxy, those methods we were talking about wouldn't give you that, and it's -- If the MSY is a requirement, and it is even with those catch time series, and so it's philosophically related, because people think that, well, if you keep catching this again and again, then it's probably somehow sustainable, and I doubt that one can make an inference whether it's close to MSY, but I think, philosophically, it's related to MSY, and what we're talking about is something that is not philosophically related to MSY and doesn't aim to get there, and it's just saying that, you know, some very small level of catch probably doesn't really hurt.

DR. NESSLAGE: Yes, and I think that's the same assumption we make for a lot of our unassessed stocks that do have catches. We have no idea what MSY is for those stocks, but we're assuming that the catches, the historical catches, are not approaching it. It's a strong assumption, but it's an assumption nonetheless. Jeff has been so patient. Jeff.

DR. BUCKEL: This is a good -- It follows on Kai, and so, if Shep said it doesn't have to be MSY-based, right, and we have these ABCs that are developed from catch, and so, if there can be justification for what this low ABC is, and so I would look to the stock assessment scientists to say is there literature out there, can you do a simulation that says, if we had this catch, and this number -- Or this amount of catch and this amount of ages per year, in X number of years, we could do a more traditional assessment, and is this ABC going to get us to -- This experimental fishery, these low ABCs, able to get you to, eventually to, some kind of assessment, where you can estimate an OFL.

Then that gets back to Alexei's point about, well, you need an ABC to determine what the experimental fishery is, and, if it's -- If your simulation shows that it can be this low number, right, and we don't need that many animals aged and that much information, in terms of catch, then it's this low amount that we're all comfortable with, and we know it's not going to have an impact.

DR. NESSLAGE: That might be where some of the previous assessments might -- We could revisit them to see if the OFL -- We could accept an OFL if it's really far different from our sustainable experimental fishery catch, something along those lines. Anyway, to that point, Shep, and then we'll go to --

MR. GRIMES: Thank you. Just real quick, I would just remind everyone, as a managed stock, right, then we have MSY now for this, and we have overfished and overfishing definitions, I presume, and, I mean, those are all statutorily-required things that are in the FMP, and my guess would be they are formulaic expressions of values, and let's say MSY might be the yield associated with fishing at a 30 percent SPR, right, and I have seen that a lot, and we cannot currently estimate that, based on available data, but that's what is in the fishery management plan and fulfills the legal requirement to have that value in the plan.

It may not currently be estimable, but you have a value in the plan, and so just keep that in mind, and that's why I would think any effort to do this would necessarily revisit, or at least address, what is on the books for this stock, and at least use that to inform, going forward, any decisions or recommendations going forward. Thank you.

DR. NESSLAGE: No, and that's a good suggestion, and perhaps the working group can take a close look at what's already on the books, because we are obviously not familiar enough with it at this point. Let's go to Fred.

DR. SERCHUK: Given that there is a relationship between the juveniles in state waters and the population offshore, and that's given, and I don't know whether that's true or not, how was the number of 200 derived, and should the federal -- Should, because of the relationship between state fish and offshore -- I am just wondering how did 200 come about, and do we consider that a safe number relative to the contribution of inshore recruitment to offshore? I mean, it's a legal question, okay, but it's a population dynamics question, because we're in the same boat. I don't know how they came up with 200.

DR. NESSLAGE: Let's start with the biological. Kai, you raised your hand, but you're also -- Do we know, Dustin? I will look to you, and do you know how --

MR. ADDIS: I don't know exactly how the number of 200 came to be. I will have to look more into that.

DR. LORENZEN: For context, for a long time -- They made several attempts to put this together over the last ten years, and, for a long time, the number was 100, and I think, at the last go-around, they increased it to 200, but, you know, I think it's just something that people said, well, this is -- 100 is a good number, or 200 is a good number, and it probably doesn't cause harm, and I think that's about as much as went into that.

DR. NESSLAGE: Dustin.

MR. ADDIS: I just wanted to agree with Kai. It's sort of a limited number that would presumably have a minimal impact on the population and rebuilding.

DR. NESSLAGE: Understood. I am getting -- Folks are just going to the bathroom, and I think we need a bathroom break, and I know I do, and so I have Chris still on the list, and I'm sorry that I skipped you, and I forgot, and we want to come back to Shep as well, to answer the second-half of Fred's question, when we get back, and so let's take, if we can, a ten-minute break, and come back at 10:05, and we'll reconvene our discussion. Thank you.

(Whereupon, a recess was taken.)

DR. NESSLAGE: Okay, folks. Let's get back to work here. All right. Let's get back to the discussion here, and I think we left off -- We'll come to Chris next, but let's wrap up the second-half, if we could, of Fred Serchuk's question, if Shep is willing to come back to the table at least one more time, or just stay.

MR. GRIMES: Can you restate the question, please?

DR. NESSLAGE: I think it had to do with the interaction between state and federal, whether the state harvest would impact the fact that we're setting a federal ABC, and is that right, Fred?

DR. SERCHUK: My question was whether one would consider it part of the same stock, and, therefore, any removals by the state, even though the state has legal jurisdiction to do that, would have an impact on the stock. They don't have to set an ABC, as I understand it, but, to the extent that there is an interconnectedness, any removals therefore, whether they're scientifically based or not, would have an impact on the stock, and that was my concern.

My concern is the number was set, as I understand it, legally, within the State of Florida, for juveniles, and I don't know whether all the reproductive activity of goliath happens in inshore waters or not, and, again, I'm not familiar with the nuances of it, but the fact is that I suspect they're part of one unit, and, to that extent, we have to justify one removal, but the state now has gone and said we're allowing 200 fish to be taken, even though they're small fish, and does that have some impact, theoretically, on the overall stock condition?

DR. NESSLAGE: I'm not sure that's a legal question, and I will let you off the hook, Shep. I am not sure we have an answer to that today, but I think you're suggesting that needs to be considered when doing whatever analyses would need to be done to set an ABC, right, and we have a note up there, to that effect of connectivity, somewhere in the report, and Shep does have a follow-up.

MR. GRIMES: I would say clearly the answer to that is a scientific question, right, and so you would answer it, and then that would inform any related decisions made by the agency, but, in terms of jurisdiction, Florida -- Under the Magnuson-Stevens Act, the states have their own jurisdiction, and the federal government has its jurisdiction, and there is a provision that allows for the federal government to preempt the states, under very limited circumstances that I do not think would ever apply here.

For one, the fishery needs to be predominantly in federal waters, and that's obviously not the case here, but, in deciding -- In setting catch limits and state and federal harvest, I mean, the South Atlantic Council is dealing with this a little bit in red snapper, and the Gulf of Mexico has definitely dealt with this with red snapper and where they're caught, and states have their jurisdictions, and you can have separate state and federal catch limits, and you could have entirely kind of separate programs, and you could do it together and set one limit that is looking at, you know, this is what everybody gets to catch, and you account for all those landings, but I would say certainly, if you're going to talk about a new catch level, or any kind of allowable level or harvest in federal waters, you must at least explicitly consider what's happening in state waters, and maybe add on top of that why what you're allowing, in addition, is not a problem, and just it would need to be addressed in the record, so that we didn't have this glaring thing that we didn't consider.

DR. NESSLAGE: Excellent. Thank you. Let's see what Judd is putting up there. Allowable harvest of fish in federal waters would need to consider the harvest from state waters, and so any of our analyses of an ABC or some other allowable catch would need to take both state and federal into account. While Judd is writing that down, let's go, finally, to the ever-patient Chris.

DR. DUMAS: Thanks, folks, and so I just wanted to talk about the -- Go back and talk a little bit about the experimental fishery that Alexei and Fred were talking about and perhaps the need to set a low number for the catch of goliath grouper that scientists felt was a safe number, if we were going to do an experimental fishery, and I just wanted to talk for a minute about the inverse sampling method.

It could be used in that case, and so suppose you've got, for the offshore adult fish fishery, offshore, you've got a snapper grouper complex, and goliath grouper is one of the species in that snapper grouper complex, and you've got an experimental fishery, and you're running boats out there, and you're dropping lines down, and you're bringing up fish, and so, with inverse sampling, you start with setting a PSE for the proportion of goliath grouper in the overall complex there, and so supposed you wanted to have like a 10 percent PSE on your estimate of the proportion of goliath grouper, and then you would only need to catch a hundred goliath grouper.

What you do is you keep fishing until you catch a hundred goliath grouper, but you also count the number of all the other snapper grouper in the complex that you catch as you're on your way to catching a hundred goliath grouper, and so then you've got numbers of -- You've got a hundred goliath grouper that you caught, and you've got numbers of all the other snapper grouper that you caught, and then, based on those data, you can estimate the proportion of goliath grouper in that complex proportion, and you've got a PSE on that proportion, and so you basically have the variance of that proportion, also.

Then you have an estimate of the total abundance of snapper grouper, because you have large numbers of the other snapper grouper species, and so you can get a pretty good estimate of the number of the other snapper grouper that are there and a PSE on that, and so you have totals, estimate of the total number of other snapper grouper, a PSE for that, and you have an estimate of proportion of goliath grouper, and a PSE for that, and so you can put those two numbers together and get an estimate of the number, or the abundance, of goliath grouper and a PSE on that.

You can get that from just catching a relatively small number of goliath grouper in an experimental fishery, and so using this inverse sampling method, and so it's a way of estimating at least the

abundance of goliath grouper from relatively a very small catch of goliath grouper, and this could possibly also be done with data that already exist from MRIP, the MRIP data, or from the national park, the creel survey, data, if, in those data, you have the numbers not only of goliath grouper caught, but also the numbers of all the other snapper grouper that were there, that were in the creel, for example.

They count everything in the creel, and you've got the numbers of everything that were caught, including goliath grouper, and then it's sort of as if you've done one of these experimental fisheries in your creel survey, at least for the areas that the creel survey covers, and you could use the MRIP data, because they count everything, right, and so you could also do the same method with MRIP data, to get estimates of the numbers of goliath grouper in the areas that MRIP covers.

I guess you could get separate estimates for the three geographic zones that MRIP breaks down their data to, the inshore, offshore, and far offshore, or something like that, the three MRIP zones, and so I'm just saying that the inverse sampling might be a way of looking at how to use the data from an experimental fishery when you want to set a low number of goliath grouper, a low allowable catch of goliath grouper, from that experimental fishery to be able to at least estimate the abundance of the goliath grouper, to feed into your further analysis. Thank you.

DR. NESSLAGE: All right. I think we've got that on the board, and it would be interesting to see what that estimate looks like compared to any other, like Alexei's approach to getting an estimate of abundance, which, just from my point of view, as a stock assessment person, I feel like, if we go the route that Alexei is suggesting, of using the historical catch and any long time series of surveys to kind of then project forward what the abundance was, I feel like that's got -- We need to make a point that that's probably going to have to be a custom assessment model, and it doesn't need to be very elaborate, but it's not something that is going to come out of a canned program.

It could be done relatively easily by an assessment biologist who can do that kind of coding, but I think we need to make that apparent, so that it's not assigned -- People don't think, oh, we can just run it in ASAP or something, or SS, and magically the answer will come out, and it's going to have to be a custom code. Not complicated, necessarily, but a custom code would need to be developed. Anne, go ahead.

MS. LANGE: I have just a quick question, and this 200 limit -- Is this in the South Atlantic? Is this a South Atlantic Florida fishery?

DR. NESSLAGE: It's across both coasts.

MS. LANGE: Both coasts, and so the total of 200 for the entire coast of Florida.

DR. LORENZEN: I think that's correct, and the main South Atlantic distribution of the goliath is excluded from that harvest, and so it would be just off of southeast Florida, because that's where the greatest dive interest is, and so I think, effectively, probably more of the 200 will be taken from the Gulf than from the South Atlantic, but it's statewide.

DR. NESSLAGE: Dustin, to that point?

MR. ADDIS: The harvest area is all state waters of Florida, excluding state waters of Palm Beach County south, through the Atlantic coast of Monroe County, just to let you know.

DR. NESSLAGE: Thank you. All right. I'm not seeing any other hands raised at the moment. I would like to take the opportunity, in the next few minutes, because just a side note that we do have a hard stop at 11:00 for our next agenda item, and our presenter will be joining us virtually, and so we'll need to stop then, if not before, and so, in the next forty minutes, or if it takes us less time, but I would like to go through our consensus statements and make sure we're prioritizing and getting these a little bit more well ordered, and not that you weren't trying hard, Judd, and that sounded really rude. You were just trying to keep up with us, but I think we need to think hard about what our main points are that we need to make upfront, and then the gory details of various analyses and ideas we have can go a little bit farther down.

Our main take-home points that are overarching, and not just goliath-grouper-specific comments, probably I think you all were suggesting would come first, and would you agree, and so the issue of when you have a stock that has an ABC of zero, and there are certain statements we want to make right upfront, and then we can dive into some of the details. That first point, is that just a question that someone raised, or does that need to be reformed into a statement? I am not sure what that was referring to, other than -- Does anyone remember?

DR. CURTIS: I think that was to one of Fred's points, but we can rephrase that, instead of a question, and so I just jotted it down so we had captured it.

DR. NESSLAGE: So, if it's not something anyone is going to claim, we can get rid of it, too. Was this your point, Amy? The top one there, and is there a legitimate basis for changing ABC set to zero in the absence of sufficient scientific information and uncertainty? Carolyn.

DR. BELCHER: This is -- I am just going to kind of throw this, because this is one of the hardest things about having straddled both of these groups, between being on the SSC and the council, and I think Jeff is the only other person in this room that was around when we were going through these struggles with the original ABC sets to begin with, and Anne too, and so the difficulty with goliath was the fact that you had a prohibition.

ABC, really, at that point, when we did that, zero was never an arguable point for this species, and it was zero. Speckled and warsaw, we punched that window out more times than we set to zero, because of issues with the post-bycatch mortality, and so we knew that was going on, and so do you really set those equal to zero, knowing that it was more of a disallowance in the commercial fishery for that zero?

The difficulty with this is, at a legitimate basis, the question is do we have data that suggests, knowing that there is all these observable trends, and we have no assessment that can say anything for certain, and it's been rejected, but Florida is seeing an uptick, and there is this idea that we should be able to revisit, and how do we get that ABC away from zero, knowing that this has had sufficient protections for a number of years?

I think any of these -- I mean, is there a legitimate basis? I think there is, if you've got data to say that we're at a good stage, and so, to me, that's kind of one of those questions, and it's almost like loaded question, and is there a legitimate reason for us to question this zero? I mean, is there a

legitimate reason to consider any of the ABCs and changing them? I mean, you could ask that same question of almost any species, I think, right? Any time you go back in and we decide to discuss and how we're changing things, is there a legitimate reason for us to change any of it?

I think, again, just getting back to my earlier point about my question is what do we do in these situations where we have species that the ABC is zero? Do we have the sufficient data to do it? Have we chipped at everything to say the P* doesn't work, and we're looking at the generalized ABC Control Rule, to help us figure out what level we're going to, and, again, we're evolving off the page, and what do we do when we go off the page? This is off the page, and so help us find a procedure that's going to help us get it back on the page.

DR. NESSLAGE: Thank you, Carolyn. Okay, and so, to frame this, our response to the council, there is several key points, and you all can help me prioritize them, hopefully. The first is that there -- Well -- Sorry. I feel like I can't look at two things at once and find the thing that I'm looking for. Hold on.

DR. BELCHER: The other thing is, when you think about the assessment, the assessment is including Florida's data, right, and so any of the stock assessments is how we're defining the area of the stock, and so the fact that Florida does want to actually put fish in people's hands kind of does beg us to go back to looking at the ABC, because, as Shep said, it does indirectly relate to the federal waters as well, because those landings would all be included as part of the stock assessment, if you got to that point, as well. Does that --

DR. NESSLAGE: Yes. Thank you. Get rid of that first point. We're not doing questions, and we're doing responses. Thank you, and so we have the issue of we need to communicate that there needs to be -- In order to change any ABC, there needs to be sufficient information, right? There needs to be a -- For goliath in particular, and any other stocks that we would like to change the ABC that is zero, there needs to be a comprehensive review of the data, to see if anything has changed, correct, and it doesn't appear that that's -- If that has been done, it hasn't been presented to us, correct? I am getting blank stares.

The fact that we were asked what would it take, and to look at these data streams, but it wasn't presented, I guess is where I'm going, and I feel like, before we can give a goliath-specific response, we need some of the bullet points that are elsewhere, that I can't seem to find, and I know you wrote them down, Judd, about we need a review of the research recommendations for 47, and that needs to be upfront. In order to do something about -- We can pull all those up.

I am thinking that we might need to take a moment to reorganize these and then bring this back, because I think we've got all the ideas down on paper, and we just need to reorganize them, and so I might take a crack at this tonight and bring it back on the agenda tomorrow, but, Wilson, go ahead.

DR. LANEY: Thank you, Madam Chair. It occurs to me that, and see if you all agree with me, that there may be an analogous situation with respect to the Endangered Species Act and listed species for which possession or harvest or whatever is federally defined as zero, but there are criteria for determining when a species has recovered, and so, maybe if we look at what those are -- Those are specified, and I believe Shep could say whether those are mandated for the Fish and Wildlife Service and NMFS to -- They have to meet certain criteria in order to take something off

the list, and so that is sort of what we're considering here, maybe, and there is some analogy there, and it might be useful for us to look at what those criteria are for listed species, and we might be able to see if any of those would apply in this case, where we have an ABC set to zero, but, you know, in order for us to get the data we need, maybe there is some analogy there that would be useful for us to look at, and I don't know. What do the rest of you think?

DR. NESSLAGE: Just my quick response would be I think Shep essentially laid it out, and we need some estimate of the magnitude of the stock and MSY, according to Magnuson. How we get there and what sort of proxy we assume is up to the analysts and us, I assume. Kai, is that a wave?

DR. LORENZEN: Yes, and, I mean, I think it comes back to all these sort of risk-based things that we talked about, and so we can definitely -- There are a variety of methods that we could use to come up with a small number that is probably not too risky to take, but it wouldn't get us to anywhere near MSY, and that is, in the Endangered Species Act, and the question is not what is the MSY of this, but the question is, you know, can it withstand certain impacts without becoming endangered again, and I think we can do that, but I think getting to something, some sort of MSY estimate, is going to be difficult, and so this will have to be something that is based on other considerations, but, other than that, I wanted to support your idea of just taking it back and re-jigging it, because, otherwise, we'll be re-jigging it step-by-step by committee, and I'm not sure that's a good use of our time.

DR. NESSLAGE: Agreed. Dustin.

MR. ADDIS: Just to follow-up on what Kai said, largely the data sources for goliath have remained unchanged, and there is nothing novel or anything for us to consider in getting us to this MSY estimation, and there's just nothing new or robust to get us there.

DR. NESSLAGE: John Carmichael.

MR. CARMICHAEL: Just a thought, as you ponder reorganizing, and I think the real question here is you have an ABC that's based on management, and the question is should you have an ABC that's based on science, which then determines what the management will be, and maybe it ends up at zero, and I don't know, as has been discussed, and maybe running this through the working group that was discussed and Amy brought up, it seems like many hours ago, when the ABC Control Rule is approved and ready to go, is a good way, but I think that would be -- If the SSC agrees that the ABC should be based on zero, I mean should be based on science, then it's just a matter of how you get there, what you evaluate, and that's really what we're looking at.

You don't have to answer it today, but what would be necessary to actually -- What do you have now that you could look at, and what might really be useful to get, that could help you answer that question, or maybe even improve your estimate in the future, and so that's really all we're kind of looking at here.

DR. NESSLAGE: Great. Thank you, and I think we have a lot of good ideas down here, and I'm sure that the working group will come up with even more, and so I'm confident that we've -- I think we've got a good amount here. We are currently working on whether we can adjust the agenda. In the meantime, perhaps we could ask our illustrious SEP Chair -- Would you be willing to -- We could work on that agenda item while we're waiting for Will to come online and be ready.

Are folks willing to entertain that change to the agenda? All right. Do you mind? That would be great, and so we're going to change gears here and hear from our SEP, and then we'll go the Great Red Snapper Count.

SEP MEETING SUMMARY

DR. CROSSON: Good morning. The SEP met on Monday afternoon and Tuesday morning, and we were very efficient, and we finished up at 10:30 in the morning. Some of the items, briefly, that we went over is we had a discussion of citizen science, and, Jennifer, I don't remember much about that, and it was just sort of giving feedback, and, if you want to talk about it a little bit, you're welcome to. You participated in that more than me.

DR. NESSLAGE: Sorry to put you on the spot.

DR. SWEENEY-TOOKES: That's okay. I have notes. Yes, we got a citizen science update, and they talked about some of the key main projects that they are working on right now, one being a grant proposal to obtain underwater stereo camera access to an underwater stereo camera tool, as part of a larger project, and also working with commercial and for-hire and recreational fishers on the RELEASE program, with the motto of "Reel, Record, Release", and so they're finding that people don't really release many scamp grouper, and so they're trying to collect multiple datapoints now, in collaboration with fishers, trying to motivate access and motivate participation in these sorts of recording programs, by recreational fishers in particular, by recreational anglers, by bringing some of the for-hire fishers into tackle shops and doing outreach in collaboration with for-hire fishers, which we thought was a great idea. They are building -- I have a lot of really detailed notes.

DR. CROSSON: Yes, you gave me a lot of detailed notes. I'm sorry that I put you on the spot, and I haven't drafted up the SEP report yet, because people are still sending their notes to me, but, yes, Jennifer was in charge of that section.

DR. SWEENEY-TOOKES: I have way more detail than --

DR. CROSSON: No, you don't need that much detail, and so we discussed that. The second thing that we discussed, which was of high interest from a lot of the economists, were some of the -- Alexander Gordon is a post-doc, an econ post-doc, which is something that didn't use to exist, but the economy has changed, I guess, and so he's a post-doc at the Center in Miami, working with us, and he's been assigned to -- He's specifically been brought onboard to work on alternative ways for managing recreational fisheries, to get at data collection issues and discard issues.

Obviously, that's of high interest to both the Gulf and the South Atlantic Councils, and so he has been basically putting together a proposal, and he showed it to the Gulf SSC, I guess a couple of months ago, and he brought it to us as well, basically showing an alternative where you would -- Red snapper, of course, the season is longer in the Gulf, but they scream about it nonetheless, and so it would be a way of exchanging -- Initially at least, exchanging information for access, and so recreational anglers would be allowed to fish out-of-season for red snapper as long as they were providing data, rather intricate data, lots of data, about what they were catching, what they were encountering, when they were fishing.

We brought up -- He talked about it in terms of -- You know, initially, it would have to be some part of some quota set-aside, and it wouldn't impact the rest of the recreational fleet. Of course, we were also interested in whether you could change that around so that it would impact the rest of the recreational fleet, as a way of controlling effort, but, you know, it was a very interesting presentation.

We did say, in terms of what he was actually looking at, whether it would ever be applicable to the South Atlantic is an open question, but the idea of exchanging additional access to a recreational angler for something that's out-of-season we felt was a very strong incentive, and a lot of people would be interested in doing that, and, since that's the case, then we would also demand as much information as possible about those anglers and what they were doing and what they were fishing for, and, of course, being economists, how much money they spent, and so that was a long discussion, and that ate a good chunk of the first day.

We also reviewed the council's allocation decision tree again, and we did not have a ton to add, because this thing has come before the SEP and the SSC multiple times, and so I'm not going to go into much detail about that and was very minimal. The best fishing practices, that was something that Jennifer alluded to, and they're looking at the ways to engage with the recreational fishing community, and so, I mean, if you want to say more about that, and that was talking with guys that work at tackle shops was a big key to that.

DR. SWEENEY-TOOKES: It was, and it was a great set of guidelines for ways to approach working with recreational anglers on how best to approach issues that are really of concern to the council, but they know could be also of concern to the anglers, you know how to build alliances, how to build sort of collaborative work with the community, and could this include the ways that they phrase questions, which shops they approach, what are the best strategies for getting really positive feedback from anglers and from tackle shops, and so they had really a great set of guidelines, like some of their rules-of-thumb for how they were going to go about doing this, and so we offered feedback on that and sort of elaborated on different phrasing to use, maybe, or different strategies or different agencies to work with, in collaboration with, rather than showing up mainly just as council staff, that they might want to bring in a Sea Grant ally with them with they do this work in communities.

DR. CROSSON: So that was a good talk, and that was enjoyable, and council staff, Mike Schmidtke, brought up what we're going to be looking at, which is the red snapper discard issue, which, you know, we had a very frank discussion about that, and I'm sure that will continue for the SSC, but I will contribute more when we actually have that discussion, but the council has got to figure out ways to change management for this species, so that we can convert some of these discards to retained fish, and there are multiple projects that are ongoing that are trying to find a way to do that, and so I listened to the advisory panel meeting, like a week or two ago, and it was very illuminating what's going on, and so that's something that I guess we'll discuss this afternoon.

Then the last thing is that I did a quick presentation, and Tracy Yandle, our emeritus social scientist from this committee, who is now in New Zealand, and Tracy and I -- The last paper that wrote is under final review, hopefully, at a journal, but we were looking at the golden tilefish longline fishery, and we compared it to the Gulf golden tilefish longline fishery, and the Gulf -- Both of

them went from basically having a snapper grouper, or a reef fish, permit to something more intricate, in terms of management, around the same time, around 2009 or 2010.

The Gulf went to an ITQ, and the South Atlantic went to this endorsement that you get on top of your snapper grouper permit, and so there's about twenty-two or twenty-three of those permits that are out there for the tilefish longline fleet, and what we found is that both of these fisheries are profitable. The ones in the South Atlantic -- Unlike a lot of the snapper grouper fisheries, they are extracting rents out of the golden tilefish longline fleet in the South Atlantic. They're not extracting rents to the same degree that they are with the ITQ in the Gulf of Mexico, but crew members get a larger share, because quota leasing is deducted as a cost.

Most of the fishermen in the South Atlantic and the Gulf pay with -- You have a share system, and you get a portion of the profits, and that share is distributed after costs are taken out, and the costs, in the Gulf of Mexico, including quota leasing, and they do not in the South Atlantic, and so the fishermen do get a little bit larger proportion of the share in the South Atlantic. The flip side of it is that it's a derby in the South Atlantic that ends usually before Easter, and they burn through the quota, and they use trip limits as well, and so, because of the high fuel costs, they're also burning through all their profits on that side.

Trying to find a way out of this is the challenge for that fleet, and so that fleet is going to be meeting with the council staff, I guess hopefully in the fall, and so I'll be speaking to them about what I found and what they're looking for, and so we'll talk about some alternatives and what they could do.

One thing that is notable is that the combination of the endorsements and the tight trip limits and the derby in the South Atlantic have driven down -- The Gini coefficient is something we use in economics to measure inequality, and so, basically, most of the fleet is catching the same amount of fish now, because they have to, because it's a derby, because they have a tight trip limit, and there are so few of them, and so the landings are fairly equally distributed, and so they decided to move to something where they try to, instead of distributing quota to individual vessels, and it probably wouldn't be as contentious as it would be for a lot of other fisheries, because the landings are already pretty equal, and so we'll see how that progresses, and that's it, I guess, for the SEP.

DR. NESSLAGE: Thank you, Scott. Are there questions? Wilson.

DR. LANEY: Thank you, Madam Chair. In that discussion -- That concept of allowing fishermen to fish outside the season, in exchange for information, is really an intriguing and attractive concept to me, as an angler.

DR. CROSSON: For you as a fisherman.

DR. LANEY: Exactly. Did you all discuss though that the fly in the ointment would be how you validate the data, and so what would prevent me, as a fisherman, and I will use myself as an example, from going out there on a fishing trip, outside the season, and catching however many fish I want and then just making up the data?

DR. CROSSON: Yes, that was definitely something that we would have to be finding a way to wrangle around, because one of the other things we were talking about -- One of the big needs that

we have in the South Atlantic is knowing just sort of -- If you were to just go out fishing in different regions of the South Atlantic Council's jurisdiction area, what would you pull up? If you were required to retain the catch, what would be kind of the distribution of fish that you would pull up, basically different species, different sizes, because that would be very useful, for management purposes, and, of course, it's going to vary quite a bit as you go from the Carolinas down to South Florida, and so if there was some way of measuring all of those things, but how do you enforce that is a big question.

Telling people they have to retain everything that they catch and bring it in, so we can measure it and weigh it and verify it, that's an open thing, because, yes, you're not going to get the Coast Guard out there standing and watching them.

DR. NESSLAGE: Chris.

DR. DUMAS: To that point specifically, there's a set of methods that accountants use to detect fraud in accounting data, based on the frequency distributions of digits and the numbers that are reported, and it's based on something called Binford's Law, Binford's Rule, and the variance of that, and so that could be something that could be looked into and applied to validating -- Looking at validating those types of self-reported data, and so the validation issue that Wilson brought up.

DR. CROSSON: I remember, at one point, when I was working for North Carolina DMF, they found one of the recreational port agents was engaging in fraudulent activity, and was just basically making up -- He or she wasn't going to the dock, or going to the intercept spot, and the way we found it out there -- I mean, I think they noticed that the landings were different, but they also noticed that the license plates were nonsense, and so they checked the DMV, but yes.

DR. DUMAS: Right, and so it's the collection methods, and it's that same idea, but, in order to not be detectable, in order to hide your fraud, you have to be a pretty advanced statistician, in order to be able to know how to make up data in way that's not detectable, and it's pretty hard to do, and so that's something that we could look into for this particular issue, but also in general, for any type of self-reported data, citizen science data of any type that's being self-reported and there's a possibility that folks are making up data.

DR. NESSLAGE: I have a golden tilefish question, of course, and so it's two parts. The first part is how interested is the fishery in getting away from the derby approach in the South Atlantic, and I will ask my second part in a second.

DR. CROSSON: They are very interested in getting away from the derby, but how they get to that point -- Maybe Chip will come up and contribute, but they would like to get away from the derby, because, right now, they are trying to find ways, and the council is trying to find ways, to time it, over and over again, and the timing doesn't work very well with a derby, because you have incentives to just catch it as quickly as possible, and they're trying to do this sort of management, and like, oh well, if we started a week later, could we get to this -- Or could we get to orthodox Easter, and it's like all these questions that we're trying to do, when, in some years, the quota has been snapped up long before you ever got to Easter, and so it's tricky, and I think there's a lot of dissatisfaction.

What they want in exchange, what kind of different management they want to shift to, is something that's going to have to come up, but I heard, during the council meeting as well, the last council meeting, just the shooting up of fuel prices is -- When you have trip limits, and this affects lots of the commercial snapper grouper fishery, and that's the biggest input for a lot of this stuff, and so, if fuel limits go up, and one of the things that you all saw when Christopher Liese came and did his presentation, a year or two ago, is that's the big -- Compared to the Gulf, the South Atlantic burns through fuel.

That's what you do. That's what the trip limits do. They exchange higher fuel costs for control, and so, you know, the excess -- It's not excess labor, and it's not rents or anything like that, and it's like where is the cost savings in the South Atlantic, and the cost savings is in fuel used, because they burn like three or four-times as much per pound of fish in the South Atlantic than they do in the Gulf, and that's what trip limits do. They force you to go back and forth, back and forth, back and forth, and the problem with it, of course, as well, and this has been brought up repeatedly, is that you can't react to fuel prices. You can't react to change management in time to react to fuel prices, and so they fluctuate too quickly, and so any kind of economic assumption about profitability now, based on fuel prices now, is out the window a month from now, or six months from now.

DR. NESSLAGE: Thanks. I guess my follow-up comment is just to remind folks that the longline index, if I remember correctly, Erik, was the last few years were dropped out of that assessment, because of concerns about that index -- The catch per unit effort for the commercial longline was no longer reflective of abundance for a number of these reasons that you were just describing, and so I would encourage -- I think you all would probably agree with me, perhaps, that anything that can be done to bring that back as an information source would be -- For CPUE, because we're not -- Granted, there hopefully will be more from the new bottom longline survey, but it's always good to have more information, and so, from a stock assessment perspective, I'm glad you're working on this problem. Thank you. Other questions or comments for our SEP, our hardworking SEP? All right. Thank you.

DR. CROSSON: So, in the next week or two, I will get the report drafted up, and it will get sent out. A draft of that will get sent out with the SSC notes, and people can comment more if they wish to.

DR. NESSLAGE: Brilliant. All right. Then let's continue on with our next agenda item, which is an update on the South Atlantic red snapper count, and I believe we have Will Patterson online. I know we're coming to this agenda item a few minutes early, and I'm being reminded that we need public comment for the SEP Report Update. Do we need that?

DR. CROSSON: People had the opportunity to comment during the SEP meeting itself, and so I don't know.

DR. NESSLAGE: We might as well open the floor, and so let's reverse direction and go back. If anyone in the room or online has a question or a comment from the public, raise your hands and speak now. Okay. Nothing? Okay. Back to -- Folks are whiplashing around. Back to the South Atlantic Red Snapper Count, Agenda Item 6.

I would draw your attention to Attachment 6, and this is Dr. Patterson's presentation. He will be providing us with an update on the South Atlantic red snapper count project that is trying to provide an estimate of absolute abundance of red snapper in the South Atlantic, and, Will, are you ready to go early? I appreciate you accommodating our schedule.

SOUTH ATLANTIC RED SNAPPER COUNT OVERVIEW

DR. PATTERSON: Yes, we're good to start. Thanks for the opportunity, and thanks for the floor, Madam Chair, to talk about a study that got underway in 2021, Estimation of U.S. Atlantic Red Snapper Abundance. I noticed, on the agenda, it was called a count, and I know the study in the Gulf was called a count, and we have purposely tried to stay away from using the word "count", but refer to this as an estimate of abundance, and you can see, by the logos at the bottom, that we have a pretty diverse team from the University of Florida, NC State, Texas A&M at Corpus Christi, NOAA Fisheries, Florida FWC, South Carolina DNR, and Georgia DNR, and so academics as well as agency scientists on the team, and it also uses quite a bit of cooperative research among commercial and recreational fisheries, as well as for-hire recreational charter boat captains.

Again, our study team is quite large. In the top-left, those folks are at the University of Florida and are responsible for ROV surveys and getting data to the modeling team working on the Bayesian integrated modeling approach to estimating population abundance. In the top-right, you can see Dave Portenoy, and he leads the genomics group, he and Chris Hollenbeck at Texas A&M Corpus Christi.

In the center-left, you see Jeff Buckel, who should be in the room with you there, as a member of the South Atlantic SSC, and this is the Bayesian hierarchical integrated modeling team, and then Paul Rudershausen also is focused on interviews with fishers, that we're going to talk about here in a minute. Bev Sauls leads our team at FWC, and she has been -- As a group, they've been phenomenal in getting fin clip samples for our genomics work, and then we have a large presence at NOAA Fisheries and NOS, with Nate Bacheler and Kyle Shertzer from Beaufort, Eric Anderson from the west coast, and then Chris Taylor with benthic mapping at NOS.

South Carolina DNR, we have Marcel Reichert, who has just retired, and Wally Bubley and Dawn Glasgow, and Dawn has recently left the agency, and so Wally is the lead and sole member of our team now at South Carolina DNR, and then Dawn Franco in Georgia.

Those of you in the room probably know a little bit about the background here, but Congress allocated funding to estimate red snapper age-two-plus population size in the Atlantic in 2020, and South Carolina Sea Grant hosts the program, the South Atlantic red snapper research program, and they competed among the regional Sea Grant offices, and they were selected as the host.

The first RFP was in 2020, for $1.5 million in funding, and there's been a second RFP, or there was a second RFP, issued in 2021 for an additional $1.7 million in funding, with a potential $1.6 million in additional funding, which is pending congressional appropriation, and so, the team of folks that I just introduced to you, we won the competition in 2020 for the initial funding, and the second round of funding has just been announced, and so we'll be expanding our work, and there is the potential, again, for additional funding, and so what I'm going to talk about today is our

objectives for the first two rounds of funding, and then I'm briefly, at the end, going to talk a little bit about what we plan to do if Congress decides to allocate this additional $1.6 million.

Our study objectives and approaches, the first is to estimate the distribution and density of red snapper across the U.S. Atlantic shelf from North Carolina through the Florida Keys with remotely-operated vehicles in unknown or unconsolidated habitats. The second is to develop a hierarchical Bayesian integrated abundance model to estimate age-two-plus red snapper population size, based on SERFS, which is the Southeast Reef Fish Survey, trap-camera, ROV, and habitat data.

The SERFS trap-camera, there are three components. There is SEFIS, and that's run out of NOAA Fisheries in Beaufort, and then there is MARMAP and SEAMAP South Atlantic, which are run by the DNR folks there in South Carolina, and so Wally Bubley's team. The habitat data, this is work that Chris Taylor and his post-doc, Pickens, have recently published, as well as other habitat data that are being collected by study personnel that I will get to in a moment.

The third objective is to conduct genetic close-kin mark-recapture analysis, and also to estimate age-two-plus red snapper population size, and so our plan is, and the plan that has been implemented, is to produce two independent estimates of age-two-plus red snapper population size in the U.S. Atlantic. Then, fourth, a really important component of our study is to integrate and reconcile study results with the Atlantic red snapper stock assessment model, and so we built this into our program to be thinking ahead about how to best do that and utilize results produced by the study.

I am going to run through these various study components, and we'll talk about the Bayesian hierarchical integrated modeling. Folded into that will be the ROV sampling, and we'll talk about the SERFS trap-camera sampling, and we'll talk about fishermen interviews, collecting habitat data in a different approach than a technological approach, and then I'll get into the close-kin mark-recapture.

We do have a draft red snapper genome, which Portenoy et al. published in 2021, and we have quite a bit of data on Atlantic red snapper population dynamics, which these rates and arrays, or matrices, or vectors or matrices, of population dynamic data are important inputs to the close-kin mark-recapture model, and so we have a plethora of information already collected with respect to those rates.

Fin clip sampling, I will talk about how we're sampling and tell you year-one results of that sampling, and then a new approach to estimating age, methylomic ageing from fin clip DNA, and so I'll talk about how we can utilize regulatory discards are DNA samples, even though we don't have otolith samples to go along with those fin clips, and then I'll talk about integration and reconciliation with the stock assessment and then ideas for this potential future funding. Having Dave and Jeff here on the call, we'll be able to, among the three of us, answer, or attempt to answer, any questions that come up from the SSC members.

The hierarchical integrated modeling approach, again, the objective is to estimate Atlantic red snapper population size with a coefficient of variation less than 0.3, and so that was stipulated in the RFP, and the data sources here are trap-camera data, ROV data, and habitat data, and so the approach is to integrate red snapper, the density estimates, from multiple survey methods to jointly

estimate red snapper abundance at three spatial scales, and this is where the hierarchical approach comes in, and so have at the survey site, which is the scale of about -- That should be 1,000 and not 10,000 meters squared, or that is, excuse me, 1,000 meters squared, and we have grid cell, which is twenty-five kilometers squared, and then we have the survey area, which is 100,000 kilometers squared.

We have habitat suitability, to be informed from study video data, and so the surveys from ROV or the cameras from the traps will inform a bit about habitat, but definitely suitability, where red snapper are found and where they're not. We have fishery-dependent data sources, and then we also have informed priors from previous studies and recent mapping, and this is where Chris Taylor's input is critically important to our efforts. Then, third, we have separate observation models, to account for different detection probabilities and effective sampling areas for the ROV, traps, and then cameras, which are mounted to the traps.

Now, when utilizing these various survey methodologies, to try to estimate density, or scale that to abundance, we have some challenges that we're aware of, and these include converting counts to density estimates, spatial variation in abundance, and detection can vary by survey method, and so detectability, and our ability to estimate that is critically important, and then, also, spatial sampling, and so we have different sampling designs for the different surveys, and actually different frames. The ROV sampling goes from the Virginia-North Carolina line down through the FLorida Keys, whereas the SERFS sampling is more focused in the central portion of the overall study frame utilized by the ROV.

I am not going to get into any great detail here about the various approaches which we're taking to try to understand these sources of uncertainty and overcome the challenges, but I will say that, among our team, Nathan Hostetter and Krishna Pacifici have done a considerable amount of work, using N-mixture models to look at detection probabilities, for example, and Kyle Shertzer and Nate Bacheler have been examining some of the spatial dynamics, along with Jeff Buckel's team at NC State, of red snapper and other reef fishes in the system, and then my group at the University of Florida has undertaken some of these same types of analyses to understand detectability and behavior of red snapper with the ROV gear during the snapper estimation study in the Gulf of Mexico.

This is just a handful of recent papers that examine some of these processes and trying to understand the potential biases and how to account for or mitigate those biases in our sampling, and we have other sampling, which is ongoing in the current study, such as sampling sites jointly with the trap-camera gear and the ROV sampling. In year-one, we had sixty of these joint stations, and, this coming summer, we'll have sixty additional stations, and then, in our proposed additional funding, we have some other approaches to try to examine some of these spatial dynamic and movement dynamic behavioral issues, as well as the detectability issues that will -- Any type of optical gear that's used to try to produce an abundance estimate potentially will suffer from.

The ROV gear that we utilize are these mini Pro-4, video array Pro-4, ROVs. On the left-hand side, you can see the ROV that we utilize. They weigh about six kilograms, but, despite their small size, they are quite robust, and we've done a few thousand dives with these in the Gulf of Mexico and the Atlantic, surveying reef fishes. The bar that you can see across the bottom here of this ROV, and has a camera housing to the left and a camera housing to the right, and this is a stereo camera housing, and we've actually published a paper on this methodology.

With the mini-ROVs, it's a robust estimate with high precision, and so we utilize that to estimate the size distribution of fish that we see, and, typically, on a given site, we can estimate between about 15 and 20 percent of the fish that are observed, and we can estimate their size. The ROV itself is tethered to the surface, using the yellow tether that you see below, and then there's a control panel that the ROV pilot utilizes to fly the ROV across the seabed, and then this is a camera view of the ROV looking down on an aggregation here of red snapper on some live-bottom habitat off the coast of Florida.

In 2021, we did 267 ROV surveys, and these were randomly selected across the shelf, and you can see that the spatial distribution -- They appear to be in clusters, and that's because of the selection of the cells to be sampled across the shelf in these regions, and so this is our 2021 sampling. Then we have a little bit of a tighter cluster here off of northeast Florida, and a little bit of a tighter cluster here off of southeast North Carolina, and these were areas in which we used the randomly-selected SEFIS samples to do paired sampling with the ROV and the trap-camera, and so that's why the density of sites looks a little bit different in those regions.

The ROV sampling is done with for-hire recreational charter boat captain cooperators, and so we used the eleven vessels that you see pictures of on the right in 2021, and then, in 2022, we will sample in the areas shown here in yellow, and so this sampling will get underway actually at the end of next month and carry through until late summer or early fall. We plan to sample another 300 sites in the coming year, and fifty of those sites will be artificial reefs, identified by Pickens and Taylor, and then we also plan to focus some more on shelf-edge deeper sites in all of the study region, from about central Florida up through southeast North Carolina.

The SERFS sampling, again, this is MARMAP and SEFIS, as well as SEAMAP South Atlantic, and I accidentally omitted that from the title here, and it's trap-camera sampling, and so you can see the distribution of stations, and there's a little over 2,200 sites along this distance from Cape Hatteras down to Port St. Lucie in the central east coast of Florida, and these are the typical trap-camera gear that the SSC is used to considering, as far as competing indices of abundance, with cameras mounted exterior to the chevron traps and then a camera inside the trap, to look at who is entering and leaving, and then the view at the top here is the camera facing out from the chevron trap deployed on that reef habitat.

The sampling for the SERFS survey in 2021, 2022, and 2023 will be of similar magnitude, somewhere around 2,100 or 2,200 stations, across the distribution that you see here, the spatial distribution of samples.

Then we also have fishermen interviews, and so the objectives of these are to increase our knowledge of hardbottom habitat distribution in the U.S. Atlantic from North Carolina to Florida. The second objective is to estimate the spatial distribution of fishing effort and relative catch rates of commercial red snapper fishermen. Our approach was intended to be in-person interviews, conducted by Paul Rudershausen, but this has been complicated by COVID-19, and so the sort of amended approach is to contact fishermen via questionnaires through the mail, and so there's a cover letter, and then there are region-specific maps for the fishers to indicate where reef habitat exists in their fishing area, where their fishing effort occurs within that area, and then the relative catch rates of red snapper in their fishing region.

Thirty-two fishermen initially were contacted, and I believe eight more have been contacted since that initial group. Of the initial group, six have responded, and so hopefully we'll get responses from a large percentage of the remaining twenty-six, but, folks who are listening into the call who have been contacted, but have not yet had a chance to fill out their maps, please participate in that, and your information is critical to our study success.

On the right-hand side over here, you can just see the northern region map here, and so we have a northern, a central, and a southern region, depending on where the home port of a given commercial fisherman is, and they get sent maps for those regions, to indicate where their fishing typically occurs.

The next main component of the study is close-kin mark-recapture, or the genomics portion, and, really, there are two main objectives here. The first is to estimate red snapper population size in the U.S. Atlantic, and the second is to estimate red snapper genetic population structure. In the Portenoy et al. 2021 paper in the Atlantic, there was no difference across the Atlantic region. There is no genetic structure indicated among the samples, and I will show you that distribution here in a second, but perhaps, with additional sampling, we may have a better chance of finding structure, if it does exist, and clearly that will have implications for conducting close-kin mark-recapture analysis, and so that's an important secondary objective here of our work.

The approach is to collect fin clip samples of Atlantic red snapper, up to 5,000 per year for three years. Initially, in our initial funding, we said we would do at least 2,500 a year for two years, and the red snapper -- The most recent red snapper assessment was finished after our original proposal, and the estimated population size tripled, and so we were conservative in our ability to collect fin clips, and we've been able to get many more than we originally committed to, and so we will be able to, with our enhanced sampling, as well as our successful fin clip collections so far in year-one and the beginning of year-two, we will definitely be able to get a sufficient sample size of fin clips to meet our objectives.

The second part of the approach is to develop a genotyping in the thousands, develop panels to allowing throughput sequencing of 400 microhaplotypes, and so two panels that we can do 200 of this SNP-containing loci on each of the panels. That work is nearly completed, and there's a couple of reactions that Dave and his group, Dave Portenoy and his group, are working on optimizing, but, otherwise, in the next month or so, we should start to do the actual sequencing of the samples collected in year-one.

Then, lastly, sequencing of fin clip samples and conducting population size estimates with the close-kin mark-recapture model, and so the code for this -- We have CKMRsim and CKMRpop, which are available in GitHub, and these are R packages that were written by Eric Anderson, a co-PI on this study, working with Dave on the analytical side of this work.

Again, we have a considerable amount of a priori information here about the red snapper genome, as well as population dynamics in the region, and so the paper shown on the left is a recent paper from Portenoy, as the lead at Texas A&M Corpus Christi, and you can see the spatial distribution of samples from the southern Gulf on the Mexican shelf, through the northern Gulf of Mexico, and then into the U.S. Atlantic, and I will point that we just have this one location here off of the east coast of Florida, just south of Canaveral, and then from South Carolina through southeastern North Carolina.

With our fin clip sampling in the current study, we'll be able to fill in some of the spatial dynamics here along that area of the shelf and perhaps get a better idea of what the genetic population structure of red snapper is in the Atlantic versus the Gulf of Mexico.

The figures to the right, and the papers that are shown, are just to demonstrate the rich amount of information that exists on red snapper reproductive biology, and some of this is fairly recent from Sue Lowery-Barbieri and her colleagues at FWRI, as well as the MARMAP folks in South Carolina, and then a series of different age and growth papers that have been published through time, as well as the growth function, and that was part of the most recent SEDAR assessment, SEDAR 73, for red snapper.

The genomic information is important, because not only do we have the population structure information going into the model, but Dave and his group have produced a draft genome for red snapper, and so this really enhanced our ability, Dave's group's ability, to produce the panels that will be utilized in the close-kin mark-recapture sequencing that is going to get underway, and so the panels are nearly developed, and then the sequencing will start soon, and so we were able to leverage that earlier work, quite successfully, to get up to speed quick rapidly, in that respect.

Our fin clip sampling, we did simulation work, and, again, this is with Eric Anderson's CKMRsim model, ahead of our first proposal submission, and so you can see, on the panel on the left here, we have the coefficient of variation on the Y-axis and then estimated population size in millions of age-two-plus fish on the X-axis, and so two simulations were run with different assumed population sizes, and so, starting at what was estimated to be the population size at the time, 500,000 age-two-plus red snapper, and then doubling and tripling that, to one and then 1.5 million fish, and then assuming that we would be able to get 2,500 and 5,000 samples per year for two years of sampling, which was in the initial proposal.

The reason that we estimated up to three-times is because, if we estimated a higher population size than what the assessment was estimating, we wanted to still be able to do that with the prescribed CV of 0.3, and so what our simulations showed us is that, if we sampled at least 2,500 fish per year for two years, and even if the population was three-times larger than the then current estimate of 500,000, and so it was actually 1.5 million age-two-plus fish, we would still be able to meet our threshold of a CV of 0.3.

Again, after that proposal was submitted, SEDAR 73 came to a completion, and the population size estimate was then 1.5 million fish, and so, instead of being our upper endpoint, it became our starting point. Given the fact that we're sampling -- We sampled 5,400 fish in year-one, and we should be able to do that in the next two years, even though our population size is now estimated, from the assessment, to be 1.5 million, if we estimate a larger population size than that, with the close-kin mark-recapture methodology, we still should be pretty safe, as far as our precision of our estimate.

Our fin clip sampling has occurred in a variety of manners, from regulatory discards to sampling carcasses from commercially-harvested fish to sampling recreational fish, or commercial harvest, at the docks, and the next slide shows the size distribution of the fish from these various sampling programs, and so we have recreational sampling and commercial sampling in Florida, and, again, this is led by Bev Sauls' group at FWC.

We have SEFIS sampling at-sea, and so Nate Bacheler has led that effort. MARMAP and SEAMAP South Atlantic, Wally Bubley, has led that effort, and North Carolina recreational and commercial, and so Jeff Buckel's group has led those efforts, and then recreational harvest in Georgia, and Dawn Glasgow has been leading those efforts, and so our team up and down the coast was really busy in 2021, and, in addition to the samples that you see here, which are 4,382 fish collected with otolith samples, about a little over half of which have now been aged, but we're hoping, by later this spring, we'll have all the age data from the first year of sampling.

We also sampled 1,019 fin clip samples from regulatory discards, and so this is also Bev Sauls' group in northeast Florida, or the east coast of Florida, sampling fin clips, and so having the age data is really important for these fin clip samples, when we're doing the close-kin mark-recapture analysis, and you might question then, well, what's the utility of a fin clip sample from a regulatory discard, and, well, recent work that Dave Portenoy and his colleagues have performed -- His graduate student, Nick Webber, led the paper on the left, and it utilizes epigenetic, or also called methylomic ageing, to develop clocks to utilize methylation and demethylation processes at different loci in the red snapper genome as a means to estimate age.

Over time, the DNA molecule becomes methylated, or demethylated, in certain locations, and I'm not going to get into the details of Nick's work here, but just to show you that the loci that we utilize for red snapper -- The otolith-derived age agreed -- Excuse me. The epigenetic age prediction agreed very well with the otolith-derived ages for these samples, and you see the R^2 of 0.9995, and that's actually even higher for red grouper, to the fourth decimal place, but still it's a little bit higher, and we have a project that Dave leads, from Saltonstall-Kennedy, to further develop the methylomic clocks for red snapper and red grouper, and so, in the current study, the red snapper work is critically important, and so we sampled last summer, and we continue to sample to try to get large, old red snapper from the eastern Gulf of Mexico, the U.S. Atlantic, and the western Gulf of Mexico, but the plan is to use this approach then to estimate the age for the fin clips of regulatory discards. Among our samples in 2021, about 20 percent were from regulatory discards, and so we can clearly enhance our sample size significantly by utilizing fin clip samples from these regulatory discards.

A really important component of this work, these studies, is integrating them, integrating the results, into assessment and management, and so I was part of the study which involved the Great Red Snapper Count in the Gulf of Mexico that was led by Greg Stunz at Texas A&M Corpus Christi, the Harte Research Institute, and so we had a team from across the Gulf of Mexico, and then different members, like John Hoenig from VIMS, for example, from Virginia, was a member of our team.

In this study, overall, which you may have heard something about over the past couple of years, and so, in this Gulf of Mexico study, optical methods, and so mostly ROV or towed camera rig gears, were utilized in all of the regions, and so from Florida to Texas.

In Florida, we exclusively used the ROV approach that I ran through earlier with the ROV transects. Off of Alabama, there was a depletion method which was utilized off of Alabama and Mississippi, in addition to the ROV methods, and then, in Texas and Louisiana, in addition to ROV and towed camera, there was a sonar approach utilized, which was important in those regions,

because the water clarity can be quite low, and so high turbidity, due to the Mississippi and other rivers flowing onto the shelf, and it's a highly-productive system, but it greatly affects visibility.

The key difference is it's mostly optical approaches, but then sonar as well, in the Gulf of Mexico, versus one method that we're using is mostly optical, but also trap catches, but then using the close-kin mark-recapture to produce a second estimate of population size in the Atlantic.

In the Gulf study, a random forest model was computed, and this was work done by Zack Siders and Rob Ahrens to predict high, median, and low probability of encountering red snapper, and this was done for the analysis of numerous fishery-independent and fishery-dependent -- It was mostly VMS data from the commercial fishery, and so these datasets were -- They had really strong spatial coverage and much more comprehensive than what we had available, potentially, in the Atlantic.

Then there was a stratified random design, which was implemented based on the random forest model. It was followed explicitly in Florida, and there were modifications in other regions, based on local conditions, and so I won't get into all of those details, but, if you read the Great Red Snapper Count report, you will notice some differences among regions, as far as sample design, but the random forest model was then utilized, despite some of these deviations, to produce a population estimate, and, again, the target CV was less than 0.3, and, overall, that study produced a CV of less than 0.2.

No attempt was made in the Gulf of Mexico study to integrate the red snapper population estimate into the stock assessment or otherwise reconcile differences between the assessment estimates and the study estimate until after the study was completed, and so, in hindsight -- Again, I was a member of that team, and, in hindsight, it would have been smart of us to kind of push more, or consider more, the need for this type of integration and reconciliation, and so, having gone through that process, it was something that I knew that we needed to do, or I thought we needed to do, in the current study in the Atlantic, is to be thinking about those processes earlier and not after the study was completed.

In the Great Red Snapper Count, in the Gulf of Mexico example, the Great Red Snapper Count results were presented to the Gulf's SSC in March of 2021, and this was after CIE review, and, actually, that fall, and I think it was in October, Congress wanted to have a presentation of what the results of the study were, and so there was that sort of early release of data and estimates, well before any scientific or peer review had occurred.

The Gulf SSC passed a motion to have the Great Red Snapper Count results go through a CIE review, which is, obviously, a pretty high-level review, and I thought that was a really great idea, and that occurred, and the CIE review results were presented, as well as the Great Red Snapper Count study results presented, at the March 2021 SSC meeting.

There was an interim assessment approach proposed by the Southeast Fisheries Science Center, which was based on scaling assessment projections with the Great Red Snapper Count population estimate, and the 2021 OFL was estimated as a three-year average by the Gulf SSC of the scaled projections, and so the value of the estimate was 25.6 million pounds, which was a pretty substantial increase of about ten-million pounds over the then current estimate, or the then current ABC, and so this was assuming 13 percent of the Gulf uncharacterized bottom UCB was targeted by the red snapper fishery.

One of the significant results of the Gulf study was that a fairly large percentage of the red snapper biomass, particularly in the western Gulf of Mexico, was estimated to occur away from structure habitat, and so this 13 percent was important, because it basically scaled the available biomass to the fishery, the biomass available to the fishery, from the Great Red Snapper Count estimate.

The ABC was set at 15.4 million pounds, which was based on the independent assessment results scaled to -- Not independent, but the interim assessment results scaled to the Great Red Snapper Count population estimate, but informed by the updated bottom longline index through 2020. Some other data streams were only available through 2019, but the bottom longline through 2020 was important, because of a downturn in that index was perceived by some Gulf SSC members as perhaps a warning, or to be precautious, and so, in the end, there were these two different approaches to setting OFL, or estimating OFL, and setting ABC.

This caused some consternation, and we got sort of informal feedback from stakeholders and council members about how -- Why two different approaches were utilized, instead of going through an ABC-control-rule-type process, and some of the answer to that was, well, this wasn't an assessment, and this wasn't a process that lent itself easily to using the P* approach in our ABC Control Rule, and so lots of discussion, lots of back-and-forth, and it was somewhat contentious at times, but this was what came out of the Great Red Snapper Count as far as the 2021 OFL and ABC estimates for the Gulf.

In 2022, at the last Gulf SSC meeting, the OFL was estimated as 18.91 million pounds, and this was based on an ensemble approach of Monte Carlo simulations which assumed a range of zero to 15 percent of the uncharacterized bottom habitat was targeted by the fishery and taking a five-year average of OFL projections, and so that zero to 15 percent -- That was kind of thought of as the plausible range, and so the range of simulations, different simulation runs, were done assuming zero, seven-and-a-half, and 15 percent. They were combined in this ensemble approach to increase the variance in the OFL projections.

Then the ABC was set at 16.31 million pounds, based on the probability density function around the OFL, or the probability density function of the OFL estimates, with OFL, obviously, at 0.5, and then using a P* value of 0.3, and so the Gulf Council's risk policy allows the SSC to select a P* between 0.3 and 0.5, and there is a control rule that is utilized to pick that, based on the type of assessment and ecosystem consideration, et cetera, and there are different tiers of information that are utilized to discount the OFL to ABC, based on the PDF, the OFL PDF, and the selected P* from this other information.

In this case, the Gulf SSC selected the lowest possible value, according to the council's risk policy, of 0.3, and so the ABC for the coming year then is set at 16.31 million pounds, and so quite an involved process, and, again, I think perhaps some of the clunky nature of how this evolved was due to the fact that we just didn't think ahead enough about how this would eventually be incorporated, and that caused some of the issues that I think have resulted thereafter in the Gulf situation.

We built into the initial proposal here, and Kyle Shertzer is a critical component team member here of our group, and we built integrating population estimates into the assessment and management, and so our plan is to evaluate two different assessment approaches. One is to scale

the current assessment model to externally-derived abundance estimates, with associated error, and the second would be to integrate the new data sources and methodology into the assessment model, and so build the close-kin mark-recapture estimation procedure into the likelihood framework of the assessment model. Now, neither of these have been attempted, to this point, but this is the plan, to take those two general approaches.

Kyle Shertzer has an internal MARFIN proposal to fund a post-doc to begin to do this type of work, through simulation, and then eventually attempting to integrate study estimates into the BAM model for red snapper in the Atlantic. If that proposal isn't funded, we'll find a way to fund it with study funds, through the South Atlantic red snapper research program, and then there is the next research track assessment, and the plan is to incorporate study results into that next research track assessment, which is scheduled to start in 2024.

I am going to walk through the timeline of the current study here in a second. 2024 is the start for that, and that may be a little optimistic, if the plan -- If one of the chief reasons to have a research track assessment is the next red snapper assessment is to incorporate these externally-derived estimates of abundance, but that remains to be seen, and I just kind of wanted to highlight that at this point. If that's early in 2024, versus later in 2024, I think it's going to make a difference, and Kyle can speak to that as well.

Potential future funding, and so, again, there's this $1.6 million which Congress may or may not allocate next year, and we think it would be quite useful for refining some of the information that goes into one or both of these estimation procedures. One thing that we would like to do is to conduct a conventional tagging study, a high-reward tagging study, and so Dave Chagaris produced the simulation runs that you see on the left, again with an attempt to estimate F with a CV of less than 0.3, and so we have that work that we've done, anticipating this additional funding, and so that conventional tagging study would start next year, if that funding came through.

Another aspect of habitat surveying that we would like to do is to combine some AUV transect work with the SERFS surveys, and this would mostly be conducted with MARMAP and SEAMAP South Atlantic folks, and the AUV that you see there is from the Monterrey Bay Research Institute, and the actual partners here would be at Harbor Branch, but I couldn't find a good image that they had on their website, and so I borrowed this one from Monterrey Bay, but the idea would be to deploy the AUV in a given area while the trap-camera survey was being conducted, allow the AUV to mow the grass and collect the multibeam and reflectance data from the sediments, and then have the AUV return to the ship, as then it departs and moves to the next general region to deploy traps.

Another thing that we would like to do with the additional funding would be some three-dimensional telemetry to further examine gear calibration, and also potentially to derive independent estimates of natural mortality, M, and the figures that you see on the left -- These are from some three-dimensional telemetry work that Jeff and Nate Bacheler and a series of students at NC State have conducted through the years, and so there's a lot of expertise in utilizing these gears, as well as in attempting to estimate M, using joint tagging models.

My group has done quite a bit of this large-scale three-dimensional telemetry work in the Gulf, and it informed some of our estimates of red snapper behavioral reaction to the ROV and other gears that we utilized in the Gulf study, and so our plan is to deploy these large-scale, on the scale

of thirty to fifty square kilometers, on the shelf and utilize the telemetered red snapper to examine behavioral reactions to baited traps, to ROVs, and then potentially to do joint tagging work to estimate M.

Then, lastly, we would like to utilize these additional funds to look for sex-identifying genes in red snapper. Most fish species don't have all their sex-determining genes on a single chromosome, and so it's more difficult to take genomics approaches to estimate sex, but, given the draft genome for red snapper, we have sort of a leg-up for this species, but this is work that Portenoy and Hollenbeck would pursue if this additional funding came through.

Our timeline for study components, you can see that this started in April of 2021, and so we've had one full year and a month from the initial study, and then that was to go through the end of 2023, but now we have funding that will carry us into 2025, and, at the top here, you can see the various components, and so we have the ROV and the SERFS surveys, and we conducted them in the summer of 2021, and we're about to do the work in the summer of 2022, and then we'll have one more year for the SERFS surveys, in the summer of 2023. We have begun the model parametrization, and a post-doc at NC State is doing the day-to-day here, working very closely with Nathan and Krishna on the integrated modeling parametrization and analysis.

Then, for the genomics components, conduct fishery-independent and dependent fin clip sampling, and so, again, we sampled 5,401 fish in 2021, and we've already sampled a few hundred fish, through the regulatory discard program at FWC, in 2022, and we'll carry that through 2023, with the goal of sampling at least 5,000 fish per year in each of those study years.

The genotyping in the thousands and sequencing and the GT-seq chip development, or panel development, is nearly completed, and then, as soon as that is done, the sequencing will be in for our 2021 fish, and that will go relatively quickly. Instead of a several-month-long process, it will take a couple of months to complete the sequencing, perhaps, for 2021. Then we have genomics and close-kin mark-recapture analyses that will follow, starting in 2023, and then, for the population estimate component of the study, we'll integrate those components and write reports and submit manuscripts in the final year of the study.

For the model integration, the goal here is to start, in 2023, to develop integration into the stock assessment of these population estimates, and then, also, starting in 2023, if additional funding is made available by Congress, we would perform these additional calibration experiments, conventional tagging, et cetera, and so the green highlighted region indicates where we are to this point in the study, as well as what's been completed.

We had a pretty ambitious timeline for this work in year-one, and I'm happy to say that we're ahead of schedule. We're on schedule for all of the study components. We have a team of quality scientists that are used to doing this type of work in their various aspects of the study, and they were able to hit the ground running.

Agencies have been amenable to giving our agency scientists, PIs, the latitude to focus on, or prioritize, the sampling or analysis, such as the ageing work, for this study. They realize the visibility of red snapper and the importance of this study, and so the state agencies and NOAA Fisheries have been excellent partners, as part of this, and we anticipate that to continue as we move through to completion.

So lots of folks to thank, and the initial funding, through South Carolina Sea Grant, or the funding period through South Carolina Sea Grant, and the technical review committee provided us some things to think about, after the first proposal, as well as our second, and Susan Lovelace leads the South Carolina Sea Grant consortium, and then her team there, with Suzannah Sheldon, Graham Gaines, and Ryan Bradley, have been really easy to work with and have helped us in numerous ways in getting started and moving things forward.

Lots of different agency folks that have been instrumental in helping us out, fishery observers and port agents, and Paul Conn has worked with the modeling team, both -- He has worked with Kyle, done a considerable amount of work with Kyle and Nate Bacheler in the past, but he's also working with Eric Anderson and David Portenoy in some simulation work that they're doing, looking at assumptions of life history parameters and how critical those assumptions are for the potential bias in the population estimates.

Then all of the charter boat captains that have helped us in the first year, some of whom will be helping us again in the coming year, and then the fishermen interviewees, and, again, we're at six of forty so far that have returned their questionnaires, and we're hopeful that, in the coming weeks or months, that Paul will be able to collect information from even more of the folks that were initially contacted.

That's it, and this is a pretty broad overview of what we're up to, and, again, Jeff is there in the room, and Dave is also on the call, and so, if there are specific or technical questions that folks have, we would be happy to try to address those.

DR. NESSLAGE: Thank you very much, Will. I know folks are going to have lots of questions, but, before we go to that, I didn't provide the most thorough background for why this is on the agenda today, and so Chip is going to chime-in and remind us why we asked for this.

DR. COLLIER: This is a policy from long ago that the SSC had requested that in-depth analyses that were very complex -- That they would like to be part of the discussions as these projects are developed, and so that's why we're bringing this project to you, the red snapper abundance estimate, as well as we're going to be bringing to you the greater amberjack one, and so this is going to be providing context, as a complex analysis is being completed, and hopefully it's going to lead to a seamless integration into the stock assessment, that you guys are well aware of all the complexities, any potential concerns, and so we get them talked about in the beginning, and so you're not at the final review and you're saying, oh, you should have thought of this. This is an opportunity to think of things and provide guidance that you would like to see, to make sure you're comfortable with the final conclusions of the project.

DR. NESSLAGE: Outstanding. Thank you, Chip. Are there questions for -- Go ahead, Wilson.

DR. LANEY: Well, not so much a question as a comment, and thanks, Will, for that excellent presentation, and I would just note that the work that you all are doing is going to be extremely beneficial to the Habitat AP as well, because of the habitat mapping component of it, which is on Slide 13, that Objective 1, and then, also, it seems to me, and correct me if I misspeak, that it will be very good information for helping us to further refine the Ecopath with Ecosim model as well, because of all the additional information on the habitat, and especially the red snapper information,

because now we will actually -- It seems to me that it would be almost possible to start looking at answering that habitat versus production question for red snapper, maybe.

DR. PATTERSON: Madam Chair, there wasn't a question there, but I would like to address that, because I think that's spot-on. With Chris Taylor, the mapping that he and Pickens have recently completed, and one thing that we can do with the ROV and the camera-trap data is to do some groundtruthing of where their model-derived estimates of different habitat types on the shelf, and so that's one component, but, secondly, with the Ecopath and Ecosim work in the Atlantic, we actually thought, long and hard, about including a component in this out year group of projects that we hope to be able to have funding for to enhance the legacy of this work, and perhaps even refine some of the estimates that will be produced.

In the end, we felt like that's work that we can use the data collected here as a part of that process, and, obviously, Dave Chagaris is heavily involved in that process, and we have a new PhD student who will be doing some additional trophic work in the system, but, yes, I totally agree, and I think this will enhance the ongoing ecosystem modeling and management aspects of reef fish in the region as well.

DR. NESSLAGE: Excellent. Thank you. Next on the list, we have Fred Scharf.

DR. SCHARF: Thanks, Genny. Thanks, Will, and that was a really nice presentation, and the study design, as you indicated, has some really strong components, and you have these two sort of independent approaches, using the ROV visual surveys and then the close-kin mark-recapture, to estimate abundance, and then the additional component at the end of the integration into the stock assessment process are really nice features.

I wondered if you thought about the distinct possibility that your ROV visual surveys and your genetic close-kin mark-recaptures end up giving you really different estimates of abundance and how you would resolve that, moving forward, in terms of the maybe relative weighting that you might give if the estimates are really different from each other, if they diverge.

DR. PATTERSON: Thanks, Fred. That's a great question. We have thought about that, and we've spent less time thinking about integrating, or reconciling, the estimates from the two studies as we have like trying to think about how to integrate and reconcile overall study results into the assessment, but you're right that it's likely that they're going to produce different estimates.

The first question that we'll have is are they within the statistical error of each other, and so there might not be a statistically-significant difference between the two, but I also think that, with the camera-trap and the optical approaches, this will give us a good comparative study, concurrent study, to perhaps address some of the potential biases that occur, that potentially can occur, with optical studies, and so there's a whole component that I really didn't talk about today of N-mixture modeling to try to estimate detectability with the ROV gear and the trap-camera gear.

Detectability is really an important component of trying to scale up from density estimates to the habitat area and then onto the entire study frame and an estimate of abundance, and so we have some empirical studies that have been done with telemetry that I sort of flipped through here, and didn't really talk about the details in any great extent, to any great extent, but so we have this

information that we've been gathering and trying to refine and move this toward the least amount of bias, and really just understanding what the level of bias could be with those gears.

We did have a workshop, and Jeff Buckel held a workshop at CMAST, back before the holidays, just to try to get a handle on, with the hierarchical integrated modeling approach, like what are the different areas that we really need to focus on here, and so I think we're still -- It's kind of a work in progress.

We have quite a bit of information, but, you know, it's sort of this pragmatic approach, where the folks that are doing the field work and are saying what's possible, versus the modelers, who want higher and higher-resolution data, which is totally understandable, and trying to find the sweet spot for making sure that we have the resources to do everything at an appropriate scale, and, obviously, we considered that when we proposed the work, but, as you move forward, you're finding new things that pop up.

I think it may be useful to compare between the two, and it may point us to some areas where we need to think more about some of the behavioral challenges of red snapper, and are they attracted or are they repelled, by either of the gears, and the trap-camera has bait in the water, and how does the plume -- How does current affect the plume? Those are types of things that perhaps a comparison between the two can help us refine a little bit, in addition to the empirical studies that we've completed, but also that we plan to do, given funding.

DR. SCHARF: Great. Thanks a lot, Will. I appreciate it, and I agree. I think that having the two approaches -- I think they really have a lot of potential to inform each other and learn a lot, particularly about the ROV surveys and detection probability, and I would echo Wilson's comments too about how much this study has the potential to inform some of the other aspects of the ecosystem and working towards some expansion of those approaches too, and so I appreciate it.

DR. PATTERSON: Thanks, Fred.

DR. NESSLAGE: Thank you. Up next is Kai.

DR. LORENZEN: Thanks, Will, for that great overview of a great project. I particularly -- I have more of a comment than a question, I guess, and I want to start by saying that I really commend the project team here for being proactive about the integration of the results from this study into stock assessment and management, and, as you pointed out, that was something that really was left much too late in the Great Red Snapper Count, but I also want to point out, of course, that it's not primarily, and certainly not exclusively, the responsibility of the project team, but it's a responsibility of the Science Center and the SSC and the council.

What I wanted to do is to encourage the SSC, and the council, and the Science Center, to work towards a very clear plan for the steps that will be taken to incorporate the results from the study into the stock assessment, because, once the first numbers become available, particularly if they seem to look better than what the assessment has been telling us, there will be tremendous pressure to do things quickly, and the -- So there are two questions.

One is, obviously, outlining the long-term process, and, since there is a lot of new and different information that will come out of this, you're probably looking at a very big, very drawn-out, research track assessment that will take a long time to report, and then you have to do an operational assessment to get an ABC, and so that will be several years down the line from the first glimpse of information from the study, and so one of the questions that we should also consider is, you know, what, if any, sort of interim analyses would be acceptable to make catch advice, based on this information.

I would say, having been involved from the non-project side in the Gulf process, that we had this sort of interesting situation that we have more data than we had ever before, and we probably have the most half-baked analysis underlying the ABC that I have ever seen, and so we should try and get ahead of this and get a good plan of how to navigate through this process, and that's really a responsibility for everyone in the room here and the Science Center and the project team, but more so the Science Center and the council and the SSC than actually the project team, because their main task is to produce this information. Thank you.

DR. NESSLAGE: Thank you. I hope we will learn from previous processes, and I'm glad you're at the table, Kai, and can guide us as we go along. To that point, is the plan really to do interim analyses to incorporate this estimate of abundance? That's new to me, and is that -- You're saying that's what happened in the Gulf, but is there any plan --

DR. LORENZEN: That's what is happening in -- That's why I brought it up, and, no, and, I mean, I think the -- In an ideal world, I would say the plan is to do a research track and all of that, but we should not underestimate the pressure that may occur, particularly if the figures seem to suggest that there is room for more catch, and so we have to have a plan for that too, so that it doesn't get off the rails at that stage.

DR. NESSLAGE: Are there other questions for Will? If not, I have -- Chris, go ahead.

DR. DUMAS: Thank you so much for going over this tremendous research effort, and I think there will be a lot of great new information provided, and it's fantastic, and I had a question regarding the OFL estimates for 2021/2022 and the ABC estimates for 2021/2022 that were on one of your slides, and I think those were from the Gulf, and I'm not sure, but if you could back up to the estimates of OFLs and ABCs for 2021 and 2022.

With those, the OFLs went down from 2021 to 2022, but the ABCs went up from 2021 to 2022, and why was that? Was that because the -- Going from 2021 to 2022, did you precision get better, or did your PSEs get smaller, and so that allowed your ABCs to go up, or was there a change in P* from 2021 to 2022? Just generally, can you tell us why the OFLs went down and the ABCs went up?

DR. PATTERSON: I will try to make this as short as possible.

DR. DUMAS: Thanks. I understand.

DR. PATTERSON: Different approaches were used between the two years. For setting OFL in 2021, this interim assessment approach utilized this 13 percent of uncharacterized bottom as being targeted by the fishery, but it utilized the various indices updated through -- The data updated

through 2019, and so there was another year of information that went into the interim assessment for 2022, and so that explains some of the change in the OFL, but, also, how the simulations were conducted.

There were some differences, and now the uncharacterized habitat -- So it was used -- The uncharacterized bottom used a range of zero to 15, and so that basically centers on seven-and-a-half, or 8, percent, and so, if there is less of the population vulnerable to the fishery, then the OFL declined a bit because of that.

The change in the ABC really has to do with two totally separate approaches, and the ABC in 2021 wasn't set as a reduction from OFL based on the variance in the OFL estimate, and it was utilized -- It was produced -- Really, what that ABC was, it was borrowing the OFL estimate from a separate analysis, a related analysis, that had a little bit more conservative information, because it utilized an index that was declining in that last year, and so, you know, basically, the SSC utilized that, instead of a P* approach from the OFL, with the prevailing sentiment being that it was more precautionary, and at least it was an estimate that was produced, but, again, that did cause some consternation among folks who viewed this after the fact.

In our more recent -- For the 2022 estimate, this was done taking a P* approach, but the variance in the OFL estimates was increased by utilizing these multiple runs of zero, 7.5, and 15 percent put together into this ensemble, which allowed that PDF to broaden, and then a P* of 0.3 was the most conservative P* value, and so you're taking it as far away from the median as we could, based on the council's risk policy, but it's still utilizing that PDF, and so, you know, one part of the answer is that different approaches were taken, but then, within the different approaches, some different parameterization occurred as well.

DR. DUMAS: Thank you.

DR. NESSLAGE: It looks like John Walter has his hand raised. Is it to that point, John?

DR. WALTER: Yes, it is. Good day, everyone. Thanks for recognizing me, and just, having had a fair bit of experience with the Gulf red snapper count, I think that I definitely can agree with those sentiments that were expressed by many here, and I think Will's presentation did an excellent job of conveying the information and the process and why it's really important for us to work with the SSCs, because you will probably be the body that is reviewing a lot of this, and may be reviewing some form of advice, if this can't go through the research track in time.

I think Kai hit it very directly, that there might be a request for the Science Center to do some sort of analysis with this data, and I think getting it in front of the SSC early and often, as we're trying to do, as Chip alluded to, is key, in terms of your comfort level with the kind of work and the type of analyses that the Science Center might be able to do with it, and then, also, ensuring that it is not a rushed process, and I think that's the key lesson learned, is, when it's a rushed process, it's challenging for everyone involved, and, given that we've got some time, we would like to make sure that we are able to do the due diligence throughout the course of it and work together to develop an advice framework.

In that regard, what I would do is probably say that the Science Center is going to need to develop some way that we might be able to give advice on this in an interim, and it might be similar to

what we did in taking the numbers from the Great Red Snapper Count and developing some sort of ABC and OFL, as Will alluded to, and, if there are recommendations from this SSC to either embark upon something similar, or to improve upon that, I think that's where we would take guidance and counsel.

There is the challenge that the research track will not be completed in time for when the study is probably giving either initial or final numbers, and that's probably the challenge that is ahead of us, in terms of there will be numbers out there, but they may or may not have been through the full process that we think is the best integration of this information, would be through the research track, which could fully incorporate this, and so I don't know how to assess that, whether we need to look at the timing of the SEDAR schedule in that regard, but I think flagging it now is the best that we can do right now. Thanks for the time, and I will be on for the rest of the day, when I can.

DR. NESSLAGE: Thanks, John. A question then. The part of the project that is, I guess, Kyle's section, integrating the estimates into the BAM model, either by scaling it, the estimates of abundance, or integrating the actual data and estimation into the BAM model, and, if that's part of the project, is that going to be rolled out at the same time as the estimates themselves, because I see, in my mind, that's a much more robust approach than the -- I am not a big fan of the projection approach that they used in the Gulf, personally, and so especially after all of our recent -- Our discussions yesterday afternoon, and I don't see that being super useful, but this part of the project could inform an ABC earlier than a full research-track-type approach, and it's something that would be solid that the SSC could review, but what is the time -- It looked like the timeline was similar, and, Will, is that something that -- Can you comment on that, please?

DR. PATTERSON: Well, I can speak to the timeline briefly, but Kyle is also on the call, and he would be best to address that aspect, and so our plan is to have a post-doc funded through a couple of different potential mechanisms, in place as our population estimates are produced, and really ahead of that by a little bit, to start to consider the different ways in which the external population estimates could be integrated for scaling, or could scale, the assessment results. It just depends on how long that research process is taking and occurring, and whether we have early success or late success in that, and that would dictate some of the timeline, but, you know, Kyle is really tuned into this, and sensitive to the timing issues, and so I will let him answer that.

DR. NESSLAGE: Kyle, are you on the horn?

DR. SHERTZER: I am.

DR. NESSLAGE: Would you mind giving us your two-cents?

DR. SHERTZER: Sure. I hope -- Well, we don't have the funding yet for the post-doc to work on this, but I hope it will be funded, and I hope to have somebody onboard in 2023 to start the evaluations, and I expect that it will take a couple of years, and so this would be ongoing when the research track assessment is scheduled to start, and so, I mean, I guess it's a research track assessment, and so maybe that's okay, and usually we like to have information worked out a little bit before we try to apply it in SEDAR assessments, especially when this is sort of going to be the dirty parts of the research. I guess that's my main comment, is, the way things are lined out right now, with the timing of the research track, is that it would be -- The research on how to integrate these data into the assessment would be ongoing with the research track.

DR. NESSLAGE: Thanks, Kyle. I will just take off my chair hat for one second and put on my assessment hat, and I would much rather see 1A, which can be done in a morning, and I've done it for menhaden, using a BAM code, than using projections, but others may disagree with me, and I will go to Kai.

DR. LORENZEN: No, and I totally agree with you, and I think -- I'm still not quite clear why in fact the Science Center did not go that route with the red snapper in the Gulf, because certainly I would have been much more comfortable with something like that than with this bizarre spreadsheet projection, and I don't want to belabor that, but I think there might be ways of getting to some sort of interim advice that are quite acceptable, but I think the Center needs to take the lead on making some proposals that we can review in good time and be comfortable with before the whole -- I am trying to think of a good way of saying it, but before the whole thing happens. Thanks.

DR. NESSLAGE: Other thoughts or questions for Will or Kai? Kyle, go ahead.

DR. SHERTZER: I was just going to agree with you that 1A here is sort of the simple approach that we could do fairly quickly with the current stock assessment, and so, if we were looking to do an interim approach with preliminary information from the red snapper abundance estimates that Will was talking about, then that could be done. It's the integrating these methods into the stock assessment model that's going to require a lot of time for evaluation and for coding.

I am, right now, not fully optimistic that it will be an improvement, and it, on the surface, sounds like it could be really nice, because CKMRpop has, underneath its hood, an age-structured population model, just like the stock assessment, and so it would be really bringing in the likelihood formulations, but I suspect, without having done the evaluations yet, that it will be sort of an impractical approach. It will be feasible, but impractical, because it will be very slow, and I'm not sure that it will improve the estimates much beyond what we see in 1A anyway, and so I guess I'm just predicting what we might find two or three years from now, but I agree with what you said, that 1A would be feasible and fairly quick to achieve.

DR. NESSLAGE: Excellent. Thank you, Kyle. Kai.

DR. LORENZEN: This is more of a philosophical reflection, and I think one of the things that has put this Science Center in a strange situation over the red snapper count I guess was that -- You know, partly, the red snapper count was seen as sort of an independent challenge to the established assessment, and so the question was not so much, oh, we're producing additional data that will be integrated, but, particularly when the absolute abundance estimate looked different from the assessment, I think there was a movement to say, well, the assessment is obviously wrong, and we want to throw that out, and we want something different and new.

That's quite different from the approach of saying, well, we have additional data that we will integrate into the existing assessment, and that's something that I think the SSC, and the council in particular, needs to grapple with, is how this is viewed, whether this is viewed as an independent estimate that essentially is a challenge to the assessment or whether it's a new data source that is to be integrated, and so there is a discussion that has to be had, and I think that it's not actually really a science discussion, and it's more about how this is viewed and how it -- Well, it has a

science component, but it goes beyond science, and so, again, this is something where it's important that we keep communicating and we're sort of on the same page as to when the data hit the public and the management system.

DR. NESSLAGE: Absolutely, because -- Now I am backtracking a little, but 1A is -- Even if the error estimates are large, it's still going to anchor that population on whatever the count project estimate is, and so it might look very different than what the current BAM is producing, in which case then, after the research track is done, you could yo-yo back, if it involves incorporation of the data rather than anchoring the estimate, and so the council needs to be prepared for that, and we all need to be talking together, probably, is what I hear you saying. Is that right, Kai?

DR. LORENZEN: Right, and I'm all for 1A as the sort of quick-and-dirty look at what the implications might be, but I am also cognizant of the fact that there will be people who will challenge the use of the assessment, because they will say, well, but obviously your assessment is wrong, and so why are we still keeping that, and we just have to have an answer for that, and we have to be prepared.

DR. NESSLAGE: Once again, what's the estimate of -- What's MSY? We need some broader framework, right, for setting ABCs besides what is the total abundance, and that's certainly part of the argument. Other questions? I know folks are anxious to get to lunch, but this is an important issue.

I guess is there a plan, and I don't know who to look to for this, and maybe I will look to Jeff, because he's closest, or Will, but is there a plan for regular updates to the SSC, because I can see there are several decision points along the way, not only what do we do once the abundance estimates are out, but also things like Fred Scharf brought up of what if the two different methods produce different estimates, and will we have some feedback on that and your proposed approach for incorporating that, because that could be a big stumbling point as well, and I'm sure there's others that we haven't thought of, and is there a plan for regular communication between the group and the SSC?

DR. BUCKEL: I think that's up to Chip, and so Chip is the one who came to the table and said the reason why we're here, or why Will is here, is to answer the SSC's previous request, and so, if the council and the SSC wants to see updates, then I think I can speak for Will that we would be happy to provide those.

DR. COLLIER: It's an SSC policy, and it's not staff policy, and so it's up to you guys what you think is the best approach to be updated on this. I know you guys have some tight agendas here and there, and so it just depends on what you guys want and how you see it going forward. In my thoughts, it was trying to give some brief updates, maybe at every meeting, but I don't know if that's too often, if that's too heavy of a lift for Will, and this is -- That was not an effortless presentation that he put together, and that took some time.

DR. PATTERSON: I think, as a team, we would be happy to keep the SSC informed of study progress, and as well as any issues that we've encountered or things that we're maybe grappling with, as far as mitigating bias and trying to understand different processes. Given that the Atlantic SSC, I believe, meets twice a year, and it couldn't be any more frequent than that, but I would suggest is the spring works really well, because it's also our reporting season to Sea Grant, and so

we'll be putting all this information together for them already, and it might be a good time to come back, a year from now, to the SSC, and say, okay, here's what we have and here is -- The next go-round, we'll have data to share and say this is what we're seeing.

DR. NESSLAGE: Kai.

DR. LORENZEN: So coming back to the responsibilities, I think we don't want -- I think it would be great to have regular updates, but we don't -- We can't, and we don't want to, put the responsibility for this whole framework for how to incorporate that onto the project team, because, I mean, that would be unfair, and so what I would suggest is maybe we can get a commitment from the Science Center to say, well, okay, we will, you know, take the lead in this and, you know, come up with a suggested process and run that past us, so that, you know, there is -- Because someone needs to take the lead on developing something, right, and it seems, to me, that would naturally fall to the Science Center to basically come up with a proposal that we can look at and further develop.

DR. NESSLAGE: Perhaps. I wonder if a very small steering committee of SSC chair or rep and council, the center, and you can do double-duty, maybe. Poor Jeff, and here I am volunteering him, but just to get all of the key players, but only the very key folks involved, might be an approach, so that let's say the Center or the project team doesn't go off in one direction without thinking holistically. That could be a recommendation we make, and is that kind of what you're thinking?

DR. LORENZEN: Yes, and I think that sounds good.

DR. NESSLAGE: Wilson.

DR. LANEY: I like the idea of the regular updates, and I have a question for you, Madam Chair. Don't we still have an ecosystem model workgroup? I know we had a review group that Yan chaired, and I thought we still had maybe a workgroup, and maybe we don't, but it would be very useful for the model folks to have regular updates on the process as well, from both a habitat perspective and a population estimate perspective, and, also, I think the Habitat AP is going to be very interested in the habitat information that is generated by the process, and so, if we could include, or at least make a recommendation to the council that the Habitat AP get briefed at some point, that would be appropriate, I think, also.

DR. COLLIER: We can have Chris Taylor and Chris Pickens give a presentation on what they've observed, and I feel like they gave a presentation recently on some of the work that they've done, and I have a feeling it was covering this, but I will have to reach out to Chris Taylor to figure out exactly what additional information he would have.

DR. LANEY: I know Chris gave a presentation on the work he's done relative to the offshore wind habitat investigations, and I don't recall that he did on the red snapper stuff, and he may have, and I just may not be remembering it, but, yes, thanks, Chip.

DR. NESSLAGE: I think Will seemed to indicate, and correct me I'm wrong, that a big presentation like this once a year, in the spring, would be ideal, and then maybe what we could ask folks is that, if there's any other major decision points, or stumbling blocks, that come up along

the way that you think the SSC would benefit from knowing about, to let us know, and we can have a briefing, but, otherwise, we'll wait until you have some major decision points. Does that seem reasonable? Jeff is nodding his head, but I'm hoping -- Will, do you agree?

DR. PATTERSON: Yes, that seems reasonable, and it would be great to be able to handle updates kind of at the same time, but I understand if that's not always possible.

DR. NESSLAGE: Wait. I'm not sure -- I guess all I'm saying is it sounded like our spring meeting was a good time for you, but I guess what I'm asking is, if you run into any major hurdles that you think we need to know about, to just give us a heads-up in between, but probably hopefully not, and is that --

DR. PATTERSON: Sure. If we come upon something that is pretty substantial that we think the SSC needs to know about, then we can make you aware of it.

DR. NESSLAGE: That would be fantastic. Thank you, and we really do appreciate this very thorough report and all of the work that you're putting into this. It's a huge project, and it's going to be greatly beneficial. Any last-minute, last final questions or comments? I didn't do public comment, and we should see if there's any public comment on this presentation before we break. If you have any public comments, folks, and I don't see anyone in the room, but please raise your hand online. I am not seeing any hands raised, and no hands raised from the SSC, and we will thank you very much, Will, for your presentation, and we look forward to hearing from you in the future.

DR. PATTERSON: Okay. Sounds great. Thanks for the time.

DR. NESSLAGE: Thank you. Then I guess we went a little longer than anticipated, to basically 12:30. We usually take an hour-and-a-half for lunch, because folks go to the restaurants and whatnot, and so would that mean we would start at 2:00? That seems late, but it's hard to get everybody back, unless people go for fast food, and so I'm going to say 2:00, and hopefully we will then pick up with the release mortality reduction framework at that time. Thank you all for your attention this morning. I appreciate it.

(Whereupon, a recess was taken.)

DR. NESSLAGE: All right, folks. Welcome back from lunch. Thank you for your prompt return. This afternoon, our first agenda item will be Release Mortality Reduction Framework, and I will draw your attention to Attachment 7. We're going to hear from Chip Collier first, and then Mike Schmidtke. Basically, the council is investigating some potential management measures that would reduce out-of-season encounters for snapper grouper, and they want our opinion on it, but I'm going to let these two gentlemen give you more of a thorough background on that, and so, Chip, would you like to take it away?

RELEASE MORTALITY REDUCTION FRAMEWORK

DR. COLLIER: Thank you. I just want to start off by giving a little bit of a refresher of what has happened with red snapper, and so, in May of 2021, the SSC was presented with the results from

SEDAR 73, which indicated the red snapper stock was overfished and overfishing. In addition to the usual projection runs that are requested of the Center, the Center staff developed a two-step approach that could be used to develop projections for red snapper. This was a new analysis, and so the SSC had asked for additional time to review and consider the technique.

Kyle is on the line, if there are questions about this, but I just wanted to give you guys a highlight of what the technique is and then what the SSC discussion was regarding the topic, at least what was presented in the report to the council.

In the SSC-selected rebuilding scenario, the Southeast Fisheries Science Center uses a combination approach with two steps to compute the F rebuild. The first step is applied to the discard mortality rate from a previous time block to compute F rebuild, and the second step applied a discard mortality rate in the projection time period that varied from the first one. In the second step, the projection F rebuild applies a discard mortality rate that was reduced starting in 2021, when the regulations changed. If you remember, that regulation change is the requirement for descending devices to be aboard vessels.

The two-step approach is well documented, and, if you guys want to look for it, it's Attachment 5 in late materials from the July 2021 meeting, and now I'm going to get into the SSC's information, or what they wrote up in the report. The SSC supported the Science Center's proposed mixed approach to incorporate discard mortality in projections, and this applies to the Block 3 F 30 benchmark from the assessment period as the projected fishing rate, but it decrements the rate based on Block 4 reductions starting in 2021.

The SSC supported this approach, because it uses the prevailing conditions, a requirement to have a descender device onboard, and it prevents rebuilding goalposts from changing, and it avoids penalizing the fishery for attempting to reduce bycatch mortality, and then, regarding the proposed projection model selection that would shift discards to landings, the SSC recommended that discards not be shifted to landings until substantial increases in spawning stock biomass are observed. It's counterintuitive to increase landings while simultaneously attempting to reduce fishing mortality by approximately half. Shifting discards to landings would offset the benefits of increased descending device usage. The descender device savings could help to reduce fishing mortality, but the descending devices alone will not be sufficient to reduce fishing mortality to a sustainable level, and that was from the SSC report provided to the council for September 2021.

DR. NESSLAGE: That sounds familiar. Thank you, Chip. I appreciate that summary, and so, now that we've had our memories refreshed on what we said previously, I think we'll go to Mike Schmidtke for an introduction and overview of the issue at-hand here.

DR. SCHMIDTKE: All right. Thank you, and so, today, I'm going to be talking through what has been termed Regulatory Amendment 35 now, and this amendment is looking at reducing the release mortality in the snapper grouper fishery, and it would also address revisions to the red snapper catch levels, to align them with the SSC's most recent recommendations.

Chip gave kind of the overview of SEDAR 73, and so I'm not going to dive into all of that, but I will just put some highlight points up there on the screen, but we've seen, from the assessment, that the stock is making progress towards being rebuilt, and there is relatively high levels of

biomass and numbers at this time, but just not to the point that it has crossed the thresholds to be declared not overfished and not overfishing at that point.

This corroborates some of the anecdotal information that has been seen on the water of high red snapper abundance, and so we have this situation with red snapper, that I'm sure a good chunk of you are aware of, that there is high amounts of mortality for that fishery that is coming from the releases, rather than the landings, and this release mortality is -- Despite the reduction in release mortality rate that was included in SEDAR 73, there is still a very high number of dead releases that are occurring in the fishery, and that kind of comes out of the flow chart that you see on the right side, where there is a very short season, and there is a higher abundance of the fish as it's being rebuilt, and red snapper, for a large portion of the year is closed, but it occurs in an area with other snapper grouper species that have open seasons, and so this leads to a lot of out-of-season encounters of red snapper, many releases, and you take a proportion of that, and there are many dead releases.

There was kind of a high-level investigation of this problem and how it's affecting really not just red snapper, but it's a pretty pervasive issue throughout the snapper grouper fishery. John Carmichael and Chip put together some data that was presented to the council at their last meeting.

While red snapper has been viewed as kind of the poster-fish for this problem, we see it in other places. The figure on the screen here shows the recreational harvest releases and percent of the recreational catch that were released for all fifty-five snapper grouper species from 2000 through 2020.

What we see here is that harvest has remained about the same, hovering around ten-million fish. However, released fish, and catch overall, have increased, from around twenty-million fish -- Released fish, rather, have increased from twenty-million fish to around thirty-million fish, as well as catch overall, and the percentage of catch that is being released has also increased, from about 70 percent that you see in the early 2000s to now, in 2020, as we're approaching 2020, it gets close to 80 percent. That percent released is that black line, and you would evaluate it against the right vertical axis.

To kind of frame these data relative to some of the harvest levels, if the fishery-wide average release mortality rate were 33 percent, which is within the range that we've observed for species within this complex, if that were the case, then the number of fish counted as dead releases would be about equal to the number of fish harvested, and so this problem is not a small one in magnitude, and reducing the number of fish that are dying from catch-and-release, even in a partial fashion, could have substantial benefits, in terms of increasing the number of fish that would be available for harvest.

There was also a look across the species within the snapper grouper recreational fishery, and we identified species that are relatively highly impacted and would be most likely to benefit from a reduction in the dead releases.

What we were looking for in this analysis was a fairly sizeable fishery, but that also had a high proportion of releases, and so there were criteria developed, and those are shown up on the screen. Greater than 50 percent of the catch is needed to be released, and the cumulative recreational releases in the 2000 through 2020 timeframe are at least 500,000 fish. The cumulative harvests

over that timeframe are at least 500,000 fish, and, based on these criteria, there were eighteen high-impact species that were identified, that fit all three of those.

These species account for 93 percent of the snapper grouper recreational harvest, and 99 percent of the releases, and so that's -- If we're addressing the problem, then it's going to be somewhere up on the screen. Nine of these stocks have been assessed, and those are shown in bold, and three of the stocks are overfished, and so, again, while red snapper is kind of front and center right now, with the recent assessment and the way that management and recent harvests have been going on, what's needed to help red snapper, in terms of lessening the dead releases, could have widespread benefits for the snapper grouper fishery.

I'm not sure how many of you tuned into the advisory panel meeting last week for Snapper Grouper, but there actually may be more interest from the fishery to looking into the benefits to stocks other than red snapper that the current fishery would really be more reliant upon.

Just summarizing the problems that we have here, red snapper release mortality is high, in terms of the number of dead releases, and this limits the number of fish available for harvest, and it limits the number of fish available to rebuild the stock, and it also causes frustration for fishermen that are observing, many of them, the highest abundance that they've seen in their lives, and it's inaccessible to them.

There's also the issue that snapper grouper releases overall, throughout the fishery, are high, and this is an issue that shows that there is a low amount of efficiency, when people are catching fish that they're largely not able to keep them, and this can impact the catch limits and the rebuilding timelines for several of the stocks, and there are several stocks within the snapper grouper management group that are overfished and rebuilding at this point.

The council has come up with kind of this two-pronged approach, and I believe this has been brought up to the SSC before, but there is a longer-term project going on, which is a management strategy evaluation, and this will continue to be talked about a bit more in-depth in future meetings, but this would consider larger-scale changes to the snapper grouper fishery as a whole, and then the shorter-term response, which is a bit more of the focus for today's discussion, is Regulatory Amendment 35, and this would have two actions in it.

The first would be to put in some form of management measure that would reduce the number of dead releases for the snapper grouper fishery, and that is intentionally ambiguous, because the council hasn't quite narrowed down which direction they want to take that, and so that's the place where we're at. We're at some management measure that would be put in, and with the goal of reducing the number of dead releases. There would also be inclusion of the red snapper catch levels in this amendment, as required by Magnuson, since we got the stock assessment, and we have to put in the most recent ABC.

There would be some, with this management measure, reducing of the dead releases, and there would be some focus on red snapper here, but we're also, as we're kind of working our way through the process, trying to branch out and see what other species we can give a little bit of focus on, especially with the fishery, and what we heard from the fishermen on the advisory panel is that they've basically adjusted to life without red snapper, and it's not something that they are heavily reliant upon, and so we do also want to make sure that we can provide some form of benefit, in

terms of other species that they are a bit more reliant upon, and provide some benefit, through this measure, for those as well.

The council is hoping, with this measure that would be decreasing the number of dead releases, that there could potentially be reconsideration of the SSC's red snapper ABC recommendation, and this would be based on a change in the management regime. Right now, the projections forward -- They account for a change in the discard mortality rate from the increased use of descending devices, but there would be -- From this measure, presumably, there would be a further change in the number of fish that are being caught and released, and that would be the intent of this action, and, based on that change in management, there would be the request from the council of whether the SSC would consider altering the assumptions of the projections and rerunning them to consider a new ABC recommendation.

Right now, where the council is, they're considering temporal, spatial, and/or depth-based closures, and there is also consideration of some changes to the gear that would help slow down the catch rates, and so these are all things that are on the table, and, by the time we get done with this, there may be some combination of these different things.

One aspect of this that we're really trying to keep in the forefront is that there would need to be some level of quantifiable, or estimable, change to the number of fish that are being caught, to the catch rate, that we would be able to estimate and project forward, where we're trying to keep it to something that can be used and fairly easily put into the projection estimations, so those can be rerun.

The current step that we're on is the council gave staff a list of different pieces of information that they wanted us to bring back in June, and so we are -- We are diving deep into the data, and we've got a lot of people working on it, to try to gather all this information and bring it back to them, so that, hopefully in June, they can start kind of narrowing down their scope of what they want considered and start developing some options, moving forward.

A later-on step of this process, probably in the October, or the fall, but presumably the October, meeting, when the SSC meets, there will be a request for the SSC to review the considered options, the impacts to the stock projections, and if there would be any reconsideration of you all's ABC recommendation.

For today, there are some questions for you to consider and discuss and provide any feedback that you have to the council. They're shown there on the screen, and we're really trying to direct the efforts that are going in, so that we're not looking too heavily and spending a whole bunch of time on things that are not going to be fruitful, moving forward, for this amendment, and that's what we're trying to go for, and so we're looking for some discussion about the uncertainty of the mechanism that are being talked about, those spatial or time or depth-based closures, or any gear changes, and what the uncertainties associated with those would be, as far as reducing the discards.

We're also looking for kind of the overall question of would reducing the number of red snapper that are discarded dead -- If we were to put in a regulation that would be estimated to do that, would that provide an opportunity for increased harvest, and then there's some follow-up questions along those lines, and so that's all I have, and I will pass it back to you, Madam Chair.

DR. NESSLAGE: Thank you very much, Mike. Let's start with questions for Mike and/or Chip, if necessary. After we've done questions, we'll go to public comment, and then we'll launch into these two big bullet points here, and so any -- Is the issue clear, or do you have any particular questions for council staff? You did a great job, Mike. Jeff has a question.

DR. BUCKEL: Mike, I am trying to remember, and the way you had posed it was that the ABC -- The projections were dealing with the reduction in F due to the descender devices, but weren't the projections based on F rebuild, which was much lower, right, and it was going to take a lower F than what these tools could do, and so the F rebuild has to take into account these spatial or temporal management, and so, if that's the case, then there wouldn't be any like trading of dead discards for harvest, because we need these managements to get the F down to F rebuild, and so that was my recollection, and I think what Chip's description described, but that seems a little different than maybe what you described, and so, if you could clarify that, that would be great.

DR. SCHMIDTKE: I guess, to the first part, as far as the descending device incorporation, that is already a part of the projections, the lowest level of discard mortality estimated, and that's in there, moving forward, and that's acknowledged, as far as I understand, and is understood by the council as well. I guess the question, as far as the F rebuild, I might have to think on that a little bit more, and get a bit more information from others, to try to understand where that needs to be and what that needs to be, as far as the council and their management ability at this point, and so I might need to pause on that question.

DR. WILLIAMS: I can speak to that, and I was also going to give you a primer on discard information, which is going to be critical to any analysis you do on this front, but, first, on the projections, recall that almost all of our projections are always just constant F projections, which means we assume a proportional reduction, or increase, in both catch and discards at the same time, and so, as Jeff pointed out, F rebuild is much lower than current F, but that also assumes that F discard is much lower than current, and so, if setting an ABC is heavily dependent then on whatever management action you're putting in place to get those discards below the level that the projections indicate, and so that needs to be taken into account, and so that's that point.

Then I can go into some science information about discards that the committee might want to be aware of, before we get too far into the discussions on this, and so the state of discard information in the South Atlantic might be the title of this. It's not good. None of it is validated to any good degree. The closest we have is probably the headboat, where we put at-sea observers on, and we've done some minimal comparison of discard rates from observers to discard estimates, or reports, in the logbooks, but that was done years ago, and it hasn't been updated, and so I don't know if that information, if that validation, still stands.

Keep in mind that all of -- The majority of the discard information is self-reported. Add on top of that one of the trends we've seen in the commercial discard arena is -- Let me first describe how we get discard information from the commercial sector. We have logbooks required for all trips in the commercial sector, but then we do a 15 percent subsample of those participants, and we ask them to report discards, and then, of that 15 percent -- That is all self-reported, and the proportion of zero discard reports that we get out of that 15 percent subset in most recent years has gone up to 60 to 70 percent zeroes, and so the data is essentially worthless. I don't think it would pass any review at this point, at least in the most recent years.

There has been a -- There is a temporal trend to that as well, and so, when the program started, which was 2010 or 2012, somewhere in there, the reporting of zeroes was only 30 percent, and that was viewed as acceptable, but, now that it's up to close to 70 percent, it's probably not acceptable, and so keep that in mind. You have to then think, all right, what is causing that trend, and why is that happening, and is that infecting other sources of discard reporting, which is all self-reported as well, and so I lay all of that out before you, that be cautious that our discard estimates are not terribly good.

DR. NESSLAGE: Thank you for that sobering summary, Erik. Other comments or questions before we launch into discussion? I do want to take public comment earlier than later here on this issue, and so, if no one has a burning question for Mike, do you mind -- I am not seeing anyone, and are we ready? Let's take some public comment then. If anyone -- There is no one in the room who seems eager to talk, and so, if there's anyone online who would like to make public comment, please raise your hand on the webinar, and we will call on you.

DR. CURTIS: I am not see any hands raised on the webinar.

DR. NESSLAGE: All right. Thank you, Judd. I didn't want to forget this time. Okay. Now we can discuss. Scott.

DR. CROSSON: I am just jumping ahead a bit, but, to that second question, which is the big question, which is how could you increase the harvest, whatever comes out of the management measures to address the current overfishing situation is going to have to overshoot the minimum, okay, logically, and so you can't -- When the council is listing all these different alternatives, it can't be just what is the absolute scrape-by, just barely get over the high-bar minimum to get out of the overfishing situation. If that's the case, you're not going to get an increase in harvest from this committee, okay, and so I would like to see an increase in harvest from this committee, but that's what is going to have to happen to get to that point. I had a second thought, but I will probably hold it for later.

DR. NESSLAGE: While he's stewing on his second thought, are there other thoughts? Amy. This is what I miss from webinars.

DR. SCHUELLER: The head scratching before the speaking? Yes, and the sigh. I guess I am a bit concerned that we're going to be pulling in a bunch of data that we already used for assessments to try to figure out how we can number crunch and show we're going to reduce discards in some way, meaning, if we have depth data, for example, and we know where fish are captured by depth, and then we say, oh, we're not going to catch anything over, whatever, ninety feet or something, we would say, okay, we're just going to cut all those fish that were caught over ninety feet, and it's not going to work that way.

I guess my main concern is that there needs to be a bit more of a holistic approach to looking through the literature to look at how behavior is going to change, how effort is going to shift, temporally, spatially, and we can't use basic assumptions here, because we just already know they're not going to hold, and so, if that's what we're handed at the time of, yes, we're just going to analyze these depth data and assume all these fish are then not caught, that will not fly, because it will not hold water, given the science that's out there.

DR. NESSLAGE: Right, and so I think, Amy, if I may turn that into a recommendation, that any analysis of changes in discards needs to incorporate changes in fishery behavior, which is a huge undertaking. Good luck, Mike. Are there other thoughts?

DR. SCHMIDTKE: I guess, just putting out one of the discussion points from the last council meeting that was kind of along the lines of the change in behavior, is that, if there were a restriction considering depth, something of that sort, where the effort was shifted more inshore than offshore, inshore would be a place where the effects of barotrauma would be less evident, and the thought that was passed around at that time was that there would be a better survival of the fish that are caught and released, if they're being caught and released in the shallower depths, if they were redirected there, and so I definitely agree that there wouldn't be zeroes. Definitely not zeroes, but that there would be a better survival of fish if the effort were directed to occur in shallower water.

DR. NESSLAGE: Amy.

DR. SCHUELLER: I mean, that gets to my point. If you say you can't catch anything in ninety feet or above, right, what's going to happen? Are those folks going to go into twenty feet of water, or are they going to go to eighty-five feet of water? I mean, that's the question, and I would suggest that they're not going to wholesale move way into much shallower depths, in some way like that, and I would assume the behavior would cause some clumping, sort of, on that edge, especially if that's where they deem to be a valuable fishing area, and that's where they're going to catch what they're looking for.

You know, they're going to be in eighty-five feet of water, if they can be, and so that's why I'm bringing up this point of what is the behavior truly going to look like when that is happening, and we might not even be able to answer that question. I am not a social scientist, but I think it's really the real question here, is what is actually going to -- What's the fishery going to actually look like?

DR. NESSLAGE: So then are there any of the temporal, spatial, or depth closure general ideas that the council might consider that we kind of can anticipate fisher behavior? Is there? I am opening the floor. Can we learn from other regions how they have behaved and learn from that in some fashion, like the Gulf? Jeff.

DR. BUCKEL: I mean, there's huge literature on marine protected areas, right, and effort redistribution, and I think that's what Amy is getting at, and so that's there, and that's exactly what Amy is describing. The effort doesn't disappear, but it shifts, and so how you model that becomes more complicated than just saying they all disappear, and so I agree with that.

Then there's a study that was done in the Gulf of Mexico, and, Kai, you can help me, and I think it was out of Sean Powers' group, on the temporal -- I don't remember the details, and I was trying to pull it up, but I didn't have a chance to look at it, but what I remember was that the -- You know, you have the temporal closures, right, and you have this, and so it's wide open, and you have a certain effort, but then you have a really restricted temporal season, but all that effort moves into that really restricted, and so you don't have any reduction in effort when you have the smaller temporal period, because everyone just -- The effort is shifted into that shorter period, and so those are a couple of examples from the literature, to get to Amy's point.

DR. NESSLAGE: Thank you, Jeff. Kai.

DR. LORENZEN: It's true that there's been a lot of analysis around the season length in the Gulf, and, indeed, as you shorten the season, you don't proportionally reduce the effort, but there's a limit to how much more you can cram into it, and so I think, if anything, the temporal closures probably would be more effective than spatial, because people will just go where they are still allowed to fish.

One thing I would -- I'm not sure so much about the situation here, and so I'm familiar, obviously, with Florida, and with the Gulf, but a lot of the recreational reef fish catches are taken in relatively shallow waters, and I would assume that that's probably the same here, but I don't know, and then so barotrauma is an issue in maybe 20 percent or so of what they pull up, and quite a -- About half of those get vented or descended, and so -- Then there's a lot of effort to increase that, but then you're talking about improving the mortality of maybe 10 percent of the discards, and so just to bear in mind that barotrauma is only one component of release mortality, and I think a lot of the ideas that we have about just how important barotrauma is comes from the west coast, where it's a much bigger deal, because they are pulling those rockfish from much greater depths, and so, there, it makes a really big difference to have barotrauma mitigation, because they virtually all show signs of barotrauma when you pull them up, but the situation here is quite different.

I think, even in principle, the gains you can get with more barotrauma mitigation, but also the depth aspects of spatial management, are probably more limited than what we've seen on the west coast, because we're not dealing with the same sort of depth, and I think that's why they developed this framework, and they actually have a clear framework that allows you to get credits for barotrauma mitigation, in terms of that is sort of applied in the assessment and translates into higher catches, eventually, but it is based on a system where barotrauma is the main source of post-release mortality, and the way you address that is relatively better known, I think, than our mix of discard mortality sources.

DR. NESSLAGE: Excellent. Thank you. I have Fred Serchuk and then Wilson.

DR. SERCHUK: This may demonstrate my naivety, but do -- Are red snapper caught when fishing for other species, or are they directed for red snapper in certain areas? In other words, what I am suggesting is the saying to move to a different depth -- If they're fishing for a complex of species, and, again, I may -- Just tell me if I'm wrong, but red snapper may be only one component of that, and so they may be fishing for something else that, quite frankly, doesn't exist someplace else, or it could be just the number of species on the reefs, and I'm thinking that it's just not a red snapper problem if they're fishing for a conglomerate of species, which they would rather --

Any one of them might be okay, and they just cooccur, and so it's not finding an area where red snapper are less abundant, because the trip is not only for red snapper, and it could be for five other species, which have different ecological preferences, than saying we move into shallower water, where we reduce the barotrauma on red snapper, and, again, I don't know the details of the life history, but I bring that up as a point, because, if it's not a directed fishery on just red snapper alone, but for a montage of species, that's a different consideration that you have to think about differently for that. Thank you, Chair.

DR. NESSLAGE: Thank you, Fred. Wilson.

DR. LANEY: Thank you, Madam Chair. I was going to ask about the Pacific rockfishes, Kai, and have they actually demonstrated out there that use of descending devices is an effective means of reducing mortality for those species?

DR. LORENZEN: I have to say that I am not an expert on Pacific rockfishes, and I believe there have been some studies, and there's been a decision, basically, to take that information and make that rule that basically allows you to gain credits for that, but mostly my argument was that it's -- Because the barotrauma is clearly the main source of release mortality, and I don't think that's the case here, and it was a more tractable problem, and I think a more -- Also, the information, I think, is probably better. If anyone else has better --

DR. NESSLAGE: Chip, to that point?

DR. COLLIER: I'm just putting a plug in for our seminar series on Tuesday, and it's going to be talking about the Pacific groundfish fishery, and so you guys are welcome to go there and listen to the presentation and ask questions of them, and that's actually why we have it timed as such, and, unfortunately, it wasn't before the SSC meeting, but we wanted to have it so that it could inform discussions of this topic.

DR. NESSLAGE: Fabulous. You read our minds. I have Anne and then Mike, or is it to that exact point? Let's go to Anne. She's been waiting, and then we'll come back.

MS. LANGE: Just quickly, weren't the descender device things required because there was an issue with barotrauma? I mean, if there wasn't an issue, why did it become such a big point to add that to the regulations?

DR. NESSLAGE: I am going to go to Jeff for that one.

DR. BUCKEL: I think Kai was asking if we're different than the Gulf, and we definitely -- The red snapper in the Carolinas is deeper, and it's greater than ninety or a hundred feet, and that's where there's a lot of interactions with red snapper, and so I don't know about off of Florida and Georgia, but that's -- So that you do get this benefit from the descender for that, those fish that are caught in those deeper, that greater than ninety or a hundred feet of water.

DR. NESSLAGE: Mike, to that, to Fred's question?

DR. SCHMIDTKE: Just addressing Fred's question about what are they targeting when they're catching red snapper, we asked our AP members that question, and it varies a bit regionally, but some of the common species throughout this list that they gave us were black sea bass, triggerfish, vermilion, and amberjack, and so, I mean, 362 days out of the year, they're not targeting red snapper, because they're not allowed to keep the red snapper, and so, the majority of the time, when they're catching them, they are trying to find something else, and there is --

Within the best practices, and, as far as we know from talking to the advisory panel, there is an effort that, when they're catching red snapper, that they try to move off the site and go someplace else where they can catch something that they can keep. It's, as far as I understand, kind of a frowned-upon practice to catch red snapper and then just sit on a spot and keep catching and

throwing back red snapper, and so that's something that -- That's just some information that we have fairly recently, to Fred's question.

DR. NESSLAGE: Kai.

DR. LORENZEN: This is just a clarification, because I brought up, you know, the effectiveness of the barotrauma mitigation, and, of course, it's a good thing to do. One only has to also see that in the context of how prevalent barotrauma is in the fish pulling up, and so, typically -- I only know that, for Florida, it's maybe about 20 percent of the reef fish in the recreational fishery, and so it's a relatively small proportion of the fish that are pulled up that actually show signs of barotrauma. It's quite possible that, if you're fishing deeper off the Carolinas, it's a bigger contributor.

DR. NESSLAGE: Thank you. Alexei.

DR. SHAROV: My understanding is that the currently proposed mechanisms that we're discussing are season, space, and depth limits, right, but we don't have any information to base our recommendation on at this point, and it says that this is a further step, right, after the data collection.

Understanding and accepting all limitations or compensation mechanisms that might happen, it seems to me that, in order to proceed any further, we do still need to, A, do the first step, and that is evaluate the effectiveness of each mechanism, in terms of how efficient it is going to be in the reduction of the discards. Obviously, season is the most effective, probably, and, of course, it depends on the scale, right, but season and space and then depth, but that certainly would be easier to review once the data, the distribution of the harvest by season, space, and depth, or not just harvest, but harvest and the overall species distribution is available, sort of without the consideration of a compensatory mechanism.

Then getting to each of them the possibility of the compensatory mechanism, because, for example, it's probably more difficult to compensate for a lost hundred days of fishing, right, and it's unlikely that you will double your trip, in order to recuperate what you lost, and so there will be some savings, but, if the season reduction was five days, then, obviously, there is a neutral or no savings at all, and so, in terms of the compensation, of course, what we should be considering is that -- Well, increase in effort, with respect to the season, and, with the space, it depends on the scale, again.

It's entirely possible that you would move 150 miles away, into the area where you were allowed to fish, and so, individually, for each port, each location, there is a sort of optimal radius beyond which the compensation is unlikely, and so that might be considered, and the same with depth, and certainly what should be considered is the compensatory effects of that, if we are effective at reducing the number of dead fish, then they leave, and they stay in the population, increasing the -- Well, not increasing the abundance, but, yes, increasing the abundance, as opposed to the alternative, where they're all dead.

Therefore, the number of live fish increases, and the catch rate increases, and so, essentially, if I say that 30 percent of fish that used to die as a result of discarding are present in the water, then, for every trip, I encounter 1.3 times more fish, again, and then, therefore, I am discarding the higher number, and so the density-dependent consideration, and sorry for explaining to you what it is.

This has to be calculated, because, otherwise, we're not going to make any progress, but that's what I would suggest. Thanks.

DR. NESSLAGE: All good points, Alexei, and I guess the question is, can we do it with the available data, which I think was Erik's first point, and so but, Jie, you had your hand up?

DR. CAO: I guess I just want to speak a little bit to the spatial measures, because I think spatial targeting can be one of the measures that pick up the exploitation of species that are caught together, but that requires the understanding of the interaction between the fish community and the dynamics at a spatial scale, and that mainly goes to the managers, and I just wanted to let you guys know that I've been -- Currently, I'm doing a kind of joint species distribution model to look at the -- Hopefully to estimate the associations among the major snapper grouper species, and I think it's around twenty-something, to estimate the associations among those species, in terms of the cooccurrence spatially, and so hopefully that will provide some insights on which species are more likely to cooccur.

DR. NESSLAGE: That's great. What's the timeframe on that?

DR. CAO: I'm not sure about that, because that's kind of like a side project, and it's not funded.

DR. NESSLAGE: That might have to change. We'll see how high of a priority this is. Okay, and so I think we've already listed a number of uncertainties for these proposed mechanisms, and I wonder if we could talk a little bit about what data or analyses could improve efforts, and, I mean, we already discussed a little bit. If we need better discard estimates, we could start with that, and what else do we have? Amy.

DR. SCHUELLER: I wasn't -- I guess I'm not sure that I am totally done with the first one, meaning we talked about temporal closures and spatial closures, but are any other management actions being considered beyond that, I guess is my question, maybe to staff, and like there's lots of other things they can do besides spatial and temporal closures, and so how broad are we sweeping here?

DR. SCHMIDTKE: So gear changes are on the table as well, and that's one of the areas that the advisory panel seemed to favor more than a temporal or spatial closure. The hurdle that we would need to deal with with the gear closures is we would need to get some type of current and future estimation of use, what is the gear used right now, how would it be projected to change in the future, and then converting that into a change in the number of red snapper that are being caught and released.

That is kind of a tall order to do in the timeframe that the council is asking this to be finished in, and so that's a place that is a maybe, and I feel like it may get put on the table a bit more, now that the advisory panel has said that they are pretty emphatic against the spatial and the temporal closures, and they would be more for a gear type of change, but I guess I would be curious to see if there are other options that the SSC would throw out that could affect this.

DR. SCHUELLER: What do you mean by -- Do you have an example of a gear change that they're considering or that they think sounds good?

DR. SCHMIDTKE: I am scrolling through my notes from the AP meeting, and so one of the thoughts is to set a requirement for the hook. Right now, we're not delving into the enforcement aspect of this, and we're operating on the assumption that, if something is required, that it will become common practice, and so just bear that in mind, but one of the thoughts was to have a lighter hook, such that it could be basically pulled out more easily, without hooking into the fish, that it would kind of bend back, so that it can come out, and the lighter-gauge hooks are able to, I guess, do that, and that's a technique that's been used. If they feel a bite, and they can tell it's red snapper feeling, that they will yank out, and the hook will bend back, and then they'll move on to somewhere else.

There's also the thought of different lengths of leaders, and there would be a requirement of the length of the leader, and I don't have as much -- Sorry, and some of these notes are interesting.

Then another one would be a single-hook requirement, and kind of the thought would be that they would identify hotspot-type areas, and, if you're fishing in that area, you can only fish with a single hook, so you're not double-hooking two red snapper at a time, and so those are some examples of what's been talked about so far.

DR. CROSSON: Mike, a real quick clarifying question, and you said under the timeline of the council, and what is the timeline that the council needs this done by?

DR. SCHMIDTKE: The preemptive schedule for this is to have final consideration in March of next year, and so it's very fast, March of next year.

DR. NESSLAGE: Seriously? So you would have to have the analyses done for our October meeting, or we would see it at our April meeting, to consider an ABC? Sorry, and I'm not getting upset at you, and I'm just --

DR. LORENZEN: We're talking about one of the more complex analyses that would be coming before this panel.

DR. NESSLAGE: We could just simply say that council staff have been asked for way too heavy of a lift in such a short time period to properly address this question satisfactorily, to the extent that we would change the ABC, and it would require a longer timeframe and in-depth analysis and way better data, right? I mean, I am seeing people's faces, and I don't want to belabor this and make you go through a lot and jump through a lot of hoops in a short period of time and then have us -- Go ahead.

DR. SCHMIDTKE: I guess the reason why the council has kind of that two-pronged approach is they recognize the complexity of the issue, and they're not trying to fix everything. There are a lot of things that the council has discussed that need to be addressed within the snapper grouper fishery to make it better, and they're not trying to address everything through this action, and this is meant to be more of a band-aid, a stopgap, something to lessen the blow that would come, and some of the effects that would come, with the drastic reduction to a very limited red snapper fishery, and so that's kind of where they are with this action, and so, yes, it's --

Certainly staff recognizes, and the council mentioned, at the last meeting, that it is a heavy analytical lift, but there's also kind of this larger effort, and, if there are things that are going to

take too long, then they have tended to have been shifted over towards that MSE larger-scale change process, and so that's kind of -- That's some of the discussion that has happened thus far.

DR. NESSLAGE: Chip.

DR. COLLIER: I am just wondering -- I have heard you guys mention some ideas that seem -- What you guys thought was more feasible, and so a season, and that sounded like that was something that you felt was more easily quantifiable, and would that be something that the staff should pursue? Is that going to be easier than a spatial? I mean, given that -- If we're going to do one, which one do you think we could potentially get done in this timeframe, as opposed to a suite?

DR. CROSSON: I mean, a season for what? A season for closing effort for recreational snapper grouper fishing, period? I mean, because that's what it's got to be. It's a discard issue, and so it can't be -- I mean, I understand what the red snapper season is, but it also means that there's got to be a prohibition for fishing, for bottom fishing, and that would seem to be more possible to implement in a time period, but, even there, you're going to have geographic issues that you're going to have to deal with, because of the South Atlantic's -- The issues that always come up in the South Atlantic, which is that Florida and the Carolinas have a difference experience in winter, and even the parts of Florida have different experiences in winter, and so there's probably still going to have to be some sort of geographic aspect to it, and I would be surprised if you could totally elude that, but, yes, seasonal prohibitions on it would probably have to be implemented in that timeframe that you're talking about, but I don't even know how to get to the -- Amy is a stock assessment scientist, and I don't know how to get to modeling all of that.

DR. NESSLAGE: Amy and then Wilson.

DR. SCHUELLER: I was just going to add on top of what Scott just said. Some species are spawning in winter and summer or are spawning in summer, and some are -- It's way more complicated than just shut down the whole South Atlantic for six months. I mean, you could potentially -- Some species that spawn in those alternative six months, then they're just shut down totally, right, and like there is -- Anyway, I don't think any of these questions are simple. I don't know that we could guarantee that any of them will be adequately answered by March, and maybe I'm just being pessimistic, but that's my take on it.

DR. NESSLAGE: Thank you, Amy. We'll go to Kai and then Wilson.

DR. LORENZEN: So, I mean, first of all, I want to sort of recognize that I think it's good that they're asking this question, right, and so I don't want to discourage them from, you know, exploring that further, and, in practical terms, I think -- I mean, obviously, if you look at spatial, you need, explicitly, spatial data and essentially an assessment that we don't have, and so it seems to me that the seasons are going to be more tractable with what we have to play with, and it's still going to be complicated, but I think that that strikes me as the most tractable thing.

DR. SCHUELLER: It's still not easy.

DR. LORENZEN: No, it's not, and so, I mean, we shouldn't give people very high expectations of quick results, but I do think we should encourage them to pursue this, but, yes, not expect that there is going to be a clear and easy answer within a year.

DR. NESSLAGE: So let's go to Wilson.

DR. LANEY: Thank you, Madam Chairman. It seems to me that it would be a really cool master's project to try and invent gear that would be avoided by red snapper, and I will just throw that out. For those of you who are in active academic positions, you might be able to get really creative with some proposals there, but I do have a serious question, too.

I know we spent a good bit of time, in the past, talking about trying to get a handle on the percentage use of descending devices, and have we done any better on that point, or is that still a data need that would help us out here, in terms of when the fishery is open, spatially and seasonally, and, you know, how many -- What's the compliance rate for use of descending devices, because I know we asked that question in the past, and I don't know -- I see Chip is coming to the table, and so maybe he can give us some additional insight into that.

DR. NESSLAGE: Didn't Bev say there was some data, during the last assessment, that they didn't -- It was coming, forthcoming, but it was too late to be included, and there was like a whole bunch of new data that was coming in, and is that correct?

DR. COLLIER: I can't remember, and, you know, it's a bit of a challenge, because you're looking for signs of barotrauma, and, just because you brought up a fish, it does not mean that it has signs of barotrauma and it needs to be descended, and so there's a struggle with that, and that's why we have our best fishing practices campaign, is trying to inform people about what barotrauma is and how to look for the signs of it and get the fish back in the water as quickly as possible, or the best option is to avoid fish.

If it's a fish you can't keep, and you know that's a hotspot for the fish, don't go there, and so that's the kind of messages that they're putting out there, as far as some of the best fishing practices. I believe Bev does have some additional data, and I think I saw Julie Vecchio on the call, and there's a new study that was sponsored by The Nature Conservancy, and I can't remember the results of that right now, but there is definitely some information out there, some new information.

DR. NESSLAGE: Scott.

DR. CROSSON: I mean, in the long term, there are others -- In the long term, meaning years, there are other options than the ones that are up here that could be implemented and that people are considering. I'm involved with a group that is going to be looking at that issue, and there is the council's MSE project that's going to be looking at that issue, and those are all things that may come up with options that are more palatable than what's going to have to happen in the short-term, but, in the short-term, you're probably -- Also, because of the nature of just the analysis, you're probably going to have to talk about MRIP waves, I would think, that you may have to put on the table as being closed, because that's the way the MRIP data comes in.

I don't know how -- That's probably at a time when people would like to be actively fishing, and so it's going to be -- I still think it's probably politically easier than talking about geographic areas, in the sense that I just saw -- I've been around long enough in this thing to have seen what happened when the council talked about geographic closures for red snapper around 2009 and 2010, and that pitted states against each other in a really ugly way, and so I think that, in the sense that the council

wants to avoid that, they probably are going to have to talk above waves, and not that they want to talk about it, but --

DR. NESSLAGE: Thank you, Scott. I believe Bev has her hand raised, and can you help us out here, Bev, on your data?

MS. SAULS: Thanks. I didn't want to interject, but, since my name was brought up, I thought that I would. We actually are, in Florida, adding descender device observations to a couple of our surveys. Our at-sea observer survey on charter and headboat already collects that, and we're adding it to the State Reef Fish Survey this year on both coasts of Florida, because we recognize this as an important data need. I also wanted to offer up that both of those data sources include some spatial resolution to them that we would be happy to share with council staff or whoever is conducting analyses for this topic.

DR. NESSLAGE: Fabulous. Thank you. I actually have a question, and maybe it's a stupid one, but, so, in Florida, there's a reef fish permit, right? You have to get a special reef fish permit, and do the other states -- One, do the other states have that in the South Atlantic, and has the council ever considered restricting the number of permits, as a way to reduce effort?

DR. SCHMIDTKE: I don't know about the other states, as far as whether there is a state permit, but, right now, there is no federal recreational permit, and that's something that the advisory panel has been asking for for quite some time, and there is an amendment working on that right now to put in a recreational federal permit, and that's not done, and, as far as whether that would have any effect on access, I'm not sure. I don't think the intent behind that was as much to limit the access as it was to quantify the effort, and so --

DR. NESSLAGE: Chip, to that point?

DR. COLLIER: Just to clarify that, Florida -- It's not a permit. It's an add-on so that they can get information for a survey, and so, given that Bev just spoke, I know she would probably want that said.

DR. NESSLAGE: Thank you for that clarification. Scott.

DR. CROSSON: Even if a permit was possible, and it would limit the number of people that access the fishery, there is no way that you would be able to get that implemented in the next six months, or projected, and so that's just not going to be on the table right now. I'm not saying it shouldn't be on the table in the long run, but not right now.

DR. NESSLAGE: Okay, and so I'm hearing this is going to be incredibly difficult to do well in the next year, given the paucity of data available. This is kind of a summary note here, right, and this is going to be incredibly difficult, and I will wait for him to catch up. To quantify the potential impact of any of these management measures, and I also heard the SSC say we should say something to the effect as well that we applaud the council exploring these, and it's definitely needed. Does anyone disagree with that? I am seeing heads nodding.

So we need to make a statement to that effect as well, and I want to get that down before we forget, and I think Kai mentioned that earlier, but then my next question to you all is it seemed like, if the

council is going to explore anything in the short-term, the best option -- The lowest-hanging fruit might be spatial closures, although that will also be difficult to do well. What did I say?

DR. CROSSON: Seasonal.

DR. NESSLAGE: Sorry. Seasonal closures, although that will also be difficult to implement effectively.

DR. CROSSON: But that would also be the easiest one to analyze, I would think, and so -- Especially if you're using something as blunt as a wave, and I'm not saying stick it into any particular proposal, but just start analyzing what happens if you shut down the fishing for a wave, and what is the impact on that and on the red snapper, along with the other species.

DR. NESSLAGE: Relative to the geographic seasons in those areas, right, is what you --

DR. CROSSON: Yes, but, I mean, even just as a starting point, just start with waves and then go from there, and then you can fine-tune it, but the waves are -- That's probably not that difficult, and I'm happily going to say it's not that difficult, as an economist who doesn't have to do it, but that's probably doable in a short timeframe.

DR. NESSLAGE: Jeff.

DR. BUCKEL: Just two things, and so I applaud the council for exploring these alternatives and approaching us, right, and I think that's the other, that they're asking for our input early, which I appreciate, and then, back to Amy's very early comment that just looking at what's been -- We're not the first body, or this isn't the first time these management approaches have been tried, and so doing a review of what's been done, and that could be fairly quick and provide the council with -- To make sure that this temporal closure is the lowest-hanging fruit, and maybe there's something that we missed, because of the expertise on this group, and so review what's been published, and maybe you can find a good approach there, without -- That goes in addition to the analyses, or, if the analyses are delayed, because it is a lot of work, then some regulations could move forward, just based on what's out in the primary literature.

DR. NESSLAGE: I am seeing heads nodding to that. That's good. Then, regarding what data or analysis could improve efforts to quantify the impacts of these potential regulations, we have some ideas already up there, but -- So we don't need to rehash them, but perhaps do we need to make a strong statement about any and all quantification of any impacts? Quantification of the impacts of any management measures are going to rely on the reliable discard estimates. Until that problem is solved, it's going to be difficult to prove that any of these management measures are having an impact, even if they are, and they may very well be, but it will be hard to demonstrate. Does anyone disagree? I'm trying to summarize our key points here. What else though, for data and analyses? Is there anything else that hasn't been mentioned that we need to put on the list? Scott.

DR. CROSSON: My brain is churning along with this, and, in terms of what you just stated up there about trying to quantify and all these other things, one thing, again, about, if you start with an analysis that has closures of waves, you probably -- Especially if it's during the time of year when there's a lot of effort, you're probably going to overshoot the target, all right, and you probably -- I would be surprised if you didn't end up with something where you actually have --

If you close -- I'm not saying do this, but I'm saying, if you close Wave 3 for bottom fishing, you would overshoot the -- For the whole South Atlantic coast, you would overshoot the target, I would think, and you would probably find that the red snapper overfishing is no longer occurring.

That is not politically palatable, probably, and so, at that point, you step back and start thinking, okay, how can I geographically lessen the impact of this and how can I -- But the fact is that it would give you some margin there to start doing some other analysis, and, at that point -- Also, I'm thinking, from my perspective as an SSC member, I'm going to have an easier time believing that an actual bottom closure for that entire wave, or a portion of the wave, is going to lead to a reduction in discards, because I believe it's going to lead to a reduction in effort, okay, and so now you have room to come back, I would think, to the SSC and talk about whether whatever --

If you did manage to overshoot, and you did manage to stop the overfishing of red snapper, and now you're talking about what am I going to do with whatever margin that I have left over, and am I going to use it to lessen some sort of geographical problems that come with this big wave closure, or am I going to see if I can -- If there's enough of it, can I actually ask for an increase in the ABC for the directed harvest because I've managed to do that? That's when you start having some political room to play with and thinking about what your management options are, and so that would seem, to me, to be a logical way to approach this problem.

I mean, but it's getting -- Because this bleeds into the second question about what would we need to do in terms of updating the ABC, and I would have to see -- What I would need to have to update the ABC would be to see that there is an actual analysis that's done that I find believable, and that committee finds believable, is going to reduce the effort, and therefore reduce the discarding, and it's going to be harder to do that with descender devices or the changing of the hooks and other things, and it's not that it's impossible, but that's harder to demonstrate, and so it's going to be a longer process. A big closure is going to be something that I can accept more readily, and I would think the committee could accept more readily.

DR. NESSLAGE: So you're suggesting something that we already have decent monitoring data on, which would be recreational and commercial -- Well, total landings, as opposed to something more nebulous, like reducing discard mortality, which would require some scientific studies to quantify, et cetera, et cetera, and so we would suggest we focus on something that already has relatively reliable data monitoring, like landings, something that's easy, low-hanging fruit, as a first step, and so landings-based evidence. Help me out with wording, Kai.

DR. LORENZEN: Effort. I mean, recreational effort, and that's the key, and I think -- In the end, I think that's the only really effective way of addressing this problem, and the effort has to come down, but that's not going to be very popular.

DR. NESSLAGE: Which isn't our problem, but, if you're -- Basically, what we're saying is that effort is a proxy for discards, right?

DR. LORENZEN: Yes, and, if you have much lower effort, you will have lower discards.

DR. NESSLAGE: Wally.

DR. BUBLEY: Going along with that though, I mean, how well do we know the effort of the recreational fishery? That's always the problem, and that's why they've been talking about permitting and everything like that. I mean, you get some MRIP data, and you know the people that you capture going in and out, but you don't know the pool of this, and so that's always been the issue, I feel like, is that we don't have a good grasp on the recreational effort.

They have some, right, but it's not -- It's not like commercial landings, where you know, and you feel very confident about it, but, in terms of this, the problem is the recreational encounters, and do we have a good enough understanding of the recreational effort to really extrapolate that out and say this is something good, and that's the problem that we keep running into with all of these things, is the really simple analyses that we can get in some period of time that would be useful, on a timeframe that we're looking for, are just not feasible, or they're not going to be either politically -- They're not going to be something that anyone is going to want to go with, because it's just going to be too broad, or it's just not complex enough to deal with what is actually out there that's realistic.

DR. NESSLAGE: Sage words. Kai.

DR. LORENZEN: So, I mean, we have MRIP, right, and I think the big issues with the MRIP overall effort estimates, and so it's what is now the mail survey, and not so much with the intercepts, but I think it's -- We're looking at relative changes, and I think those would be better defined than the absolute total, and so I think that would be useful.

Then, also, for Florida, of course, we do have the Florida Reef Fish Survey, and that's the reef fish permit, and the purpose is to narrow the universe for that survey, and that data -- I can't remember, Dustin, and do you know, but I think the Atlantic started only very recently, right, but there are two independent surveys for Florida effort now, and I guess the bulk of that red snapper fishery happens off of Florida, and so that would be some useful information.

DR. NESSLAGE: All right. Scott.

DR. CROSSON: I think we have pretty good information from MRIP, but it's just that it's limited to the wave more than it is breaking it down, and so, temporally, I think we have pretty good information. I think geographic areas are where it gets more complex, because MRIP doesn't do a good job of saying where exactly in the water you caught the fish, and so that's -- Then, commercially, it's much more fine-tuned, because it's a census, and because they have the logbooks and stuff like that.

DR. NESSLAGE: Jeff.

DR. BUCKEL: I agree that the effort, by itself, Wally, because you don't know how much of that -- What percentage of that effort targeted hardbottom habitats where red snapper occur, but the B2 for red snapper -- That may -- You know, you might see it in the releases of red snapper, those estimates, where it's combined effort and the intercepts.

DR. NESSLAGE: Chris.

DR. DUMAS: So, right now, we've got, what, a short red snapper season, a few days, right? All right, and let's use three days. So suppose you wanted a red snapper season that was like a hundred days long, right, and so then you need -- You need like one-thirtieth of the people fishing on each day, and then you could spread out your season from three days to a hundred days, right, to expand it out, and so you could -- You could spread out the people more, and so suppose you could only go fishing if the day of your birthday like matched the day of the month. Then you would only have one out of thirty people could go fishing on that day, right?

If you had one out of thirty people fishing on that day, you would have a thirtieth of the effort, and so you could spread out your season and make it much longer, right, possibly? Now, you might not want to go fishing on that day, and so you could have a -- You could have a website that had the numbers one through thirty, right, and you could -- If you wanted to go fishing, you would have to go pick your day, and so I could be like a Number 2 person, and so then I could go fish on those days, and you might want to make those tradeable, and I don't know, but then combine that, and so that would be a way to think about --

So you want to spread out the people more, and you want some fishing to be able to happen on every day, so that the charter people can take -- Have people have a constant demand, spread out across the whole season, but you don't want all the demand happening on one day, and you've got to spread it out, right, and so spread out the people. Spread out the people, rather than spreading out the spatially or the temporally or the depth. Spread out the people, and then let the people catch -- Just keep everything they catch, so that you have zero discards.

Then figure out, okay, if people are allowed to keep everything they catch, and there are zero discards, and then combine that with spreading the people out in some way, and not necessarily your birthday day, and you could do it some other way, but then could we get to a better situation, where we're hitting our target, and we have a longer season, and we're hitting our catch target, and we have many fewer discards. I don't know. You guys have to help me out, but I'm just -- People are laughing, and is that because you don't want to fish on your birthday? What's up with that?

DR. NESSLAGE: Amy, to that point, and then Kai.

DR. SCHUELLER: I mean, I think we're all laughing because the idea of fishing only on your birthday is -- Well, it's sort of nice, actually, but the --

DR. DUMAS: On the date of your birthday, and so, if you were born on the second day, right, and if -- My birthday is February 15, and so I could fish on every fifteenth, for like four or five months, for example.

DR. SCHUELLER: Sure, and so I guess what I was sitting here thinking was -- I mean, we were basically told the favored options for some of these things are gear changes, and I'm very intrigued by this lighter-gauge hook thing, and I could talk about that all day, and I have lots of questions. Anyway, I won't go into that, but what I'm thinking to myself are some of these things are basically slicing infinitesimal slivers off the edges of the issue, in the hopes of not actually having to take a big piece of the pie, right?

I guess my point to the council would be that stop doing that, because you're really not getting yourself anywhere, and try to look at this bigger piece of the pie, and what Chris is getting at is what the real problem is, is the effort, and it's not just the distribution, but it's the amount. You know, if there are -- I don't even know how many millions of trips there are annually, and let's say there is thirty-million trips, and we need it to be ten-million trips, and how are we going to do that, and then what does the distribution of trips look like per angler?

I would suggest there is probably lots and lots of anglers who take one trip, two trips, three trips, and so even saying things like you only get to go fishing five days in the whole year only cuts off some amount of fishermen, and it doesn't actually bring down the total effort enough, because we need those people who are going fishing once a year to not go fishing at all, basically, if that makes sense, and so I don't know what the right way to approach that is. That is, I think, basically the problem, is there's no super good, palatable way to do this, other than a tag or some other system, like they use in other natural resource management systems.

You know, you can hunt a deer, and you get one deer tag, or, in North Carolina, it's six. Where I grew up in Iowa, you get one, and so it's -- But that has not ever been super palatable for fisheries, because there's this perception that somehow it's different, right, but, anyway, total effort -- Those folks that are fishing sort of once a year, we need to figure out how to not get them to fish, I guess, which I don't know, and it makes me a little sad, right, because we're trying to get our youth to fish and go outside, and --

DR. NESSLAGE: All right. I have Kai next.

DR. LORENZEN: I mean, coming back to Chris's point, of course, the very short season at the moment is -- That's the only time you can harvest, but you can go fishing as much as you want outside of that season, right, but you just can't take the fish, and the only way to really address the effort issue is to actually reduce the amount of fishing that people do, rather than just the harvest, and you're saying -- So if only on your birthday can you go fishing, or bottom fishing, full stop, then that addresses the issue, right, but it's a massive reduction in effort.

DR. DUMAS: Or you would have assigned days, and so it might not be your birthday, but --

DR. LORENZEN: No, but it doesn't mean that --

DR. DUMAS: What brought this to mind was gas rationing, gasoline rationing systems, right, and so you can only go on odd days of the week, depending on what your last name is, or even days, or something like that, so that you still get a lot of fishing days, but just fewer, and they're more spread out across the season.

DR LORENZEN: Yes, and, I mean, my point was that the --

DR. DUMAS: Right now, you only get four for red snapper.

DR. LORENZEN: Yes, but that's only the days that you can harvest. You can go fishing all year-round, right?

DR. DUMAS: Right, but you would be able to keep everything that you catch, and so you have fewer fishing days, but you could catch it all. You could keep it all, and so you would have maybe a higher-quality experience from those days.

DR. NESSLAGE: I don't think we're going to solve the issue today, gentlemen, and ladies, and I want to try and wrap us around to our major key points here. I love the brainstorming, but we might need to save that for another day, but I have a few people on the list, and then I'm going to try and rein us in here, and so I have Scott, Wally, and Alexei, in that order. Scott. No Scott? Then we're going straight to Wally.

DR. BUBLEY: Well, Amy, I would like to say that it's really funny how much I went through this in the Snapper Grouper AP meeting last week, or two weeks ago, whenever it was, and we are having parallel discussions, and they have the exact same thought processes that we do. They like the thought of having a tag, and they have made comments like that, and I didn't hear a birthday fishing date mentioned, but I wouldn't be surprised if they would be onboard with something along those lines, but all of this stuff is great, really creative, but, again, number one, we have to figure out a way to quantify this, because there could be some unintended consequences for some of this stuff, and so it gets complicated really fast when we start going to this.

It's just what Chris was saying, how you can fish on days that aren't your assigned days, and you then have this trading system going in, and so how do you keep track of all of this, and that's really complicated, and they're trying to get this done in a relatively short period of time, and so we're running into that kind of issue with it, and even the tag-type thing, and there's a lot of infrastructure, I guess, that would go into place to have that put in there.

The Snapper Grouper AP has been talking about a tag for as long as I've been going to those meetings, and, I mean, it's been a long, long time, and it's just never gained any traction, and so, I mean, I like the idea, and I think it's great, but I just don't know if it would really be going anywhere, based on it's been put out for years and nothing has happened, and now they want something done in less than a year, basically.

DR. NESSLAGE: Alexei.

DR. SHAROV: Well, in principle, I agree with Amy and what she said, but the difference between the wildlife and recreational fishing is that, when you go to hunt for deer, there are no bears or tigers jumping in the way of the deer and intercepting a bullet, but we do have a complex of snapper grouper and a bunch of other coinciding species, and so it's not just a reduction in effort not just directly targeting the red snapper, but all other species as well, and that's what makes it much more challenging, and sorry that it's obvious, but I had to say it.

DR. NESSLAGE: I have a question for you all, and so I think it would be -- I think we've brainstormed some incredible out-of-the-box ideas just today, and I'm sure that others will come up with great ideas as well. Given the uncertainty in the data that we're likely to have, what I am envisioning, or prognosticating, is that something is going to have to be done, and we're going to have to try it and see what happens.

At the end of the day, the SSC, I think, if I'm hearing you correctly, is more likely to entertain, or be supportive, of an effort, or an approach, management approach, that greatly reduces effort,

however you manage to achieve it, based on whatever data you can manage to scrounge up that you think is the best you can use that's available, but, if it's not significant, and Judd is highlighting that sentence right there, it's unlikely that we're going to get to any of these other bullet points about turning dead discards into harvest and landed harvest and changing the ABC.

Anything that comes across our table, it's got to be big at this point, and we've said it before, and I think the council knows, but, at the end of the day, I think we can stomach the uncertainty, and we're going to have to stomach a lot of uncertainty to move forward, to make any major changes, but -- So we need to recognize that. In some way, it might be -- I hate to use the word, but experimental, because we don't have the data to support quantifying and predicting the impact of any of these management measures really well, to the extent that we would feel 100 percent comfortable in saying, yes, go ahead.

I don't know if we -- Does everyone agree with that, and I think we need to be very clear and communicate that, both in our report and in the presentation to the council, because we need to give a little, in the sense that we need to be willing to accept a good degree of uncertainty in any analysis that Mike or whomever, the MSE group, whoever is doing this, is going to say that we think this is how it's going to -- The fishermen, anglers, whatever, are going to respond, but something has got to be tried, and that's got to -- But it's got to be big, right, and is that what I'm hearing you say, as in major reductions in overall effort? I am seeing heads nod, and I am seeing thumbs-up. Does anyone disagree?

Remember this, that we're going to have to accept a good degree of uncertainty, because we tend to focus on nitpicky stuff, which is fine, and we're scientists, and we're designed to do that, and that's what we were trained to do, but, to make any major movement on this, we're going to have to swallow some uncertainty, and that's my -- Okay. I will get off my soapbox. Alexei.

DR. SHAROV: Well, there is one alternative, and that is that, if it is possible to invent the fishing methods that would be efficient in excluding on a species basis, and, I mean, if you were to design a method of catching a snapper, but avoiding whatever -- I mean, it could be a combination of techniques and tricks and equipment, but it's theoretically possible, or is it, outside of just massive effort reduction, and I agree with a massive effort reduction, but this would be the least popular, obviously, and nobody is going to like it.

DR. NESSLAGE: Gear options are certainly something we would entertain, but that's going to take studies to demonstrate their effectiveness, right, because we have no idea if it's something new, and so that might not meet the one-year timeframe, and so I think, down the line -- Am I wrong there? I don't know, Alexei, and am I poo-pooing your comment? Alexei.

DR. SHAROV: You're fine.

DR. NESSLAGE: But maybe we capture something to the -- You have gear restrictions and changes on the table as an option, but it's going to be probably a longer-term, I think is what I would add to Alexei's comment, unless folks disagree, and it's not going to probably be something that would be implemented in the next year. Jeff.

DR. BUCKEL: To that point, I think some of these, the ones that were brought up, were the ones that Kai and Amy, rightfully so, said that's just going to be slivers, right, and we need this big

chunk, and so I think the gear restriction that would get you a big chunk, this unicorn gear that can only catch the other species in the complex and not get a red snapper, and we can certainly put something like that in there, but that's -- It would have to be in that realm and not the hook gauge and the leader length.

DR. NESSLAGE: I think we've got a lot of ideas and our general strong statements down, and I will, again, craft these into something a little more palatable for tomorrow's review of consensus statements, but I'm still not sure if we have addressed that second bullet thoroughly. Would reducing the number of red snapper that are discarded dead provide an opportunity for increased harvest? Too early to tell?

DR. LORENZEN: Yes, if that is more than what is needed to get to the catch at F rebuild, right?

DR. NESSLAGE: So back to Scott's earlier point. Okay.

DR. CROSSON: The other point that I was going to bring up back then that is now appropriate is that I listened to that AP meeting, and I heard the frustration of the fishermen, and Mike already heard this, because I brought this up during the SEP meeting, but I heard the frustration of the fishermen, when they were basically asked what are you willing to give up without having anything offered in return, and it didn't go over well, any more than it does with anybody else who is asked to give something up and totally don't get anything in return, and so, if you're able to do that, if you're able to make a meaningful reduction and find a way to give at least some kind of increase in directed harvest because of it, that's probably more palatable than just getting the bare minimum to scrape by.

DR. NESSLAGE: All right. Any outstanding thoughts to add to our report? You have overnight to mull on it as well, and, if you come up with any other great solutions, like the birthday option or the tiger tag option, you can -- Or the unicorn gear change option, please share them. Not to make light of a very serious topic, but -- Kai.

DR. LORENZEN: Any other thought that doesn't necessarily involve a big effort reduction -- I mean, is the question -- When you look at the limited bycatch data that you have, are there patterns, are there places, seasons, where there's just a lot less bycatch of other species than at other times, or in other places, and so I don't know whether people have looked at that, and I would think, if you have a hard time finding those patterns, then it's not worth doing, but, if there are some really clear things, where you have times or places where you have a lot less bycatch than others, then that might be worth exploring more, but I really don't know, and I have never seen an analysis of this kind, but I would think that would be a useful thing to do.

DR. NESSLAGE: So, basically, fund Jie's side project, is what we need to do, as a recommendation. All right. Any other last-minute comments on this, or suggestions? Great. Thank you for the fruitful discussion. I would like to take a ten-minute break, and then we will come back and hear from Todd Kellison, and I believe we have him on the line, and so ten minutes, and let's say 3:50 to please come back.

(Whereupon, a recess was taken.)

DR. NESSLAGE: Okay. It's time to reconvene. Make sure you've got your cookie. All right. Todd, thank you for your patience with us while we grab our cookies, and so our next agenda item is the Southeast Fisheries Science Center 2021 Deepwater Longline Survey. We have requested, in the past, an update on this great survey, and Todd Kellison has kindly agreed to come provide us with an update, and I would refer you to Attachment 8, which is his presentation, and he will be providing us with some information on the progress of the survey, and so, Todd, I'm going to let you take the floor here.

SEFSC 2021 DEEPWATER LONGLINE SURVEY RESULTS

DR. KELLISON: Thank you, and good afternoon, everyone. Thanks for the opportunity to provide this update today. I'm Todd Kellison, and I'm with the Southeast Fisheries Science Center, and I work with Blake Price and Roidan Munoz from the Center, and with Wally Bubley, and formerly with Marcel Reichert, with the South Carolina Department of Natural Resources, to coordinate this relatively new survey.

We also work closely, as shown here, with industry to perform the survey, and listed on this slide are the industry participants from this past year, 2021, Dewey Hemilright out of North Carolina, Steve Shelley out South Carolina, Jim and Mike Freeman, and Vincent Bonura, all out of Florida, and Steve and the Freemans participated in 2020 as well, and so thanks to them. I know at least Vincent is listening in today.

This presentation, I will cover, briefly, some background and need for the survey, and I will walk through the methodology that was utilized for the survey, and I will talk about the results that we generated in 2020 and 2021, the two years thus far that we have performed the survey, the potential utility of the survey, based on the results from 2020 and 2021, and then briefly plans looking forward.

In terms of background and need, as you're likely aware, there has been a longline survey in the South Atlantic for a number of years, and it's generally frequently referred to as the shark and red snapper survey, and it's coordinated out of the Southeast Science Center's Pascagoula Laboratory, and they perform the survey in the Gulf of Mexico and the South Atlantic.

The South Atlantic component has been occurring on roughly an annual basis, generally an annual basis, since 1995, and the survey universe, or the area sampled, is shown in the figure on the right, and it samples out to 183 meters on the Atlantic side, and they don't sample deeper than that. They do sample deeper than that in the Gulf, out to I think 366 meters, but they only sample to 183 meters on the Atlantic side, because of gear loss and because of currants, currant-driven gear loss, in deeper depths, and that survey typically completes around forty-five to sixty stations per year, but, interestingly, on the Atlantic side, they catch very few teleost species, and so the catches are predominantly sharks. In the Gulf, a number of indices are generated from the survey for several council-managed species, but that's not the case, and very few teleost species are caught on the Atlantic side in the survey.

We do have a trap-video survey, which many of you are likely familiar with, that effectively samples reef habitat on the continental shelf and shelf break, out to about eighty-five, or sometimes out to about a hundred meters, but that sort of, of course, is not helpful in waters deeper than that

deep depth limit, and so we really have limited data available for the deeper-water demersal species complex, predominantly golden and blueline tilefish and deeper-water grouper species.

The South Atlantic Deepwater Longline survey, or the SADL survey, is a survey that's focused on those tilefish species and deeper-water groupers, and the intent of the survey is to generate indices of abundance and life history information for stock assessment and management support. As I mentioned, and as I'll describe in several other slides, it's a cooperative effort with industry. The first year that we implemented the survey was 2020, and we repeated it in 2021, and it is anticipated that we will continue to perform the survey annually.

The survey methodology, a lot of thought went into developing the methodology, and much of that began in 2015, when we held a workshop, and that was a collaborative effort between scientists and industry to ask the question of, if we had the resources, how would we survey these deeper-water demersal species, and that workshop resulted in a technical memo, which outlines the recommendations from the workshop, and those recommendations are really the recipe that we used for this survey, but we supplemented that information with results from more recent cooperative projects with industry, and also an effort in the Mid-Atlantic, a deepwater-tilefish-focused longline survey that was carried out in 2017, I believe, and again in 2020, and so we've worked very closely, on that front, with our colleagues from the Mid-Atlantic Council and the Northeast Fisheries Science Center.

The SADL survey methodology is from North Carolina to the Florida Keys, and so you'll see the figure on the right shows the survey domain, and the colors just represent regions sampled in 2021 by the four cooperative industry participants, and the depth range is seventy-five to 366 meters. The survey design is stratified by depth and latitude, and the gear is a bottom longline. In 2020, it was a four-mile mainline. In 2021, we shortened that to three miles, to try to increase sampling efficiency, but the hook density remained at 150 hooks per mile, and we used 12/0 offset circle hooks and baited with squid.

Then, because of the current-driven gear loss issue that I mentioned previously, because of feedback from the industry particularly, those fishing in the high-current areas off of Florida were utilizing a last-hook-in-first-hook-out methodology, where the vessel never lets go of the gear, also avoiding that potential gear loss due to currents, and the sampling is entirely during the day, and it occurs in late summer, both in 2020 and 2021.

The site selection, in the past two years, has been a little complicated, and that complication is because of the suite of focal species, and so our focal species for the survey utilize a range of habitats, from hardbottom-relief-oriented habitats to unstructured habitats, and we have a pretty poor knowledge of the distribution of those habitats within the survey domain, but we do know that hardbottom is patchily distributed, and we are concerned that a truly random site selection methodology might result in very limited, or perhaps no sampling, of hardbottom habitat.

We did have a relatively large number of known sites, and so sites within our scientific databases that were within the survey domain, and so that image is blurry, but those are just a bunch of points of different colors, and the different colors just represent the data source, which ranged from, for example, information that was directly contributed by fishermen to information that was gleaned from fishing charts, our own on-the-water experience, observer data, inputs like that that allowed us to generate a database of sites that were linked in some way to hardbottom.

For 2020 and 2021, we have used three site types, truly random sites within depth by latitude cells, sites that were selected randomly from this universe of sites that we already had in our databases, which had a likelihood of being affiliated with hardbottom, and then captain's choice sites, also within each depth by latitude cell, and so we planned, at least, to have equal allocation of effort across cells, and I will just sort of skip to an endpoint now, and that is that, while the site selection methodology has been complicated, I think that we have sufficient information, which I will talk about in the subsequent slides, to move to a fully-random site selection methodology again in 2022.

I mentioned this is a cooperative effort with industry. In 2020, we had two participants. In 2021, we had four, and then data collection at-sea occurs from a NMFS observer who participates in the trips.

Here are the results from 2020, in terms of where our sampling occurred, and so the small orange dots are where a longline deployment occurred, and you can see that it occurred from north of Hatteras down to the northern Keys, and so we didn't get sampling in the middle or lower Keys and out to the Tortugas in 2020, and so a total of forty-six deployments in 2020. In 2021, we initially scaled-up our efforts, to try to roughly quadruple sampling in 2020, and you will see that we have truly north-to-south distribution of samples, and so from the North Carolina-Virginia line down to the Tortugas in 2021. Then, below each of the figures, you'll see the distribution of sites, and that's a percentage, between the random, the universe random sites, the ones that we selected from sites within our database, and captain's choice, for each year.

This slide and the next slide are both tables, and they'll have the same format, and this is slide is sort of managed, council-managed, species, and the next slide is shark species, but they're both formatted the same way. The column on the left is the species, and the next two columns are the total numbers caught in 2020 and 2021, respectively, and the next two columns are the proportion positive in 2020 and 2021, meaning the proportion of total sets for each year in which at least one individual of that species was caught.

As a general rule-of-thumb, if the proportion positive is around 0.10 or greater, there is a likelihood that you can develop a potentially useful index of abundance for that species, and so, just sort of a general rule-of-thumb, you can see that there are a number of values. This table is near, at, or above that 0.10 value, and then, while they're not the focal species for this survey, we did collect information on a number of shark species. In talking to our shark biologists and assessment scientists, it appears that this information could potentially be useful for a number of shark species as well.

I will present to you, in the following slides, the spatial distribution of catch and some information on the sizes of the catch for five species, blueline tilefish, golden tilefish, red porgy, red snapper, and snowy grouper, and part of the purpose of this is to think about the approach that we've used in the past, where we've had this mixture of stations between random and universal random and captain's choice, and what we might achieve if we went to a random-only selection, and so the figure on the left shows the results.

The catches from 2021, and this is for blueline tilefish, with the size of the circle being proportional to the catch at that site, and so the figure on the left is from all of the 187 samples in 2021, and the figure on the right is the catch from the solely random samples in 2021, and I don't remember what

the total number of those were, but it was 48 percent of the 187. You can see that the spatial distribution of catches is similar, which is generally the case for the five species that I will show you.

This figure shows the relationship between -- It's a scatter plot showing length by depth of the blueline tilefish that were caught, and the green line in this, and in similar figures that I will show, is the divider between the shallow and the deep depth strata.

Golden tilefish, again all stations on the left and random stations only on the right, and you can see a similar spatial distribution of catches, and nearly all the golden tilefish collected were in the deeper strata, and there is a clear relationship between size and depth. This is red porgy, and we caught I think fifty-eight red porgy this year, and so there are not too many caught in the random stations. You will see the catches were all in the shallow strata.

This is red snapper, and, again, it's generally similar spatial distributions between the all-stations data and just the random-stations data. You will see that the red snapper we collected on the shallow stratum, and, lastly, this is snowy grouper, and it's a similar spatial distribution of catches for the random stations, and that's for all the stations. There's an increasing size with depth relationship for snowy grouper across the two depth strata.

This is a bit of a summary, and so the values that you see in the sub-bullets under the second bullet is part of the species-specific proportion positive values for only random stations from 2021, and, again, the first bullet is only a sort of general rule of thumb that proportion-positive values of roughly greater than 0.1 suggest index development with a reasonable coefficient of variation is likely possible, and so you see that, while some of those are shark species, a number of council-managed species are on that list, including snowy grouper, golden tilefish, and a blueline tilefish, and I noted, in the last bullet, that there is eight additional species that are below that 0.10 value, but are somewhere in that neighborhood, and that includes greater amberjack, and so it does appear likely that the data -- If we continue at this sort of level of effort as in 2021, that data from the survey could be useful for multiple teleost species, and potentially for multiple shark species as well.

We do plan for a similar level of effort in 2022 as we had in 2021, and we are considering thinking about whether the new tours are proportional to area allocation of effort, and, thus far, we've just allocated effort equally by depth by latitude cell, and we anticipate moving to a fully-random site selection. In future efforts, we need to spend some more time, and we have spent some time already, looking at the data, but thinking about the extent to which we might be able to utilize the universe, random, and captain's choice data in index development. I think that's the last slide, without the questions slide, and so I will stop there and try to address any questions. Thank you.

DR. NESSLAGE: Thank you, Todd. Great presentation, and it's greatly appreciated. Are there questions for Todd? Alexei.

DR. SHAROV: Thank you so much for your presentation, and it's really interesting. I have a couple of clarification questions. One is on the deployment and retrieval. You said that the vessel is always connected to the gear, to avoid gear loss, and so does that mean that the retrieval -- Once the longline is set, does the retrieval begin from the end of the set that is the one that was just

recently laid down on the ground, or do you have some sort of a connection to the beginning of the longline, which seems to be unlikely with a length of three miles?

DR. KELLISON: Correct, and so thank you for the question, Alexei. Yes, the last hook that goes in the water is the first hook that comes out of the water, which is a complicating factor for this survey, but the guidance that we got from industry, particularly those fishing in those high-current areas, was that it was important for them to hold onto their gear, or else they may lose that gear, and so there is unequal soak time by hook across each longline set. That said, each of the longline sets are being fished consistently.

DR. SHAROV: Right, and so what is then the average soak time for the first hooks at the beginning, that stayed the longest time in the water?

DR. KELLISON: Well, the average soak time was -- I don't know the answer to that, and we could determine the answer to that, and it would be different between 2020 and 2021, because the length of the mainline changed from four miles in 2020 to three miles in 2021. It would definitely complicate the inclusion of soak time, hook soak time, and the generation of an index, and so I think that -- Wally might be interested in weighing-in here as well, and Wally and I have talked some about this, but I think that the metric would need to be catch per deployment.

DR. SHAROV: Thank you, and just one more question, if I can. What is the logic behind the captain's choice, and it's just the -- Well, anyway, there must be some reason for that.

DR. KELLISON: Well, I think, broadly, we were just very uncertain about what the catches would be like from this survey, and particularly in the initial years, and so it was just another way of -- We were just trying to learn more about the distribution of catches, what we were likely to catch, and trying to determine the best approaches for the survey.

DR. SHAROV: Right, and so is the idea that the captain having some experience might locate the sites where there is a higher likelihood of capturing the species of interest? Is that the basic idea behind it?

DR. KELLISON: Yes, and, I mean, I have to think back a little bit to this, and so, also, I might point to Wally and see if he has recollections, but another point would be that it might have been another way that we would anticipate ensuring that we would get some areas of hardbottom sampled.

DR. SHAROV: Thank you very much.

DR. KELLISON: Thank you.

DR. NESSLAGE: Wally, did you want to add something?

DR. BUBLEY: Yes, and, I mean, I'll touch on the points that Todd was talking about, in terms of the last-hook-in-first-hook-out type of thing, and they're not keeping track of what hook these fish are being caught on, and so, by using each individual sampling unit as being one longline set, as long as they're consistent across all of them, that's still -- It doesn't matter if that last hook soaks for fifteen minutes or sixty minutes. As long as it's consistent across all of them, we felt that you

could still utilize those data, because it's coming as a big block, and it's not by hook. In terms of -- What was the other question? Sorry, Alexei.

DR. KELLISON: About captain's choice, Wally.

DR. BUBLEY: The thing with captain's choice, as Todd mentioned multiple times, is some of these areas we didn't have a lot of information about bottom type, and so we were really concerned about missing out on some of these species that are very dependent on hardbottom, and so, prior to doing just the purely random ones that we saw that actually worked enough that we could utilize them in the future, this was potentially a way to even build out the universe of sites as well. As you mentioned, it's basically these fishermen are going to a location where they feel comfortable that there are fish, which, by proxy, means that there is bottom that is suitable, and so it was just a means of identifying another area that we could potentially add to this universe, if we proceeded with that in the future, but it looks like that is not the case.

DR. NESSLAGE: I have a question, and it may be a stupid one, but it looks like, for most of the species you presented the length-by-depth relationships, with maybe the exception of snowy, there didn't seem to be any strong relationship, and do you think that has anything to do with hook size?

DR. KELLISON: I'm not positive, but that is a great question. I am uncertain what the answer is, but I do know -- Like I'm thinking from the Mid-Atlantic survey experience, and my recollection of their survey results were they utilized I believe three hook sizes, at least in 2017, and the 12/0 hooks were generally catching the entire size distribution of their species, and so those were just tilefish species, and so I think the answer is possibly, and that's a great question, and so then we need to think about it and probably talk to industry about it.

I will -- I am not sure if it was Wally that mentioned this, and somebody mentioned this to me recently, is that I think one of our industry participants was surprised at the catches of larger fish on these 12/0 hooks, maybe for golden tilefish, and they planned to start implementing more of that in their commercial efforts.

DR. NESSLAGE: Wally, do you have something to add?

DR. BUBLEY: Yes, and, I mean, we didn't -- In 2021, we actually utilized two different hook sizes, initially, and was it 2021, or maybe it was 2020, and we had a CRP where we were looking at different hook sizes, and maybe that's what it was, but we had a 12/0, and we had a 15/0, and the 12/0 covered essentially the whole range that the 15/0 did, and there was a slightly different distribution shift, but at least it covered that entire range, which was one of the reasons why we chose to go with the 12/0, was because it covered that whole range, and it simplified it, by only having one hook size, instead of multiple hook sizes, and so that was one of the reasons, and so we didn't go lower, and so we can't really answer some of those questions, but I can say -- I mean, some of those red porgy are not massive fish, and they were taking a 12/0 hook size, and so I don't -- I mean, that's not something -- Also, I guess, looking at some of the golden tilefish catches that we had, we had some very small golden tilefish.

I mean, there were some that were a foot long, maybe, and I looked at them, and I had to take a second glance to realize that it was actually a golden tilefish, but, I mean, there were some that

were about a foot long that we were catching, and so they were -- The smaller-sized fish were definitely being caught on that 12/0 hook, at least with the species of interest, I would say.

DR. NESSLAGE: That is so exciting. I can't wait until that can be incorporated in the next golden tilefish assessment. You made my day. Any other questions for Todd? Alexei.

DR. SHAROV: Maybe it's premature to pay too much attention to comparing results of two years, but I couldn't help but to notice that the effort in the second year was roughly four-times the effort of the first year, but for the top, the most abundant, species, the total catch, in some cases, was an order of magnitude more than in the first year, and do you have sort of an idea of the disproportional sort of difference? Of course, there is a measurement error, sampling error, but could this be an effect of the increased, or high, percentage of the captain's choice sites? I don't want to venture into too much speculation, but you might know better.

DR. KELLISON: Well, I think that's a great question, Alexei, and thank you for that, and so, yes, I think some of the large numbers from 2021 are because of captain's choice, and so Captain Dewey, up off of North Carolina, and some of his captain's choice sites had very large blueline tilefish catches, but, that said, we caught a lot of blueline tilefish in that area on the random stations as well, and, similarly, the tilefish grounds off of Florida, and there were large golden tilefish catches from some of the captain's choice sites, and so definitely some of the larger species-specific numbers in 2021 are the captain's choice sites contributed to those large numbers. Does that address your question, Alexei?

DR. SHAROV: Yes, and thank you very much.

DR. NESSLAGE: Wally.

DR. BUBLEY: I also want to add too that I would agree with what Todd was saying, but, with blueline tilefish as well, in 2020, there wasn't a strata from the -- I am trying to think if it was thirty-four or thirty-five degrees, and it was thirty-five degrees, I think, to the North Carolina-Virginia border, which is a very important area for the blueline tilefish fishery, and so, last year, that area was included as well, and so that could have potentially increased the proportion positive, because we had some samples allocated to that area that weren't in it the year before.

DR. KELLISON: Thank you for that, Wally. Thanks for reminding me about that point, which I intended to make during the presentation, and I failed to do so, and so, as Wally said, in 2020, the northern extent of the survey was, I think, thirty-five or thirty-six, and I don't recall, Wally, but it was not quite at the Virginia line, but, in 2021, the survey went all the way to the Virginia line, and, as Wally conveyed, those are productive blueline tilefish grounds, and a lot of the catch totals from 2021, for blueline tilefish particularly, came from that area at that very northern end of the survey distribution.

DR. NESSLAGE: Great. Thank you. Any other questions for Todd and Wally and the group here? Jeff.

DR BUCKEL: Todd, thanks for the presentation. I know the main reason for the survey is for an index of abundance, but it's also getting biological samples, and so I wonder if you've thought about, when you're getting rid of the captain's choice, if that would impact the sample sizes for

the lengths and ages, et cetera, and so if that's been thought through, and I just don't want to throw something out that might be beneficial for something besides the index. Thanks.

DR. KELLISON: Thanks, Jeff. I think one point I'll note is that, while we are collecting biological samples, and so otolith and reproductive samples, during the survey, thus far, we haven't had the funding resources to fully process and analyze those, and so we're collecting the samples, but, right now, we're not generating the data, and so, Jeff, I think that's a great comment, and what we'll need to do is just keep that in mind. As we anticipate that we're going to move to a fully random approach in 2022, we'll see how that affects the overall catches and what the implications might be for any potential loss of information on life history.

DR. BUCKEL: Thanks, Todd. We want to keep Genny happy with the golden tilefish samples.

DR. NESSLAGE: Wally, to that point?

DR. BUBLEY: To follow-up with what Todd was saying, with the last two years, we've had observers onboard, and they were removing whatever they could out at sea, and so they weren't getting 100 percent of the life history data, and so, if we moved away from captain's choice, which tended to have a lot of big catches -- Those were the catches that, probably more likely than not, got sub-sampled, versus when we have truly random, where it might be smaller catches, which might still have probably roughly the same number of life history samples, but it's just going to be -- We're not going to have to sub-sample nearly as much, if we don't have massive catches like we did with some of those captain's choice.

DR. NESSLAGE: Thank you. George.

DR. SEDBERRY: Todd, when you say that the random stations were random, they're just completely random, or stratified by depth and latitude or depth and state, but, other than that, completely random, and there's no sampling universe that you pick stations from, like is done for the trap survey?

DR. KELLISON: Thanks for the question, George. With the random sites from 2020 and 2021, they were -- Although I'm not sure of the grid size for the site selection, but they were randomly, like truly randomly, selected from within each depth by latitude cell, and so you're accurate, George, and it's not similar to, or analogous to, the trap-video survey, where we have a universe of stations from which we randomly select sites to sample each year, and this is a truly random, from all potential points, selection.

DR. SEDBERRY: So, if we ever did want to concentrate more on hardbottom area, then you could create a sampling universe from which to choose hardbottom areas that could include those captain's choice locations, and any other locations we knew about, that were hardbottom?

DR. KELLISON: Well, one challenge that we have is that the sampling gear in 2020 was four miles long, and, in 2021, it's three miles long, and so like every deployment is potentially occurring over a distribution of different habitats, and we don't have really a way to quantify, or groundtruth, what those habitats are, and so we talked about putting cameras on the gear, but we would need sort of three-mile coverage for those cameras for every set, and so that's not information that we're collecting right now, and I think that we really just have to make some inferences on -- We did

talk to the captains, or the industry participants, to get their input, and they have, of course, a tremendous amount of insight about the bottom over which they're sampling, but, otherwise, we think we're limited to making inferences about the bottom type from the catches.

DR. SEDBERRY: That makes perfect sense, and I was thinking with my trapping brain and not my longline brain.

DR. NESSLAGE: All right. I am not seeing any other hands raised. Let's take a moment to go to public comment and see if there is anyone online, because there doesn't appear to be anyone in the room raising their hand. If you are online, and you would like to make public comment on this agenda item, please raise your hand.

DR. CURTIS: I am not seeing any hands on the webinar.

DR. NESSLAGE: Excellent. Thank you, Judd. Then we'll go back to the SSC. Any other outstanding questions for Todd and the crew? Alexei.

DR. SHAROV: Just one last question. How many, approximately how many, sites are there in your current database that you call the universal something, and, in other words, the sites that you know are hardbottom and are more likely to have the species of interest, and so, essentially, you are sort of in the process of forming the stratified randomized design, as I understand, or at least, for the moment, it looks like it's shaping that way, and so the known stations with the hardbottom are likely to sort of form the sampling frame for this, and so I was curious how many sites are known at this point.

DR. KELLISON: Well, thank you, Alexei, and so a couple of things. One, I don't anticipate us, for 2022, continuing to utilize that universe of sites that we had in our scientific database. We might, and, eventually, it will be nice if we could somehow stratify the survey by, for example, habitat types, so we have some sites that are focused towards hardbottom and some towards unstructured bottom, but I would note that -- One, I do not know the answer to your question, and Wally may, about how many of those sites that we have, and it would be a quick question for me to ask, but I don't know the total number, but a point that I would make is that we don't know that those sites are hardbottom sites.

We just infer that many, or most, of them are, at least for most of them, I think, from catches from the sites or from -- I mentioned that some of them are from fishing charts, for example, and so we're inferring that those are correct.

Some are from people in industry literally allowing us to -- Sharing their points with us in the database, and others are data that have been generated from NMFS observers, and so then we're just looking at the catch and making some inferences about species that were caught and the likelihood of those being affiliated with hardbottom, if that makes sense. We didn't -- We don't really know that there is hardbottom associated with I would say a majority of those sites in our universe, but we have inferred it from other information sources, and does that make sense?

DR. SHAROV: Yes. Thank you.

DR. NESSLAGE: All right. Last call for questions for Todd. All right. Thank you. This was fantastic. We really appreciate the opportunity and the time that you've put into the presentation today, and I think that's all. We don't have any action items for this, and so this was purely informational, and we appreciate all the information that you provided. Thank you so much, Todd.

DR. KELLISON: Thank you so much for giving me the opportunity. I appreciate it, everyone.

DR. NESSLAGE: Have a great day.

DR. KELLISON: You too. Thank you.

DR. NESSLAGE: All right then. Our last item for the day then is a nice segue into the blueline tilefish operational assessment terms of reference, and I will draw your attention to Attachment 9, but I believe we'll have some additional things on the board here, and Kathleen is going to walk us through this.

BLUELINE TILEFISH OPERATIONAL ASSESSMENT TERMS OF REFERENCE

MS. HOWINGTON: Thank you, Genny. Hello, everyone. My name is Kathleen Howington, and I am the SEDAR Coordinator that focuses mainly on the South Atlantic assessments, and today I would like to bring to you the draft terms of reference for the Atlantic blueline tilefish operational assessment that will be occurring in 2024. If these seem similar to you, that's because you all approved them in 2020.

There, of course, has been a time lapse since then, and, additionally, I sent these to the Mid-Atlantic for a review, and they have added in some language, and so they are coming back to you to triple-check that we're all good, as well as hopefully update and add some language in, and so I'm hoping that, if it's all right with all of you, that we just go through these terms of reference one-by-one, and I can show you any changes that were made, and then we can just edit as we're going.

Right here, in Term of Reference Number 1, the only changes that were made were I updated the terminal year to 2022, and this was per the South Atlantic Council's request, after they requested that this assessment be postponed to add in a couple of additional years of data, as well as I added in your language from a few other terms of reference that you have been providing to the council, to provide any partial or preliminary 2023 data available at the time of data to provision.

The only other change that has occurred for this term of reference would be this language right here, and this was the Mid-Atlantic's suggestion, to incorporate the latest ASPIC model for south of Cape Hatteras to the Gulf and South Atlantic Council boundary and the latest DLM model for north of Cape Hatteras. Previous to this, the only model that was requested was the ASPIC model, and the boundaries were not specified, and so that was the Mid-Atlantic's suggestion.

DR. NESSLAGE: Any questions for Kathleen and/or any other suggested changes to these revised TORs? We have seen these before, but this is your opportunity, and I believe the last opportunity.

MS. HOWINGTON: No, not necessarily, and so, unfortunately, these are going to have to go back to the Mid-Atlantic if we make any wording changes, which I have it on good authority that we're

going to, because one of the guys who told me that he would like some changes is sitting in the room right behind me, and so, if there are any changes, I do need to send them back to the Mid-Atlantic. If they approve it, then we're all good, and this is the last time you see them, and we're fine, and, if they for some reason have any edits, then the next time you all will be seeing them will be in October, and I will make certain that a Mid-Atlantic representative is here, so that way we don't have to do it again. Unfortunately, the representative that I was working with is currently the chair of a meeting right now, and so he was unable to make it, and so hopefully yes, but maybe not.

DR. NESSLAGE: Do I dare ask what sort of changes the gentleman in the back of the room is going to suggest?

MS. HOWINGTON: It may or may not have to do with the longline survey that we just looked at a survey for. That's probably going to be incorporated, and it's just a thought though. Anyway, for this first term of reference, do we have any edits or questions? The only thought that I could potentially put forward would be the terminal year of 2022, and maybe the SSC would request a terminal year of 2023, because the council has also requested that this assessment occur later on in the 2024 year, and so, that way, we don't overlap with a Mid-Atlantic assessment that is occurring that year, and so that would be the only suggestion, but, since the council requested 2022, and then requested later on in the year, I had to put down what they requested.

DR. NESSLAGE: They didn't ask for 2023, if possible?

MS. HOWINGTON: No.

DR. NESSLAGE: Erik, to that point?

DR. WILLIAMS: On that point, I would like to, and I don't know if I have the support of the full Center on this yet, but I think we need to shift away from this idea of setting a terminal year for any of these assessments. What we should be doing is querying all of the available data, at the point when we ask for the query, whatever that is, and then the decision of what year to end the assessment should be an assessment modeling decision, much like the starting year is, and, that way, we can figure out how far we can extend the data, based on whatever we happen to have in hand, and, that way, we are using every bit of data we have at that moment.

DR. NESSLAGE: Is that something we want to incorporate in the TORs? What does the SSC think about that suggestion? I am seeing thumbs-up, and I'm seeing smiles, and I'm seeing some quizzical looks. In favor or against? Anne.

MS. LANGE: Well, that goes to the point that you made of why not use all of 2023, if it's available, and so I would think, once the council says that the assessment is to be done this year, base the terminal year on whatever data is available. Isn't that what Erik was suggesting?

DR. NESSLAGE: I think so. I think you're right, yes. Wally.

DR. BUBLEY: I am going to put on my data provider hat for this. Because we are doing so many of the ageing of different species, a lot of times, it helps us to know what our terminal year, is so we know where we need to go to. It doesn't necessarily mean that we can't get to it, but the

problem is we're going to be trying to hopefully keep up with it as we go through the years, and so the year that we're most likely not to have is going to be that most recent year.

It doesn't necessarily mean that we can't do it, but it is a lot easier if we have a year that we are shooting for, and we can go from there, but it's not necessarily a deal-breaker, but it's just a little more -- I won't say chaotic, but it's not quite as planned out as it could be for a data provider, and especially for life history type stuff. The index is a lot easier, because we get the numbers, and then we can plug them in and go from there. When you actually have processing and reading to do of reproductive or ageing samples, it's a little more difficult.

DR. NESSLAGE: But, to Erik's point, maybe -- If I understood you correctly, you could have some data sources and not have the ages and have the terminal year be different than the terminal year for the ages, correct, and so that might -- But that doesn't help you, you're saying, for planning purposes.

DR. BUBLEY: Somewhat, and I'm not sure how much that would -- Because, typically, the most recent year -- Typically, the most recent year is the most -- I don't want to say most important, but probably pretty important, to get like an age structure of what that index is doing, because that tends to play a role in it, and so that's just a thought as to why the final year may be a little more difficult, at times, to get, and not necessarily all the time, but it just can be.

DR. NESSLAGE: So what would your suggested -- Are you looking for revised wording then? She's smiling, and I'm going to take that as a yes, and what would -- How can we make you both happy, in the sense that we want to make sure that you're supported, and your program is supported, but also give the modelers some freedom.

DR. BUBLEY: I mean, I'm okay with saying this "if available", but just be aware that, at times, for certain species, that might be available, and so that may be how it goes.

MS. HOWINGTON: So, would it be good to potentially just remove "through 2022" and say, "with data through the most recent year available, and provide partial or preliminary as well", or something like that?

DR. NESSLAGE: Don't even put the "partial and preliminary", but just through whatever is available at the time of the request, is I think what Erik is suggesting, and then the modelers can decide how to deal with it most appropriately from there, but Fred has got a quizzical look on his face.

DR. SERCHUK: I am concerned that the situation may arise where maybe the catch data are available through 2023, but the ageing data isn't available, or the length frequency data isn't available, or part of it isn't available, and I think that -- There will be aspersions cast why those data were not available, when you say the most recent data, when some are available and some aren't, and I think that will create some difficulties, and so I think we need to think about.

Someone will say, okay, can we use the previous year's ageing data and apply it to -- Well, but people will think like that. People will think like that. They'll say, wait a second, we have the 2023 catch data, okay, but we only have the ageing data from the year before, and what do we do? What sort of assessment do we move forward with? Can we go with an age-based assessment if

we don't have the ages for that year? Those are really practical questions that will affect not only what models we use, and it could, and so, if you go with the most recent data available, I don't think all datasets are going to be as available as others, and that will create some difficulties.

If we go in knowing that, and allow the teams to decide how to handle it, that's fine, but it's not as if you're going to get a complete dinner, with the entrée and the dessert and the appetizer all presented to you, and one of those things may not be present.

DR. NESSLAGE: Absolutely. I guess the question then is, given our first agenda item from this meeting, is it better to have a partially-informed terminal year than a shorter time series in the assessment? Erik is coming to the table. He has an opinion.

DR. WILLIAMS: Hypothetically, we only have a partial 2023, but we have a complete 2022, and you guys declare upfront that we're only going to do to 2022. If we have a partial 2023, and we model the 2023, and you're not happy with our decision to take the data that far, guess what? You still have the complete 2022 data in the assessment, and you haven't lost anything. You can only gain from this.

DR. NESSLAGE: We might have to ask you to rerun some of the tables and things, but that would be it, for benchmarks. What do you think about that?

DR. SERCHUK: It's what the group thinks, but I just -- If I were a data provider, I would -- It's one thing to say, okay, if you have a survey point in the most recent data -- If the assessment goes through 2022, but if we have a survey data point in 2023, that may inform us better, because we now have an additional data point for a survey series, and that's a critical element, and I would say, yes, go through 2023, but I envision some problems, but, if we leave that decision in the hands of the data and the modelers, I can also agree with that as well.

DR. NESSLAGE: Amy.

DR. SCHUELLER: What exactly is it that we're recommending? I mean, I don't -- So I feel -- If we put a terminal year date in there, I feel like we're more likely to get the data through that date, and, if we don't, we might not, and I think, if you're a data provider, and you're juggling tasks, and it says whatever date you can give me, you might not get something done that you would have if they said I need through this certain date, and I'm not saying that's true, but it's just my experience in receiving data from a lot of different states, and I don't do the South Atlantic assessments, and I'm not harping on any of you guys, but I'm just -- I mean, even when we say I want all information through terminal year 2021, I still don't get stuff from some states, and so it's -- I'm a bit concerned that, if we don't put something in, then that gives a leeway to different folks will interpret and work towards those outcomes differently.

DR. NESSLAGE: That is a serious consideration. If we set the bar for a certain year, it's more likely that folks can put pressure on people to deliver data. Poor Wally.

MS. HOWINGTON: I have two suggested wording ideas in my head, but I have a question for the SSC of what would be more important in the wording, because I think all of you are saying that you would like to try and leave it where you can get all the most recent data, but you simultaneously want to be able to set a deadline, and so would it be more important for the deadline

to be say the start of the assessment or where you know that a year has been completed? So, like 2023, you know that 2023 is finished, and we know that the assessment is going to start in 2024, probably later on in the year, and would it be more important to say, in 2023, you have that full complete year, or would it be more important to say get the partial and preliminary data from 2024 included and to make the deadline described in the assessment?

DR. NESSLAGE: Did anyone else get that? Jeff has got it. Go Jeff.

DR. BUCKEL: All right, and so I think Kathleen is saying that the language would say, whatever the start date of the assessment is, we want the data up to the year before the start date of the assessment, and so we don't know when it's going to be. Say it's 2024, and then we're -- The data request is data through 2023, and is that right, Kathleen?

MS. HOWINGTON: Yes, that's what I was thinking, if we know that that year is going to be completed. If you want to try and include the 2024 data as well, then the wording -- I can change that to make it where it's the start of the assessment and just say, at the start of the assessment in 2024, include all data, partial or preliminary, or we can say please include all data through 2023, and just end it there, and try and get that most recent year, where you have the deadline.

DR. BUCKEL: It sounds like there may be some uncertainty when the assessment would start, maybe, because this might go back and forth for a while.

MS. HOWINGTON: We know that the start date for this is going to be in 2024, and we know it's going to be later on, and so we can make it where the terminal year is just the year before, where we know that that year of data has been completed, or you can say include any and all partial and preliminary data through 2024 and make the deadline for data providers be the start of the assessment.

DR. WILLIAMS: This is the reason that I made the recommendation that I did, because, no, you can't say that until you know literally the month, or even the day of the month, that you're going to start that assessment, because data in 2023, depending on the source, may not be available until as late as July, or even August, particularly if it's reading video data, and so that's why I say the better course of action is setting a query point in time, and you get what you have, period, and, if people are not providing it, guess what? There will be some back-pressure for that.

DR. NESSLAGE: We can fail the TOR. Amy.

DR. SCHUELLER: I am just -- So, Erik, what about like the age stuff, where, you know, they're not keeping up with the ages for all these species, and so some species are coming on the docket, and they're behind, and what are we doing then? I mean, I get the index thing, in that there's a delay in reading the videos and s tuff, but there's other data aspects to consider here, and I just --

DR. WILLIAMS: I enjoy arguing with my own colleague, but we have finally gotten -- The reason this is timely now, and why we can do it now, is we have finally gotten to the point where the SEDAR schedule is set two years in advance, and so two years of notice is plenty for all the data providers to know what they should be preparing for.

I agree that, in the old system, that would not have worked, because we wouldn't have given people enough sufficient time and advance notice that, hey, this assessment is coming up, but we are at a point now where we have two years of notice now, and we can afford to just say here's our query point, and it's up to you to provide what you can at that point, and, if you want to burn the midnight oil and grind through some ages to get us an extra year of age, great.

DR. NESSLAGE: I think that I see where you're going, but I also think there is concern that perhaps some providers will just use that as an excuse to not meet -- Provide the most recent information, and I think that's where the concern is. Carolyn.

DR. BELCHER: I mean, I'm just thinking as a state representative with this, and, I mean, there is other species we have besides federal, and, I mean, Georgia is a small enough group too that -- Granted, we're looking at two species, but we do have competing priorities there, and so there's only so many people to do that work, and I think it's easier -- As Erik points out, I get the two-year time thing, but to sit there and kind of say that, well, you know, people are going to have to step up, people are stepping up to the best of their abilities now, and I think it's a little bit easier to shoot when there's a deadline.

I mean, I have a tough time with that idea, and, if you leave it open-ended, now I've got to prioritize in such a way, because you're not giving me something that's really rock solid, and so, if you're going to give me a little bit of wiggle room, then I'm kind of going to portray that one a little bit different than one that I've got a hard -- That I've got to put everything in an order to meet up with those deadlines, and I think that's the only thing that's tough. It's one thing when you're with an agency, and you've kind of got that ability to work within the agency to balance it out, but, when you've got people that have other competing needs, I don't think that's necessarily so easy, and they shouldn't be penalized for that.

DR. NESSLAGE: Thank you, and I don't want this to become a let's be mean to the data providers meeting, and so, Wally, do you have some -- I want to get to some suggestions. Wally, go ahead.

DR. BUBLEY: I wanted to touch on a point, and like the two-year leeway to get it done, yes, if everything is ready to go, and then two years is -- You should be able to get it done, but I'm just thinking of this assessment in particular. With the SADL data that we have, there is no funding, at the moment, to process and to read those, and so it's just adding up, and then, if we can acquire funding to do that, that hasn't started yet, and so that two-year time is starting -- It's starting to tick right now, and we don't have the funding in hand to do that.

When we finally get the funding, it might be a year later, something along those lines, and then, at that point, we're catching up with another year's worth of data that we collected, as well as maybe 2023, and so it does -- It can catch up to you with certain circumstances. If it was just straight up you have the funding, and the samples are in hand, and you're working on it, that's one thing, but it's a different story sometimes, because there are circumstances that can slow you down from actually completing everything.

DR. NESSLAGE: That makes sense. Julie.

DR. NEER: Just so you know, one of the competing issues often becomes, when you're trying to pick a terminal year, is how badly the assessment needs to be delivered to the council, right, and

so, if you want the assessment to be delivered by December, that means you start in January, and the previous year's data is not available in January, and so there is a link between when you can start the assessment and what the terminal year will be, based on data availabilities.

Certain data, particularly some of the landings data, take six months to get finished, and so that's just something to think about, and, like in this particular case, we believe this is going to start the second-half of 2024, but we don't know that. We haven't had the scheduling call with the Science Center, where we will get every assessment across the entire stock assessment enterprise, and we have to fit everything on this big grid, and things don't always get scheduled when we thought they were going to get scheduled, and so just, in terms of the bigger picture of when you're trying to pick what the terminal year should be, don't count on when you think they're going to happen, because they may not actually schedule when you thought.

DR. NESSLAGE: So is that an argument in favor of not putting real dates on here?

MS. HOWINGTON: I think, specifically for this assessment, and I'm not speaking for the council, but I am speaking from the feedback I have gotten from the council, and they would prefer as much data as possible, and they postponed this assessment, on purpose, to allow for additional years of data, and so, Chip, can I say that the council would prefer more data than a quick assessment?

DR. NESSLAGE: Fred Serchuk.

DR. SERCHUK: Just one question, Chair. Because this involves the Mid-Atlantic Council, as I understood it, and because I presume their model effort is going to be integrated, or at least there are going to be two models, north and south, and we're just not dealing with the Southeast Center, and we'll probably be dealing with people up in the Mid-Atlantic collecting data, and is that correct?

MS. HOWINGTON: I am double-checking and trying to get eyesight on Erik, who we've had emails about this, and we are -- I know, for a fact, that we are dealing with the Mid-Atlantic Council staff, and I'm trying to remember all the emails, and I'm going to say -- I don't know them verbatim, but, during the previous assessment, we did -- We integrated Mid-Atlantic data, and did we involve the Mid-Atlantic staff? Okay. The Northeast Center was involved, yes.

For the people who aren't in the room, the reason why we're requesting that this occur later in the 2024 year is because we do not want to overlap with the tilefish assessment that is occurring in the Mid-Atlantic, which will include staff that might need to be involved in this one. That's for golden tilefish and not blueline.

DR. NESSLAGE: Despite some concerns that have been raised, I am not hearing a lot of support for changing the wording from the table from SSC members, or am I reading this wrong? I am respectful of the concerns that the council has, and certain staff members have, and I am not feeling a strong pull from folks on the SSC to change the wording though.

MS. HOWINGTON: Would you rather just change -- So, again, the goals are get as much data as possible, but simultaneously have a deadline, and so would it be okay to keep that 2022 terminal year, but then change the partial or preliminary data to 2024? That way, we can say, all right,

here's your goal, and here's what you need to do to get 2022 data in. If you happen to get 2023 or 2024 in, great, submit it. In the worst case, it gets used for projections.

DR. NESSLAGE: It is after 5:00, and I did not think this was going to blow our whole meeting. Carolyn.

DR. BELCHER: I think, for me -- I mean, Erik is part of the process, and I almost feel like it's more to the process people to kind of talk about, moving forward, what they would like to see as an operational with that, because we can sit and talk all day, and, I mean, Jared and I, Jared my guy over here, we don't have the ageing necessarily in support of this species, but, again, you get into some of this, and I can't speak for Wally's group, or what's going on in other places, but maybe they can speak better to that, because I really don't think it's right to kind of say one thing, and it's like, well, if you don't show up with it, oh well. That's kind of not fair to them, and so I think, again, it's maybe talking to those people who are bringing the data to the meeting are the ones who could better tell you, moving forward, should this be more open-ended than it is.

I mean, we always want all the data that's available to be in the assessment, and I think that kind of stands to reason, but I think you do have to have some idea of where you're going to put a terminal endpoint to what's going to be accepted, and you don't want it right up until the day of the assessment. I mean, that's not fair to that group either.

DR. NESSLAGE: I agree. Thank you. Okay. This is getting a little -- Jared, go for it. You haven't said much, and so we're going to let you talk.

DR. FLOWERS: I just kind of had a thought, and maybe it's just kind of thinking in like legalese terms, but have a terminal date of no earlier than X year, and then everything else -- So kind of have a cap on how far back you can go, but still allow everything going forward, and I don't necessarily have a problem with this, but just to have some wiggle room there in kind of how you word it.

DR. NESSLAGE: Okay. Thank you. I think, given that we are going to see these again, and I think there's clearly a lot of center/council/state discussions that need to happen here, and I don't think this is the SSC's decision at this point, personally, and I think I'm going to ask us to move on to the next TOR and come back once you guys have fought this battle amongst yourselves.

MS. HOWINGTON: I am just going to highlight this right here, and we will come back to this later. All right, and so the good news is that no other changes occurred in any of the other terms of reference from the Mid-Atlantic. However, I do -- Again, I'm pretty certain that we would want to look at potentially the longline that we just discussed, as well as the recommendations yesterday from the SSC's catch level projections workgroup, and so those would be the two things that could potentially change, but everything else you all have already approved, and this is exactly what you all saw in 2020.

DR. NESSLAGE: So you raised two issues, and one is the bottom longline data, and the second is the catch level projections recommendations. These are not complex assessment models, as I recall, and I don't even know if they would even apply in this case. Fred Serchuk.

DR. SERCHUK: I think one of the most important sentences in here is in Number 2, note any particular concerns or problems with data collected in 2020 and beyond, and this is referring to the pandemic problem. Data series are going to be interrupted, and there are going to be patterns that we see that are not going to be representative of what they would have been had there not been programs curtailed and so on and so forth.

That's going to be a bigger issue, in my mind, or could be a bigger issue, and do we interpolate data in between surveys? How do we fill in data and so on and so forth? I know they're thinking about those things in the Northeast, and what do you do when you have missing data? Do you just say it's missing, and we don't link them, or what, particularly if you have catch data, or other data, in those years, and so that's not a trivial problem, in my mind. I think people are thinking about those issues, but I think that sentence is very important in there, and I think it's going to be compounded by this thing about available data right upfront, and that's my supposition, Chair. Thank you.

DR. NESSLAGE: Thank you. Okay. Back to the two questions that I raised. Do we want to add anything regarding bottom longline and any of our recruitment -- Do they even do much in the way of projections? I can't even remember. It was so long ago. Does it even apply? I guess no one is ready to answer that question right now, and so, in order to set ABCs, we've just adopted new recommendations for a bunch of analyses that should be done for each assessment, to provide information on recruitment, to help us set ABCs, and I don't even --

To be honest, I don't remember the details of this assessment, and so I don't even know if it applies, and maybe we can start saying that, to address as many of those working group recommendations as apply, but I think then the Mid is going to be like what is this, and so I'm a little -- Again, maybe this is something that can go back to the Center to have the analysts take a look at that and see if it's appropriate, and we could add it in October. Then the bottom -- Does anyone disagree? Let's deal with that issue first, and does anyone disagree with that, so we don't go through all the details here today?

MS. HOWINGTON: I actually do have some suggested wording that we could put down, and I can keep talking with Erik and the Mid-Atlantic and see, and the wording that I have written down, which this would -- Again, this is a suggestion, and please tell me if you absolutely hate it or if you just want me to stop typing, and this would not be a topical working group, and it would be -- This wording is based off of the SEDAR 73 terms of reference, when we reference the -- I can't remember, and it was video that you did, and it was a workgroup, Chip, and I'm staring at you, but, in 2020, you did a workgroup. Anyway, we reference to the report that they submitted, but then, fortunately, the report came out with a really small paragraph that you can just copy-and-paste into the terms of reference.

The recommendations that you all had yesterday are a page long, and so that's the reason why I'm thinking that we can just insert a link to the report in the terms of reference itself and just make it a consider, where what can be done will be done and what can't be done will not be done.

DR. NESSLAGE: Or can we say, "address as many recommendations from that as are appropriate", and that's a little stronger language, rather than "consider". That's a little too wishy-washy. Going forward, and maybe not for this assessment, and they may not be able to address any of those, but, for future ones, I would like to be a little stronger, personally, and what does the

rest of the group think? I am seeing heads nodding, and I'm hearing some yeses. What do folks think of that? I am not seeing any protests, and there are no raised hands, and so I'm going to assume that folks are okay with that.

Then, again, these are very data-limited assessments, but, to the degree to which the bottom longline information could be incorporated, does that go into a topical working group? I am seeing heads nodding. Wilson.

DR. LANEY: Thank you, Madam Chair. I was just going to make the point that, if you look back at Todd's presentation, there were a significant number of blueline tilefish caught, especially in 2021, and so that would appear to add a significant amount of data for the assessment.

DR. NESSLAGE: It was an age-structured production model, and is that what I recall, the southern?

DR. LANEY: I don't remember.

DR. NESSLAGE: So you don't have a long enough time series then, do you?

DR. BUBLEY: I mean, if they found ways to incorporate the 2020 sampling, because it was different. There was a smaller sample size, and there was slightly different survey methodology, and it would still only be, at the most, four years, if you're including 2020.

DR. LANEY: I don't know, and I was just thinking of it, Wally, in terms of just purely adding to the biological sample database, and is that worth it to add that in?

DR. NESSLAGE: If it's surplus production, there's not much that would be -- There's nothing to use, but we should keep it in our brains, in the back of our brains, for the next assessment, because then it might be long enough, but unless someone disagrees. All right.

MS. HOWINGTON: The only concern that I know that I've talked with the previous analyst, Nikolai, is that the data that we have post-2007 is extremely limited, like landings only, and so just FYI.

DR. NESSLAGE: Wilson.

DR. LANEY: Does the old axiom that some data are better than none apply here? I mean, I see Erik's head, and Kathleen's head, nodding now, and come on, folks. I think I would defer to Dr. Williams on that point.

DR. NESSLAGE: This is an -- Isn't this an operational? Are you going to come up with new methods to apply to these stocks at this assessment?

MS. HOWINGTON: No, we will not. This will not be new methods. It will just be an incorporation of the survey, and that will probably be -- I would recommend making that a topical working group, just to focus on that.

DR. LANEY: I mean, I would say it's worthwhile to have a topical working group, at least to look at it.

DR. NESSLAGE: Other opinions? Does everyone agree with Wilson? That's fine. Fred.

DR. SERCHUK: I thought we had discussed what an operational assessment is and what a benchmark assessment is and these sort of things, and I thought we spent lots of time on this, and it's my recollection, and I could be wrong, that the model configurations, or the model that had been developed and accepted previously, is the model that is going to be used in an operational assessment.

If we decided there should be some small tweaks to it, and not wholesale model revisions, or a different model, then small tweaks are allowed, as long as they're well explained, and changing the formulation of the model structure I thought, in my understanding of it, was not what an operational assessment is, and, to that extent, I think we need to be very careful about allowing changes to the model configuration that has been previously agreed upon for the assessment. Otherwise, in my mind, it's not an operational assessment. Thank you, Chair.

DR. NESSLAGE: Thank you, Fred. Well, if folks would like then to at least explore how it could be used in a topical working group, and perhaps they will come back and say it would require major model revisions, in which case it would be tabled for a future date, then that's the case, and they can say that, right? At the topical working group, that could be their conclusion, and it will die there, or they will come up with some great, and they will figure out a way to incorporate it in the current format, and so I'm seeing people being largely comfortable with adding that topical working group, at least let them hash it out and report back, and does anyone strongly disagree with that? It's 5:19. I am not hitting the 5:00 mark today. Sorry.

I think go ahead and add it. I wouldn't put "2021", right, because you said -- Just say "deepwater longline", so that they can incorporate as many years as possible, if they can figure out a way to do that.

MS. HOWINGTON: Everyone that sees me on SEDAR, they all know they spell assessment wrong, and I don't know why.

DR. NESSLAGE: All right. Any other potential changes or suggestions to these TORs?

MS. HOWINGTON: Does anyone want to add any details into review and recommend catch and landings streams, because these terms of reference were created before topical working groups, and so that was for a panel, and so, if we want to add some data into that, or some details into that, and that would be my only other suggestion, but I looked back at our previous notes from 2020, which I printed out here, and there are no details as to what that was supposed to be about.

DR. NESSLAGE: Chip, please illuminate.

DR. COLLIER: The reason that some of the review recreational and commercial landings, going back to the data stream for blueline tilefish north of the North Carolina border -- It was extremely data poor, and they had to use a Delphi approach to come up with a catch stream, and so, if that's

going to be a similar approach going forward, that has to be a consideration on how to develop that catch stream.

DR. NESSLAGE: Can we be more explicit then with regard to the northern stock model? Can you please add something there, because it's not the southern region model that we have concerns with, and so this might not be a -- They don't have topical working groups in the Mid for this. Would you bring Mid-Atlantic people in?

DR. COLLIER: Yes, and let's say "north of Cape Hatteras", because that's going to be a consistent -- That's going to be a section of the model, and that's how the landings were divvied up in the past.

DR. NESSLAGE: Thank you. That's huge, and that will help focus who should be on that and what they need to do. Anything else? Wally.

DR. BUBLEY: With that one, where we have included the Mid-Atlantic Council in the topical working group process, that's including the South Atlantic deepwater longline survey for potential incorporation? Are they -- Is that of interest to them?

MS. HOWINGTON: I doubt it. I can specify that, and I can cut-and-paste that and put that right for the first topical working group, or I can just leave it up there and ask them if they're interested.

DR. NESSLAGE: Actually, Jeff has a comment.

DR. BUCKEL: I think, if I read correctly at the top, the DLM Tool for the Mid-Atlantic is going to be Hatteras and north, and so then part of that survey did include the Hatteras and north, but they might want to consider, an index, some of those DLM approaches.

DR. NESSLAGE: Great. Anything else? Good catches, folks.

MS. HOWINGTON: So, just steps moving forward, I'm going to take this, and I'm going to talk with Erik Williams, and I'm also going to talk with my contact, Brandan, in the Mid-Atlantic, and then I will bring this back to you guys in October, hopefully saying that we've figured out the terminal year discussion and that no other changes have occurred. Hopefully that's what is going to happen, but who knows? I'm already going to be bringing other terms of reference you in October anyway, and so I might as well, you know, be there.

DR. NESSLAGE: Outstanding. Thank you, Kathleen. All right. I apologize that we went over this evening. We do still have quite a bit on our agenda for tomorrow morning, and so please don't hate me, but we'll start again at 8:00, and maybe finish early, if we don't -- Well, if we don't take too long on our agenda items tomorrow, and so help me with that, but thank you all for your hard work today, and we'll see you back here tomorrow.

(Whereupon, the meeting recessed on April 27, 2022.)

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APRIL 28, 2022

THURSDAY MORNING SESSION

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The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Town and Country Inn in Charleston, South Carolina on April 28, 2022, and was called to order by Dr. Genny Nesslage.

DR. NESSLAGE: Good morning, everyone. Thank you for coming back for the last morning of our April meeting. We are missing a few folks. Has anyone seen Kai or Scott? It's a little early for Scott. He'll join us shortly though, but I think we will stick with the schedule and get started. We're going to begin this morning with the Southeast Reef Fish Survey Update, and I will draw your attention to Attachment 11, the presentation from Tracey Smart, who has kindly joined us here this morning, and she will be providing an update for us, and so I will simply hand it over to Tracey.

SOUTHEAST REEF FISH SURVEY (SERFS) UPDATE

DR. SMART: Thank you, all. I just want to say good morning, and thank you all for having us back. I know it's been a couple of years since we've had an update for you, and so it's nice to actually have some data to present. I want to acknowledge my coauthors on this talk, before I start, because I really didn't do the vast majority of this work, and I'm just taking credit for it.

Marcel Reichert has since retired, and he gave a very similar version of this presentation to the council meeting in March, and he has led the South Carolina DNR reef fish efforts for a very long time before his retirement. Wally Bubley and Dawn Glasgow at SC DNR did the vast majority of trap catch analyses that are presented here, and then Christina Schobernd, Nate Bacheler, Todd Kellison, and Adam Pollack at the Southeast Fisheries Science Center and SEFIS are responsible for the video portion of the survey and those analyses.

I am going to talk very briefly about our survey design, because I know it's been a while, and we have some new folks around, a review of our 2021 activities, and then I will present analyses for abundance, length, and distribution for selected species for the survey and then talk, just very briefly, about our 2022 planned activities.

The Southeast Reef Fish Survey, or SERFS, is currently funded through the MARMAP, SEAMAP South Atlantic, and SEFIS programs, and those are also the groups that are conducting the sampling. MARMAP has been around for an extremely long time, and it was the sole funding source and the sole source of sampling through South Carolina DNR, historically, up until about 2009, where SEAMAP and SEFIS came onboard, and so those combined efforts are highly coordinated among the programs, and both MARMAP and SEAMAP are at SC DNR, and SEFIS is up at the Southeast Fisheries Science Center.

We used three different vessels for the survey, with identical sampling methods, as well as fish workup, the Palmetto through South Carolina, the Savannah, and the NOAA ship Pisces. The chevon video trap sampling that we do now is targeting low to medium-relief live-bottom or

hardbottom habitats along the shelf and shelf break, and our depth range is about fifteen to 110 meters, although those are kind of the extremes, and the trap has been used consistently and in a standardized method since 1990, and so, for trap catches, we have a very long time series, and we have traps that are baited with menhaden, and the soak time is about ninety minutes, is our target.

Since 2011, we have also added cameras to every single trap onboard, all the vessels, with two video cameras, one facing out from over the entrance funnel of the trap, and that's primarily the one we use for fish counts, and then one facing away from the nose of the trap, to get the habitat on both sides of the trap, and so the video time series is much shorter.

The chevron video trap universe covers from about Cape Hatteras, North Carolina to Port St. Lucie, Florida, Port St. Lucie Inlet, sort of where the shelf narrows at both ends of the survey, and we have about 4,300 sampling stations within that, and it's a pure random design, and, last year, in 2021, we selected 2,400 random stations to target. In a typical year, it's more like 1,500, and our sampling season is mid-April to mid-October.

In terms of who is in charge of data processing and analyses, typically the South Carolina DNR reef fish component is in charge of trap catches, as well as our longline indices, when we are able to do that sampling, and then we take charge of all the life history sampling and reading, and SEFIS is in charge of the video reading and producing the video indices for that group. We do combine data across all the programs, and we also have a publicly-available data system at seamap.org.

In 2021, we actually had some leftover sea days, because there was no sampling in 2020, because multiday cruises just -- We couldn't get those approved, and so we had a really full cruise schedule in 2021, using some of those leftover sea days, but we did run with a reduced scientific crew. Usually the Palmetto runs with about eight to nine scientists, and the Savannah and the Pisces around eight to nine, I think too, and we reduced that down to six to seven, and so, because of that, we chose to optimize the number of traps that went overboard and were deployed, but we reduced the workup of fish a little bit. In particular, we focused on otolith and spine sampling for ages and reduced our reproductive sampling, just to kind of balance the number of bodies onboard.

We were able to complete just over 118 days at-sea, over 2,700 gear deployments, with over 2,000 chevron video traps, using both our randomly-selected stations and alternate stations, 144 short bottom longlines, which was funded through a MARFIN project at SC DNR, and then over 350 CDT deployments, for bottom temperature and salinity, primarily. Over 39,000 fish were brought onboard, composing eighty-six species, and a little over 6,000 of those fish, from thirty-three species, were processed for some sort of life history sampling, including age, reproduction, DNA, and some other external data requests, as we could.

This is a table of just the really raw data, summarized for what we most commonly encountered in any given year. The numbers in the parentheses after the names are kind of indicating where they were in previous years, and the color coding is whether or not we see an increase or a decrease, and this is very raw data.

Tomtate has consistently been our number-one species for quite a while, and black sea bass is usually in the number-two spot, and it was just bumped out by two fish by vermilion this year, and red snapper continues to become more and more frequent in our trap catches. They have moved

up from six to four in the past year, and then sort of a normal sort of group of fish, with grunts, porgies, et cetera.

I do want to note that snowy grouper, silk snapper, and scamp have become more common in our catches in the last year, and that's mostly because of those extra short bottom longline efforts and not because they're suddenly showing up in the traps more. Gag continues to be in there, but kind of low.

The next several graphs, or slides, that I'm going to present are an overview of our relative abundance analyses. Again, remember that there's going to be blank data for 2020. Currently, we are still working on the analyses for the short bottom longline index, and so I'm not going to present those today. I am going to present the chevron index from 1990 to 2021 and then the video index, which is 2011 when that survey got fully off the ground, through 2019, and there is a delay in reading those videos, and so we don't have the 2021 data yet. It takes a while to read them, especially when you have something like on this slide, where it's just a wall of vermilion.

They are all standardized using a zero-inflated negative binomial model, which has, in the last several years, been the most appropriate method, and it certainly reduces uncertainty for our indices. For traps, these are the number of fish per the trap soak time, and, for videos, the response variable is the mean count method, and it starts ten minutes after the trap lands on the bottom, and it's read as one snapshot every thirty seconds for twenty minutes.

The slide layout is going to look like this for each species, and it will have the chevron index on the top, with the video index on the bottom. There will be a red box, and red lines, to indicate where those time series overlap, to kind of get you oriented where they fit together, and the same things are going to be represented on each graph, but the color-coding is a little bit different, and we'll try to make it more similar next year, and we produce these for different reasons, and so this is our first combined presentation.

For chevon traps, the index value is the black line. On video, that index value is the red line. The 95 percent confidence intervals on the trap index are gray shading, and, on the video index, it's the dotted lines, and the nominal values are shown either in red dots for the trap catch and blue dots and line for video index.

I do want to note that both of these are the relative abundance normalized to the long-term average, and so that's that dashed or solid line at one, and note that it's a little bit of a different scale, whether you're above or below that line, because of that math, where two is twice the long-term average, but 0.5 is half the long-term average.

The other thing we'll be presenting today is some summarized spatial distribution maps, and these are based on the nominal chevron catch abundance, in quartiles, and so it's really just a relative indication of hotspots, high-abundance areas, versus low-abundance areas, from that fish-per-trap hour. They will be from 2016 to 2019 and 2021, and so our most recent five years. Cooler colors will indicate lower nominal abundance, and warmer colors are higher nominal abundance, and white is no sampling, and these dots have been kind of blown up on the map, just so they're readable, and it's definitely much bigger than a single trap's footprint.

The other thing we have available from the trap catches are the length compositions, and, again, this is trap only, and we're currently working on getting lengths from video, but we're not there yet. It's the maximum pinched total length in centimeter for each species, in one-centimeter length bins, and the bubble size is proportional to the number of fish in a length bin, compared to the total number of fish in a given year, and the red line is the average total length for that year.

I do want to make note that you can see, in the earlier part of this time series, is it looks like there is some missing length bins, and they're not really missing data, and what they are is an artifact of the fact that, in some species, we used to measure fork length, and these are all presented in total length, so that, when that conversion happens between fork length to total length, and we round up into these centimeter bins, then we just push all the fish in one bin into the next bin up or the next bin down.

A couple of just caveats, before I get into the data, and this is not an update of stock status. There is a whole lot more than just these indices that would go into that. For the trap indices, these are more or less general sort of methods that we've used for these, and so the constraint stratification units and the actual model formulation may be different from ones used in SEDAR assessments, especially for species that we haven't done for a while.

For the video, the indices that are presented here are actually the models that were used in the assessments, and so some species we don't have a video index for, because they haven't been assessed, and not all species have been assessed at all, and so these trends in the analyses haven't been discussed in that sort of framework for those species.

I will present both a chevron and a video index for black sea bass, gag grouper, red grouper, scamp and yellowmouth, red snapper, vermilion snapper, red porgy, and then, for gray triggerfish, white grunt, and tomtate, we only have the trap index.

So let's start with an easy one, black sea bass. This is the trap index up on the top line, and the last ten years have been a declining trend on trap catch, and that has continued through 2021, with the most recent five to seven years being below average. For the video index, it certainly captures that declining arm of the time series, and they also have found extremely similar trends in terms of -- This, again, I would remind you that it only goes through 2019, and we're still seeing the very low numbers in more recent years. Black sea bass is one of our more extensively distributed species, primarily on the inner shelf, and primarily off of Georgia, South Carolina, and North Carolina. In terms of the sort of sizes that we're seeing in black sea bass, the most recent ten or fifteen years, we've seen an increase in that average size and fewer and fewer small black sea bass.

For gag grouper, this is another easy one, and so the most recent ten years, again, have been below average for gag grouper, and not quite as extreme decreases as black sea bass, and the video index sees that same sort of pattern. They capture that peak around 2011 and then that declining trend afterwards, through 2019. Gag is a species that is sort of few and far between in the video-trap survey. When we find them, it's pretty sporadic, and isolated sort of catches, but there is a pretty good area of them off of North Carolina.

Because gag is kind of a sporadic catch, and not a high-volume species, the average sizes in the traps is pretty variable, but we have been sort of stabilized around about fifty or so centimeters in the most recent ten years.

Red grouper, I guess probably a pattern is emerging out here, and the most recent probably twelve or thirteen years have been below average, whereas the historical chevron trap survey has evidence of them being more common. The video index captures that time that they've already been underneath the long-term trend, and so the video index actually looks pretty flat, because they're already in that sort of decline phase by then, and so this is a good example of where that really long-term time series has a very different context and story.

Red grouper is an interesting one for us, because it has a very split distribution, where we catch them off of central and southern Florida and then not again until northern South Carolina and North Carolina. The average sizes for red grouper, again, are pretty variable, and grouper are just not super high volume in our traps, but we have seen sort of an increase in the average size, up until about 2015, and then a little bit of a decrease, below sixty centimeters, in the most recent four or five years.

For scamp and/or yellowmouth, above the top graph is the chevron trap index just for scamp, and this is different from the most recent research track assessment, where we combined both species, and yellowmouth is not common at all in the traps, and so, really, that pattern in the assessment is primarily driven by scamp anyway, and it's another one that, in recent years, are below the long-term time series. Historically, they were high. The video index, again, captures that declining trend, and so it does look pretty flat, although you can see that that decline has continued through 2019 for videos as well.

Scamp grouper is a little bit more common. When we find them, we often find several of them in traps, and a wider distribution than some of the other groupers in the region, primarily in the outer shelf and the middle shelf area, and in all states. The average sizes for scamp have been under a little bit of an increasing trend since the mid-2000s, and it has sort of stabilized right around the sixty-centimeter mark.

Red snapper is a very different story. Red snapper has been increasing in the trap-video survey since 2009. There has been a little bit of a flattening of that, but it has continued, on average, to go up. The video index sees that exact same pattern of that increasing trend, to above average, since about 2015 for the video index.

Red snapper are primarily off of Florida, but we are seeing them throughout the range of the survey. There is a little bit of a decrease in availability, or presence, off of northern South Carolina and southern North Carolina, but then they pop back up in pretty good numbers off of North Carolina. The average size -- Well, first, for red snapper, because of the increase in the number of fish being collected by the traps, we're also getting a much better view of the length compositions for red snapper in the region, and so that variability is sort of decreasing a little bit.

On top of that, then we've seen a little bit of an increase in the size and then an average decrease over the last ten years, and the great thing that I love about these graphs for red snapper is that you do kind of see a little bit of an indication of cohorts going through those length comps, which is really nice. It's a good example anyway.

Vermilion snapper, they're a pretty variable species from year to year, but we have seen a little bit of an increase, from about 2013 or 2014 through 2019, and 2021 was back below average though

for the trap catches. The video survey also saw that increase from the early 2010s up through 2019, and I'm really curious to see what the videos are going to have for vermilion in 2021. This is a very widely-distributed species throughout the survey, mostly off of the middle shelf and into the outer shelf, all states.

In terms of our vermilion snapper length compositions, the catches in the traps saw an increase in the 1990s through 2000s, and that continued sort of at a slower rate through about 2013, and then it sort of leveled off right around the thirty-centimeter mark.

Red porgy, we're sort of back to that less-than-rosy outlook. The most recent seven or eight years have been below average for the trap catches, with 2021 continuing that downward trend, and then the video index has also seen that downward trend. Again, it's a little bit flatter, because of the shortened time series, but it's been below average for the last several years for videos as well.

Red porgy, again, is a fairly widely-distributed species, although it's more outer shelf and middle shelf, and so a little bit different spatial distribution than things like vermilion snapper, but mostly it's generally been a fairly common species for us. Length compositions for red porgy have actually generally increased over the trap time series, with a little bit of a leveling-off in the most recent years. In particular, early in the time series, we saw quite a few small red porgy, and we really haven't seen those small red porgy in recent years.

Gray triggerfish is our first species we don't have a video index for, and so I'll just be showing the chevron trap index. Triggerfish is doing pretty well, and it's just sort of bouncing around the long-term mean, and then the most recent couple of years have been below that mean. Gray triggerfish are pretty widely distributed in the region, and it's one of our more common species to encounter. They're a little bit all over the place. The average size of gray triggerfish is another one that sort of increased over the course of the time series, with a leveling-off in the most recent years.

White grunt is back off the schedule, or delayed on the schedule again, and so we don't have a video index for them. The most recent ten years have been hovering right around the long-term mean, with a little bit of a decrease below the mean in 2021. White grunt is another really interesting spatial distribution for us, and they're almost completely absent off of Florida, and we start to pick them up in northern Georgia through South Carolina, and our largest white grunt catches are off of North Carolina, primarily. There's nothing terribly interesting in white grunt average lengths, other than they've been pretty stable for the full time series.

Tomtate is the last species that I will present today, and so tomtate saw a pretty distinct decrease in the 2000s, and they have bounced back pretty well, and are sitting right around the long-term mean in the most recent years. They're also a fairly widely-distributed species in our survey, most in the inner shelf and mid-shelf sort of region, and in all states.

Wally and often joke about tomtate being used as a unit of measurement, and you can see, from their length comps, that they are very consistent, and so, if you ever need something to measure things off of a video, we're thinking tomtates, and so that's it, in terms of data analysis that we have so far for this year.

For 2022, we actually just got started this week, and R/V Palmetto departed on Tuesday morning, and they started deploying video traps, and we're anticipating about a hundred days at-sea, which

will be a little bit less, and that's more of a normal year for us, using all three vessels. Both programs anticipate using a complete scientific crew and doing full life history sampling, and so we're more or less back to normal, and hopefully we'll stay that way for this year.

I do want to remind everyone that this is an extensive time series, an extensive amount of effort, and so there are a lot of people to acknowledge, both historically and in the present, research vessel crews, scientific crews, funding, support from both of our institutes, and, with that, I will take any questions.

DR. NESSLAGE: Thank you very much, Tracey. That was an outstanding presentation and very thorough, and we're excited to hear more about this program. Thank you. Are there questions for Tracey? Alexei and then Wilson.

DR. SHAROV: Thank you very much for a very interesting presentation with lots of interesting facts and pictures. I am actually learning the fish, finally. A question on the -- Or just a clarification on the survey design, and could you explain the difference -- You briefly mentioned it, but I didn't catch it, and there was a total number of stations and then the random stations, but the larger number -- Is it totally randomized or not? I would say that, and then you didn't say anything about stratification, and is there any stratification or not? Then I will have just one more question after.

DR. SMART: The short answer is it is truly randomized, and there is no stratification. We do allow that, if, for some reason, a random station that was selected for that year can't be sampled, for example there is a fishing boat sitting on it, you can go to a nearby station that was not selected and use it as an alternate, and so that's the simplest answer to that.

DR. SHAROV: All right. Then the results -- I couldn't help but notice that the video part of the index, of the video-based index, for most of the species, is much smoother than the trap-based, and has there been any discussion of the effect of the -- Well, it's totally opposite, and I was thinking of gear saturation, but then the trap index would have been smoother, but, here, clearly the video is smoother, and I wonder if there were any explanations of that.

DR. SMART: I don't work as directly with the video data, but I think there is the potential for saturation for video as well, not because the fish aren't there and it can't capture it, but you can only fit so many fish in the field of view for the camera. Red snapper are not camera shy, for example, and so, if you have a red snapper come up into the frame of the video, it's going to take up the whole frame, and triggerfish are the same way. If you have a really big school of vermilion come in, they're blocking out everything else, and so I think there is the possibility for saturation through both gears.

DR. SHAROV: Thank you.

DR. NESSLAGE: Great. Thank you. Wilson.

DR. LANEY: Thank you, Tracey. Great presentation, as always is the case, and it's always very interesting to see these time series. I have two questions for you. Are you all still -- If memory serves me correctly, you all still have a big crustacean reference collection at SC DNR?

DR. SMART: We do, and we transferred quite a bit of it to the North Carolina Natural History Museum, because we just don't have -- We don't have, you know, taxonomic specialists at SC DNR anymore, and we don't really have a dedicated curator, but a lot of that local knowledge is still there as well.

DR. LANEY: Okay. Great. Thank you. Yes, I work closely with the museum, and I know Dr. Williams, and I'm always bringing crustaceans to her for ID. The second question was, are you doing any diet work at all still? Are you archiving stomachs? I know that's pretty labor-intensive stuff, and I think, if my memory serves correctly, you all had not been doing as much of it in more recent years, but, since you're collecting the specimens anyway, I was wondering if you were able to archive any of those for possible future work at all.

DR. SMART: Yes, and we had a student who had funding for stomachs several years ago, Kevin Spanik, who gave a council seminar recently, and he is still with our group, and, because he uses a lot of DNA barcoding, it's actually pretty easy to freeze those stomachs, and so, when we can get them, we do, especially for the larger groupers and red snapper. We are hoping to get more funding through that. We used to have funding through a couple of different sources, including SEAMAP, but that's kind of dried up, but that's on our priority list, is to try to revise some of that funding, perhaps through MARFIN, this year.

DR. NESSLAGE: I have a question. I was wondering, and I noticed the first seven species are all some of our big ones, right, our assessed species, and the model-based estimates appear, at least -- Well, with black sea bass, they were over, and they were overestimating, and the other three they were -- Not underestimating, and that's hard to say, but I guess what I'm asking is the nominal doesn't overlap the confidence intervals for the zero-inflated model estimates, and so I'm wondering what factor is driving that consistent trend.

DR. SMART: I think it's partially -- I think it's partially due to the distribution of the fish versus the distribution of the survey, and so, for example, I mentioned, when we talked about black sea bass, we're primarily getting them off of Georgia, South Carolina, and North Carolina, and less so off of Florida, and we used to get them a bit more, quite a bit more, off of Florida, and so, currently, the way we're doing those models is we're not kicking out things that may be sort of structural zeroes for that species, because the zero-inflated seems to do okay with them in there.

Back when we used to do delta GLM, we used to do a lot more sub-setting of the survey itself, on a species-by-species basis. Whether or not we need to reevaluate that -- I think that might be part of the problem, but then, also, with these low numbers in recent years, fish probably are not where they used to be, and so I would be concerned about getting rid of what might look like a structural zero in recent years versus the whole time series. Wally might have something to that, and he does a lot more of the --

DR. BUBLEY: I mean, most of this is occurring when SEFIS came onboard, and so we've increased the sampling area, and so some of these species may be more distributed. Like red porgy are more offshore species, and so, by increasing the amount of inshore, potentially, it will drop that nominal, but then the standardization method will account for that, because they're not typically found in those shallow zones, and so, while we're nominally catching -- It's looking like less of a proportion, the model will take that into account, that we sampled a lot more shallow stations, and then it will bump it up.

DR. NESSLAGE: Thank you. I appreciate that. Kai.

DR. LORENZEN: Thank you, and thanks for this very interesting presentation, and, for me, as someone who is new to the region, that was the best overview I guess of the reef fish species here that I could get, and so thank you. I was just wondering whether -- Now that you have a fairly long time series and a nice sort of spatial distribution, whether there is a systematic analysis of temporal and spatial patterns in things like growth and life history characteristics and across the spatial distributions themselves. Thanks.

DR. SMART: That is definitely on our list. We did a spatial comparison for red porgy and published that in 2020, and black sea bass is on our list to next look at for the full time series, for changes in spatial distribution and range, as well as abundance. It is definitely on our list. I feel like there was a second part to that, and now I'm blanking on it.

DR. LORENZEN: I was also thinking about things like growth. For those of you who know, we you know that I have a slight obsession with variation in growth.

DR. SMART: Red porgy is a variable-growth and a variable-maturity fish, and so it is on our list, and it's been on our list for a while, and finding the time to tackle those things, or finding the student to do those, is usually how we've tried to manage them, but, yes, it's definitely on the wish list to look at variability in growth and maturity.

DR. LORENZEN: Thank you.

DR. NESSLAGE: Other questions for Tracey? Chip.

DR. COLLIER: For some of the newer SSC members, Tracey did give a presentation on red porgy, and it's in our seminar series, and so that shows some of the distribution changes over time for that species, and it's very interesting.

DR. NESSLAGE: I don't see -- Alexei, go ahead.

DR. SHAROV: Thank you, and I didn't want to monopolize the floor, but just one more question on the timing of the survey, and it's an extended survey, but I wonder if, in some years, there were fits in the time of where it starts and where it ends. Where I'm going is that our colleagues at the Northeast -- The field experience showed clearly that, when present, technical reasons, the start of the survey was delayed, or shifted, by just a few weeks, and the catch rates of a number of species were substantially different.

The working hypothesis is that, with the warming up of the waters, the dynamics of the species spatial movements is substantial, and so, depending on when you start, you will either intercept a species X at the higher rate or lower rate, and so shifting in the period of the survey may significantly affect sort of the index of abundance. In this case, have you see anything of that sort, or maybe you are just perfect, like a Swiss clock, and nothing happens.

DR. SMART: We are not. We have certainly had delays at the start, and April and May tends to be a bit windy and stormy, and, for safety reasons, and, for gear performance, we tend to stop, or

never start, deploying traps if it's above about five-foot swells, especially if it's a big chop swell with winds above twenty miles per hour, because the traps will bounce or drag.

We have certainly been delayed in starting our first cruises into May, and we've gotten -- In recent years, I think we've probably started, pretty consistently, at the end of April or early May. 1990, I think, is -- 1990 is an odd catch year for many species, and the survey was pretty spatially restricted, by comparison, to what it is now back then, but I'm pretty sure that was a very delayed start year, for example, because Charleston was still recovering from Hurricane Hugo the previous year, and so the infrastructure at our lab had been more or less wiped out for a good six to nine months.

We haven't looked at it too closely, and we do include day of year in the analyses, to try to capture some of that, and we can certainly put it on the list to look at, where that start date and where that end date is. In some years, we get a lot of our sampling done early in the season, and then we just get hurricane after hurricane after hurricane later in the year, and so it is pretty variable.

DR. BUBLEY: Alexei, I will follow-up with that, too. Looking in the trends report that we produce, there's a table that has the average day of year and the range of when we're going, from start date to end date, and it's fairly consistent. I mean, most years, it's probably within ten days or so, where that first day is accounted for, and, as Tracey mentioned, day of the year as well as temperature, and so that's another variable that could be affected that you mentioned, and they are accounted for as covariates with a standardization process.

DR. NESSLAGE: Jeff.

DR. BUCKEL: Thanks, Tracey. Looking at the length distributions for red grouper and scamp, and it looks like there's some smaller fish, and I was just curious if the folks that were on those -- It looks like 2019 and then 2021, that there is some smaller fish that we haven't seen, and so was there any discussion that -- It looks like there is some good -- These are species that we've had really low recruitment, and just what the on-the-water observations of folks look like, if they're seeing some potentially good recruitment in those species, which would be a good thing, because, as you know, those have been really low, and maybe a little bit for gag in 2019 and 2021 as well.

DR. SMART: I don't remember anyone making note of it, which is surprising, because, when we catch red grouper, it's pretty notable, because they're not terribly common, and we can certainly look into it a little bit more. I do remember, and was that 2016 or 2017, when the traps were full of very small vermilion, and that was very distinct that year, and I think we had collected something like 1,400 vermilion in like two trap sets, and so those nightmares stand out a little bit more.

We can certainly look back at that, and we do catch quite a few scamp. I have a vague recollection of them being a little bit smaller in recent years, but that was before COVID, and so it's hard to remember, and I wasn't out on the Palmetto quite as much last year. Wally was out a lot more than I was, and I do want to plug that this year is our first year of field sampling for a MARFIN-funded juveniles pilot study, looking at gear comparisons on how to collect juvenile snapper grouper, and we start that in July, and we're using small-mesh traps, small hooks, standardized hook-and-line, and we've had reports from folks fishing in Charleston Harbor of small gag, quite a few small gag, this winter, and so we're hopeful.

DR. NESSLAGE: Wilson.

DR. LANEY: Tracey, I just pulled the gag length graph back up again, and I was going to ask you about the inshore, and it doesn't -- Just looking at it, it looks like there may be, at least in the recent years, a little bit of a gap, which might be reflective of the fact that most of those juveniles are inshore and not available for the traps offshore.

DR. SMART: Yes, and that juvenile survey is focused on getting more inshore of the trap survey, so that we can try to fill that spatial gap and get hopefully that size gap as well.

DR. LANEY: Some of the folks around the table have heard me talk about this before, but, when I was doing my doctoral research on the Lower Cape Fear River, and the Brunswick Steam Electric Plant was a great sampling device, because it was pulling in seventy-four-million gallons per day on the traveling screens, and we got a bunch of small groupers, and Chuck Manooch was still doing his growth work back then, and he just casually made a comment to me one day that he couldn't get young-of-year groupers, and I said, oh, well, hey, do I have a deal for you, and so we just started saving them, and we got gag, black, red, yellowedge, and snowy even, not in huge numbers, but mostly gag and black, I think, and some reds, and so there were lots of them that were coming into the estuary there in the lower end of the Cape Fear River, and so that was kind of interesting.

DR. NESSLAGE: I don't see any hands raised right now from the SSC, and I would like to take a moment for public comment, if there is anyone in the room. No one in the room. If there's anyone online who would like to make public comment, please raise your hand. I am not seeing any hands raised. Any other questions for Tracey, or comments? I am not seeing any, and then thank you very, very much for the update. We greatly appreciate it, and thank you all for your hard work on this program.

All right, and then I think the next item on our agenda is Scopes of Work for 2025 Operational Assessments, and we're looking at Attachments 12a through c for gag, king mackerel, and red porgy. We'll be hearing from our own Chip Collier, who will walk us through this.

SCOPES OF WORK FOR 2025 OPERATIONAL ASSESSMENTS

DR. COLLIER: We're going to start with gag, but let me give a bit of a background on this. Statements of work are fairly new as being presented to the SSC, and this is a result of the change from our past assessment types to the new assessment types, where we're doing operational and research track assessments.

As we're developing operational assessments, we are putting together the statements of work, so that we can talk with the Science Center and let them know exactly what the SSC would like to see out of the assessments, making sure that it's covering the major issues, as well as what the council wants to see out of these, and so, when we talk to the council about how they want to see this process set up, they want a very detailed process, and they want the SSC fully integrated into the statement of work, as well as the council, and so we have to bring these to you guys fairly early

in the process, in order to get all the approvals that are necessary, and also have it in the correct order.

The way we like to do it is you guys are advisors to the council, and so you guys get the first crack at developing the statements of work, and then it will go to the council for the final approvals prior to us sending it to the National Marine Fisheries Service for negotiations. After we do the statements of work, then it will come back to you guys as a terms of reference, or we might have negotiations and make sure that you are comfortable with what is being decided upon to go forward into the assessment, and so you're going to see these multiple times as they go through the process, and don't get bored with it. Please stay fully engaged, but we want to make sure that the SSC is well aware of what we're trying to put together for these.

You guys have mentioned, in the past, that you would like to see more information on why the terms of reference are developed the way that they are, and this is the first opportunity to comment, making sure it's addressing all of your issues.

The way that we have started developing these statements of work, and Judd and I are completely open on how you would like to see them, and this is, like I said, one of the first times that you've seen them, but what we have done is take past research recommendations and applied -- Put those into the requested model modifications, and we also classified them, at least as an initial classification, into what we thought was strictly research, something that could be accomplished in an operational assessment, and then something that could be accomplished in a research track assessment, just trying to give some frame of reference, recognizing that there is different types of assessments that are needed, and then some of the topics might be appropriate for a topical working group.

We tried to give some initial thoughts on that, providing it to the council, and, with that, we'll get started with gag grouper, and, up top, we have the model, as well as additional years, and so, if you look at the terminal year, it was 2019, and we're going to be requesting that additional data are added to 2024. One thing I do want to note, with a positive of these research and operational track assessments, is we are getting fairly -- It appears that we're getting quicker assessments, and so we are in that five-year time block that you guys were talking about with your catch level projections, and that seems to be a positive with these research and operational track assessments.

Then apply the current BAM configuration, and the next phase under there is this is language that we've been having in most of our terms of reference, and it is include any new and updated information on life history, discard mortality, and steepness. Any issues with that? All right. Then explore appropriate CVs for landings data, to capture uncertainty in the model results, and this has been fairly standard language in the terms of reference, and I am not seeing any big concerns.

Then this is coming into the research recommendations that came from the last stock assessment, and we pulled these from the tool that SEDAR has, and so, if you look, once again, at the research recommendations -- What we're saying here is these are strictly research, and look at, for gag grouper, it's characterizing length and age composition of observed gag from video and SERFS, and that can't really be done in an operational assessment, and that needs to be researched outside of the assessment, and that can be provided to it, unless you guys think it should be part of the operational assessment.

DR. NESSLAGE: Wilson.

DR. LANEY: Thanks. Chip, I just had one suggestion in the third bullet there of better characterize population and fishery dynamics of gag, and could we add a single word in there, after "population" maybe, and put a comma and stick "distribution" in there? It seems, to me, that that would fit nicely, given Tracey's comments about the fact that they are starting that juvenile gag survey inshore, and I think there would be a good bit of interest in that as well, because of the changes that our estuaries are undergoing from a climate perspective.

I am thinking that we're looking at a white shrimp fishery developing in the Chesapeake Bay now, and so that species seems to be making a northward move, and, if gag does the same thing, we might expect to start seeing a whole lot more gag show up as juveniles in the Chesapeake Bay, and so, if we could throw that word "distribution" in there.

Then, in terms of, you know, how that might be implemented, for some graduate student at some point, there's all these state, inshore state, trawl surveys that may be picking up juvenile gag, and it would be very interesting to look at those and see if we're seeing, you know, any sort of a northward shift in juvenile gag use of these different estuaries as you go further north. Thanks.

DR. COLLIER: I am wondering if that would be better to put somewhere under the operational assessment and comment on whether or not there appears to be some shifts in distribution for this species. I don't know if the best approach for it is under the operational assessment, but there has definitely been a push within the Service to indicate what kind of impacts climate change is having on these different species, and that might be one of the items that could push this from an operational assessment next time to a research track assessment, and so that might be a good piece for the stock assessment scientists to comment on, whether or not they feel like it should be changing over, but I will leave that up to the SSC.

DR. LANEY: I'm fine with putting it wherever you want to put it, as long as it's in there somewhere.

DR. NESSLAGE: Amy.

DR. SCHUELLER: I guess I'm -- Well, I have two comments. One, I think is easy, and we made some recommendations on Tuesday about things to include in the assessment report that we should probably stick in here, because it's the statement of work, and then my other comment/question, and so requested model modification to previously-approved assessment, and that's sort of the title, underlined and highlighted title, of this section, and then there's a lot of things under here, and it makes it seems as if we have all the data analyzed to work on this, or we even have data to work on this, and is that true?

Am I understanding that properly, or is this like -- You know, it says "research recommendations", and this is just research recommendations that we still think are important? I'm a bit confused about what the hope of each of these items is, given that they're outlined under requested model modification to the previously approved assessment. Maybe this is just a nitpicky structure thing, but it would be nice to have some clarification on that.

DR. COLLIER: These are all research recommendations coming from the last assessment, and what we did not want to do, as staff, is remove things, and so we provided you guys the complete suite that you had provided as research recommendations from the last assessment that you would like to see included in the next assessment, or needs to be addressed for the species, and we provided those, and then we classified them that what we thought we were truly research, other things that could be potentially accomplished in the operational assessment, and then things that might have to be accomplished through a research track assessment.

It's just trying to give initial classifications on what could be done within an operational assessment, and we probably should have moved that up to the top one, because that's likely the most important piece, and, if there's other pieces that you guys would like to see accomplished for that, I think that needs to go underneath the operational assessment piece of it. Does that make sense, Amy?

DR. SCHUELLER: It does, and so I understand we're trying to make sure that we're sort of continuously moving this important information forward. The way I would view it is that it would -- It's great to have the list, but, from that list, what do we actually have data for, and those are the things that we're going to cherry-pick and put up for, yes, we can consider this, and the rest of it is just still a list, because we can't address it.

I guess my question is, is there anything on this list that we can actually address, and I guess I will say, under the potential topical working group, I mean, there's somebody working on that topic, which is investigate sources of recent recruitment declines, and so hopefully there should be information on that, by the time that this comes forward, and so maybe that one is an easiest one to tackle first, but I don't know that we have data on the rest of them, although it appears that we probably have telemetry and conventional tagging data available, and so maybe that's the other one that is easy to pick off a list.

DR. NESSLAGE: Wally.

DR. BUBLEY: I mean, keeping in mind though that this is still five years out, and so there could be something that hasn't been started yet that might be started maybe next year, or something like that, and so I understand wanting -- I get you wanting to have set this is what we're going to look at, potentially, but I would also hate to exclude something that maybe someone is planning on starting next year and has available five years from now and that it's not on this scope of work, and it isn't mentioned.

DR. SCHUELLER: I am not suggesting excluding. I'm suggesting parsing them out by things that we actually have data for already, in-hand, which, you know, it seems like we probably have tagging data, based on how this is written anyway, and what we know is coming, and we know there's work being done on this recruitment question, and then, if there's things that start in two years, that's great, and I think we should keep the research recommendations, but we can't force it into this section called model modification, because we have no idea whether it's going to come to fruition in time, and, given that it's a statement of work, I don't think that we're going to be holding anybody to doing that when it's not available, and that's my only point, is that we just need to categorize this a bit differently, from my logical point of view, at least how my brain works.

DR. NESSLAGE: Chip.

DR. COLLIER: That's kind of the intent, was to provide you guys with the full suite of information and then you select what is most important to incorporate into the operational assessment.

DR. NESSLAGE: Jeff.

DR. BUCKEL: I would like a title change, or suggested title change, and so, instead of "requested model modification", maybe "potential model modification", and then we -- I agree with Amy that we can have a list of these are known datasets, or known research studies, and then potential research studies, and, that way, there will be the two groups that Amy described, and I think that's a good idea, and that would still open -- There's a potential for some of these that may come online, like Wally said.

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

DR. SERCHUK: Thank you, Chair. I also have heartache with the word "model", because the model that's being used is going to be the BAM model, and so I think these are requested informational needs, and they're not -- Typically, in an operational assessment, we don't change the model configuration, or, if there are, it's very specific, but these are sort of informational needs, and so I think it's confusing, because we allow significant changes to model configurations in the research track assessment.

There are small changes that we might allow in an operational assessment, but I think these are sort of research needs, when I see to better characterize fishery dynamics or methods for characterizing age and length composition, and, to me, those are inputs to the model and not the model configuration itself, and so I have a little heartache with the word "model" in that section. Thank you.

DR. NESSLAGE: It sounds like you're going to reorganize this perhaps, Chip, based on -- How does this work next? You'll make modifications, and this will go the Center?

DR. COLLIER: We'll make modifications and present it to the council in September, as a scope of work, and then it is provided to the Center by November 1.

DR. NESSLAGE: Jeff.

DR. BUCKEL: Chip, do you want help going through these now, or do you which ones where the data exists and where others are just maybe studies coming online, like the juvenile study that Tracey talked about?

DR. COLLIER: Right, and we would love your help with this now. This is going to be the scope of work that is going to be turned into the terms of reference, and so, anything that you guys think is most important for the next gag operational assessment, please let us know, so that we can incorporate it here and have negotiations with the Science Center, to make sure that you're getting the most appropriate assessment to determine stock status and catch level recommendations for the species.

DR. NESSLAGE: Wilson.

DR. LANEY: Well, to that point then, Judd, could you add, under the last bullet that is showing on the live screen up there now, "exploring distribution shifts", and I would put maybe a parentheses and say, "both juveniles and adults". I was particularly interested in the estuarine distribution of the juveniles, for sure, and then, to respond to Jeff's point, there are, I think, quite a bit of data that are residing in databases here there and yonder.

I know that North Carolina has a bunch of estuarine survey data that hopefully would have some gag encounters in it, and so there are some long, old time series, and, Chip, you would know more about those than me, but there are some long, old time series, but then there's the new one that Tracey just told us about too that will be starting, and so, by five years from now, we should have -- That one should be better populated as well.

DR. NESSLAGE: Chip, go ahead.

DR. COLLIER: We can definitely add that, but I just want to make sure that we keep in mind that this is an operational assessment, and so they're not going to be doing a lot of digging for new data. It's going to be operationalizing the previous assessment, but, if there's key pieces of information that you guys need, in order to review this assessment and make it a more thorough review, or there are issues from last time, that's what we need to address in these scopes of work.

DR. NESSLAGE: Chris.

DR. DUMAS: So, for the data series that we look at, where we're trying to decide where to set the ABC, what are we looking at? Is it time series of catch, time series of abundance estimates, and is that what we take a look at when we're thinking about setting ABCs?

DR. NESSLAGE: You mean in the projections?

DR. DUMAS: Yes, and so catch, abundance -- What I would like to see for the time series that we look at is we're looking at, okay, how has the species been doing recently, and we see the graph of dots, and they're kind of going up and going down, and maybe there are a few outliers, and remember we've had discussions about outliers versus are they trending down recently or not, or are they tending to fluctuate around the mean, and, when we look at those graphs, are we typically looking at the graphs of abundance estimates or graphs of catch or both, when we're sitting here talking about setting ABCs?

DR. NESSLAGE: Well, the projections generate catch streams, abundance streams, discard streams, F streams.

DR. DUMAS: That's what I thought, and so, for the -- I guess, for me, the two most important would be the abundance and the catch, sort of the abundance time series and the catch time series, and so three specific things that I would like to see for the catch time series and the abundance time series would be autocorrelation function for that time series and the partial autocorrelation function, and those should be really easy to do. The data, you've already got, and just present -- Each of those would be a little graph, a little bar graph, of autocorrelation function, and a bar graph

of the partial autocorrelation function, and then also a correlation matrix of each of those series for the species of interest with the same series from other species.

If we've got a time series on abundance for gag, then the correlation matrix of the time series of abundance of gag with the abundance of red snapper, the abundance for all the other list of species, just so we can see how the abundance time series are correlated, and so a correlation matrix for abundance, and then also a correlation matrix for catch, for the catch time series. Those should be super easy to do. It's one command in R for the autocorrelation function and one command in R for the partial and one command in R for the correlation matrix, and it should be pretty easy to do.

DR. NESSLAGE: Some of that is in our catch level projections report, right, but maybe not the one with the other species, and I'm trying to recall. Is that in there? No. I'm looking to someone who remembers the report.

DR. SCHUELLER: I mean, it's a research recommendation, and it's not a suggestion for every individual species assessment, and I guess I'm -- I understand your interest in it, but I'm a bit concerned about getting wrapped around the axle with some sort of multispecies analysis, which is really an overarching research project, rather than the work for a single-species assessment, which we could argue all day whether we should be doing single-species assessments, but that's not what we're talking about, and so I don't know. I don't know if you want to refine what you're asking, based on that, and I think the --

DR. DUMAS: Sure. The correlation matrix, if there are correlations, could help produce better estimates of the single species, if you're doing a single species assessment, potentially. Also, that list of things that I just mentioned, for the abundance time series, and for the catch time series, and also for the deviations of abundance time series and the deviations of catch time series.

DR. NESSLAGE: Are you -- If I could add to what you're -- Or elaborate on where I think you're going, and correct me if I'm wrong, we had a hard time picking what timeframe to use for recruitment in the projections for gag, and this was one of the reasons that we formed the working group, this species, and so any work that can be done to support ABC setting, when we get this assessment, five or six or seven years from now, would be really helpful, and it will help us to keep from spinning our wheels, and I see that Erik Williams might like to speak to that point.

DR. WILLIAMS: Thank you, Chair. We did have a set of recommendations of things that we wanted to add to stock assessments that came out of the projections workgroup, and those were all great ideas, and I want to implement those, and I -- You know, I have had sidebar talks with Chris, and I completely agree with all of what he wants to do, and it's basically start casting some of our time series with time series analysis, which is great, because we can start to infer a lot of things from that, and we can put it into this statement of work, but I would actually say that that work is important enough that it needs to start occurring immediately, and I would recommend that actually the SSC ask for some of these additional analyses to be folded into our stock assessments.

I am more than willing to try and do it, and I'm at a point now though where I'm having let's just say workload issues, and so I need the -- It would help me if the SSC emphasizes how important adding this stuff to our stock assessments is, and I can devote the time to make sure that that gets incorporated as a regular, routine analysis, which is what I would like to see, and I think Chris would like to see that, and hopefully the SSC would like to see that.

DR. NESSLAGE: So you're referring to the assessment is happening, but way before this one is the --

DR. WILLIAMS: Right, and so I am saying you can put it in here, but I would say even pull it out and make it an even higher -- Even like a statement from the SSC, or a request directly to the Center, that we start incorporating more rigorous time series analysis and some of those other recommendations that we had in the projections working group.

DR. NESSLAGE: Right, and so, when we got to the consensus statement review, later in the agenda, I think that would be the place to put it, and maybe, if the SSC agrees, we would make a stronger statement to that effect of implementing these recommendations sooner than the next set of SOWs, or whatever we're calling these things. Fred Serchuk.

DR. SERCHUK: Just a question about whether this is the most efficacious process for integrating recommendations into work for assessments. It seems to me that there should be a list of all the research recommendations from all the assessments in a spreadsheet someplace, and then it can be determined which ones are high priority and which ones are medium priority, because it's just not the Center that can act on these.

Universities can act on them, and independent researchers can act on them, and, given the fact that there's some priority, either in terms of immediacy or in terms of the actual product itself, people can use that priority list to request funding, whether it's though the state agencies, and I think it would behoove the process to not only deal with this through a SEDAR process that lists the recommendations, but then have a discussion, both at the SSC and the council itself, in terms of how they would prioritize this list into immediate, near-term, and longer-term sort of things.

That would, I think, help the process immensely, and maybe it does exist, but my feeling is that -- Are we seeing just a portion of it here? I would like to see the bigger picture as well, and the bigger picture would be very helpful across-the-board, because there may be issues, on individual assessments, that are common to many other assessments. Thank you, Chair.

DR. NESSLAGE: Good point. To that point, Chip?

DR. COLLIER: Every two years, the council revises their research and monitoring recommendations that we provide to the council, or to the Science Center, for their consideration, and you guys are invited to comment on that every two years, and we just reviewed it, I believe, in 2021, and so -- We provide that to you, and I do need to do a much better job of getting that onto our website, and we haven't figured out a great place for it, but that is something that I think needs to be more visible, as far as research recommendations.

We do have short-term and long-term, and we don't necessarily do priority ranking, just because we aren't a funding agency, and so that is a bit of a challenge for us. We would like all the work to get done, and we recognize that funding agencies have different priorities than what councils have, and we want to give them the flexibility to rank some of these, but what we do provide is the short-term and long-term, trying to instigate, based on what stock assessments are coming up, what the Science Center has discussed, as well as what AP members have discussed, trying to

incorporate all that information in there and what's really needed in the short-term and what's needed in the long-term.

DR. NESSLAGE: I have Chris, Wilson, and Yan.

DR. DUMAS: I would just like to follow-up and say that the purpose of those requests, whether they're included in this or something broader, is the autocorrelation and the partial autocorrelation function would help us answer the question, when we're looking at projections, of should we use a three-year mean or a five-year mean or -- That question has come up a lot, over and over again, and those would directly help us decide which type of averaging to use, if we're going to use some type of averaging.

The correlation matrix, if some of the correlations are significant, either positive or negative, that could help us reduce the PSE of our projections, and so help us reduce the uncertainty envelope around our projections, which has been a concern in many, many meetings, and so that could also be useful. Thanks.

DR. NESSLAGE: Thank you, Chris. Wilson.

DR. LANEY: Thank you, Madam Chair. What Fred articulated is, if memory serves correctly, and, Alexei, correct me if I misspeak here, but is pretty much the process, and you would know this too, Madam Chair, that the ASMFC follows. They compile all of their research recommendations for all of the species, from all the technical committees, into one document, and they do characterize them, and, if I'm remembering correctly, they do high, medium, and low priority, I think, and so that document is also available, and, Chip, it sounds like you all are already doing something very similar to that anyway for the council, and so, yes, I like Fred's suggestion, and it sounds like we're already basically doing it, at least every other year or so, and that proves to be a very useful document for university folks and others who are looking for research projects and funding.

DR. NESSLAGE: I would encourage us, as we're going through and reviewing each assessment, to highlight any that we think are high and to put the word "high" in our recommendations, just to flag it for anyone who happens to be reviewing that. Let's go to Yan online.

DR. LI: Thank you, Genny. I have two comments, and, first, back to Chris's comments about the autocorrelation and partial autocorrelation, and I know that it's important to explore the time series analysis for the stock assessments, particularly for interest of better projections for the future, and I would like to add that, other than what the model shows, based on autocorrelation and partial autocorrelation analysis, how long the projections should be, and, other than that, other factors also might play a role, for example such as the management interest, and also the data availability, and so that's my comment for that.

Another thing is that I would like to echo Amy's comment earlier about adding these things under the statement of work, and I'm thinking -- To me, I feel that here we provide a good general guideline for the stock assessment, but like the details -- For example, for better projections, what kind of detailed methodology should be used, and those things I feel, as individual decisions, should be left to the lead analyst to decide, and I don't want to here to put that you have to use, and I just feel we don't want to limit those methodologies to be used in the stock assessment, and

I just think the decision should be left to the lead analyst. Also, depending on the time we start the analysis, what other new methodologies, better methodologies, might be available too, and that's my comment. Thank you.

DR. NESSLAGE: If we add the word "potential" -- Jeff is going to elaborate.

DR. BUCKEL: Yan, I think you're asking that we're not too prescriptive in the scope of work, to allow the analysts to have flexibility, and so I think that Chip, or Judd, had changed the title of this section, in the gag scope of work, to "potential modifications", and so does that satisfy your concern? I know you probably can't see some of these, and sorry, Yan.

DR. LI: I can see. Potential, okay, and I just feel like that potential, but the wording doesn't have to be that specific. For example, when you go down to Operational Assessment, and you look at the wording for the first two bullets, better characterize the reproductive dynamics, and we didn't say using what method, or using what index, or what to do, but, here, we say explore time series using autocorrelation methods, or partial autocorrelation methods, and I feel that, compared to the first two bullets -- If they weren't that way, it's a little bit too like prescriptive for that bullet. That's just my personal opinion, but we can make it more general, depending on what like Erik mentioned, like depending on the workload and other things together.

DR. NESSLAGE: On the -- For us, the right screen, the Google doc, if we say something like include abundance and catch time series analyses to inform projection timeframe, including, but not limited to --

DR. LI: How about we say like "such as", "such as the --" I also like that -- We can say "other than time series", or "other than this", and then the terminal projection should also consider the data availability and the management interest, or management urgency.

DR. NESSLAGE: Your last comment, where are you in the -- Which document and where are you? What are you referring to? Is it this same section?

DR. LI: The same section, the same bullet, the third bullet. I can see Judd typing now, and include abundance and catch time series analysis.

DR. NESSLAGE: And you would like to change it to what? Sorry.

DR. LI: Not change it, but to inform projection timeframes, and I want to add -- My point is to inform projection timeframes, and doing this time series analysis is part of it, and, also, we should consider the data availability and the management interest.

DR. NESSLAGE: I think what we're talking about here is what we were discussing on our first day, which is using the model estimates, which they will have in hand.

DR. LI: Okay.

DR. NESSLAGE: So they should be able to do this relatively quickly, as Chris indicated. The one thing that might take them a bit more would be if they do the cross-species analysis, but I think we've rephrased it now so that that's if possible, or I forget where that is now, but --

DR. LI: Okay. I get it now. Okay.

DR. NESSLAGE: I think we really need some information, and I think we're trying to press them to provide some information to inform our timeframe for projections, so that we don't spin our wheels too much when we go to set the ABC.

DR. LI: Okay. Sounds great. Thank you.

DR. NESSLAGE: Thank you. Chris.

DR. DUMAS: I am not asking for a full time series analysis, or a time series model, or anything like that, and I'm just -- That's why I'm being very specific and some specific things that I would just like to see of the autocorrelation function and the partial autocorrelation function and the correlation matrix across species, which should be relatively quick, easy things to do, and we could look at those and see if there's anything there worth pursuing further in the future, and there may not be, but there might be.

DR. NESSLAGE: All right. Are there other things to add or consider that folks think are super important, including potential topical working groups, right, and this is a big issue. We have down -- This is some of the work I think that Amy was referring to earlier, potential sources of recruitment declines, and maybe that working group could review the research that will have been completed by then by the Beaufort Lab and associated post-docs. I think, personally, this is a good topical working group. Are there -- Do you all disagree, and/or is there another topical working group that we need for gag, because this part of the big ask, and so I want to make sure we get this down. Wilson Laney.

DR. LANEY: No, no disagreement at all, and just a clarification that -- Let's see. It talks about non-traditional datasets and includes the estuarine inshore surveys and the larval bridge net surveys, and so I think that goes back to my recommendation about looking at estuarine distribution again too, and it sort of fits into this particular one, and so I like it. It works for me, the way it's worded now, and I think that, again, going back to our discussion with Kai the other day about, you know, what constitutes recruitment, certainly the estuarine phase of gag's life cycle, I would imagine, is a potential inflection point, and is that the right terminology here?

Depending on what is going on in the estuaries, especially with respect to climate change, especially with increasing temperatures, and those estuaries such as the Neuse comes to mind, where you have low DO issues already, and that could conceivably increase in the future, then that estuarine look at gag young-of-year becomes all the more important, I think, at least for that species, and maybe not so much for other grouper species, but certainly for that one.

DR. NESSLAGE: Does anyone disagree? I am seeing nodding heads around the table. That's good. Erik, do you have something you would like to say?

DR. WILLIAMS: I don't mean to throw you guys off on your conversation on this, but, just being an observer in the back of the room, something that's come up, sort of repeatedly over the course of this meeting and previous meetings, is, and this relates to topical working groups, is what is too much for adding or changing for an operational assessment.

I've heard mixed feelings from the SSC on that, from various individuals around the table, and so I don't know if you guys need to form a better consensus on what you guys are willing to accept for changes or not, but I feel like that still is an unresolved issue that's going to continue to come up with all of these assessments, especially as we move forward, because we do still have a lot of data sources coming online, and so, I mean, either we're going to have to shift everything to research track, or we're going to have to start being a little more accepting of making these kinds of changes with each of our operational. Anyway, again, this may not be the right time or place for me to interject that, but sorry for that part.

DR. NESSLAGE: It's an excellent question, but I think this is going to be our next big chance to do something with gag. It's going to be a long time before gag gets a research track assessment, and so, if there's anything important that needs to change, and the Center is willing to make the time for it -- I don't know, and, personally, I would say put it on the list, and they can only say that, no, we don't have time for it. Any other things that you think need to be added to the list of the wish list here? Kathleen.

MS. HOWINGTON: The only thing that, and I've been texting with Julie about this, that we're a little bit concerned is this one that's underneath the operational assessment that is better characterize the reproductive dynamics. That we think would be better suited to a topical working group than just a something that we would like to be updated in the assessment, that we would like the Science Center to look at. The very first bullet point underneath Operational Assessment is better characterize reproductive dynamics of gag, including sex ratio, schedule, batch fecundity, spawning seasonality, and we think that that would actually be better suited to a topical working group.

DR. NESSLAGE: Amy.

DR. SCHUELLER: Is there a bunch of new data that we expect to change that?

MS. HOWINGTON: Not that I'm aware of, but that definitely would be getting into the nitty-gritty of like specific details, and it is better suited for that. If there's a -- If that's going to be an in-depth discussion, and that is what we're going to need to be able to have those decisions be made, then that would be something that would be more appropriate as a topical working group. That's what we're thinking.

DR. NESSLAGE: If we do that, can we just put "if data are available, form a topical working group to -- " I am seeing hands. Amy and then Jeff.

DR. SCHUELLER: Not only just if data are available, but it has to be if new and different data are available, because, if we have the same exact data we had last time, I don't know why that's a topical working group. We're going to do what we did last time and put it in, but, if all of a sudden, there's 20,000 records of something, okay, I understand that, but that's why my question was what's new, and, if there's nothing new, I don't think it's worth a topical working group.

DR. NESSLAGE: To that point, Wally?

DR. BUBLEY: Yes, and I'm not so sure if there's going to be new data, per se, but I think this came up during the last assessment, because they decided to use male and female biomass, and maybe not initially planning on that, and then it came up, and then the question came up, during the discussions, about sperm limitation and other things like that, which maybe didn't have enough time to get fleshed out, and so maybe that's why it could -- Not so much that there's new data, but the group never got a chance to really dig into it and see if there was something there, and I think that might be why it could potentially serve the role here, but that's just the recollection that I have from that.

DR. NESSLAGE: Thank you, Wally. Jeff.

DR. BUCKEL: I was going to ask Wally what he knew about this, and so thanks, Wally, on that, and, yes, I'm struggling with these -- You know, we still have these sub-bullets that I'm not clear on what -- You know, when one is under Operational Assessment, versus Research Recommendation, and I guess, if we know that a working group, or this should be a data workshop topic, because nothing -- There is something new there that folks could work on, and that would be -- That falls under this working group.

If we know that there's nothing there, then that would fall under a research recommendation, right, that we would like to get the research started, and so I'm trying to think about what -- How these fall, and like I don't know -- The telemetry and conventional tagging to get natural mortality, I am not familiar -- I don't know of anyone doing that, and do you, Wally? So then that would be a research recommendation and not operational assessment, because it's not going to -- Unless someone has already started it, it's not going to probably make it into the operational assessment, and so maybe we could just go down each of those and put them into either research recommendation or consider for the operational assessment.

DR. NESSLAGE: Okay, and so, if we do that, under Research Recommendations, the first bullet is develop methods using SERFS, and is that something that can be done for this, and so we would pull it down into operational? Wally.

DR. BUBLEY: Yes, and that's -- The last few years, we've been putting stereo cameras out on the traps, and so we're starting to get some length information, and then this MARFIN selectivity study that we just had this year is we're going a little more, and we're adding more stereo cameras to the traps now, and so it's going to be more consistent, at least for a few years, and it's not going to be the whole time series, obviously, but it's going to get us a better idea of how the video lengths will match up with the trap lengths.

DR. NESSLAGE: Great, and so we'll move that down. Then we have implement systematic age sampling recreational -- This sounds like a major research recommendation, and this is not an assessment thing, and so keep it there? I am not seeing anyone disagree. I'm looking at time, and we have to keep rolling on this. We have two others to do and consensus recommendations, and so better characterize -- This one is about fishery dynamics, and you moved that one up. Okay. Then we already moved the age-dependent natural mortality, and so now we're under operational, and we brought SERFS down. Jeff, go ahead.

DR. BUCKEL: That second bullet that we -- I think that was the estuarine juveniles, and I think that is under the working group now, right, this dynamics in estuaries?

DR. NESSLAGE: Can it be combined with what's in the statement of work, or, sorry, the topical working group? 1 or 2? Thank you. Are we comfortable with all the bullets under Operational Assessment and Research Recommendations then? Amy.

DR. SCHUELLER: I have a -- This develop methods to characterize length and age comps from the videos, is that a topical working group? So that's a new data, right, that hasn't been included in other assessments, and so I guess I'm -- I guess I'm swirling around a question in my head, which is this isn't necessarily specific to gag, meaning this is going to be methods across multiple species, and so is that some other type of broader working group? Didn't we have some other kind of working group in the SEDAR process for that, and so does that go here, but then also end up with us requesting another type of working group completely?

DR. NESSLAGE: Chip.

DR. COLLIER: Yes, and, I mean, that sounds, to me, like a procedural workshop, more than necessarily a SEDAR workshop, but similar to red snapper, where that was that selectivity study that we investigated that was done under one assessment that was going to inform other assessments as well, and so it is possible. However, the other issue that we're running into is we're getting to the maximum number of topical working groups that is recommended.

If you're getting a bunch of topical working groups, that's indicating that you need a research track assessment, as opposed to an operational assessment, and so what we're working under right now is basically two topical working groups for an operational assessment, and, if you're getting more than that, there's a lot of issues with the previous assessment, and it probably should go through a different path.

MS. HOWINGTON: One of the paths that it can actually go through would be through another research track, and so, for example, gray trigger is going on right now, and red snapper is coming up, and so, if we wanted to develop a process through there, and then have it apply to this operational, that could be a way that you could do that, and then not have a specific topical working group for this operational assessment, but just have it follow the guidelines of that research track.

DR. SCHUELLER: That's fine, but it just needs to be dealt with somewhere, and that's why I was bringing it up, because it's not specific to gag. If it gets assessed or dealt with somewhere else before this, that's fine, but we should make a note that it needs to be dealt with somewhere ahead of this.

DR. NESSLAGE: All right, and so Judd is going to add a recommendation, unless anyone disagrees at the table, that this become a -- What did you call it, a procedural working group? What is the word that you used?

DR. COLLIER: Well, I think, like Kathleen had mentioned, is try to do it under a research track assessment, and that's probably going to be the cleaner, and then use the approach that is described under the research track in this operational.

DR. NESSLAGE: But, if it's under the research track, will they look at multiple species or just the one that's going on? That's what I am worried about.

DR. COLLIER: Well, this is -- I mean, we're developing methods to characterize length and age compositions from SERFS videos, and, to me, that's -- It's not just a single species at that point, and you're probably thinking about developing methods for multiple species, right, and they're not going to look at just gag in one way, but --

MS. HOWINGTON: They would develop the method for that species, and that method could then be applied for gag in the future. There might be -- You might have to tweak it or something, but that method of looking at the length and age comp and characterizing it in the videos would be then part of the process.

DR. NESSLAGE: Okay. So then maybe not develop methods, but incorporate newly-developed methods, if available, in the operational assessment? How does that sound? Then we have include abundance and catch time series, and we just talked about that, and catch level projections working group topics, which is another kind of sub-bullet under that. Are folks good with what's listed here? Wilson, you're making a face.

DR. LANEY: Well, I think so. I was hearing sort of two different things, and so Chip made reference to a procedural workshop, and, to me, that would deal with the first part of this bullet, which is develop methods to characterize length and age composition of any species observed on videos from SERFS fishery-independent surveys, and then you have a particular need with respect to gag, which is the fact that the trap sampling was limited, and potentially biased, due to size selectivity of the gear, and so, to me, you've got that broader, overarching procedural workshop thing that would just deal with that dataset and figuring out how to characterize length and age composition for any species that you have enough data from the videos to use for that particular purpose.

Then there's this separate thing that you're trying to address for gag, and I don't know how you -- However you want to capture that is fine, but it sounded to me like Chip's recommendation for a procedural workshop -- No?

DR. NESSLAGE: No, and I think we moved on to we'll do it during a research track, to develop the methods, which I think he's trying to grab, Judd is trying to grab, on the right-hand screen, and then, whatever new methods, they will try to apply it for gag, with the comment that they will need to deal with the issue of, as you mentioned, potentially biased selectivity, blah, blah, blah.

DR. LANEY: Okay. Just as long as it's captured.

DR. NESSLAGE: Thank you.

MS. HOWINGTON: I will make certain that that is included in the research track for red snapper, and I just had a little bit of an aside with Wally, and we should be able to have a few years to be able to incorporate it in that, where then the method will be developed during that research track, and the planning team for that one is going to -- For the red snapper research track for 2024, it's probably going to be convened at the end of the summer, and so I can just put it in the draft right now, and it will be incorporated.

DR. NESSLAGE: Brilliant. Thank you. Are folks comfortable with what's on the screen, and then on the left in particular, and then we'll have the topical working groups, if you could scroll up, but that's going to be -- Is that one or two now? Two, and thank you, topical working groups. Last comments? Kathleen.

MS. HOWINGTON: Sorry, but this is just from the SEDAR perspective of when we receive the statement of work, because the statement of work is technically an SSC and a council product, and so. the research recommendations that you all have at the very, very top -- Those are not going to be addressed during this operational assessment. Those are there, but they will not be addressed, and the operational assessment bullet points that you have will be addressed, but there will not be any topical working groups, and those hopefully will go to the Science Center, and we'll have some negotiations about what they think that they can get done.

Then the topical working groups -- Those are going to be where you would actually have separate groups that meet up, and they're not going to be panels like you all are used to, and those are going to be specific small groups of people with specialized knowledge about that specific topic that will meet up, typically for about two webinars, or maybe three, if they really need it, but that's, in general, the process that's going to happen, and so that's just -- I wanted to clarify, when you all are moving forward -- Those research recommendations at the top, we are not going to be addressing during this assessment.

DR. NESSLAGE: Thank you for that clarification. Jeff.

DR. BUCKEL: I guess someone mentioned, right, that this is five years out, and so there's the potential that someone may tackle one of those and have something, but it's less likely, I think, than the ones that are under operational assessment, but, yes, thanks for the clarification.

DR. NESSLAGE: Okay. Last call on gag grouper. Wilson.

DR. LANEY: I just have a clarification question for Amy, because you had said that we don't need to form a TWG unless we got new data, new information, and, in my brain, would new information include like if Wally discovers a filing cabinet at SC DNR that has, you know, twenty years' worth of gag data in it that hadn't ever been analyzed before, and that would still fit in your definition, I presume, of new information, even though it's old information that hasn't been analyzed before?

DR. NESSLAGE: Indeed. New to us.

DR. SCHUELLER: I think everyone is nodding yes to that, I mean, assuming it isn't just additional information to something we're already doing, and, if it's something totally new, which that happens. Sometimes there is a treasure trove of something historical, and I would consider that new.

DR. NESSLAGE: Excellent. Okay. I think we've wrapped up gag. I might throw a wrench into king mackerel, and so I'm thinking of taking a five-minute break, if that's all right. I know it's a little soon, but I feel like we need a quick breather. I was going to break at 10:00, but I feel like this might be a good spot, if that's okay with everyone, just a quick biological break. We're getting a little behind, and I'm a little worried, because we have consensus statements to review, and there

is some issues that are coming up there, and so can we do a quick biological break and be back in five? Thank you, all. Okay.

(Whereupon, a recess was taken.)

DR. NESSLAGE: Thank you, folks, and so Chip is going to walk us through king mackerel here.

DR. COLLIER: All right, and the next one -- This is 12b, Attachment 12b, and it's king mackerel, and so the model and additional data years. It's going to be updating SEDAR 38, the king mackerel assessment, and the previous terminal year was 2017-2018, and that's a fishing year. The operational assessment is going to go through 2024, adding six years of new data. This model is done using SS 3.

The requested data updates, those are going to be the same as you saw with gag, and then we've already changed this language that you had for the previous statement of work, and now it is potential information modifications, and so, for this one, we only had operational assessment modifications, and these all were from the research recommendations from the update assessment that you reviewed last time, and, just starting off with the first one, research aimed at improving documentation, including standardization, and we feel like that should be definitely done for this assessment, and could be done outside and be prepared for it, and evaluation of alternative age references, or age-specific time series, for SEAMAP fishery-independent data.

Then analysis of the effect of excluding sub-legal fish size observations on the assessment should be undertaken. Evaluate model sensitivity to the age data and explore alternative parametrizations, and then staff added one that was not included as far as a research recommendation, but was based on some of the information that we've been collecting through the FISHstory project to explore sensitivity of FISHstory length data, and what FISHstory length data is looking at is size distribution off of Daytona Beach, Florida from the 1950s to the 1970s, looking at the charter boat fishery.

Then I added the two that we discussed for the last assessment, or the last statement of work, to include abundance and catch time series to inform projection timeframes, as well as catch level projection workgroup topics.

DR. NESSLAGE: All right. I will open the floor for comments from the SSC. If no one else does, I do, and will you entertain that committee? You may recall that I had a little heartburn with this model, the last time we reviewed it in April of 2020, I think, and, in particular, if you recall, this is a largely length-based model, which is great, and they are estimating eight growth parameters, and so four parameters for each sex, and the max gradient was greater than the typical recommended threshold, which isn't the end of the world, but it does indicate that there is probably highly-correlated parameters, and I would bet a lot of money that it's in the growth parameters.

At the time, I let it slide, and I put it -- We had something in the report, in our report, in our review, to that effect, but I didn't make a big stink out of it, because it was an update, and I get that, during an update, you're not going to do a lot of model exploration and kicking the tires, but now we're at an operational, and I'm not suggesting that they change the model framework, per se, but I think they do need to carefully examine the correlation among parameters and identify if any of them are extremely correlated and do some sort of exploration, if so, to figure out -- Well, I guess that's

Number 1, and Number 2 is, if that's not the cause of the high max gradient and performance of the model, try to figure out what is, because I think that's going to have some impact on the uncertainty around the parameters in the model and how it's performing overall, and I think we need to get to the bottom of this.

It may not ultimately impact anything super important for management, or it could very well, because those growth parameters are underlying the whole model, and it makes me nervous when the max gradient is not low, but I would look to the rest of the committee, if you don't agree, and I know I'm chairing right now, and so I don't want to be too overbearing. If you disagree, and you don't think this is a high priority, I'm happy to step back again. Chip.

DR. COLLIER: I took a little liberty from what you had started off with, and I felt like you were trying to address the high max gradient, and so I put that as the major bullet, and then, underneath that, I put examine correlation among parameters and then examine growth parameters as a potential cause.

DR. NESSLAGE: Yes, and if we could add something, and I'm not quite sure how to word it, about characterize the impact of whatever they find on model outcomes and performance, something along those lines, just to give us an idea, and it might be nothing, and it might be something, but I would like to know where in the spectrum of how much I need to worry when I'm setting an ABC off of this assessment in the future we need to be. Anyone else? I am suggesting the words maybe "characterize the impact of sub-optimal model performance", and this isn't maybe the best wording, and so help me out. It's not super high, but it's high enough to make me worry. Amy.

DR. SCHUELLER: I was just going to say that I remember this, and we did -- I remember talking about this, now that you say that, and so I agree that that's something that should come into this statement of work, and it made me think about the relatively-recently-reviewed gag, and so I think it's a bit more fresh on everybody's brain, and so one of the things that I was thinking is something that's not as fresh, like this, and it might be good to consult our reports as well, when we're doing these statements of work, just to see if there's anything like this that's in there that isn't in a research recommendation document or something, and make sure we're actually picking up those things that we spent time talking on at this meeting and make sure those things are addressed in some way.

DR. NESSLAGE: I did take a look, because I had to go back and see what exactly the beef was that I had from that assessment, and I'm not seeing anything other than we did have some heartburn over the uncertainty characterization, but that was limited, again, by the modeling framework, and so, Chip, go ahead.

DR. COLLIER: Another tool that's being developed is, on the stock assessment pages, we are putting the SSC's comments, and we're extracting them from the PDF and attaching that with the -- As additional information for SEDAR assessments, and so it's going to be a bit easier for you guys to find.

DR. NESSLAGE: Excellent. Thank you. Are there other thoughts from the committee or other issues that need to be addressed, and any -- I guess are you asking -- We need to figure out if any of these need to be topical working groups too, and is that still -- That's up for grabs?

DR. COLLIER: If any -- If you guys don't think these are appropriate, if you feel like a topical working group would be more appropriate for them, please let us know. Otherwise, it would be the analyst or the group within NMFS that is going to be doing the assessment addressing these issues.

DR. NESSLAGE: If no one else, again, I will comment, and so they're considering incorporating age data, and is that -- I'm not sure that I understand completely what they're doing, and is that Bullet 4? Is that new age data?

DR. COLLIER: This is coming from the research recommendations, and so I would imagine it's from the previous age data.

DR. NESSLAGE: I am not seeing a lot of interest in changing any of this, which is fine, and we don't need to belabor it, if folks think it's good, and I don't hear anyone advocating for a topical working group, although Amy has a thought.

DR. SCHUELLER: It says, just above the yellow, explore sensitivity with FISHstory length data, and are we saying run a sensitivity analysis including those data? I don't know what that means exactly, and then have the FISHstory data been used in the past, or is this a new -- I think it's new, right, and so that's the one thing that jumps out to me as new, and so I wanted clarification on the bullet, and then maybe it's a topical working group?

DR. NESSLAGE: Does anyone think that needs to be a topical working group, besides Amy? Wilson.

DR. LANEY: I don't know, is the short answer for me, but I would ask Chip, and where are we on analysis of those data? I know that's the program using Rusty's family photos, Rusty Hudson's family photos, and we have lots of volunteers that are going through those photos and actually measuring the lengths of the fish on that, and so are we anywhere close to having completed that? We are? That's good, and so I don't know, and I would defer to the analytical folks like Amy, to say whether that's something that you need a topical working group for or whether we're going to have a spreadsheet that has all those data in it, and you can just hand it to the analysts, and they can explore sensitivity with it, and I don't know. I don't have a feel for how complex of a task that is and whether you need a TWG to do it or whether the analysts can do it.

DR. NESSLAGE: Amy.

DR. SCHUELLER: I don't know if we need a topical working group. I mean, if the point is to run a sensitivity run with those length data, I think that's -- I guess what I'm turning around in my head is I don't know what that would look like, exactly, because it is replacing the length composition for a certain fleet, or like what -- I don't know what that means, and I just -- How would that even be functionally incorporated into the assessment model itself, is what I am struggling with.

DR. NESSLAGE: Chip.

DR. COLLIER: Thinking about how SS runs, they already have a fleet for the charter boat, and they have a length distribution for the charter boat, but they just don't have any information in this time period, from the 1950s to the 1970s, and there's no length data, and so this would just be essentially populating those blank cells with some information, and it shouldn't be too hard, at least in my understanding of how SS runs.

DR. SCHUELLER: So, I mean, if it's one sensitivity run, where we're putting in a set of comp data in a time period where we're not replacing anything else, or making any other decisions, I think it's pretty straightforward, and I don't think it needs a topical working group, but, if it was more complicated than that -- If it was some other thing, maybe it would require one in the future, but --

DR. NESSLAGE: Dustin.

MR. ADDIS: I think this would be easy to incorporate in the SS model. You just put them in as retained lengths, length compositions, for that fleet for those years, and it's pretty simple.

DR. NESSLAGE: So that addresses your -- We don't need a topical working group? Okay. Kathleen, do you have something?

MS. HOWINGTON: I think my only hesitation with not making a topical working group with this is, after you all described it, I mean, if it is that simple, then, yes, we wouldn't, but, if any hiccups occur, this is a new dataset, and then we would want people to look at it, and, if that's the case, if suddenly this length data is completely different from everything else, and it becomes a problem, then that means that the assessment would probably need to be paused, so they can come to you guys and ask what they want to do, since nobody else could look at it, and there's no one else to be able to focus on those numbers, and so that's the risk that you run with when you're incorporating a new dataset and you say no topical working group involved. Then that's -- I am just giving you the options of worst-case scenario.

DR. NESSLAGE: Wilson.

DR. LANEY: So would it be possible to say we might need one for this? I mean, it sounds like, from what Dustin has said, and Amy has said it's pretty straightforward, and we shouldn't need one, but, in the event that some hiccup did occur, it would be nice, maybe, to have the option, and so I don't know.

DR. NESSLAGE: Amy.

DR. SCHUELLER: Right now, we've couched it as a sensitivity run, and so, to me, that means, if something is haywire with it, then it gets shuffled under the stack of papers, and let's be honest, right, and, if it's that we're going to move forward, and this needs to end up somehow in a base run, that's a different story, but, the way it's written right now, it says sensitivity run, and, I mean, it's -- We have sensitivity runs that don't necessarily behave all the time, in all kinds of assessments, and so I guess -- I mean, it's a question back to the group, I guess, of what is the intention here.

DR. NESSLAGE: Wally.

DR. BUBLEY: Going along with what Amy is saying, this is a sensitivity run that's happening after the model has already been developed, and so, I mean, you're going to have a topical working group that then jumps in at the very last second, and I can't imagine that's happening, and so I think it makes sense to just --

DR. NESSLAGE: All right. We're going to say no topical working groups. Sorry, Kathleen. If I may add -- Does anyone else have comments or suggestions? I want to modify the wording a little, in my picky max gradient section, because I think they might not know what I'm talking about, at least from when we chatted the last time, and so can do "examine correlation among parameters in the .eva file", and then, in parentheses, put "identify where difference between smallest and largest eigenvalues are greater than one million", and that's Fournier's rule-of-thumb for you have a poorly-performing model. I would like to know if Dr. Fournier would be concerned, in this case, and I hope that I'm wrong.

Then I'm not happy with the "describe the potential impact of", and can you say something like "the issue identified", because it's not the max gradient that is causing the issue. It's whatever the underlying issue is that's causing the max gradient, and so I'm just being super picky, but describe the potential impact of the issue identified, or the cause identified, and then I can rest. Anyone else on king mackerel? I think it's looking good. Jeff, go ahead.

DR. BUCKEL: Just a minor wording, and, if you scroll up to the heading of this section, I think we had the -- The bold heading. You got it, the potential. Thanks.

DR. NESSLAGE: All right. Last call for king mackerel. No one is making eye contact except for Chris Dumas, and so I'm going to consider this good. Thank you, all. Then we have red porgy, right?

DR. COLLIER: For red porgy, this is going to be an operational assessment using the prior assessment, SEDAR 60, which was a standard assessment for red porgy with a terminal year of 2017. The new assessment is going to have a terminal year of 2024, and that's going to be adding seven years of new data, but it's currently used in the BAM configuration, and the typical information here under data requests, which is update life history, discard mortality, and steepness, and then explore CVs for landings.

I made the change from the model modifications to potential information modifications, and, once again, we have these split up into strictly what is research recommendations, which will not be addressed during the operational assessment, and these will be removed from the statements of work, if you do not think that they can be addressed in this.

We also identified one that is likely to be something that is addressed through a research track assessment, just because it will be complex modeling changes that will be needed, or complex model development that will be needed, to change in order to address these, and then we also have our operational assessment and potential pieces of information, and I have added the two comments that you guys have talked about at this meeting, and then I added a third one for this species, which is climate change.

There was some discussion about the impacts of climate change, and we did have a seminar series that has been identifying some climate impacts on this species, where the distribution is changing over time, and so it might be good to have discussion about that in the assessment. Other than that, I will leave it up to the group on how to fix this.

DR. NESSLAGE: Wow. Thanks. Comments from the SSC? You have stunned them into silence.

DR. COLLIER: We'll start off with the research recommendations, and the reason I thought that these were more just basic research recommendations is, when we're thinking about territories and male areas and pieces of information like that, it's hard to really determine how that would be incorporated into a stock assessment, and so I wanted to potentially move that down, as well as the potential impacts of other species. This is a single-species assessment, and incorporating some of those pieces of information might be a bit of a challenge, and so that was my thought process of making these research recommendations.

DR. NESSLAGE: Wilson.

DR. LANEY: Just to clarify, some of that work is ongoing, right, Chip, with using the EwE model, I think, and they've been looking into some of those species' relationships, in terms of predator-prey and things like that, I think.

DR. COLLIER: Yes, and you guys had a presentation on the EwE model and on the impacts of high abundance of red snapper. Red snapper eat very few species within the snapper grouper complex.

DR. NESSLAGE: Does anyone disagree that these should be research recommendations, as opposed to something they're going to tackle during an operational? It seems reasonable to me, and I'm seeing nodding heads. Thank you. Then we're at what might be in a research track assessment, versus the operational, correct?

DR. COLLIER: My thought process with indicating that they investigate temporal trends in growth, sex-at-age, female-maturity-at-age, and I felt like that was going to be adding additional blocks into an assessment that's not currently there, and Amy can definitely chime-in on whether or not these would be easy to do in the current assessment framework or they would be extremely challenging to do.

DR. NESSLAGE: If it were during this, it would probably be a major topical working group, right, and so that's the alternative, and is that correct? I'm looking at Amy.

DR. SCHUELLER: I mean, it can be done, putting these things in, and, I mean, it's in there for Atlantic menhaden, but I think it's a big change to go from a constant set of things like this to, all of a sudden, some time-varying thing, and it has impacts on all kinds of things, including benchmarks, which, to me, that's just a whole other level, even maybe beyond a topical working group, and so I think it's fine to go in a research track assessment.

DR. NESSLAGE: Thank you, Amy. Does anyone disagree? I see a few shaking heads. Okay. Good call, Chip. Thank you, and so we're down to the operational assessment list. Again, this is potential factors contributing to continued low recruitment, and hopefully some of the new

research being conducted can inform that, although how does that -- Okay. Then our new catch level projection suggestions, and Chris's suggestions, and then there's the climate change question. Chip.

DR. COLLIER: I will say, under gag, you did kind of have this investigate the potential factors for low recruitment under a topical working group.

DR. NESSLAGE: Yes, and I am seeing that Chris has his hand raised.

DR. DUMAS: I just wanted to say that, for this, for red porgy, that it seems to be one that is negatively correlated with like red snapper, and with the lionfish, and so this could be an example where you've got negative correlation across species, in abundance, or catches, or over time, and, if you also have negative correlation in the deviations of abundance, or species, then analyzing both species together could help you project both species individually, when you've got negative correlation between the time series, or the time series of the deviations.

Here, you've got negative correlation, and what I didn't say about king mackerel was that, between king mackerel and Spanish mackerel, you've got positive correlation, and, as you've got positive correlation, that can also help out, and so that's why looking at the correlations across species might be able to help. I don't know whether that should go in operational assessment or research track, and maybe research track, and I'm unclear which topic should go into which category, but I just wanted to point that out, related to my comments earlier about looking at correlation matrices across species. Thanks.

DR. NESSLAGE: Thank you. Where did we end up putting that with gag? Do you recall?

DR. DUMAS: These last two species just happen to be poster-children for positive correlation and negative correlation.

DR. NESSLAGE: This could be a situation where, if we put it in, we put it in the general recommendations for the operational, correct, for gag. If we ask people to do this really quickly for each assessment, and we start to see a building-up of evidence that this could be a potential approach, then, maybe during the next research track, people can figure out ways to actually use that information, and would that be good?

DR. DUMAS: Just by chance, and perhaps fortuitously, or perhaps the opposite of fortuitously, these two species that we looked at, right after I gave my suggestion, could be two really good species to see whether looking at cross-species correlations would be beneficial, because one seems to be positively correlated, the two mackerels, and the red porgy and red snapper seem to be negatively corelated, and so these two could be good ones to look at, to see if it would be a useful additional type of analysis to perform.

DR. NESSLAGE: I am just asking staff if we put it under mackerel then too, but, Fred Scharf, it sounds like -- I apologize, and you have had your hand up for quite a while. If you're still patiently waiting, please go ahead.

DR. SCHARF: Thanks, Genny. Just a comment about the factors contributing to low recruitment, and it seems -- I am not really sure how, right now, looking at some of things, like egg production

or egg quality, fit in an operational assessment. Given that most of those things, most of those traits, are associated with reproductive dynamics, it would seem like evaluating some of those would be, at least fundamentally, linked to what's up in the research track, since the research track is kind of focused on looking at aspects of reproductive dynamics and how they might contribute to porgy biomass production and how we assess the stock. I'm not really sure if this is the right place for that, but that was just my initial thought.

DR. NESSLAGE: What do folks think? If we move it to research track for this species, do we want to do that for the others as well, I would assume? This isn't actually recommending incorporating this information, but it's just commenting on what might be -- Or providing information on what might be causing these trends, correct, and so it would be informational within the assessment, and we're not suggesting that they do anything to modify the model, et cetera, et cetera, or change the life history parameters, and so maybe it's okay, and that would be research track, perhaps, and what do you think, Fred?

DR. SCHARF: Yes, that's okay, and, I mean, I was kind of just thinking about maybe deferring to the assessment folks about how, you know -- I just wasn't sure, functionally, how that bullet fit under the operational assessment.

DR. NESSLAGE: Wally.

DR. BUBLEY: I mean, I feel it's more -- Like you said, it's informational, but I feel it's more informational for maybe projections afterwards, and so you're talking about all of our discussions of what kind of -- What period of recruitment should be worked with, and, if we see something -- Exploring this, it says, look, this is something that looks like it's structural, and it's potentially going to happen, then we have more evidence to use one or another for projections.

DR. NESSLAGE: In addition to that, some of the regime shift box information, table information, would come from that, and so maybe keep it in operational. Sorry, Chip, and you can paste it back in, unless, Fred, if you feel strongly, but maybe we can modify it to say something like, blah, blah, blah, investigate to inform recruitment projection decisions, just to give people the context for how we would be using it in the operational, and I'm not suggesting they go in a crazy modeling direction.

DR. SCHARF: Yes, and I agree with what Wally was just saying, and I guess I was just -- I didn't know what data was available, and, I mean, is there sort of time series data on egg quality and fertilization rate and size and age at sex transition that would inform, you know, things like recent trends in recruitment and the time period that we would define recent recruitment? I just wasn't sure what kind of data is available to inform those things, and so that's why I was kind of thinking of it more as a research recommendation, because I wasn't sure that data was actually there.

DR. NESSLAGE: Can it be in both? Chip, go ahead.

DR. COLLIER: I'm just wondering if we just get rid of -- After "to inform projections", and, that way, they can investigate whatever topics they think might be most important for the species.

DR. NESSLAGE: Would that work, Fred?

DR. SCHARF: Yes, it works for me, and I don't have a really -- You know, I'm not really stuck in the mud over it, and it just seemed -- Like I said, I didn't know what was available, in terms of that kind of information, on the reproductive dynamics and how it would inform the operational assessment, and that's all.

DR. NESSLAGE: But I think you make a good point that there's probably a need for that research, and so can you paste that down into research recommendations? Whatever is available, they can look at to help inform projections, but then make it still a priority for research that we need more information on this, for this species, and would that be a good compromise?

DR. SCHARF: Yes, I would be fine with that.

DR. NESSLAGE: Excellent. Thanks for bringing that up, Fred. Did you have anything else?

DR. SCHARF: No, and that was it. Thanks.

DR. NESSLAGE: Thank you. Are there others pondering this statement of work or the climate change question? George.

DR. SEDBERRY: I was just going to say, about the climate change question, that the red porgy is one of these winter spawners that is experiencing low recruitment, like gag and some others, and there is some research being done right now on that topic of winter spawners being more affected by climate change than some other species, and I can't remember all the people involved, but it's from North Carolina primarily, I think, and so there is some work going on now that could maybe be incorporated.

DR. NESSLAGE: So would that be incorporated into our understanding of recruitment, and do we need to move it up then?

DR. SEDBERRY: You know, it was the paper that was presented at the Southern Division of AFS a couple of months ago, and it was in terms of recruitment and how those winter spawner -- Recruitment for those winter-spawning species is reduced, and that climate change is one of the key causes, and does this not sound familiar to anybody else?

DR. NESSLAGE: So this is Brendan Runde's work, just to get it on the record there. Wally, did you have something? Sorry. Chip.

DR. COLLIER: In the seminar series, they were also describing the truncation of the distribution of the species, and it was starting to contract more towards the central part, as opposed to other species that are being impacted, which might be shifting northward due to climate change, and this one seems like it's not really moving northward, and it's hunkering down in space.

DR. NESSLAGE: Wally.

DR. BUBLEY: Just to clarify, for Tracey back there, it's not so much that it's shifting towards the center, but that's because what we were seeing were the younger fish, and the recruitment was occurring kind of on the edges, and so, with less recruitment, it appears to be shifting, because we don't have as many younger individuals.

DR. NESSLAGE: Okay, and so how do we want to incorporate the phrase "climate change" into our recommendation, or request, here? I am looking to George. Help me out.

DR. SEDBERRY: I am not sure that I can help you out. I feel like I just told an anecdote rather than gave you any information, but it -- It's not just red porgy, and it's winter spawners, like red porgy, that climate change seems to be -- They have reduced recruitment, and, of all the things that could possibly be causing that, and many things were ruled out, but climate change was not, I think is the finding of that paper.

DR. NESSLAGE: What if we put, at the end of the first bullet, "including, but not limited to, impacts of climate change on winter spawners such as red porgy", and would that address your concern?

DR. SEDBERRY: That sounds good, yes.

DR. NESSLAGE: Anyone else? Anne, go ahead.

MS. LANGE: If you put that there, should it also go down in the research, with all the other factors that weren't listed, or that were removed from the list?

DR. NESSLAGE: Absolutely, and so there's probably, hopefully, more work going on on this topic. Good suggestion. Amy.

DR. SCHUELLER: So is this a topical working group, because it was for gag, and then I started to think to myself, are we going to have a topical working group to talk about recruitment and projections for every single group, or every single statement of work?

DR. NESSLAGE: Wally.

DR. BUBLEY: I mean, gag might be slightly different from red porgy, because it's so estuarine-dependent, and there's a lot of other factors that might go into play with it, whereas red porgy isn't as much, and so I am not sure. I mean, gag might be different from a lot of the other suite of species that we might deal with, and so it might be a special case, maybe.

DR. NESSLAGE: Jeff.

DR. BUCKEL: We can go back and check, but I think there was language talking about looking at what you're development of a new -- Potentially there's a new index of abundance for young-of-the-year and so that might be a recruitment index, and so it would inform something other than projections, potentially.

DR. NESSLAGE: So I hear a recommendation to make this actually a topical working group, and does anyone disagree? Is that what I'm hearing?

DR. SCHUELLER: I think what's being said is this is not a topical working group in this case, but it is one in the case of gag, because there's some potential information that would be coming in that would be different, and I just think -- I'm not sure that's totally clear to me, based on the

language in each of the different statements of work, and so we maybe need to look at comparing those and just make sure it's crystal clear, so that the council and Center understand that there's a different level of work in the two different species, given the available data.

DR. NESSLAGE: Do we need to pull up gag again, Chip, or can you guys massage that?

DR. COLLIER: Well, there is also the issue of who else is going to be involved with it, and so some of the data collection might be different agencies, and so that part of it too could necessitate the need for a topical working group, as opposed to just being done within NMFS, and I feel like some of that estuarine work is going to require some of the state agencies to be involved.

DR. NESSLAGE: I apologize, and I was conversing about the schedule. Are we good with the language? Kathleen.

MS. HOWINGTON: I think, ultimately, if you're debating turning this into a topical working group or not, the question for the SSC is do you guys want this to be completely in-house for NMFS, or do you want to be involved in the discussions? If it boils down to you trust NMFS and you're good, and they can do it in-house, then you don't need a topical working group for this one.

DR. NESSLAGE: We have a post-doc on it, Jeff is saying. It's Kyle's post-doc. Kyle Shertzer and his post-doc will be working on this, correct? I am seeing nodding heads. I trust Kyle. Is he listening? It's on the record now, and it's official. I trust Kyle Shertzer. Fred Scharf, go ahead.

DR. SCHARF: I would agree with that sentiment, right, and so I think we have a super-high level of trust in our NMFS lab there in Beaufort, and I agree that I don't think that we need a topical working group for red porgy, and I just wanted to make a broader comment about the topical working group for gag, and it comes back to Wilson's comments before on the historical catches of species like gag, but other species that also larval recruitment that come into the estuaries, and so I think that's there's great potential for that working group on gag to inform more than just gag, and potentially to inform recruitment processes for some of the other species that have that aspect in their life history, have an estuarine component, and so I think it's a good working group.

DR. NESSLAGE: Great. Thank you. Folks seem comfortable, at the moment, with porgy, and let's take a quick peek at the gag, one more time, to make sure we're comfortable, now that we've solidified our ideas on the importance of that being a topical working group, just so it's clear. Take a look at that. Amy is giving me a thumbs-up. Jeff.

DR. BUCKEL: Just to be consistent, this says that gag recruitment has been low, possibly due to overharvest or external environmental factors, and that may be what we want to -- That phrasing, we may want to include that in red porgy, instead of just being specific on climate change.

DR. NESSLAGE: Do we need to add overfishing, overharvest, and external environmental factors? It's likely a combination of both. Thank you, Chip, and so we're good with gag, and we're good with red porgy. Any last thoughts on red porgy statement of work? Chip.

DR. COLLIER: Not on red porgy. I apologize, but if we could go back to gag for a second The one question that would remain is do you suggest these be in-person workshops, or can they be

done via webinar? That can have some impacts, but it sounds like these are likely best handled through a webinar.

DR. NESSLAGE: Does anyone feel strongly for an in-person? This is the time to request one. It's easier to request one now, and you don't get one if you don't request it. It will be webinar, if not. Fred Scharf has his hand up. Go ahead.

DR. SCHARF: Sorry. I just never put it down.

DR. NESSLAGE: The vestigial hand. I don't see any overwhelming support for an in-person working group, and so I think we'll just default to webinar, unless the Center requests it. All right. Are we good with --

DR. COLLIER: Yes, we're good, and thank you, guys, for working through this process, and hopefully, in the future, it's going to be a little bit smoother. If you have any recommendations on how to improve it -- I think one thing that we heard, loud and clear, was the research recommendations, and we need to kind of figure out where to put those, to make sure that they're not considered in the information for the new assessment, but, other than that, it's going to come to you guys in a similar format.

CONSENSUS STATEMENT AND RECOMMENDATIONS REVIEW

DR. NESSLAGE: Thank you very much, Chip, Kathleen, Judd, everyone involved. It's greatly appreciated, and we look forward to these assessments. All right. I am looking at the clock, and getting a little worried, and so I would very much like to jump to consensus statement recommendations, a review of those, and then, as time allows, we'll go to fishery management plan updates, other business, and, of course, we'll have public comment and elections. We're not leaving without that, and so, if you all can muster the energy to review our consensus statements, I would greatly appreciate it.

I took the opportunity, last night, to flesh-out the report, the way I normally would before it goes out to the SSC, because I didn't want to dump a bunch of notes in Jeff's lap, and, also, I wanted to make sure we were clear on a number of these really important topics, and I want to make sure that you all -- If I interpreted your comments properly, and so I would like to go through the consensus statements at this time. Give us a second to get those loaded up.

Okay, and so we're going to start with our first big agenda item, catch level projections working group. I am just going to read them, if that's okay with folks, because this is the first time that any of you are seeing these written the way they are.

The SSC adopted the workgroup recommendations outlined in the report as best practices, with the following modifications and added emphasis, and I have grouped it into recommendations for short-term, long-term, et cetera, the way they were organized in the report, and so, for the short-term forecast used to set ABCs -- Again, we're providing support for a maximum of five years, noting that availability of data may hinder the generation of shorter time series. That was a discussion we had.

Short-term forecasts should use recent mean recruitment when setting short-term ABCs, and then I'm asking folks to look down below, to the long-term rebuilding projections section, for our comments there. Then we also noted that, in some circumstances, short-term ABCs may be set using a different recruitment assumption than long-term rebuilding scenario projections, and we emphasized the need for extreme clarity in our reports when describing the justification for such an ABC recommendation, and our report should include an explicit description of the data limitations, relevant model assumptions, and potential implications for management of using different recruitment timeframes in setting short-term ABCs versus long-term rebuilding projections.

That was my interpretation of our very lengthy discussion on this, but -- I don't want to wordsmith too much, because you'll have a chance to do that when you review the document, but, if this is not characterizing the discussion, we need to hash it out now. Alexei.

DR. SHAROV: It looks okay to me, but I just wanted to ask if we want to define what the recent recruitment is, or do we just assume that, on a case-by-case basis, the analysts will decide what is the range for recent recruitment, because, in some cases, it could be three years, and, in some, maybe ten years.

DR. NESSLAGE: The working group report recommended that the analysts would do the analyses, which we put in the statements of work now, and make that recommendation, with a maximum of five years, unless there is indication from other analyses that it could be longer than that. Anne, did you have your hand up? Alexei, does that answer your question?

DR. SHAROV: No, and the five years is the time for a projection, right?

DR. NESSLAGE: Right, and that's the framework under which you would make those recruitment -- Oh, you mean --

DR. SHAROV: I mean what period in the past you define as recent recruitment, and is it the previous two years, or is it the previous ten years, or is it the pattern that you're looking at that is recent recruitment that is indicative of the productivity stage?

DR. NESSLAGE: Again, in the report, we leave it up to the analyst, and, by default, if it's not in our recommendations here, we're accepting what's in the report, and so, if you want to open the floor for modifications, and we don't think that that's a good idea, this is the time, agreed. Otherwise, I don't want to rehash the entire report in our report, and so the default is let the analysts decide. Does anyone disagree with that approach? Sorry for my confusion.

I am not seeing any consternation, and so let's go to long-term forecast recommendations for determining rebuilding and benchmarks. The SSC approved adoption, again, of the working group's recommendation to use essentially a four-tiered approach to making recruitment assumptions and long-term forecasts for benchmarks and -- We can massage that, and that's repetitive, and so Type A, again, is forecasts using average recruitment and historic variability, and Type B is, and I am just laying it all out again, just to be very clear, forecasts using stock-recruitment relationship and historic variability, and Type B2 is forecasts using time series properties or environmental corelates, and then Type -- I don't have it memorized. Type C is forecasts using the stock-recruitment mode with time series or environmental correlates that affect

longer-term processes. Any consternation? Basically, we're saying we like what the working group said, but I was being a little bit repetitive there. Sorry. Just to be clear.

I am not seeing any consternation, and so we'll go on. The SSC approved -- This is with regard to the products generated by stock assessments that should be included in all reports to support ABC setting, and we're basically saying we'll adopt what's in the working group report, with the following modifications.

A request for recruitment-projection-related analyses in support of ABC setting should be incorporated as recommendations in all future statements of work, and we've already done that today, and so we're already implementing that. The SSC emphasized the importance of conducting post-hoc analysis of previous projection performance and recommend this be prioritized in all future statements of work.

The SSC expressed support for continued data preparation and simulation analysis work to develop an interim analysis approach to set ABCs. Such simulation analyses could inform decisions regarding the appropriate timeframe for projections used to set ABCs. The SSC noted that it may deviate from the working group's recommendations if evidence from interim analysis suggests alternative recruitment assumptions are more appropriate for projections.

Then, on PDF page 16, we wanted to clean up the language a little bit there and added the specific guidance to use autocorrelation and partial autocorrelation analysis to inform the choice of timeframe used in short-term recruitment projections within the maximum timeframe of five years, and so that's the issue of are we going to use three, four, or five.

Then the SSC noted that the report focuses on methods of characterizing recruitment uncertainty used in the Beaufort Assessment Model, and we expanded upon the working group's recommendations to include other modeling frameworks. All stock assessments should characterize recruitment uncertainty, regardless of the modeling framework and the strengths and limitations of each modeling approach should be considered when setting ABCs. The SSC should be explicit in describing to the council how the resulting ABCs are influenced by choice of modeling framework, be it BAM, Stock Synthesis, et cetera.

That was my attempt to characterize that, and I want to stop for two seconds there. This one was one that I want to make sure that I got the gist of the discussion. I am seeing some nodding heads. Okay. Then I won't belabor it.

Future research recommendations section, the SSC recommended the last bullet on the bottom of page 16, to clarify the wording, basically, and that was explicitly what we wrote, and so we'll go to the next one. The SSC requested a briefing, at a future meeting, on the final results of research being conducted by the Beaufort Lab comparing recruitment patterns among South Atlantic stocks and exploring potential environmental influences.

Now, folks who were assigned to this topic, did I miss anything? Check your notes, because, once -- For those who are new to the group, basically, we will wordsmith offline, but we will not change the major content, and so, if you disagree, or we're missing something -- It's unlikely that we'll add something, unless -- We'll have to have a major email discussion, and that's highly

discouraged. We like to do it all in front of the public. I will give people a second to look at their notes. Cool. Okay. I'm not seeing anything, and so we'll just keep rolling.

That was it for catch recommendations, and now we're on to goliath. This is where I tried to pull -- I wasn't sure how to handle this, and so I tried to pull up all of the big, overarching what do you do when you've got an ABC at zero comments, and then put a list of goliath-specific recommendations below it, and so that's the order this is going to go in, but, if you don't like it, we can change it.

The SSC expressed concern that traditional stock assessment approaches are unlikely to produce management advice for goliath grouper and that our ABC Control Rule, both current and potential future versions, do not accommodate stocks with no recent catch time series. This creates a roadblock in the typical stock status determination and catch level determination process, and so we're acknowledging that there's a big problem here.

The SSC recommends establishing a process for data collection, analysis, and assessment for setting catch levels for stocks with ABC equal to zero. This process would impact not only goliath grouper, but also other council-managed species, such as speckled hind and warsaw grouper. That's just characterizing what our big, overarching -- This is a bigger problem than just goliath.

The SSC recommends the unassessed stocks working group be tasked with brainstorming new and perhaps nontraditional approaches to assessing goliath and other species with recent ABC equal to zero, including explore options for assessing stock dynamics using historical catch and indices that span pre and post-fishery closure, and this was Alexei's idea.

This may allow historical landings data to inform estimation of the magnitude of the stock, the abundance, or biomass, and how it has changed or over time, assuming the index, or indices, used are proportional to abundance across the time considered. This approach will require a relatively simple, but custom-built, modeling approach, and I think must be developed, and we need to change the wording there, but you get the idea. Does that capture -- I am looking to Alexei in particular, and does that capture your thoughts? Others? I am seeing thumbs-up. Other approaches that incorporate reliable indices that span pre and post-fishery closure, and, if the group comes up with anything, we're all ears. Okay. I will keep rolling.

Those were the overarching ones, and now I'm diving into specific to goliath grouper, and so consider any new data streams and updated indices, and this is what we were tasked with doing. The SSC recommends a summary of progress made on research recs from the last assessment be generated to help characterize the utility of new and updated data for assessment and catch level determination purposes, and this was we would like a summary of that.

The SSC suggests exploring the utility of both new and old data sources, or sources of information, including, but not limited to, identification of additional spawning aggregation locations, which could be indicative of a growing population. I had a -- There was a note in there about telemetry research, but I wasn't -- I do not recall what we were referring to, and so I'm looking to you all to fill in the gap there. Kai.

DR. LORENZEN: I don't think it was my point, but I recall that this was to do with the link between the inshore sort of juveniles and offshore.

DR. NESSLAGE: Right, and there is a bullet below about connectivity, and so maybe we can merge those. George.

DR. SEDBERRY: Luiz was on the webinar and mentioned locating spawning aggregations through telemetry.

DR. NESSLAGE: So maybe -- Can we add that to the bullet above as well, and let's make sure, when we get below -- I know there's a comment about connectivity, and remind me, and we can add that, too. Perfect. Thank you, Judd. Then, continuing on with other goliath, any information on the connectivity, and here is it, connectivity between juvenile inshore and adult offshore stocks. Alexei.

DR. SHAROV: I am not sure -- Well, that was my question, and, if it's ongoing research, and that is, if it's taking place, then it's not potential. It's ongoing.

DR. NESSLAGE: Good catch. Thank you. Okay, and so then we had it grouped into nearshore Florida waters versus offshore. In nearshore, folks identified the REEF citizen science program with divers, the Everglades National Park juvenile index, the great goliath grouper count, the RVC out of the University of Miami, and then, offshore, we had listed SERFS and revised, updated MRIP data, taking a closer look at that. Is there anything we missed? I am looking to our note takers. George.

DR. SEDBERRY: There was talk about getting genetic samples from discards, and was that -- I think that was part of using it to estimate population size, as well as population structure.

DR. NESSLAGE: Was that -- That would be nice if it was everywhere, right, and not just near versus offshore.

DR. SEDBERRY: Yes.

DR. NESSLAGE: So I wonder if we can add it to the -- Yes, right above the near versus offshore split, and so after the any information one. Thank you, George. Is that getting at it, George, as you recall?

DR. SEDBERRY: Yes, I think that's it, and a close-kin analysis, and is that what it's called?

DR. NESSLAGE: I think we have close-kin down under analysis methods, but please be my brain and remember when we get down there. If it's not there, let's make sure it gets in there. Excellent. Thanks. Wilson.

DR. LANEY: Maybe just to clarify a little bit, and Dustin shared with us the requirement for that limited harvest is for taking tissue from those animals. At one point in time, they had requested that the carcasses be retained, but I think that got dropped as it went through the process, because it was deemed to be somewhat overly complicated for trying to get the anglers to do that, but this specific reference that George is making was to see if we couldn't get tissue from fish that were just being captured and released, and so that -- I don't know how that would work into the Florida plan, Dustin, and would that revision have to be added into that, or --

MR. ADDIS: This close-kin analysis is including directed sampling by FWRI, and it's been expanded to include fishing guides and charter captains, but that's the extent of what I know about it, but that's what Luiz told me yesterday.

DR. NESSLAGE: If we leave this open, it could be from any source, if it's this program, the limited harvest, charter boats captains, whatever. Excellent. Anything else in this section? I am not seeing any hands. Let's scroll down then, and then we also said that we expressed support for the collection of biological and catch location data associated with the fish harvested through the FWC's new limited recreational harvest program.

However, the SSC cautioned that data collected in state waters may not be reflective of the size distribution of the offshore population in federal waters and may be of limited utility in informing the ABC, and so there was some discussion that people need to kind of temper their expectations. We're excited that they're collecting data as part of this program, but it may be of limited use in setting the ABC, and does everyone agree with that? That's a pretty strong statement. I am seeing some nodding heads, and so I'm going to go with folks are okay with that.

The SSC recommends exploring the use of inverse sampling methods to generate an index of abundance, and this is where I wasn't sure. I thought, Chris, you were saying from MRIP or other angler survey data, and is that correct, or other data, any data?

DR. DUMAS: Or other.

DR. NESSLAGE: Any data source, and so you can just clip that off, if you would. I wasn't sure. Excellent. Thank you. We also talked a little bit about how the council may wish to consider development of a carefully-planned and scientifically-designed experimental fishery with strict reporting requirements to gather more data, which was a research recommendation from the last SEDAR for this species. Alternatively, the council may also wish to consider development of a non-retention fishery, given the MSA contains provisions for catch-and-release-only fisheries. However, an ABC would still need to be set and generated from existing data, prior to the implementation of such a fishery, and then see recommendations below. Do folks feel that captures that section of our discussion adequately? Wally.

DR. BUBLEY: The only addition I would have is we would need to generate the ABC due to release mortality, and like do we need to spell out why the ABC would need to be generated for that?

DR. NESSLAGE: Oh, for either of them, and so be more specific, and, so, however, any ABC will still need to be generated, in either case, from existing data, either directed or --

DR. BUBLEY: I think the non-retention fishery would be a little unclear as to potentially why an ABC would have to be generated.

DR. NESSLAGE: Okay, and so then would still need to be generated from existing -- Need to be generated for either directed harvest or dead discards, right, because we've got two different types of fisheries that we're talking about here. Is that clear as mud, or does the wording need to be --

For retention or non-retention fishery. Thank you, Jeff. Wally, does that get at it, or do you still think we need to use the word "discards" in there somewhere?

DR. BUBLEY: I mean, I just wanted to want make sure it was clear, because people might be questioning -- Because people, I think here, questioned why we would need an ABC for a non-retention fishery, but that was because due to some sort of potential discard mortality.

DR. BUCKEL: How a parenthetical statement, after "non-retention", that discards, e.g., --

DR. NESSLAGE: We can make this flow a little better in the office, but making sure that's in there is important. Thank you. Other thoughts on this section? Okay. We were asked to determine what analysis is needed to reconsider an ABC, currently set at zero, and we had a couple of thoughts. One is, to reconsider catch levels for a stock with a current ABC of zero, the SSC would require information about both the magnitude of the population, and so we're talking abundance or biomass, and an estimate of or a proxy for MSY. A population size estimate alone will not provide the information the SSC needs to estimate a proxy for MSY, just to be clear on that discussion, and maybe that doesn't quite capture it, and so I will open the floor.

I just think we were trying to emphasize the fact that just getting a population size alone might not be everything that we need, and so, even if the genetic analysis, close-kin or whatever, were able to produce that, we would probably need a little bit more information than that, or to make some very strong assumptions. I am not seeing anyone with heartburn, and so I will keep going.

The SSC suggested exploration of new and more advanced approaches to estimation of population size, e.g., close-kin mark-recapture, tagging, et cetera, that have been developed since the last assessment as well, and so this was the idea that the SEDAR was a long time ago, and there is new methods that folks might want to consider applying to goliath. The SSC also suggested exploration of inverse sampling methods to estimate abundance using bycatch/cooccurrence data from the existing fishery. Judd.

DR. CURTIS: Just briefly, do you want to include the acoustic telemetry in this previous bullet point, as well as the tagging?

DR. NESSLAGE: I don't see why not. Does anyone disagree? Good catch. Thank you. Okay, and we'll keep going. Outline an approach for review of these data, and we talked about how new or updated data sources and recommended assessment strategies from the working group and the SSC to explore should be reviewed by the SSC and considered for inclusion in future assessment statements of work, and so I thought what we decided was that just doing these analyses alone would not be sufficient for us to change the ABC, and we would want this to go through an assessment at that point. If I mischaracterized our discussion though, this is the time. What do folks think? I am seeing some thumbs-up. Folks are okay with it? Nodding heads. Excellent. Okay. We'll keep rolling then. Anything else on goliath that we missed? Anne.

MS. LANGE: I am not sure if it needs to be included or not, but, when we were talking about the things besides just the population estimate needing MSY, Shep had indicated that, because it's a managed stock, we also need MSST and MFMT, the other parameters, and that those would have to be updated if we were changing the ABC, and is that right, Shep? I just wanted to be sure that the council is aware that it's not just -- If that's the case.

MR. GRIMES: I wouldn't say necessarily changing the ABC, but, you know, it's a managed species, and we required to have those things on the books now, and we have them, and, if we are going to make changes to it, we would need to revisit all of those, and any change to the ABC would need to be in the context of those, but, if it's zero, I don't know how important it is to revisit whether you have the appropriate MSY and overfished and overfishing definitions. It's probably not that important if zero catch is allowed.

DR. NESSLAGE: I think we're talking about if we were to move away from a zero catch.

MR. GRIMES: Yes, and justifying any level of catch would then need to be built upon those how is it going to prevent overfishing, is the stock not overfished, and then you would set a catch limit.

DR. NESSLAGE: So we need to add stock status metrics, or what do we call those, just so we don't have to list them all. Benchmarks. There we go. Up above, under that we're going to need more than just a population estimate, "and an estimate of, or a proxy for, MSY and associated benchmarks". All right. Anne says yes. Does anyone disagree? So "associated benchmarks for stock status determination" is what we're adding. Good catch. Thank you. Anything else that we missed from our illustrious note takers? Jeff.

DR. BUCKEL: We had some conversation about, if it was a really low ABC, that we may be able to justify that, and I don't think that was captured anywhere here, and maybe we all agreed that that wasn't a good idea, but, if we had a population size estimate, and it was one-million, and we said, well, we're okay with 200 fish, because it's so low compared to the population size, and so I seem to remember that discussion, but maybe others can try to help out.

DR. NESSLAGE: Anne and then John.

MS. LANGE: I was just wondering -- I didn't, but we got a copy from I think Julie of Florida's rationale for the 200 fish, and I didn't look at it, but I don't know if there's anything in there that might be useful for wording in that area. Jeff was just saying that, if we have a small enough number, and the question was is 200 fish, or 100 fish, a small enough number, based on what Florida did, and is there anything in the Florida discussion that would get to that, but John may have something.

DR. NESSLAGE: My recollection was that there wasn't a lot of biological justification for that number, and so we kind of let that be, but let's see what John has to say.

MR. CARMICHAEL: If you scroll up a little bit, I had a question about the -- Yes, to reconsider catch levels for a stock with a current ABC of zero, and then requiring all that information, and so consider other species that are data-limited that have ABCs that are not zero, where you don't have information about necessarily the magnitude of population and stock status determination, et cetera, and you have a lot of stocks where they're not assessed, and they are data limited, and you determined, or previous iterations of this group determined, OFL is unknown, and the council has proxies for FMSY that have been established and are in place.

I mean, goliath has one, and I think it's 40 percent, going back to like the original SFA Amendment, and the issue is the values associated with that can't be estimated, in terms of like

fish poundage, but, you know, you do have a way that you've set ABCs that aren't zero for stocks where you don't necessarily have all that information, and so it seems like this may be setting a higher bar for these three stocks.

Like Anne was saying, you have catch in that case, and that's true, and you have catch, but, you know, there's nothing about this, right, and this says catch levels for a stock with a current ABC of zero, and I think the reality is, if the ABC is -- If you don't have catch, you're going to need some type of information on which to establish an ABC, and I don't know what that is, and I think a group of people have a fair amount of work ahead of them to figure out what that means, and I think that's fine, and I think it probably means going back in goliath and looking at the previous assessments, and why did they not work out, and where might we overcome the deficiencies, because there was a catch-only assessment attempted, and it wasn't able to provide reliable estimates, and so what avenues are open to try and resolve those issues? To me, that seems like really the interesting question.

DR. NESSLAGE: I think we agree, and we would love to get working on that, I think, the working group, and so we'll look to the council for direction on that. I think maybe we need to, based on your comments, that we need to clarify, and so something along the lines of "given the lack of catch information in recent years, in order to reconsider" -- John.

MR. CARMICHAEL: Maybe you could just say "and no catch", or "no recent catch history" for that, after "ABC equals zero". You would be saying the stocks with an ABC of zero and no catch information, because that's what we've used, and the agency has said that was fine, to base it on catch when you had nothing else, and so I think that addresses, or sort of clarifies, where this is going.

DR. NESSLAGE: Anne, I would also like, based on your comments, to emphasize the proxy portion there, and it would be great if we have an estimate of MSY, but, in the absence of that, maybe put, in parentheses, "or, more likely, a proxy for MSY", just to give people the context of we anticipate that's where we'll have to go, at least initially, until we get this back on track. Thank you, John. Okay. Anything else that I forgot or failed to include in the goliath section? These are all good catches. All right. I am not seeing any, and so we'll move on to our next section. Thank you for that.

Interim analysis was postponed, and so we don't need to worry about that. The Great Red Snapper Count, here, it was pretty brief, under general comments and providing feedback. Data and information from the study can be used to inform future EwE and habitat models. The SSC requested an update on program progress at our next spring meeting and to be alerted to any major potential obstacles that are encountered in the interim, if possible. Does that capture what we said? I am seeing nodding heads. Okay.

Then, under how to integrate this into the overall red snapper stock assessment process, we noted that it may be difficult to reconcile differences between the two different methods of producing abundance estimates, if they're statistically different, and so that might be an obstacle, and then the Southeast Center should outline a proposal and analytical strategy for the integration of the external abundance estimate in advance of the research track assessment, anticipating that folks will want to make this -- Use this sooner than that research track will complete.

Then the SSC recommends formation of a sub-group of key members from the project team, the Center, council and/or staff, and SSC, just a small group, to determine how interim analyses might be used to inform ABC setting prior to completion of the research track assessment, and we should add "and subsequent operational assessment, if requested". Does that capture our discussion and recommendations adequately?

DR. LORENZEN: Yes, I think it does, and I think I like this a lot, and I was thinking, as we were going through the SOWs this morning, I was thinking we have very detailed plans for assessments that are already quite well set, and this will happen on the same, or a faster, timeframe, and, right now, I think it's important to get that down. Thanks.

DR. NESSLAGE: Alexei.

DR. SHAROV: I think "if requested" is a rhetorical question, and I don't know if we really want that.

DR. NESSLAGE: Well, if the estimate is lower than the assessment, I am guessing that there won't be a lot of interest in speeding it up, and so that's why I put it in, but we can drop it, and I am in jest. We trust Kyle. Anything else on this agenda item?

Then release mortality reduction framework, I think our last big issue here, and I grouped this into overall comments, versus other recommendations, and so, here, and this was a little tricky, and so I would really appreciate your feedback on this, and so I started with the SSC applauds the council for pursuing regulatory action to reduce discard mortality for the snapper grouper fishery. I think we all agree that there was a lot of thumbs-up, and even claps, around the table here.

The SSC emphasized that F rebuild is much lower than F current, and, thus, dramatic reductions in overall fishery effort to reduce discards will be required. Small changes that allow only a slight reduction in effort or discard mortality rates will not be sufficient to address the challenges facing this fishery and red snapper rebuilding success. I am seeing more nods. That's good.

To reconsider catch levels, a robust analysis of how efficient each proposed regulation would be needs to be conducted within the short timeframe of this amendment. Substantial data, analyses, and review would be required in a very short timeframe for meaningful changes in the red snapper ABC to occur. Given the short amendment timeframe -- That's a little repetitive, and we can get rid of some of that wording. Sorry.

Given limited data availability, it would be incredibly difficult to thoroughly quantify the potential impact of any of these management measures. A higher degree of uncertainty surrounding the potential impact of these management strategies and how they affect discard reductions may need to be accepted by the SSC to make initial progress, and so we're noting that this is going to be a huge lift, and sorry Mike and whoever else is involved, but, if it does land on our desk in the timeframe suggested, that we recognize there is a lot of uncertainty here, and we're willing to accept some of that, if we can make big changes. I am seeing nods. Okay.

In the short-term, for this regulatory amendment, the SSC recommends pursuing temporal reductions over spatial or gear reductions, because they will likely be easier to quantify in the short timeframe than the spatial reductions. Seasonality differences among regions within the South

Atlantic should be considered when developing these regulations, if possible. "Seasonal differences" sounds more like better English. Thank you. More better.

Spatial reductions may be less effective in the South Atlantic, as compared to the west coast, for example, where barotrauma complications account for the majority of discard mortality. Smaller proportion of red snapper caught suffer from barotrauma, and that needs to be fleshed out. Sorry. Also, spatial closures would need to identify if different species have different ecological niches and take into account the community composition and cooccurrence of species. Does that capture our overall thoughts there? Wilson.

DR. LANEY: Thank you, Madam Chair. Going back to the previous one, and Scott is not here, but remember, when we were talking about temporal reductions, he had suggested that we might want to consider wave-based reductions, and maybe we could put that in parentheses after the word "reductions", and say "possibly wave-based", or something like that.

DR. NESSLAGE: That's true. We did discuss that. Does anyone disagree with adding that? It seems like it captures our discussion. I am seeing nods and thumbs-up. Good. Thank you, Wilson. All right. Moving on, we're justifying this decision now, and so spatial reductions may be less effective than -- I already read this one. Sorry about that.

This is with the gear restrictions, commenting on that, and effectiveness of gear restrictions, or changes, to reduce discard mortality will be difficult to quantify within the short timeframe of this amendment and should be considered in the suite of longer-term solutions. What do folks think of that? I am not seeing any objections. Okay. Similarly, recreational --Wow. That is not a complete sentence. The option to develop a federal recreational permit, I believe is what that meant to say, to quantify effort and number of anglers would be useful, but will require a much longer timeframe for implementation. I think that captures that discussion we had, and I'm looking to Wally. He's nodding. Jeff would like to comment.

DR. BUCKEL: So Wilson is correct, and Scott mentioned looking at the waves, and so I looked on the MRIP page, to see, well, maybe there is a wave or two that stands out, that you could get a good bang for your buck, and, when I was looking at that, I saw that January and February, in many years, had high -- This is MRIP B2s, high live releases, and I was curious where that was, and so then I looked at the live releases by state in the South Atlantic, and I was really surprised to find out -- I knew that it was higher in Florida, but I didn't realize that it was multiple orders of magnitude higher, and so I plotted those data and sent those to Judd, and I think he's going to put those up on the screen.

This whole business about focusing on the temporal and not the spatial -- We may want to think about the spatial, because it seems to be mainly an east coast of Florida issue, and that spatial would be a way to deal with this, or temporal maybe within Florida, but it may not be -- These temporal closures may not be required in Georgia, North Carolina, and South Carolina, if we believe the MRIP B2 estimates.

DR. NESSLAGE: Kai.

DR. LORENZEN: I think that's correct. I was thinking about spatial more in terms of depth and things like spatial management, but, here, the point is that the fishery is really -- You know, it

occurs mostly off of Florida, and so, obviously, the other areas are not so significant, when it comes to regulations and addressing this issue.

DR. NESSLAGE: Would we like then to add some language to that effect, Jeff?

DR. BUCKEL: Yes, and I think, within one of the bullets, or maybe a new bullet, in that section that we were just reading through. Instead of saying the temporal over spatial -- Pursuing temporal reductions in Florida, I guess, and maybe that would be --

DR. NESSLAGE: Primarily on the east -- Well, we don't have any jurisdiction in the Gulf, and so primarily in Florida. Anne.

MS. LANGE: Well, the catch rates are so low in the other states, and does it matter? I mean, is it going to be more difficult to get closures in one area, rather than coastwide, and, if so, is the impact that great in the other states, when there is not that much caught anyway, and I don't know. Wally knows more.

DR. NESSLAGE: Wally.

DR. BUBLEY: Not so much know more, but just remember this isn't for a closure of red snapper, and this is a closure of the fishery, because they're discards, and so it's not so much how many red snapper are being discarded, but you're talking about potentially closing these fisheries for other species, and so that's where it would be coming from.

DR. BUCKEL: Yes, and, I mean, right here, we're thinking about red snapper discards, but there was language in this item that was thinking about the snapper grouper fishery overall, discards in the snapper grouper fishery overall, and so, yes, that is something to -- Go ahead.

DR. NESSLAGE: Wally.

DR. BUBLEY: I just have some recommendations, potentially, for wording, and, here, we have, in the short-term, the SSC recommends pursuing temporal and/or spatial reductions, and so we have that there, where it's included, but then, the next bullet point, we talk about spatial reductions for depth, and for depth may be less effective in the South Atlantic, and so that covers both of those, I think. Then, Judd, maybe, at the end of that paragraph, just that the bulk of red snapper live releases in the recreational fishery are off the east coast of Florida. The bulk of recreational discards for red snapper are occurring off the east coast of Florida, and, thus, the spatial closures would be most effective there.

DR. NESSLAGE: Brilliant. I love that wording. Amy.

DR. SCHUELLER: Was that just for -- Did you only look at the first wave, or did you look at all year, and I guess I'm --

DR. BUCKEL: To clarify, when I looked at by state, I looked at annual and not by wave.

DR. NESSLAGE: Maybe we can massage it to say, "may be most effective", just in case there's some part of the analysis that comes out different, and we may be proved wrong, but we're guessing this is going to be the best, most effective approach.

DR. BUCKEL: I did that quickly, and so you can make mistakes in those query tools, and so I appreciate council staff, or whoever would be appropriate, to double-check that. Thank you.

DR. NESSLAGE: Thank you for looking, Jeff. This is a big catch. How do folks feel? Are folks comfortable with the wording, at least the general sentiment? Anne.

MS. LANGE: I am, but, based on Jeff's suggestion right then, would it be worth having staff double-check his analysis before we finalize this, and put a note in here that a parenetical check before finalizing, or something to that effect?

DR. NESSLAGE: Is that possible? I am looking to Mike or Judd, to just do a quick double-check query. Can you just put it in the comments, and that will remind Jeff, and all of us, when we look at the document, to make sure we don't sign-off on it until we've made sure we know what we're talking about, because these are bold statements. Wally.

DR. BUBLEY: I mean, knowing what I know, where we see the red snapper, it does not surprise me in the least, and so it may be slightly off, but I would be willing to bet those numbers are pretty close to each other, but, yes, I would say put in something to double-check before we finalize it, but I would be surprised if they changed that much.

DR. NESSLAGE: Thank you, and thank you, council staff, for checking on us. Good suggestions. All right. Jie.

DR. CAO: I just want to make a suggestion to add something for the bullet point, the spatial reduction bullet, and I recall that we have discussed the behavior change, and so my suggestion will be, for the last sentence, to take into account the community composition cooccurrence of species in fleet dynamics.

DR. NESSLAGE: Okay. Anne.

MS. LANGE: Based on part of what Kai just said and the behavior, the issue with the fleet dynamics is related to whether they will shift if there's a closure, right, and so it's just not the fleet dynamics, but it's how their behavior might change. I mean, just to make it clear what it is we're saying by fleet dynamics.

DR. NESSLAGE: I think there's a point below to that, under uncertainties, isn't there? Yes, and, if you keep going, the angler behavioral response, and is that what you're talking about? Okay, but that doesn't adequately characterize it though, and let's fix the wording, or add whatever needs to be added. Are we good with this? Perfect. Okay. I think that was -- We haven't read through those yet? No wonder you didn't know it was coming. All right. Let me read it through it. So now we're under the uncertainties section. My apologies. I am familiar with this, but you aren't.

Angler or fisher behavioral response to new regulations is highly uncertain and may result in unintended consequences that are counterproductive, that may be counterproductive, something

like that. The SSC recommends literature from other regions be examined to potentially inform how changes in management might result in changes in fisher behavior. We've got a thumbs-up from Amy. Anne? She's nodding, and so that adequately addresses her concern.

Compensatory effects of reducing discards may result in higher encounter rates and higher catch rates. I think that was Alexei's point, if I call. To significant reduce discard mortality, reducing encounters and effort is paramount. Long-term management strategies need to focus on these reductions in order to enable greater harvest to occur, and so that's directly addressing the council's question about that.

Then I wasn't sure if we were talking about commercial and for-hire or just commercial in this last bullet point, but I think this was Erik's point, just to raise the issue that discard information is highly unreliable for the snapper grouper complex, for a number of reasons, and the majority of discard information is self-reported, and logbooks are sampled at 15 percent, and there have been increased reports of zero discards, upwards of 60 to 70 percent in recent years. Anne.

MS. LANGE: The last line, it says, "increased from 60 to 70 percent", and I thought it was from 30 percent to 60 to 70 percent.

DR. NESSLAGE: You're correct. Let's fix it.

MS. LANGE: I think, overall, it was both commercial and for-hire that self-report, and is that right, Erik? Is it both commercial and for-hire self-report?

DR. NESSLAGE: Okay, and so that's why I highlighted it, and I couldn't remember. Thank you. Are there other corrections or changes? Amy.

DR. SCHUELLER: The bullet that says, "to significantly reduce discard mortality, reducing encounters and effort is paramount", and I don't feel like this should go in the uncertainties, and I think this should be the second bullet under we applaud the council for working on this. Then the second bullet should be we need to reduce effort, and that's my opinion. Just put it way up there, and it's the second thing they see, because clearly we spent time talking about that, and that's really the main point, and I was one of the note takers, and so I have, in capital letters, "need reliable discard estimates" and "need to reduce effort". Those were the two biggest ones.

DR. NESSLAGE: Do we need to move it into or combine it with now the third bullet, because that's kind of the same thing, and can we -- Is it redundant, or does it matter? It's a pretty big point, and we can say it twice. I don't care. John says it's good. Okay. We'll keep going then. Thank you. Good catch, Amy. Anything else on that section? All right. Then, under the section of would reducing the number of red snapper discarded result in increased harvest, we basically, I thought, said -- Alexei, do you want to -- Go ahead.

DR. SHAROV: Just purely procedurally, I mean, this information on the increase in the zero discard percentage reported, that's just verbal information that we received, and is there any --

DR. NESSLAGE: At our last meeting, we received a big report on that, and we commented on it in our last report, and so --

DR. SHAROV: All right, and, secondly, did we ever discuss what led to this, and not that I am opening up discussion, but, I mean, is the increase to 60 to 70 percent indeed an indication of poor reporting, or quality of reporting, versus the potential changes in the fishing method that results in reduced discards? Again, I am not -- I mean, if there is -- If somebody can please confirm that, yes, it's just the uncertainty, or the misreporting, the underreporting, that's the cause, and then we have a reason to state that.

DR. NESSLAGE: I think there hasn't been validation of these in recent years, and correct me, Erik, if I'm wrong, and so maybe what we can do is say that we are concerned that commercial discard information is unvalidated and may be highly unreliable. What do you think? Would that address -- John, go ahead.

MR. CARMICHAEL: Just a reminder, because it comes up a lot, and the commercial has been getting beat up a lot, and the MRIP private recreational discard data is self-reported, 100 percent, and it's also unvalidated, and so I think it's very careful to sort of pile onto the commercial program, that does have some observers, and does have a logbook, and then act like, well, MRIP is great, because, in other venues, we pile on MRIP and how bad it is, and so MRIP is self-reported. Almost all of our discard information is unvalidated and self-reported, and so it's not just a commercial problem.

DR. NESSLAGE: That is a good point, and we can massage the wording, although I will say it seems like there's a lot of anecdotal evidence that people are throwing away -- Anglers are throwing a lot of red snapper, and that seems to be the major concern, as opposed to the commercial, and so would folks feel comfortable making a blanket statement about we are concerned about self-reported discard data in particular, or -- I think this change over time, from 30 to 60 to percent zeroes seems counter to what's going on in the recreational sector, and so that's why we have a red flag on it. John.

MR. CARMICHAEL: I think it would be great to raise the concern about all the discards, as you just said, and then I think, in that bullet, that's a really good example that, in the commercial, where you have some more information, you've seen this increase in the reports of zero discards, because that certainly deserves some more scrutiny and evaluation, to figure out what's going on there and to see what we can actually make of all of these different discard reports that we have.

DR. NESSLAGE: Wally.

DR. BUBLEY: Maybe add "self-reported" in front of "discard information".

DR. NESSLAGE: Let's give Judd a second to catch up with all of our recommendations here, and then we'll go to Erik. All right. Erik.

DR. WILLIAMS: Maybe this is splitting hairs, but it could -- The wording might be important, that self-reported data by itself is not necessarily bad, and it's self-reported and unvalidated, because, if you have self-reported data, but you have some validation, you could always do like a correction factor, sometimes, if it's consistent with reported.

DR. NESSLAGE: Yes, and so we're saying we're concerned that self-reported data is unvalidated, and does that get at your concern? Okay. Alexei.

DR. SHAROV: Erik, didn't you say that there are some observers on the commercial boats, and so some validation does take place, and the same with the for-hire, and nothing with the private boats, but with the for-hire recreational sector, there are also observers onboard, and so partial -- Some level of validation is there.

DR. WILLIAMS: Yes, and it's just not -- It hasn't been thoroughly -- The validation is very low numbers, and there's a tremendous amount of uncertainty, and sort of preliminary, which is why I've said that -- The statement I said was something about the commercial discards being basically unreliable, because one of the preliminary analyses, and this is very preliminary, suggested that the underestimates were as much as twenty to a hundredfold less than what the observers were seeing for some species, and so --

DR. SHAROV: So can we say largely unvalidated and that we shouldn't be --

DR. NESSLAGE: So we want to add, before "unvalidated" -- We'll say "largely unvalidated", if we could, I believe is what you're suggesting, Alexei. Yes. Okay. This is good. Thank you. This is why we go over this. Are there other thoughts on this section? Okay. I think we've got it. Thank you, Judd.

Then we didn't talk about this that much, because we were busy talking about all these other points, which were excellent, but I think -- I wasn't sure what to put here, but, at the very bottom, if you go down, basically we're saying -- Would reducing the number of red snapper that are discarded dead provide an opportunity for increased harvest? I thought what people said was, in the short-term, no, and again repeating that F rebuild is substantially lower than F current, and dramatic reductions in overall fishery and total discards will be required, and so that was a -- I wasn't sure what to put there, but I thought that was kind of our initial gut reaction to this section of the action items, but I am happy to entertain any thoughts. We can delete this, or change it, anything you want. Wally.

DR. BUBLEY: I mean, I don't know if I have a great suggestion for it, because it is kind of up in the air, and, I mean, if they close the fishery, or close the ocean, for six months, then, yes, you would be able to -- They could do something short-term that would potentially allow a shift from discards to the harvest, but, I mean, they're not probably going to do that, and I think they would have a mutiny, but they potentially could do something short-term, and so I don't know if making a broad statement like that is --

DR. NESSLAGE: What about, in the short-term, this is unlikely, or highly unlikely? How about that?

DR. BUBLEY: That could work.

DR. NESSLAGE: And that's our reasoning, that it would take substantial reductions in overall fishery effort. Boom. If you do it, that's great, and we'll entertain a revision of an ABC at that time, gladly. Okay, and so are folks okay with this wording then, the content at least? Okay. Great. Thank you.

I think the rest of this is pretty easy, and we had nothing there, and then I don't actually think -- Basically, usually we say, "see revisions", and it's appended at the end of our report, and so we don't need to worry about that. The SEP, we didn't have anything. SERFS was this morning, and is this where we need to switch documents, or did you take notes on here? Okay. Is there anything we really need to say about SERFS? No. Okay. Then we'll go on to scopes of work, and, again, we'll say see the recommendations. I am glad you kept notes, and we'll save these, but probably the report will -- The devil is all the details that Chip and Judd recorded on the actual document.

So we'll just skip down, and now we're caught up. What else do we need to include under the consensus statements? Did we miss anything, note takers? Is it comprehensive? All right. Thank you very much for going through that. That's huge. All right, and we have twenty miles left, and I think we can do this. We will see if we can end at exactly 12:00. Myra, how long do you think you need?

MS. BROUWER: Hi, Genny. I can do it in five minutes, if I just speak really fast.

DR. NESSLAGE: You go, Myra. Fishery Management Plan Amendment Updates speed talk by Myra Brouwer.

FISHERY MANAGEMENT PLAN AMENDMENT UPDATES

MS. BROUWER: Thank you. Hi, everybody. Sorry I'm not there in person, and you get the disembodied voice today, and that's just how it worked out. A quick update on what the council has been up to, as far as amendments, just so they're on your radar, and the ABC Control Rule Amendment that you guys have talked about, and Genny provided recommendations to the council in March, and this is the one that addresses changes to the control rule and allows for carryovers and also revises the framework procedures to make those carryovers easier to do, and so that's going to be considered for public hearings at the upcoming meeting in June.

The SEP got a more in-depth review of the allocations decision tool and where that is, and I know that Scott covered it in his report, and so I'm going to skip over that, but just so you know that we're continuing to work on that and continuing to change the way that we gather information on the fishery performance reports to help the council with their decisions on allocations.

Other items for dolphin wahoo, as you know, Dolphin Wahoo Amendment 10 is going to be effective on Monday, and this is the one that adjusted catch levels and sector allocations for dolphin and for wahoo, and it also reduced the dolphin vessel limit for charter vessels. It set a trip limit for vessels with gear that was previously disallowed in the fishery, to allow vessels fishing for lobster with traps to retain dolphin and wahoo, and it removed the operator card requirement and also revised the FMP goals and objectives.

There is a new regulatory amendment that is just getting started for dolphin and wahoo, and that one would extend the geographic range of the minimum size limit and then look at potentially separating the recreational retention limits on the for-hire and private vessels and also removing or reducing the captain and crew bag limit retention for dolphin.

Other species, for mackerel, there was an amendment that just was approved, CMP Amendment 34, and that was for king mackerel, adjusting the catch levels based on the most recent assessment, and a bunch of modifications to management measures, mainly recreational, and that one is going to be submitted here shortly.

On to snapper grouper, and you've already talked about the release mortality reduction on the red snapper amendment, and so I'm not going to cover that. There is some movement for the recreational reporting and permitting amendment, Amendment 46, and that one will continue to be developed this year. The council is looking at putting together an ad hoc advisory panel that's going to be appointed in June, and then the council is going to resume discussions on the amendment in September, and this is looking at potentially a private recreational permit and reporting requirements.

Work continues on the wreckfish ITQ modernization amendment, and that one is a monster, and so it's moving rather slowly, but it's continuing to move forward, and then we're just getting started, or kind of halfway through, amendments to snowy, to adjust catch levels based on the SEDAR 36 update, and that one is, as you know, under a rebuilding plan that is not currently being modified, and so it's just catch levels and management measures, accountability measures and that sort of thing.

The same thing for golden tilefish and blueline, adjusting catch levels for golden and looking at any tweaks to management there that may be needed, especially for the longline endorsement holder portion of the commercial fleet, and that one is also going to be potentially approved for public hearings at the June meeting, and, for blueline tilefish, they are looking at maybe tweaking the recreational accountability measures, and there's been some overages in the recreational sector in the last few years, and, also, maybe looking at ways to modify the recreational season, to alleviate that.

For gag, Amendment 53 is going to respond to the latest stock assessment, and you guys know all about that. The amendment is going to establish a ten-year rebuilding plan and adjust those catch levels and the management measures to end overfishing. That one is on a little bit longer timeframe, and so they're going to be considering that for approval next year, early next year, and then, finally, greater amberjack is another snapper grouper amendment that's underway, and that one will adjust catch levels in response to SEDAR 59, and it also looks at changes in management measures and accountability, and so I think I'm under my five minutes. Thank you. If you have any questions, let me know.

DR. NESSLAGE: Brilliant. Thank you, Myra. Are there questions? I think I'm supposed to take public comment here too, based on the agenda, and is there any public comment on anything that Myra provided? If so, raise your hand on the webinar. No hands raised. All right. Thank you very much, Myra. It's greatly appreciated. All right. Then we have one other piece, I believe, of outstanding Other Business, but Chip is giving me the, no, let's not go there right now, and we'll do it over email, look.

DR. COLLIER: It's not necessarily a let's not go there. It's going to take a little bit of thought right now, and I think everybody is a little bit burned out, and it's not necessarily business that is associated with South-Atlantic-managed species, and it's dealing with the National SSC and

developing some trigger questions, and so I think it would be much better addressed through some email discussions and so --

DR. NESSLAGE: All right, and so we will look forward to communicating with you, and providing some feedback for you, over email on that. Is there any other Other Business that we didn't get to that I am forgetting? Okay, and so no other Other Business. Amy.

DR. SCHUELLER: We were going to -- So we're going to have a meeting in July, right, to talk about Spanish mackerel, and that's under Other Business, and that's why -- I'm just looking at the agenda, and yellowtail? Yes? Okay.

NEXT MEETINGS

DR. NESSLAGE: Okay. We'll do next meeting now, and I think we were -- We were looking for some feedback on whether the third or fourth week of July would be the best for the SSC for this yellowtail -- Go ahead, Judd.

DR. CURTIS: Thanks. As part of the upcoming yellowtail interim assessment, we're going to do that joint meeting, as we were talking about earlier. In talking with Ryan Rindone at the Gulf Council, we had kind of identified July 20 through 22 as possible tentative dates for just -- It would be a one-day webinar, joint between the Gulf and -- That's the former week that mutton snapper was scheduled for, but it's been postponed now, as you all know, and so that's freed up.

DR. NESSLAGE: Jeff.

DR. BUCKEL: I know that's a bad week for Jie and me. We've got a university event that's happening that we have to work with undergrads that week, and so we've committed to that, and so, unfortunately, the --

DR. NESSLAGE: So you're looking at the fourth week in July then, and is that right? So the week of the 11th through 25th would be preferred, if you would like a chair.

DR. CURTIS: Okay. We'll make a note of that.

DR. BUCKEL: Do any others have issues with a preference for the week of the 11th to the 25th?

DR. BUBLEY: I have a preference for the 25th. I am scheduled to be at-sea during the week before, the two weeks prior to that, and so, whether that happens, due to weather, I don't know, but it's scheduled.

DR. NESSLAGE: Amy and then Jared.

DR. SCHUELLER: I will second my preference for the week of the 25th.

DR. NESSLAGE: Jie.

DR. CAO: The 25th is tentatively scheduled as the SEAMAP annual meeting, and so I don't know, and that might affect my availability, but I don't know about anybody else.

DR. NESSLAGE: Other thoughts? Okay, and so you've got your feedback, and I will let council staff work with the Ex Comm and figure out a date then for the July webinar, and then thoughts on October? Anne.

MS. LANGE: Just quickly, what is the topic for the July webinar?

DR. NESSLAGE: We'll be reviewing the yellowtail and Spanish mackerel assessments. Now the October meeting.

DR. CURTIS: The October meeting, I think probably the best process is to just send out a doodle poll for some of those weeks, and we'll have to look at a schedule. October always is pretty busy as well, and we have other AP meetings that are cooccurring during that month. I know there was some talk, at the meeting last year, in 2021, of we wanted to move it a little bit earlier in the month, but I will send out doodle polls and get some feedback for potential dates for that meeting, and that will be another in-person meeting here in Charleston, for probably two days.

DR. NESSLAGE: Outstanding. We will look forward to that. The other big timing issue is when we'll need to provide our report from this meeting, and I will look to Jeff to talk about dates on that.

DR. BUCKEL: Chip or Judd, our report, in terms of getting it in in time for the briefing book, is that --

DR. NESSLAGE: It's May 20.

DR. BUCKEL: Okay. That's May 20, and so we'll shoot to have the draft -- I will shoot to have the draft to you by the first week in May, and then we'll get that back, and I will ask for that back by around the 16th, so that I have a few days to incorporate your edits before it's due on the 20th, and is that right?

DR. CURTIS: That's correct, yes. We want to get the final report in by Friday, May 20 for the briefing book for the council meeting.

DR. BUCKEL: All right. I will get that report to you, and thank you, Genny, for all the work that you've done on that, and that report will be coming to you by email soon, and I appreciate the quick turnaround. Thank you.

DR. NESSLAGE: Great. Thanks. Any other thoughts on dates or timing or scheduling? I am not seeing any. All right. Then we do need to take public comment, and then we'll do elections, and does that sound like a good plan here? If there's anyone in the public who would like to make final public comment from this meeting, please raise your hand.

DR. CURTIS: I do not see any hands raised on the webinar for public comment.

ELECTIONS

DR. NESSLAGE: Last call. No hands raised. All right. Thank you, all. I believe our last item is Elections. First, we need to elect a new Chair. My term is up, and so I would like to solicit nominations for Chair, and I would like to start by offering a nomination of Jeff Buckel, our current Vice Chair. are there any other nominations? We have a second from Anne. Are there any other nominations on the floor for SSC Chair? You know you want to. I am not seeing any, and I believe we have a new Chair, Jeff Buckel. Thank you very much.

DR. BUCKEL: All right, and so it's my first duty to elect a Vice Chair, and so I nominate Fred Scharf for Vice Chair, but we'll entertain other nominations for Vice Chair. Fred Scharf is aware, yes.

DR. NESSLAGE: Does he accept the nomination?

DR. BUCKEL: Fred Scharf, could you accept the nomination, so that we have that on the record?

DR. SCHARF: Do I have to? Yes, I accept the nomination.

DR. BUCKEL: All right. Thank you, Fred. Let's see. Other business that I would like to do before we leave is to thank Genny Nesslage for an awesome job of being Chair over the last couple of years and guiding us through lots of webinar SSCs and dealing with reports, and I hope to do half the job that Jenny has done, and so that's big shoes to fill, and so thank you very much, Genny,, for all that you've done.

DR. COLLIER: To that point, Genny stepped into a very odd situation, and we were extremely grateful. Normally, people get an opportunity to be Vice Chair and get eased into the role, and she jumped right into chairmanship and then jumped into COVID, and so she had a lot of trials and tribulations, and she led us through great, and we're very appreciative of the work she's done over the past couple of years, and all the work that the SSC has done over the past couple of years as well, and so thank you, all.

DR. BUCKEL: Thanks, Chip. Any other business? All right. I think I get to adjourn the meeting. Thanks, everyone.

(Whereupon, the meeting adjourned on April 28, 2022.)

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Transcribed By
Amanda Thomas
June 6, 2022

Attendee Report: Scientific & Statistical Committee Meeting (April 26-28, 2022)

Report Generated:
04/29/2022 10:56 AM EDT

Webinar ID	Actual Start Date/Time	Duration
460-063-251	04/26/2022 01:00 PM EDT	4 hours 4 minutes

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Yes	Christiansen	Heather
Yes	Corbett	Ellie
Yes	Cox	Derek
Yes	DeMaria	don
Yes	DeVictor	Rick
Yes	Foss	Kristin
Yes	Gentry	Lauren
Yes	Glabach	Miaya
Yes	Guyas	Martha
Yes	Hadley	01John
Yes	Helies	Frank
Yes	Iverson	Kim
Yes	Klasnick	01Kelly
Yes	Lazarre	Dominique
Yes	Li	Yan
Yes	Locascio	James
Yes	MUNYANDORERO	JOSEPH
Yes	Marhefka	Kerry
Yes	Mehta	Nikhil
Yes	Muller	Robert
Yes	Murphey	Trish
Yes	Patten	Willow
Yes	Scharf	Fred
Yes	Sedberry	George
Yes	Shertzer	Kyle

Yes	Siegfried	Katie
Yes	Smart	Tracey
Yes	Smillie	Nicholas
Yes	Swanson	Chris
Yes	Travis	Michael
Yes	collier	chip
Yes	thomas	suz
Yes	vara	mary
Yes	vecchio	julie

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Attendee Report: Scientific & Statistical Committee Meeting (April 26-28, 2022)

Report Generated:
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Webinar ID	Actual Start Date/Time	Duration
460-063-251	04/27/2022 07:28 AM EDT	9 hours 58 minutes

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Yes	Bianchi	Alan
Yes	Bonura	Vincent
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Yes	Chaya	01Cindy
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Yes	Christiansen	Heather
Yes	Coggins	Lew
Yes	Cox	Derek
Yes	Cross	Tiffanie
Yes	Curtis	Judd
Yes	DeMaria	don
Yes	DeVictor	Rick
Yes	Foss	Kristin
Yes	Franco	Dawn
Yes	Gentry	Lauren
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Yes	S	Adam
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Yes	leonard	edward
Yes	taylor	chris
Yes	thomas	suz
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Yes	DeVictor	Rick
Yes	Franco	Dawn
Yes	Gentry	Lauren
Yes	Glabach	Miaya
Yes	Guyas	Martha
Yes	Hadley	01John
Yes	Helies	Frank
Yes	Hoke	David
Yes	JOHNSON	ERIC
Yes	Lazarre	Dominique
Yes	Li	Yan
Yes	Marhefka	Kerry
Yes	Mehta	Nikhil
Yes	Murphey	Trish
Yes	Neer	Julie
Yes	Patten	Willow
Yes	Ramsay	Chloe
Yes	S	Adam
Yes	Scharf	Fred
Yes	Shertzer	Kyle
Yes	Smart	Tracey
Yes	Smillie	Nicholas
Yes	Swanson	Chris
Yes	Willis	Michelle

Yes	collier	chip
Yes	thomas	suz
Yes	vara	mary
Yes	vecchio	julie

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