SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

Town & Country Inn
Charleston, South Carolina

April 15-17, 2025

Scientific and Statistical Committee

Dr. Marcel Reichert, Chair
Dr. Walter Bubley, Vice Chair
Dustin Addis
Dr. Jeffrey Buckel
Dr. Jie Cao
Dr. Chris Dumas
Dr. Jared Flowers
Dr. James Gartland
Dr. Kai Lorenzen
Dr. Genevieve Nesslage
Anne Markwith
Dr. Christina Package-Ward
Dr. Fred Scharf
Dr. Amy Schueller
Dr. Fred Serchuk
Dr. Alexei Sharov
Dr. Jennifer Sweeney-Tookes
Dr. Steve Turner
Dr. Jason Walsh

Council

Trish Murphey, Chair
Dr. Carolyn Belcher
Amy W. Dukes
Kerry Marhefka

Council Staff

Dr. Judd Curtis
Dr. Chip Collier
Myra Brouwer
Julia Byrd
John Hadley
Kathleen Howington
Allie Iberle
Kelly Klasnick
John Carmichael
Dr. Julie Neer
Emily Ott
Dr. Mike Schmidtke
Rachael Silvas
Nicholas Smillie
Suzanna Thomas
Christina Weigand
Meg Withers

Attendees and Invited Participants

Shepherd Grimes
Nikolai Klibansky
Dr. Lauren Gentry
Dr. Erik Williams
Dr. Jennifer Locht
Dr. Matthew Vincent

Observers and Participants

Other observers and participants attached.

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened at the Town & Country Inn in Charleston, South Carolina on April 15, 2025, and was called to order by Dr. Marcel Reichert.

INTRODUCTIONS AND PUBLIC COMMENT

DR. REICHERT: Welcome to the April meeting of the South Atlantic SSC. I'm Marcel Reichert. I'll be chairing this meeting. However, before we begin, I want to share a little bit of sad news about the passing of a former SSC member, and also council member, John Mark Dean.

John peacefully passed away on March 27, at the age of eighty-eight, at his home, surrounded by family. John had a long and productive career, leaving a distinguished legacy as an educator, researcher, and marine conservationist. He advised and mentored a long list of folks, including people you may know, Dave Secor, Roy Crabtree, Chuck Wilson, Trey Driggers, Frank Helies, and myself, and, on a personal note, John played a critical role in me coming to the U.S. and my following career in fisheries. John Mark will be missed by family, friends and colleagues, and so thank you.

Again, welcome to the April SSC meeting. Several members could not attend in-person, but are joining us online for this meeting: Amy, Fred and Christina. Anne is currently online. I think she is on her way here, and there are several SSC members that are apparently stuck in traffic, and so they will be joining us as soon as possible.

You will also notice that a number of presenters and federal colleagues are joining us online for this meeting too, including Erik Williams. He is our Science Center liaison, and Shep Grimes from the Office of Legal Counsel. Welcome, guys online.

I would also like to welcome Dr. Carolyn Belcher, who is our counsel liaison, and Amy Dukes, a council member, and I think those are all the council members present here, and last, but not least, I would like to recognize our council staff who's present today. Judd, and Wally, anyone else I should recognize? So let's do -- Let's start with a round of voice recognition. Alexei, let's start on your end of the table.

DR. SHAROV: Good afternoon. Alexei Sharov, Maryland Department of Natural Resources, SSC member.

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

DR. DUMAS: Hello. Chris Dumas, University of North Carolina Wilmington, SSC member.

DR. FLOWERS: Jared Flowers, Georgia Department of Natural Resources, Coastal Resources Division, SSC member.

MR. GARTLAND: Jim Gartland, Virginia Institute of Marine Science, SSC member.

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

DR. REICHERT: Marcel Reichert, SSC Chair.

DR. BUBLEY: Wally Bubley, South Carolina Department of Natural Resources and SSC Vice Chair.

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

DR. SCHARF: Fred Scharf, UNC-W, SSC member.

DR. NESSLAGE: Genny Nesslage, Chesapeake Biological Lab, SSC member.

MR. ADDIS: Dustin Addis, Florida FWC stock assessment and SSC member.

DR. TURNER: Steve Turner, SSC member.

DR. LORENZEN: Kai Lorenzen, University of Florida, SSC member.

DR. SWEENEY-TOOKES: Jennifer Sweeney-Tookes, Georgia Southern University, Chair of the SEP and SSC member.

MR. WALSH: Jason Walsh, North Carolina Division of Marine Fisheries, Vice Chair of the SEP and SSC member.

DR. REICHERT: Thank you. Judd, the people online, should we do a quick round there?

DR. CURTIS: Go ahead, Amy.

DR. SCHUELLER: Amy Schueller, NOAA Fisheries and SSC member.

DR. CURTIS: Christina Package-Ward.

MS. PACKAGE-WARD: Christina Package-Ward, NOAA Fisheries, Southeast Regional Office, SEP and SSC member.

DR. CURTIS: Fred Serchuk.

DR. SERCHUK: Fred Serchuk, SSC member.

DR. CURTIS: Erik Williams.

DR. WILLIAMS: Erik Williams, NOAA Fisheries, Southeast Fisheries Science Center liaison.

DR. CURTIS: Shep Grimes.

MR. GRIMES: Shepherd Grimes, NOAA Office of General Counsel.

DR. CURTIS: Anne Markwith. Sorry that I forgot you.

MS. MARKWITH: No worries. Anne Markwith, North Carolina Division of Marine Fisheries, Fisheries Management Section, SSC member.

DR. REICHERT: Thanks, everyone. All right. Next up is the review and approval of the agenda. Any additions or changes to the agenda? Any oppositions against approving the agenda? Seeing none, the agenda is approved.

Approval of the minutes of the October meeting, Shep already provided some comments. Anyone else? If there are minor corrections to the minutes, maybe you can let staff know, and we'll make those. Any opposition to approving the minutes, with minor corrections? Shep, by the way, thanks for those corrections. Appreciate that. Seeing none, the minutes are approved.

We have a revised October final report. After we completed the report, we noted that a comment on page 15, under Agenda Item 6, was factually incorrect, and it also seemed to appear to be attributed to Erik Williams, which was also incorrect. In your briefing book, there was a corrected version of this report. That's attachment 1c, A1c. Any questions or comments? Any disagreements on this revision? Seeing none, then the revised report is approved. We basically struck that comment from the report.

We have a lot to go through this meeting, but, before we do that, I want to go through a couple of logistical housekeeping stuff. First off, as a little bit of a heads-up, rather than reviewing all the notes at the end of the meeting, we discussed reviewing the consensus statements at the end of each agenda item. I feel that that's particularly relevant for the heavy-lifting agenda items. The discussions are still fresh in our memory, and at least, like what happened in October, if we don't have time at the end of the meeting to complete a review, at least we have some notes that are reviewed, and that will help myself, Judd, and Wally tremendously with completing the report.

However, there will still be an opportunity for discussing and reviewing the notes at the end of the meeting on Thursday. Any questions or comments relative to that? Also, and that's to reduce the switching of stuff between screens, and that especially helps Judd a lot. Folks on the webinar will mostly see the presentation slides, or, once we start discussing the agenda items, they'll see the overview, and that will be once we start discussing the consensus statements, and so there will be less flipping back and forth between documents during the meeting, and hopefully that will smooth the work for Judd a little bit.

Also, in the past, we've had notes up on the screen, that we later changed, and so that sometimes may create a little bit of confusion by those who are trying to follow the discussion, and so that was another reason. We're just going to try to see if that works, and last, but not least, Judd created a Google Doc for folks to deposit notes in. We need to be very careful. That's not meant as a means for additional discussion, and so it's not meant for people to reply or discuss the notes that are there.

It's just an easier way for people to deposit the notes, and, again, it will help Judd write the report. We'll just see how that's going to work, and I will ask Judd to maybe provide a little bit of clarification on how this would actually work. Judd.

DR. CURTIS: Yes, and so, SSC members, I've emailed you the link to this shared Google Doc. You have commenting privileges only, and so you can review and add a comment to areas, to

contribute if you would like, but you do not have full editing privileges. For the members online, as Marcel alluded to, you'll see mostly the presentation slides. You will see the overview document when we start discussing the action items and SSC recommendations.

The notes page will be kept more internally on the other screen, that is being broadcast only in the room to people live, and we've also got the hands-raised document side-by-side with that as well, and so, similar to other meetings, that will operate the same. Raise your hand, for the online members, if you have a question, and we'll call on you.

DR. REICHERT: Thanks, Judd. Any questions, or comments, relative to what we just discussed? Jim.

MR. GARTLAND: Just to make sure I'm clear, so for those of us -- Like when you have us assigned to take notes for a particular agenda item, you take those notes still in a Word document, like we normally would and then dump it in later, and is that correct, or keep that separate from this document, and just send that later to make the full report?

DR. CURTIS: Yes, and so keep your notes on your own documents, for starters, and then we can decide if it's more appropriate to input into that shared document or if it's better to just compile through an individual email.

DR. REICHERT: Thank you. Anyone else? Okay. All right. Well, during the March meeting, SERO and the Southeast Fisheries Science Center staff provided an update on staffing, et cetera, and we thought it would be good, and relevant, for the SSC to hear about it too, and Judd will give you a brief overview of those statements. Judd.

DR. CURTIS: Thank you. What I'm going to read from is a document from the briefing book of the March Council meeting, Full Council I, the summary report that's available online, on the website, and it touches upon a couple of updates from the Southeast Regional Office and the Southeast Fisheries Science Center that we thought would be appropriate for the SSC to hear.

Andy Strelcheck, Regional Administrator, gave an update regarding operations of the Southeast Regional Office. SERO has lost several employees in the past few weeks, and keep in mind this was back in early March. Due to the current hiring freeze, several positions have not been filled. The Department of Commerce is required to submit a reduction in force plan in mid-March.

Regarding the ongoing issues with the SERO Permits Office, progress has been made to prepare snapshot information to the council to resume work on developing amendments. There has been a suite of executive orders issued in recent weeks, and guidance is emerging on how they will impact the activities of the Regional Office. The ten-for-one deregulation requirement will be challenging to address. NOAA Fisheries is working with NOAA on a process for how to implement it.

The council was encouraged to focus on deregulation actions, or deregulatory actions, excuse me, and workforce optimization requires that, for every new hire, four others need to be let go. This will affect travel restrictions and other activities.

Next, we heard from John Walter, the representative of the Southeast Fisheries Science Center. He stated the Southeast Fisheries Science Center lost 14 percent of its staff in two days. Ten recruitments have been put on hold. Stock assessment capacity is down by 20 percent, and it is anticipated that there will be a significant reduction in the center's ability to conduct regional surveys.

The Southeast Fisheries Science Center is looking to borrow staff from around the country to conduct surveys. The reduction in force will also affect the Southeast Fisheries Science Center. One bit of good news is there are congressional funds for rebuilding the facility in Beaufort, North Carolina, and, to this extent, the council directed staff to prepare a letter to support preserving the Beaufort facility, which was sent on April 7.

Then, lastly, earlier this week, you may have heard the Secretary of Commerce, with concurrence from the White House, selected Eugenio Pineiro-Soler as the Assistant Administrator for NOAA Fisheries. That concludes the update.

DR. REICHERT: Thank you. Any questions, or comments? I think, you know, in a way, this will affect us, in terms of what the Science Center's capabilities are in support of the SSC, in terms of analysis, stock assessments, et cetera, and so we'll see, in the future, how that will actually impact the work that we as an SSC do, and so thank you. Thank you, Judd. Next on the agenda is public comments. Judd, were there any public comments submitted, or are there any public people that want to make a public comment online?

DR. CURTIS: If you wish to make a public comment, please raise your hand on the webinar, and we'll call on your name.

DR. REICHERT: Not seeing any, just as a reminder, the public has an opportunity to provide public comment after the presentations for every agenda item, and also at the end of the meeting. Thank you. We move on to Agenda Item 3. That’s the SEDAR 92: Atlantic Blueline Tilefish Southern Region Model. Relevant documents are in 3a to f, and, as a reminder, Jeff, Dustin, Jie, Chris, Kim, Kai, and Genny were assigned to this assessment review.

You may have noticed that we assigned a relatively high number of people to both the blueline and, in particular, black sea bass, because we anticipated some significant discussion, and so we thought it would be good to have a larger number of people taking notes for us, and so thanks. As you may know, blueline tilefish distribution is an overlap.

It overlaps the South Atlantic and Mid-Atlantic Fishery Management Council jurisdictions, and, as a result, this assessment is a little more complicated than many of the other stocks that we routinely review, and Judd will introduce this agenda item. Judd.

SEDAR 92: ATLANTIC BLUELINE TILEFISH SOUTHERN REGION MODEL

DR. CURTIS: Thanks, Marcel. Just before I hand the mic over to Nikolai to go through the stock assessment report, I just wanted to introduce, or revise and review, the kind of assessment plan for blueline tilefish, given it's a little more intricate regionally than some of our other stocks, and you've seen some of these slides before, but just some background.

The last assessment was SEDAR 50 in 2017. This comprised a stock ID workshop, data assessment, and review workshop, and so the full gamut. You'll see Nikolai's updated model. It bases a large proportion of this information from SEDAR 50. During that workshop, it was determined that a combined two-model approach was the most appropriate, which included a model south of Cape Hatteras, which is a production model, like you'll see here today, and north of Cape Hatteras provides a data-limited model.

Within the SEDAR 92 process, there were two topical working groups that met several times, one focusing on catch and landings north of Cape Hatteras, and that information would go to inform that north of Cape Hatteras data-limited model, and another second life history topical working group.

For the northern region data-limited model, there will be a review by a subgroup of Mid-Atlantic and South Atlantic SSC members, three members from each of the different SSCs, and this is due to a few procedural differences in the SSC's responsibilities, which I covered in the last meeting, I think, as we were looking at adopting this approach, but, as a refresher, the Mid-Atlantic SSC does not review stock assessments similar to the South Atlantic.

There is a technical review panel that reviews these assessments, and the SSC applies their ABC control rules and sets catch level recommendations, whereas the South Atlantic SSC does review these stock assessments, is oftentimes the sole body responsible for the stock assessment review, and then also applies their ABC control rules and sets catch level recommendations.

This joint review by the two SSCs, I'll get into a timeline in just a minute. You see the composition, which I touched on already earlier, and the review panel will be held similar to a SEDAR review panel format and procedure, which included a terms of reference that was given out to the subgroup members, and okayed by the executive directors of each of the Mid-Atlantic and South Atlantic councils, as well as the council chairs.

The Mid-Atlantic Fishery Management Council's SSC will review this data-limited portion on May 13 and 14, and the South Atlantic SSC will review this in a May webinar meeting, which will be held the week of May 26, which I'll provide more detail on in our last section of this meeting, the other meetings, or future meetings.

They will consider these recommendations of the subgroup review panel, apply an ABC control rule, and make catch level recommendations, and the reason for the Mid-Atlantic SSC to see the subgroup recommendations first is they have experience applying these ABC control rules for data-limited models, whereas, the South Atlantic, we have yet to accomplish this task, and so we thought that going through the Mid-Atlantic's SSC was probably the proper approach to provide some guidance for this body as well.

For this meeting now, we're tasked with reviewing the southern -- The South Atlantic SSC is tasked with reviewing the southern region model. This will be reviewed by only the South Atlantic SSC. You're to review the base model and uncertainties, apply our ABC control rule, and make catch level recommendations based on projections, or any other method, and then the recommendations from the SSC, from this meeting, and then also the subgroup and the subsequent review of the

northern model, will be all sent to the council for review during their June council meeting, and lastly is just a timeline of the different entities and how they all play together.

DR. REICHERT: Thanks, Judd, and, as a reminder, it's Jim, Genny, and myself, I believe, that are the three South Atlantic SSC members that are part of that subgroup reviewing that northern part of the population. Any questions or comments for Judd? Seeing none, maybe we can move to the overview of the assessment. Nikolai, you're online?

DR. KLIBANSKY: Yes, and here I am.

DR. REICHERT: Okay. Cool.

DR. CURTIS: Nikolai, let me hand control over to you, and I'll let you take it away.

DR. REICHERT: Thanks, Nikolai.

DR. KLIBANSKY: Thank you. Okay. Do you see a presentation or the Guggenheim?

DR. REICHERT: Yes, we can see that. Can you, too?

DR. KLIBANSKY: The presentation?

DR. REICHERT: You're ready to go.

DR. KLIBANSKY: Okay. Okay. I have two screens, and so I wasn't sure which one you saw. All right. Well, hey, everybody. I'm going to be talking today about SEDAR 92. Atlantic blueline tilefish, and, as Judd gave that nice intro, I'm going to be talking about the area south of Cape Hatteras, where we applied an age-aggregated production model, abbreviated AAPM, throughout this presentation, and so this is an operational assessment, and so it's an update of what we did in SEDAR 50, and so I'm largely going to be reviewing decisions that were made in SEDAR 50.

I think I have twenty-nine slides. I don't know how exactly long that will take. Some of the slides are kind of for reference, and so I'll go through them kind of quickly, and, if you guys want, and whatever is fine with me, questions during the presentation or questions during the end. although I'll just say this, and I won't know if your hands are up, and so someone will have to shout at me.

Okay, and so, for starters, I'm going to go through the methods, a description of the model, the data, some of the basic specifications for the base model, and look at a sensitivity run, uncertainty analysis, and projections. I just have one projection here today, which is probably the wrong one. I know that there will be other ones that you'll recommend, and I can do those, you know, in the coming days. Then we'll go through the results, and then I just have one last slide of kind of summarizing where we leave off, and some kind of parting thoughts, while I take your questions and hear your suggestions.

So, for this assessment, we used a different model than in most of our SEDAR assessments in the Southeast, and it's based on the limited data that we have for the blueline, for blueline in the Atlantic in general, but, in the South Atlantic, we apply this age-aggregated production model. We use a software called ASPIC, that you may be familiar with from previous assessments, but we

don't use it that much these days, and so it looks at the population without age structure, and everything is just in terms of biomass, and sometimes we call it a surplus production model. It assumes recruitment plus growth, minus natural mortality, equals this surplus production.

I'm not going to get into the equation. It uses this Graham-Schaefer logistic formulation, and it assumes that surplus production is symmetric about BMSY equals 0.5 K. Here, K is carrying capacity. It's conditioned on yield, or removals, and so it basically treats the removals time series that we put in, which is one removals time series in biomass, and it treats that as being the truth, and then we fit two indices of abundance and estimate just a few parameters. It's B1 over K, which is biomass in the first year of the assessment, over a carrying capacity, FMSY, MSY, and then catchability parameters for each index.

Just a very, I hope, neatly summarized inputs and outputs. The model takes a single series of removals, and it can take multiple indices and annual CVs for those indices. We give it starting values for the parameters, range limits, or prior distributions on parameters, and then there's a bunch of other settings that we can tinker with to get the model to fit better, and then so it estimates a single time series of biomass, estimates the parameters that we supply the initial values for, and estimates indices, and then finally produces these status time series.

Getting a bit into the data, we talked a lot in SEDAR 50 about data for blueline tilefish and how we need to look at -- You know, how we look at data in the different parts of the Atlantic, and so, for this assessment, we are looking at data from the Gulf and South Atlantic Council boundary near Key West to Cape Hatteras in the Atlantic, and so not going all the way up to the actual council boundary in the north, and this slide is looking at all Atlantic removals that we assembled through the landings stream topical working group process for SEDAR 92.

They're color-coded by these sub-areas, the Mid-Atlantic, North Carolina north of Cape Hatteras, North Carolina south of Cape Hatteras, South Carolina, Georgia, and Florida, and I'm just showing you all of them, partly to illustrate that the process of putting together the landings stream for this area was coupled with the process of putting together landings for the entire Atlantic. We basically got all of these together through that process, and then we are just going to subset the landings south of Cape Hatteras in these four sub-areas for this assessment, and so it's North Carolina south of Cape Hatteras is this green color, South Carolina is light blue, Georgia is dark blue, and Florida is that purple, or magenta, color.

When we separate that from the landings North of Cape Hatteras, this is what we see, and so this is a stack bar plot. Now, this is just the landings that we're using in this assessment, now broken out by fleet, and so you have commercial landings in red, recreational landings in green, commercial discards in blue, which is sort of hard to see, as it's not a lot, and just commercial -- Excuse me. Recreational discards in purple.

The indices of abundance, as I think I may have mentioned earlier, but, if I didn't, these are identical to what were put into SEDAR 50. They were not updated for this assessment, and that is because, even in SEDAR 50, the time series of the fishery-dependent indices that was usable ended in 2006 and 2007, before the end of the assessment, and I believe that assessment ended in 2015, and so even then changes in regulations and fishing behavior affected the time series that could be used for indices, and so, going into this assessment, I think even back in 2023, when you were talking about scheduling assessment, and what we would need, we were aware that we wouldn't be able

to update these indices. We have a commercial handline index and a commercial longline index, which are inherited from the previous assessment.

Getting into some of the basic specifications for the model, we started the model -- This, again, is as in SEDAR 50. We started the model when removals were minimal, back in 1958, and so the population in that initial year was considered unexploited, and that allowed us to provide the model with some information and say that the ratio of B1 over K is one, that we're basically at carrying capacity in that year, and so B1 over K was fixed at one and not estimated.

We did estimate the remaining parameters, and so, without prior information, prior distributions on those, and, going back again to SEDAR 50, we had lots of discussions about how to treat the handline and longline indices in the model, and we determined that the handline and longline indices should be considered equal quality, so that we didn't want the model to, you know, treat one as more reliable than the other, and so what we actually did was to run the model twice, one with just the handline index and one with just the longline index, and then we actually averaged two models throughout, you know, to get out the results, to get a single set of results from the base model.

It was determined that we could -- If we combine the model, the indices, and put them into the model as one kind of average index, or ran them both in the same model, that it actually ends up putting undue weight on the handline index, which has a smaller CV, and so that's why we have this two-model average approach.

Okay, and so the models are run from 1958 to 2023. We have removals for all of those years, indices of abundance for just 1993 to 2007, or 1993 to 2006, and fishing status is similar to what we usually use in BAM assessments, where we have F current over FMSY for our estimate of fishing status, and the F current is the geometric mean of the three last years of estimated F, and so it's considered overfishing if F current over FMSY is greater than one. Our MSST value is 75 percent of BMSY, and B status is the terminal year estimate of biomass over MSST, and so we're considered overfished if that ratio is less than one.

Here, I guess, a potentially important difference is that we're talking about B over MSST, and not SSB over MSST, like we normally do in BAM, and that's because we don't actually have any maturity information or age structure in this model.

One sensitivity was just that model run that was I talking about where we include the handline and longline index together, and, as far as the uncertainty analysis goes, ASPIC has this built-in uncertainty procedure. It's a bootstrapping procedure that is, in some ways, similar to what we do for the Monte Carlo Bootstrap Ensemble for BAM. ASPIC actually fits -- Here, ASPIC fits to the observed data and saves those results and residuals, and then it actually resamples from the residuals and generates these bootstrap datasets.

Then, in each run of this bootstrap procedure, it will refit to that bootstrap data, save the results, and then, you know, do that, in this case, a thousand times per model. Then, here, we actually combine the bootstrap results for the handline model and the longline model. Then, when we needed, you know, a single time series of let's say biomass, those results are averaged across all of those bootstrap runs.

I ran one set of projections here, and, you know, this is also all in the report, and so, if you did your due diligence, and really read that report, you know, in detail, this is probably especially boring, because it's all review from that.

Anyway, I ran this five-year projection from 2024 to 2028. F was set at F current for the first two years, and then at F P* 30 in the last three years, from 2026 to 2028. I think that's where we left off, that P* 30 from SEDAR 50. That's why I ran that projection. There's a deterministic projection, and then projections made from each bootstrap run, and so that's how we get the uncertainty in projections, similar to what we do with BAM.

Okay, and so now we're getting into some results. These are some classic ASPIC plots. I think these are the plots that actually come out of the ASPIC software, and I'll explain what's going on here for a moment. On the left is the fit to the handline model, and the right is the fit to the longline model. The red line is the removals time series. It's the same in both of those panels. There is a solid black line, with open circles. That is the observed indices in each panel, and then a dashed blue line and solid blue dots, which represents the fitted index. There's two Y-axes, and so the indices are relative to the left Y-axis, and removals are relative to the right Y-axis.

The models fit the indices pretty well, as you can see. You can really get a sense, I think, from this plot how the indices, or time series of indices, is fairly short, compared to the total time series of the assessment. The model is, you know, estimating, or telling it that biomass is a carrying capacity in the first year, and then, as we go forward in time, the removals increase to a peak in the early 1980s. Biomass goes down. It, you know, follows the indices, and then the indices trend up, toward the end of the time series, and then there's no more index information after 2006 and 2007, and, given the landings that are occurring over those last sixteen years, the indices continue to trend upward.

These are the status plots for each of those runs. Purple is B over BMSY, and green is F over FMSY, and they're reflecting the trends that we see in landings and the indices that we just looked at, and so this is where the presentation gets to. There's a bunch of slides that are very similar, and I'm kind of going to go through them quickly, because they show you just slightly different views of some of the same stuff.

This is the biomass time series, where here now we're just looking at -- I'm going to flip back for just a second, and so here we're looking at the runs separately, and now here we're looking at combined runs, longline and handline runs, with the confidence bands here in light bluish purple, that are the confidence bands for all the bootstrap runs. The horizontal dashed line is BMSY, and the horizontal small dash, or dotted, line is the MSST at the end of the assessment.

Anyhow, and so the biomass is high, and it goes down as we had those higher landings, and it stays low, but then increases above MSST, by about 2010, and then continues to increase through the end of the assessment.

This is a similar plot, but for F, with FMSY as the horizontal dashed line, and then F current as the horizontal dotted line, and so, here, you know, F was highest early on, in the 1980s, and then has been sort of -- You know, obviously, it has bounced around a lot, but is declining over time, and has been, you know, relatively low in recent years, as landings have been relatively low compared to historical levels.

This is just a plot of bootstrap perimeter distributions, for B over BMSY in the top-left, B over MSST in the top right, and F -- This is F current over FMSY, in the middle-left, MSY in the middle-right, FMSY in the bottom-left, and BMSY in the bottom right.

One thing that might jump out at you is there's this kind of bimodality in a lot of them, and that tends to be because, you know, we -- This is combining two different models, and these are somewhat different things. Here, the orange vertical line is the -- Basically, it's the base model result. The vertical dashed line is the median from those bootstrap distributions, and they're, you know, pretty close for all these parameters.

We looked at a similar plot before for biomass. This is B over BMSY. Again, a similar plot for B over MSST, and now F over FMSY, and, finally, this -- Or not finally, but a couple more slides after this, but this is a phase plot showing the results for the 2,000 bootstrap runs, with the F status on the X-axis and the biomass status on the Y-axis, and so, out of all of those bootstrap runs, 96.2 percent were in this top-left quadrat, which is, you know, not overfished and not undergoing overfishing, and so, in terms of sort of statistical uncertainty, you know, I think we can say that the status is little uncertainty, from a statistical perspective, you know, given that these are all, you know, in the same quadrat.

This is the benchmark table from the report, for reference, if we want to go back to this in a minute, and this is the results for that sensitivity run I was telling you about, where here we actually just have both indices in the same model, and the results are very similar. The indices had similar trends, and the model fits those indices both pretty well, but there's a little bit of a compromise in the fits, as we would expect, because it's fitting them both at the same time. This is a table just showing that run, this HLLL Run 6, and so a sensitivity run, and then the separate model run results, for comparison, for reference.

The last couple of slides, or two last slides before we get to conclusions, are about projections. This is actually basically like a figure caption for the next slide. I couldn't really fit all this on one slide, and so this is here for your reference, but, here, the top-left-hand panel is the F, which we're putting into the projection as fixed information, and so the first couple years are F current, and then the last three years are F P* 30, which ends up being 0.138, and so we see, in this next panel, on the top-middle panel, the biomass increases a little bit at this F current, and then decreases a bit as we go to that higher F.

The yield is lower, of course, at lower F, and then it goes up, and so all these panels are doing what we hoped that they would do, and then, kind of looking at the B over MSST in the bottom-right, throughout that projection, you know, the B over MSST is actually pretty well above one, and so are the confidence bands around those projections, and so I know you'll want me to do some other ones, but this is the one that we've got so far.

This is the associated table from the report, and so, you know, taking it to conclusions, this model shows that blueline tilefish south of Hatteras are not overfished. Overfishing is not occurring, you know, by a good amount in both cases. Again, the bootstrap analysis showed little statistical uncertainty in stock status and fishery status. I kind of emphasize statistical here because, you know, given the shortcomings of this approach, and really the data that we have for it, you know, we don't have an index of abundance for the last sixteen years of the model, and so the model

really doesn't have any information on recent abundance trends, and is largely depending on historical data for estimating the model parameters.

The parameters did differ from SEDAR 50. You know, we updated the landing series, and so the parameters are being re-estimated, and so there's some difference there, but, otherwise, the model is really a very long-term projection, with updated removals, and so just some kind of words of, you know, caution how we interpret these results, you know, but, that said, catch levels have been relatively low, and fairly stable, since even the beginning of the indices, and so, you know, no obvious signs of concern, but, if something is happening now that's different than, you know, when we have those indices from, we wouldn't really know about it, and so that's the end of my presentation. I'm happy to take any questions, or comments. Thank you.

DR. REICHERT: Thanks, Nikolai. Appreciate that. Any comments, or questions from the committee? I'll give the committee a couple of minutes to ponder any questions. Nikolai, while the committee does that, I have a quick question. You mentioned that the removals were relatively modest, and stable. Is that correct?

DR. KLIBANSKY: Yes, and, I mean, that's sort of my interpretation, trying to look at all of this. Let's see, and so like, if we go back to -- You know, just trying to -- I'm trying to make sense of what we have here and what -- You know, obviously, it's not everyone's ideal situation to have a surplus production model to manage from where we don't have an index for the last sixteen years, but I know the management has to do something, and so, you know, trying to look at it and think, you know, what can we -- What can we say from all of this, and so kind of where -- What I was thinking there is, you know, we have this time series of removals that was very high back in the 1980s, and has gone down a lot, and it, obviously, bounces around in recent years, but it doesn't have a ton of directionality to it.

You know, I think if you were to like just fit a line from somewhere, maybe at 2000 onward, you know, it's fairly level, you know, and bouncing around over the years, but not an obvious like increase or decrease. That's what I was suggesting when I said that, and you could flatly disagree, and that's fine.

DR. REICHERT: No, I was just thinking, you know, that was modest, in terms of what we saw in the 1990s, and so that's why I was asking for a little clarification of what you said earlier. I saw -- Thanks, Nikolai. I saw Alexei's hand up. Alexei.

DR. SHAROV: Yes, and I have a few questions, but I really wanted to get to the last one to ask. Thank you, Marcel. Nikolai, so the first question I have on the sort of the logic of combining two model runs, and, well, suppose if we would assume even that the indices -- That we had a full time series of indices, that lasted through, you know, the whole time series, but we have two separate runs, and each of them is based on one of the index.

The good thing is that they result in pretty much the same status of the stock as the B over BMSY ratio, and F over FMSY, which is good, but, if we look at the estimates of FMSY and BMSY, they're substantially different, but, visually, there is -- You know, both indices have pretty much similar trends, and so could you explain as to what drives the difference? What creates that so much of a difference that we end up with -- Say, if we were to trust the surplus production model outputs, with one, we have the FMSY for not so productive stock, and, for the other one, a much

more productive, and substantial differences, and how could that be explained, in terms of calculations here?

DR. KLIBANSKY: Yes, and, I mean, I think it's basically, you know, a function of how -- You know, there's, I think, a fair amount of uncertainty, particularly in the longline index, based on those CVs and so I think that the estimates are just not really not very precise, but, you know, the reason that we ended up going with that averaging is that -- This is kind of often the case, that we have CVs that, you know, we get out of a model analysis to develop an index, and they --

You know, it's often hard to square up the CVs from one index to another, you know, but, when you put them into the model, it basically weights one index over the other, and so we didn't necessarily think that -- Even though the hand line indexes is fit more tightly and it has, you know, lower CVs, we didn't necessarily think that those parameters were more reliable than the ones coming out of the longline index. I say we, and I think this was made -- I guess it's probably the assessment panel that was discussing that at SEDAR 50.

DR. SHAROV: If we could look at the -- Go back to the plot of the ASPIC bootstrap parameter distributions, and that's what -- This one. Right, and so, you know, if we look for the plots of FMSY, for example, clearly it's just an overlap of two distributions. One would have a median of estimated FMSY around, I'm guessing, 0.15, and the other one close to 0.3. We're combining them, and we're estimating the median and the mean here, which comes in between, and I don't think that this is a proper characterization of uncertainty here.

It is more like, you know, one index is likely to be more representative of the true dynamics of the stock than the other, but, clearly, we have no means of distinguishing, you know, which one is actually true, because we have a limited time series for which we have the CPUEs available, and there's maybe not that much of the contrast in there, but, I mean, it seems, to me, that merging them is not the best way of doing it. I might be wrong, and there might be a better argument. If you have a better argument, please let us know.

DR. KLIBANSKY: Well, I guess I'll first sort of play the, you know, operational assessment card and say I didn't really revisit, you know, that decision, you know, for SEDAR 92. That was a decision that, you know, was made by not really me, but by the assessment panel for SEDAR 50, and that was -- The explanation I gave you was based on that.

We had lots of discussions about how to do it, and didn't believe either model more than the other, and that, you know, decided that the best approach was just to average, to apply a straight average, because, otherwise, any other approach puts more emphasis on the handline model, and so it was sort of a least of multiple evils, maybe, you know.

DR. SHAROV: Okay.

DR. KLIBANSKY: We would like to have longer indices, and better data, but that was kind of what we came up with.

DR. SHAROV: Can I have one more? One more question, and so it's my understanding that, essentially, the estimation, in fact, is limited with the period of years for which the indices are available, right? I mean, once they stopped, after, whatever, 2007, the catch information is not

contributing anything towards the model fit, and, therefore, just the interpretation that we have for the most recent period, like you mentioned in the presentation, is totally driven by that relationship that we observed in the past. That essentially tells us we don't know anything about actually what is happening within the last ten-plus years.

Is there any information additional to this, indirectly, like a size structure, and age structure is unlikely, but at least size structure, recreational CPUE, whatever it is, that could tell us about the potential changes in the population that we could have some indication that what we think is happening, just based on the catch, is actually supported by some, you know, external additional information as well, that's not the part of the surplus production model?

DR. KLIBANSKY: Yes, and so I think it's sort of yes and no. So, you know, there was a -- So length distributions were provided for the area north of Hatteras that go into the DLM approaches for assessing that area for the assessment, and there's a working paper that shows those distributions and, you know, doesn't show any, you know -- Well, you could, I guess, decide for yourself, but, for that area, it's not, you know, obvious size truncation in recent years, just, you know, something to be concerned about, but, also, the sample sizes of, you know, numbers of fish sampled in the past two years were fairly low as well, and so we kind of have to be a little light on interpreting those.

There are certainly lengths that are available for the south, but they weren't provided from the assessment, and so they haven't really been a part of the assessment thus far, but we could, you know, look at some plots, that we could pull together for, you know, Thursday, or something if we wanted to look at that.

DR. SHAROV: But the group only looked at it with respect to the northern region, the one that was subjected to DLM, right, and so I wonder if anything that's available for the southern stock -- Because, looking at the graphs that we have on the screen here, the increase in the relative abundance, and we're translating this into the absolute abundance, is, you know, is substantial, and so we are almost approaching, you know, like unfished stock status, or lightly-fished stock status.

There would be an expectation of significant buildup in the size structure. That is, you know, normally, you would think that, with the reduced F, is that what we -- What is suggested to us here by the model, and increased biomass, there has to be an increase in the middle to the older ages, and, therefore, an increase in the average size, an increase in the, you know, proportion of the larger fish, et cetera, and so I was wondering if there is anything that's been picked up, you know, through at least incidental surveys, recreational catch information, et cetera.

It would be really helpful, because, currently, I mean, as the model -- Because of the way the model is, because the time series are stopping, or the indices stopping, in 2007 -- These very optimistic trends are very calming, but they have no support. Thank you.

DR. KLIBANSKY: Yes, and so let me just -- Just let me quickly clarify. I mean, those -- There are certainly lengths. I was just sort of saying that they weren't provided for the assessment, but, if you wanted me to try to pull some together for Thursday, and put some plots together, I could do that.

DR. REICHERT: I think that would be very helpful, Nikolai. Dustin.

MR. ADDIS: I'm just looking at this substantial increase that Alexei is talking about, and I'm wondering if it's because of the Fs were low, or has recruitment been very, very high. Is there any fishery reports that have anecdotal information about more young fish in recent years, or anything like that?

DR. REICHERT: Judd.

DR. CURTIS: I can look back on the advisory panel's fishery performance report. I don't have that information off the top of my head, but to see if any observations on the water indicate what you're describing. I'll get back to you on that.

DR. REICHERT: Steve.

DR. TURNER: Didn't Dewey Hemilright indicate-- I think he provided some information on mean weights, and scale weighted, you know, trophy fish, or something like that from the recreational fishery, perhaps showing an increase in size. I'm not sure about the latter part of it, but I think there was some of that sort of anecdotal information.

DR. REICHERT: Thanks, Steve. Genny.

DR. NESSLAGE: Thank you. Great job, Nikolai. Thanks for all your hard work. I'm having a hard time wrapping my brain around slide 17. This is the slide of the graph of fishing mortality over the years with the uncertainty envelope around it, and so, if the surveys end in 2007, and that was the last of the two surveys, right, and you can see the uncertainty bars around it tighten up when it has less information, just the information on the catch, correct, but the bars -- Excuse me. The confidence intervals don't really shrink until 2011, and that's what's puzzling me, because a production model should be production this year gives you biomass the next year, right, and so why is there that delay? I'm just having a hard time figuring that out. It's probably a simple answer, but thanks.

DR. KLIBANSKY: Okay, and so, just to clarify, so you're saying if we look at -- Like here, if we look at 2007-ish, that the confidence bands are -- I guess I'm having a hard time seeing what you're describing.

DR. NESSLAGE: Yes, so they're wide, right where you have your little cursor, but then they shrink in 2011 and years afterward, and like I would expect them to shrink when you lose the survey information, perhaps, but because I don't know -- Well, I should say that that could happen, but I don't know why there would be that lag.

DR. KLIBANSKY: Yes, and, I mean, because it does -- Because it looks like it doesn't happen until like 2010?

DR. NESSLAGE: 2011.

DR. KLIBANSKY: 2011. Sorry. Yes, and it's 2011. I haven't really -- I haven't really thought about that. I'm not really sure. I mean, you know, so these are confidence bands that are, you know, being estimated from the 2,000 bootstrap runs. I guess -- So, in my mind, I'm just sort of

thinking that those -- The predictions from the two models are sort of converging, and they're not converging until 2011 or so, and that's where we're getting those -- You know, when the confidence bands are going -- You know, are decreasing, but, yes, I guess I don't have a more -- A better explanation.

DR. REICHERT: Nikolai, this is Marcel, and so I may be interpreting this wrong, but then what you are saying, or implying, is that the large distribution earlier is mostly a result of the differences between the models, because they're -- They start -- They may be converging in 2011, and that's what strongly reduces the variability, or am I missing your point?

DR. KLIBANSKY: I mean --

DR. REICHERT: Dou know what I'm trying to ask?

DR. KLIBANSKY: I mean, I think so. I think most of the variability we're seeing is -- Well, we're seeing more variability -- A lot of the variability is during the years where we have the indices, and less so afterward, and, I mean, I guess I'm thinking it's just that they're -- You know, in the years that we have the indices, it's just reflecting the actual differences in the indices themselves, and then afterward we're kind of just looking at -- It's sort of characterizing uncertainty in a different way, because it's sort of just uncertainty in the predictions. I guess I haven't really thought about this too much. I'm not sure I have a good explanation.

DR. REICHERT: Okay. Alexei.

DR. SHAROV: Well, in 2011, there was a significant drop in the catch. It was the lowest catch in the time series, and, you know, obviously, when you have a very low catch, and there is no index, that you are -- You're uncertain, and your CVs are very low, and so it's not surprising that this is a very tight data point, but, yes, but I guess I'm a little bit confused. What are we bootstrapping here in the years, you know, after the surveys? You know, what is -- What residuals are bootstrapped to provide characterization of uncertainty for, you know, 2010 and later?

DR. KLIBANSKY: Yes, and, I mean, the bootstrapping would just be, I think, happening during the -- You know, during the years where we do have indices.

DR. SHAROV: Right.

DR. KLIBANSKY: You know, and so the ASPIC bootstrap procedure resamples from those, to basically construct bootstrap indices, and then it refits the model to those bootstrap indices, you know, and so I'm kind of guessing that this is a sort of net effect of those, some kind of convergence in the -- You know, basically the projections that are occurring after the end of the indices, and so there's nothing being bootstrapped after 2010, but it's just the resulting F trends, you know, from after the indices for each of those bootstrap runs.

DR. REICHERT: Thanks, Nikolai. That at least answers part of my question. Genny.

DR. NESSLAGE: Thank you. I'm still trying to wrap my brain around this, and I think I'm following your argument, Nikolai, but then I'm not understanding then why the uncertainty around the biomass would stay relatively uniform from 1985 to present. Wouldn't we expect to see a

similar convergence on -- Or is that because that's magnitude, and the Qs are so different for the two different indices, and what are the Qs, and what are the Rs? The R's aren't reported either, right?

DR. KLIBANSKY: I don't know. I'll have to look at the table. I mean, it partly might be -- The Rs aren't there, but --

DR. REICHERT: What slide is this, Nikolai?

DR. KLIBANSKY: I guess I don't have slide numbers on here, but it's close to the end.

DR. REICHERT: Okay.

DR. KLIBANSKY: I can dig up the Qs, but they're not in the presentation.

DR. REICHERT: Genny. I see some -- Kai.

DR. LORENZEN: Yes, and I think I'm trying to wrap my head around a similar -- I was looking for the Rs too, but I think this is parameterized, so that it estimates MSY and BMSY, and I was trying to work out the R, and, if I've done it correctly, it seems really quite large, which makes sense in the context of it seeming to increase very rapidly, and so I think maybe we should look at that a bit more.

I'm kind of generally -- When I give my students an index time series that doesn't do much, and that's the main piece of information that we have, then it's very hard to make something of that, and this seems like one of those cases, where actually we have a short index time series, with very little contrast, and then there's this one -- This mega removal, which seems to be just one year at the beginning of the time series, that probably is quite influential, and so I'm sort of generally a bit -- I don't know how to say it, but worried.

DR. REICHERT: Jim.

MR. GARTLAND: So, just to add on to that, actually, you're right. The indices aren't doing a lot, but, if you notice for the time period that we have indices, and it's on slide 7, the landings are going pretty much trending down consistently throughout that time series, but then, once the index stops, our landings do two things. They come up, and about half of them, or maybe more, is from a new, effectively, fishery, recreational, right, and so selectivity differences and all that.

That's just to say, if there is information, additional information, like length comps from the recreational, or even a simple nominal index that can be made out of that kind of stuff, it might be worth looking at, just to make sure that this increase that we're seeing at the end of the time series isn't just an artifact of the way the math worked out and that it can be backed up with some other source of information.

DR. REICHERT: I see people thinking around the room. Genny. Mike.

DR. SCHMIDTKE: Sorry, and, while people are thinking, I just wanted to respond to Dustin's question about the fishery performance report from earlier, and so we had comments from our

advisory panel members about the portion of the stock that is off of North Carolina, and then off of Florida as well, and the comments there both stated that blueline tilefish -- They didn't necessarily state any increase or decrease in the small individuals.

They said that there is a healthy mix, and they still see the smaller individuals that are caught by the fishery mixed in with the larger individuals, and so no size segregation, but they're still seeing the smaller ones. I would also point out that it's very likely that, even though there is no minimum size limit, not all of those smaller sizes are going to necessarily be exposed to the fishery. It's pretty rare to catch a blueline tilefish that's under say twenty-five centimeters.

DR. REICHERT: Thank you, Mike. Did you have your hand up? Sorry.

DR. LORENZEN: I was just wondering if there's any sort of index information, even though, you know, we know we maybe don't trust it very much, but I was wondering whether they tried to compile sort of index information for the period after that block where they decided that that's the only part of the time series we can trust, and even if it's -- You know, presumably, it must be possible to at least have some sort of nominal index for the period, since -- For those fisheries that would at least give us some information.

DR. REICHERT: To clarify, you mean extending the index that was used in the model, or are you talking about other potential indices that may be available?

DR. LORENZEN: I don't know. I mean, that data presumably is still available. It's just that, you know, because of regulation changes and so on, they decided not to use it, but I don't know, or that's what I understood.

DR. REICHERT: I have Chip, Alexei, and Jeff.

DR. COLLIER: I just wanted to point out the fishery performance report that Mike was referencing. I put that in the chat on the webinar, and so, if you go under the past reports, we have one from 2023 and one from 2019, and so you can look at that, if you want to summarize it for yourself, and see if you're getting a different opinion. I just wanted to make sure everybody knew where it was.

DR. REICHERT: Thanks, Chip. Alexei.

DR. SHAROV: I wanted to ask Nikolai. Nikolai, given all this uncertainty that we're facing, essentially, knowing very little about this period past 2007, other than removals, did you, or the assessment group, consider to test, or do the simulation testing the model results? If you were to continue the index, either of the two, into the future, through 2023, and assuming that the index has an increasing trend, which, you know, currently, the estimated biomass suggests that the population has been growing, or a declining trend, or was say at least variable within the range for which we have information, and I'm really -- You know, I think it would be really helpful to see how much the model results would change if we had information on the CPUE trend in recent years.

It could be either growing, or declining, or a variable within, you know, whatever range, but at least we could assume the range. You know, the current results are -- Like I said, they're very

comforting, in a way, and the tendency is to accept them as they are, because -- But I have no clue whether this model tells us the truth or not, and at least this simulation testing would have given us, you know, to what extent the model results would change if we knew what the CPUEs were, if we had an opportunity to measure them through that time period, and so sorry for being so long. Anyways, any chance that this was tried?

DR. KLIBANSKY: It was not. I mean, really, if you look at the time period that this assessment has been going on, most of the assessment -- Most of that schedule was, you know, looking at data, and assembling data, and topical working groups and stuff, and I think I basically assembled final versions of the data from all of the data, you know, somewhere in like in January, and then started doing some modeling, and then write the report, and so on, and so my goal was just to update what we had done in SEDAR 50, given the nature of this being an operational assessment, and so I didn't do that, but I agree with you that, you know, it's hard to know how far to take these results.

I think that's paraphrasing what you said, but I think what you're suggesting is, you know, if you were to kind of, you know, project an index forward at different levels, like you said, kind of increasing, flat, or decreasing, or something like that, and what would that look like, kind of to kick the tires on the model a bit, but we did not do that.

DR. REICHERT: Thanks, Nikolai. I may come back to that later. I have Jeff, and then Chris.

DR. BUCKEL: Nikolai, thanks for your work on this. I'm curious, and did you try a run without the indices, just the catch and effort? Can you do that?

DR. KLIBANSKY: I mean, no, I didn't. The effort wasn't really provided separately, and so --

DR. BUCKEL: Then, following up on Kai's question, did you try running it without the spike and these high landings that happened those couple of years, particularly the one year with the real high catch? I'm just curious if you tried it without that.

DR. KLIBANSKY: I didn't this time. I think we did that in SEDAR 50. I don't know how many of you remember SEDAR 50, but we tried about -- We tried a lot of different models, for various spatial areas, and this is basically a subset of all the stuff that we did. I know that we tried that in the age-structured production model in SEDAR 50. I think we also did it in this age-aggregated model, but I would have to look back. I don't remember it being as consequential as we're thinking of it being, but, again, that may be based on the age-structured production model.

DR. REICHERT: Before I go to Chris, Genny, to that point, and then Jeff.

DR. NESSLAGE: Thanks. We're having fun. This is great. I was looking at Figure 3.2 from SEDAR 50, and it was for the age-structured production model. I couldn't -- Maybe I missed it, and I couldn't find it. The alternative -- Excuse me. The alternative runs where the catch from that peak in 1992, I think it was, was reduced by either 50 percent or 10 percent, and it did -- The 10 percent one, obviously, had a big impact, and the 50 percent one, but this is, of course, the age-structured production model. I couldn't find it for the non-age-structured model, but, when we get to discussion, that was going to be one of my requests, and so I'll bring it back up then. Thanks.

DR. KLIBANSKY: Thanks for clarifying that, Genny. I haven't looked back into that documentation recently, and so we may not have, and so one thing that happened with SEDAR 50 was that we -- I wonder if that appeared during the CIE review, because the CIE review panel was very interested in the age-structured production model, and so we did a lot more with it then, and they were not as interested in the ASPIC model, but then the SSC actually, in the end, preferred the ASPIC models over the age-structured production model. Just a little SEDAR 50 history.

DR. REICHERT: Exactly. Jeff to that point, and then Chris.

DR. BUCKEL: Yes, and, just to finish up on my earlier comments, I just -- Building on others' pessimism, I guess, about this six to eightfold increase, based on the catch and then the biomass, I think, is a fourfold increase since the low, and so it's just -- Those are -- For me to believe that that's happening, having some other information, just to follow-up what others have said, anything else to support that would be helpful, and I did -- I know there's some fishery-independent, would be the South Carolina -- I'm looking at Marcel, and Marcel is pointing at Wally, but the -- I know it's been spotty, or if it's just off of South Carolina, but any indication from that spotty longline work that this is indeed, you know, a real population signal.

DR. REICHERT: Do you mean our short bottom longline?

DR. BUBLEY: Yes, and I can't remember exactly how we went about it, and where that was incorporated in 50. There are data there, but, as you said, it was really spotty. I mean, we would have a few years where we had funding, and we were more consistent, and we started to ramp it up, and then, I think in 2012, it just shut down for a few years, and so it was -- It kind of went up and down quite a bit. There might be some data there that might be useful, but it wasn't incorporated here.

DR. REICHERT: It seems like Tracey online, maybe with an answer to that question, and, Chris, I haven't forgotten about you yet. Tracey, I think you're unmuted on our end.

DR. SMART: Can you all hear me?

DR. REICHERT: Yes, we can hear you loud and clear. Go ahead, Tracey. Thanks.

DR. SMART: Yes, and so there wasn't -- The percent positive for blueline tilefish in the short bottom longline wasn't high enough to be used, recommended for use, as an index in SEDAR 50. We did -- We are missing years. We did have increased sampling in 2021 and 2022, and so we do have an index, that we're actually working on a publication, and that's in the proof stage right now, with indices for the blueline tilefish and snowy grouper, and so we can share -- You know, we're happy to share that, if it would be useful at all. They have been standardized, and so it sort of deals with the difference in sampling effort between the years, and as well as there are length and age compositions from that as well.

DR. REICHERT: Jeff.

DR. BUCKEL: Thanks, Tracey. That's great. Yes, I would love to see that, and I think others here would too.

DR. REICHERT: Okay. I see heads nodding around the table, and so we can talk a little bit more about how and when we can take a look at that. I'm just trying to wrap my head around how we can move forward, because -- How this can potentially be used as an interpretation for what's happening in the population, and so let's collectively think a little bit about that, that we're not, you know, going into a direction that may lead to nowhere. Chris, you've been patiently waiting. Thanks.

DR. DUMAS: Thanks. Thanks, Nikolai. This is great. I've got three questions. One is does anyone know, anecdotally -- Well, first of all, it seems that the removals in the region south of Cape Hatteras are driven by what's happening in Florida, and the big spike in removals in 1982 was due to commercial landings in Florida, and a big spike in removals in 2013 was due to recreational landings in Florida. Does anyone know, anecdotally, what happened in 2013 in Florida that spiked recreational landings? Okay, and maybe we can maybe we can find that out later, but if --

DR. REICHERT: Chip.

DR. COLLIER: I'll look into it in more detail, but, at that time period, Florida had a hundred-pound trip limit for blueline tilefish for recreational fisheries, and that got intercepted, I think, a couple times, and it shows up in the spikes in the data. They've since changed the catch limit, but I will dive into details of MRIP, just to see what was going on around that time period, to give you all some more information, I guess.

DR. KLIBANSKY: Yes, and I'll just jump in, and you might look at Matt Nuttall's working paper, you know about the MRIP landings, because I believe, you know, that the working papers that they put together often address spikes like that, and I seem to remember being in there, but I can't remember the details of it at this moment.

DR. DUMAS: This is Chris again. Thanks. That's great, and so we'll look at that. The second question is, when you were talking about combining the handline index with the longline index, you said you did not want to combine them because they had very different CVs, and they would be, in effect, weighted by their very different CVs. Why not allow that to happen? It would seem like you would want them to be weighted by their CVs. Why was that a bad thing?

DR. KLIBANSKY: Yes, and so, again, this is a discussion that we had a few years ago, about why we wouldn't want to do that, and my sense of it was that the CVs -- That sort of the scale of those CVs -- You know, we want them to -- Ideally, they would really represent the value of that index, but that, in practice, they don't really, that -- You know, we had that discussion.

I don't remember the details of why that was. I don't know if it was just, you know, the number of samples that went into it, but, basically, that's it, is that we didn't trust that those CVs really were a good representation of the truth value in those different indices.

DR. DUMAS: Okay, and so there was a discussion of that in the previous SEDAR report?

DR. KLIBANSKY: Yes, and I think, in particular -- I think it’s probably in the in the report. It may also be documented in -- Eric Fitzpatrick has left the agency since then, and he did a working paper on, or maybe a couple of working papers, on indices for SEDAR 50.

DR. DUMAS: Great. I'll check that out. Thanks.

DR. KLIBANSKY: But it is kind of a discussion we tend to have, you know, across our assessments, and why we end up sometimes upweighting index versus another, because we often will have an index that has smaller CVs, but we don't really trust it as much, and so we'll like to upweight a fishery-independent index over a fishery-dependent index that has, you know, tighter CVs, and the model wants to put more stock in it.

DR. DUMAS: Great. Thanks. Yes, and so I'll check that out in the previous SEDAR report. The last question is are there any abundance indices for other species, that are similar to these abundance indices, but where the indices for the other species have a longer time series, and those indices might be correlated, or significantly correlated, with these indices, and so then we might be able to use those correlated indices to sort of extend out the time series for these indices, and I'm not sure, and has anybody looked? I'll just put that out there for folks to consider. Thanks.

DR. REICHERT: Thanks.

DR. KLIBANSKY: I'll just say I haven't looked. I haven't looked at that. I mean, the one that would come to mind to look at would be golden tilefish, or just tilefish, depending on where you're at.

DR. DUMAS: That's what I was thinking.

DR. KLIBANSKY: Yes. I believe in the -- I think, in the tilefish assessment, the main index of interest, you know, that the model relied on, was the longline index. We could look at that, but I -- I'm not sure I would -- I'm not sure I would want to -- I think it would be interesting to look at. I don't know that I would expect it to be the doing the same thing as blueline.

DR. DUMAS: Thanks. That's all my questions.

DR. REICHERT: Thanks, Nikolai. One comment relative to the 2013 spike. I think I mentioned that, and several others have mentioned it also, and we always tend to look at the peaks, but, if you look at 2011, that's going the opposite direction, and so I know that may be part of that working paper also, and so, if you're going to take a look at that, let's not just look at the peaks, but also at low values.

DR. KLIBANSKY: 2011 was a closure.

DR. REICHERT: Okay. That makes that makes -- Thanks for reminding me. Any other comments, or questions? Seeing none. Nikolai, I hope you'll be able to keep joining us once we are discussing. We may have a couple of questions that come up relative to our discussions, but, before that, let's take a ten-minute break, and then we'll come back at 3:15. Thank you.

(Whereupon, a recess was taken.)

DR. REICHERT: Okay. Welcome back. A couple of things I think is important for us, as a committee. At the end, we need to provide a fishing level recommendation to the council, but it

was -- Also, we can come back to some of the projections, or potential additional model runs, on Thursday, and so also what I would like to do is what's the pleasure of the group, in terms of requests to Nikolai for potential additional runs, and then we can ask Nikolai if what we are asking of him is doable by Thursday morning, and so I want to make sure that we have that on the record, and so I would like to ask the committee.

We talked about a couple of different things that we potentially, or Nikolai potentially, could look at, and so I would like to open the floor to any of those recommendations, in terms of additional runs, or work, that we are asking Nikolai to do, so Nikolai can tell us what -- Whether that's feasible or not.

DR. CURTIS: Before we go to that, we have public comment.

DR. REICHERT: Yes, and thank you, Judd, and so Judd reminded me that, before we do that, we need to go to public comment, and so I'm asking anyone from the public to -- If there's anyone who makes want to make a comment before we go to the discussion. Do we have anyone online who would like to make a comment. Seeing none, let's move on to our discussion, and so, if you recommended anything during our discussion, please speak up, anyone. Is there anything that we need to ask Nikolai? Genny. Jim.

MR. GARTLAND: Are there any convenient data streams that can be used to make just a simple nominal CPUE index for recreational or commercial or longline survey? Just something that, again, that can be done in a relatively short amount of time, just an average catch per tow, by year, just to get a quick eyeball on a trend.

DR. REICHERT: Correct me if I'm wrong, and that is something you're asking that we can look at, and not as an addition to a potential model run?

MR. GARTLAND: Correct. Just something that, given the trends that came out of the production model, particularly in the recent years, when we didn't have indices, is there something that could just be put together that we could eyeball that would give us like a, okay, yes, I feel better, or like that's just going straight down, and is in total conflict with what we're seeing out of the production model, just to keep the heartburn down, and that's all.

DR. REICHERT: I can’t answer that, but, Genny, and Tracey provided us with a presentation of -- I think it's the work that they are currently working into a manuscript that looks at the short bottom longline survey for blueline tilefish, the historical and an expanded, and I have the slide in front of me. We just sent it to Judd, and so we can take a look at that, but I can tell you in -- If you look at the assessment model, in the period that that biomass increases, you don't see that happening in that index, but Judd will bring that up, and, Nikolai, I hope you can see that, and please feel free to comment.

DR. KLIBANSKY: I right now just see text.

DR. REICHERT: Yes, and sorry. Judd is working on it.

DR. KLIBANSKY: Okay.

DR. REICHERT: Because Tracey emailed it to Wally and myself. While we -- While Judd is working on it, would anyone else like to see additional sensitivity runs, or anything else? Genny.

DR. NESSLAGE: -- give us more potentially a more accurate idea of what the uncertainty in the stock status for this stock would be, and I guess I have a question for Nikolai too, and should I stop there and wait, and hold my question, or just go for it?

DR. REICHERT: Why don't you go for it, unless it's a completely unrelated, separate issue. Okay. Go ahead.

DR. NESSLAGE: So is there -- I've never actually used ASPIC. I've only created my own production models from scratch, and is there any reason why these three indices couldn't be put in the same production model? It's possible to do within a production modeling framework, but I don't know if Mike's code allowed for that, and then that may not be an update issue, and that might be -- It would feed into our research recommendations for the future, but just something -- A quick question for you. Nikolai.

DR. KLIBANSKY: So the sensitivity run that I ran, and maybe didn't explain it well, does include the handline and longline index, you know, in the same run, and so, yes, you can put a bunch of indices in one run. Is that answering the right question?

DR. REICHERT: Genny is thinking.

DR. NESSLAGE: Now I'm really confused. Maybe I misread things, and so, in SEDAR 50, to come up with the final -- What do you want to call it? OFL, and was it not an average of the two separate -- Run separately, the handline and longline index based run separately, or am I misunderstanding?

DR. KLIBANSKY: No, and it absolutely was, and the reason was that I didn't -- I guess I didn't explain well was that, when you put those two indices into the same run, ASPIC tends to fit the one with the tighter CV, which is the handline model, and so, when you do that it -- You know, basically, we thought it was overweighting the value of the data, you know, from the handline, you know, the handline index, and so there's different ways you could account for that.

You could just, I guess, you know, modify the CVs, and have them in the same model. We had lots of discussions about this, and that preferred method ultimately was to run them separately, and then average them, which actually was a ton of extra work on my part, but it would have been much easier to just use the one model, but we thought it was a better approach to have them separately, so that they're given equal weights.

DR. NESSLAGE: Yes, and I guess -- I just remember, and maybe -- I swear it was Mike, but maybe I'm wrong, and someone else who remembers him saying that you should -- If you have multiple indices in there, the one that -- If there's CPUE, the one that has the larger fishery should be upweighted, and I'm looking at the time series, and this isn't -- The time series of landings between 1993 and 2007.

After the first couple years, handline takes over. It's almost double, if not forty-times, the longline landings, and so it may not -- Even though those CVs may not truly reflect the total uncertainty in

those landings, it's probably not a bad decision to let the model put more weight on the handline fishery CPUE, just as a for between us. I'm not criticizing what you what you did, Nikolai, at all. This is -- You did exactly what you were supposed to do, but I'm just putting this down for our notes for our discussion. Thanks.

DR. REICHERT: When we're looking -- Thanks, Genny and Nikolai. Looking at this, you know, I want to remind the committee of the caveats here. This is data that is not peer reviewed just yet, and also not evaluated in a like a SEDAR or other framework, and so just a caution there, but this is what we were -- This is the trend that we were discussing earlier, and, obviously, there's -- There doesn't seem to be a signal of a significantly increasing biomass in the population. Kai.

DR. LORENZEN: Well, I was sort of eyeballing the same thing, and I would say there's an increase compared to the sort of 1995 to 2000, to the low thing. There's an increase that is sort of similar to what the model is doing until the sort of 2013 or so, and then that goes down as the model does and then the last -- At the end, I think it's not increasing as much as the model is projecting, but it's actually not that bad, I don't think, and so --

DR. KLIBANSKY: I can't raise my hand, and so I'm just going to shout out of turn, if that's okay.

DR. REICHERT: Chime-in, Nikolai, anytime.

DR. KLIBANSKY: Yes, and I just wanted to -- I'm curious, and I think this is the same survey that was used to develop an index that was used in the tilefish assessment. In the report, it’s just called the MARMAP longline, and is that different?

DR. REICHERT: That's a different survey, Nikolai. The golden, or tilefish, us using the long bottom longline. This is the same methodology, the same survey, that was used for snowy grouper.

DR. KLIBANSKY: Okay. Well, I guess I was just wondering how it how it compares to that, the, I guess, long bottom longline, in terms of precision. Just reflecting on the tilefish assessment, the model, I think, for tilefish kind of plows right through that index, just due to the uncertainty. Just thinking of like, you know, as we try to interpret the trend, or as you try to interpret the trend, and it might be -- If it's comparable, and maybe it's not. Maybe this is much more precise, and maybe they catch a lot more blueline than the long bottom longline catches tilefish.

DR. REICHERT: Chris.

DR. DUMAS: How is this abundance index shown on the slide that we're looking at now? How is that different from the handline and longline indices that were used? I missed that. Sorry. What is this abundance index based on?

DR. REICHERT: Sorry, and we should have mentioned that. This is a fishery-independent short bottom longline gear, a gear of twenty hooks that MARMAP has used for quite a while, but, in a large number of years, was deployed opportunistically.

DR. DUMAS: Deployed where, in the whole region or just off some state?

DR. BUBLEY: It's reduced. It's not as reduced as that long bottom longline survey that they were talking about for golden tilefish, but it is --

DR. DUMAS: I can't hear you. I'm sorry.

DR. BUBLEY: Sorry. It's reduced, in terms of not the entire region, but it's not quite as reduced as like that long bottom longline survey that Nikolai was talking about, and so it's predominantly off of South Carolina and southern North Carolina, and so it's not covering the whole region, but it is more than that, that previous one.

DR. REICHERT: Alexei.

DR. SHAROV: How many samples, or whatever, sets are we looking at here, on average? Is it, you know, 100, ten, 200?

DR. BUBLEY: Up until those last couple of years, most of the times, it was probably forty to sixty deployments. In 2021 and 2022, I think it was 120 to 140 deployments each year.

DR. REICHERT: Steve.

DR. TURNER: Was this presented to SEDAR 50?

DR. REICHERT: Off the top of my head, this was presented. This was a considered, but not used index, because of the sample size, if I remember correctly, but I -- You know, I don't want to extend this. I think it's good to take a look at that, in terms of whether or not the committee feels that that biomass trend is a real signal, or something in the model, something we talked about earlier, and so I think that's why this is shown. Kai mentioned that it's not that much different from what Nikolai showed us. The increase in biomass is significant in the model. Genny.

DR. NESSLAGE: So it's not that different just in trend, but, if you look at the magnitude of the relative abundance, if we were to put it in the model, it's doubling in the fishery-independent dataset, but, if you look at the predicted index, slide 14 of Nikolai's slide show, for handline, it's going from one to almost four. In longline, it's going from one-and-a-half to six, and so remember that it's a production model, and it's assuming that that index of relative abundance is -- Any change is relative to the change in the whole total population of biomass, and so we're talking about going from, you know, three-times, or four-times, difference, versus doubling.

It's going to make a big difference, even though the overarching -- If you were to overlap them without anything on the Y-axis, they might look similar. That's going to create a very different answer in the production model, unless I'm way off base, and, Nikolai, tell me if I'm wrong, which is where I just want to point out, and I'm backing up my own comments from earlier a little bit, because this is just a nominal CPUE, correct, coming out of the longline, or the bottom -- Was it standardized with the GLM or a delta GLM.

DR. KLIBANSKY: With a Delta GLM.

DR. NESSLAGE: Oh, it is? Sorry, and I missed that too. So this zero-inflated takes into account all the zeroes?

DR. KLIBANSKY: Not zero-inflated, but it's also the sample size is relatively small, and so there's not nearly as many zeroes in this gear as there would be with some of the other gears, I believe.

DR. REICHERT: Kai, I thought you had your hand up.

DR. LORENZEN: Yes, and so I agree with Genny there that sort of -- What I was saying, and I think that's still true, is it's behaving in a way that is sort of similar to the model up until the 2015 or so, but then that really steep increase that we're getting since then isn't really borne out in that particular index, and, also, I'm kind of concerned that -- Because then, when you project this out, it will project that, you know, this increase will continue, and so we're looking at these enormous increases in catch limits over the next few years, and that's really unrealistic, as far as I'm concerned.

You know, I think probably the last the last, I don't know, ten years or so, and I'm not sure what to what to make of that, and I'm -- But, also, I'm thinking, you know, okay, we have these this potential for an index that will come out of the data we were looking at here, and maybe in 2017, and was it SEDAR 50 or so, that didn't look like a really good index, because of the sample size, and so on, but now, if we don't have anything else, maybe it's becoming a better index, but, anyway, I'm sort of concerned about the implications for, you know, the projections into the future, because I think we're, you know, projecting things now that seem possibly wildly unrealistic for the last few years and the near future.

DR. REICHERT: So my question to the committee is how do you want to deal with that, once we start, you know, and we can go through the action items, but, at some point, we need to take a look at that and say, okay, then -- You know, we have this biomass estimate, and we have an uncertainty estimate around it, and how do we translate that into our ABC, and so please keep that in the back of your mind, because that's ultimately where we need to go. Jason, go ahead.

MR. WALSH: It sounded like people were talking earlier that length composition might help to confirm, possibly, the trajectories and is that something we could get?

DR. REICHERT: So you're saying seeing the length or age composition would be helpful?

MR. WALSH: Yes.

DR. KLIBANSKY: If I can just jump in for a second. During the break, I remembered that the most recent trends report -- SC DNR comes out with a trends report, and it has length information over time, and that's available to look at now, if people wanted to look at that, but I'm not sure if that's from the long bottom -- I think that's from the trap survey, actually, and so it's not a ton of lengths, but that's probably where I would have looked to get the length information.

DR. REICHERT: Thanks for that, Nikolai, and that trends report is actually in our briefing book. I think Wally is looking that up right now.

DR. BUBLEY: So, at this point, because it's been inconsistent, they hadn't been putting the short bottom longline in the trends report, and so there are some catches of blueline tilefish in the traps,

but they're typically smaller individuals, and small sample sizes, because they're on the shallow end of their distribution.

DR. REICHERT: So the trends report may not be much of a help, because of the location and the gear type. Nikolai, do we have, or, anyone else, do we have some information on length and age, as Jason, and I believe someone else mentioned earlier, that is easy to pull up and we can take a look at for possible changes?

DR. KLIBANSKY: I would have to look to see what I have, because it wasn't provided for the assessment.

DR. REICHERT: Okay.

DR. KLIBANSKY: You know, to sort of just dig into my data closet.

DR. REICHERT: Yes, and would that be possible to show us on Thursday, maybe?

DR. KLIBANSKY: I'll see what I can pull up.

DR. REICHERT: Okay.

DR. KLIBANSKY: You know, with caveats, of course, given that it's data that I'm pulling up, you know, on sort of short notice.

DR. REICHERT: Thank you. Any other requests we have for Nikolai to help us ultimately come up with an ABC recommendation of additional runs, additional sensitivity runs, at this point? We may -- During our discussion later we -- There may be additional requests, but seeing none around the table. Alexei.

DR. SHAROV: I don't know how much flexibility Nikolai has, I mean, given the TORs, right? I mean, I would certainly be extremely interested in seeing what the model results would look like with the fishery-independent survey, that data that we looked at just a minute ago, but it was not in the terms of reference, and can we ask him at this point to do that?

I think for us trying to groundtruth, or at least to get some idea of what is actually happening to the stock, that would have been extremely useful, but, you know, I understand that there is a process in the place as well, and so I don't know where the limits are, but, looking at this plot, you know, I think it is -- You know, it should be clear to us that the level of uncertainty that we currently are, you know, being presented, and it's only sort of a measure of uncertainty back in the, you know, 2000s, and essentially projected forward around the trend that is driven exclusively by the information on landings, and nothing else, and there is much more important process uncertainty that we're not addressing here as well.

It's not the analyst's, you know, fault, obviously, right, and it's just, you know, we're limited by the model, and we're limited by the data stream that we have, and so, if the actual trend is totally different, you know, we might be making absolutely wrong conclusions, and, with this information that we have, we have no ability to discern, you know, the good one from the -- You know, the wrong one from the right one, and so I think we -- With the exception of the, you know, additional

sort of reviews of something like that the fishery-independent survey CPUEs that we looked at, and that really helps to get some idea.

The trends in the recreational catch that I've looked at gives me some idea what was happening with the catch, and, you know, whether it supports like a significant increase in the population biomass or not, et cetera, but, as it stands by itself, I think that the uncertainty is underestimated, and it doesn't offer us much with certainty on concluding what the status of the stock is.

DR. REICHERT: Thanks, Alexei. Anyone else? Genny.

DR. NESSLAGE: I'm confused. Do you want us to brainstorm right now, or do you want to wait?

DR. REICHERT: Well, what I would like to do is, if there are any additional -- If there are any additional requests that we have for Nikolai, let's come up with them sooner rather than later, and there may be others that we may come up with later in our discussion, but, based on the conversations we've had so far, if anyone has anything that we would like to ask Nikolai, please bring it up now, and so that's -- Genny.

DR. NESSLAGE: I have some ideas, but, recognizing that we may need to prioritize, and/or it may -- Nikolai may not be able to do all this, and so I'll just put my ideal wish list out. The first would be if it's possible to run an alternate run with just the bottom longline, just to see. Did I say the right thing?

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

DR. NESSLAGE: Short bottom longline. Thank you, and I would love to see all three indices together. The other thing I would really like to see, to help me make sure -- I agree with you on the uncertainty envelopes tightening up in 2011, and it would be just the -- I couldn't find it anywhere in the reports, where you just plot the estimates for each of the of -- Sorry, but the time series of estimates on top of each other, and they get -- You show the mushed average, and I shouldn't say "mushed", but the averaged time series, but not the individuals on top of each other for the F's and biomass, and so I'm not saying that well.

The alternate run -- For each of the three alternate runs, if you could put it like on one graph, the F trend, then a separate graph with the biomass trend, and then, if you end up doing the all three together monster model, that the F and the Bs on top of that too, just so I can see where they're -- If they really are all converging in that same timeframe, and therefore the uncertainty envelope shrinking in 2011-ish makes sense.

Plus, I think it would be an informative graph, just for everyone to see how they're performing, or what they're suggesting, what each time series is suggesting, and just what -- If it's possible, and, I mean, you can eyeball what the Rs are, just by looking at the FMSY estimates, but if those could be reported, and the Qs, that would be great too, but that would be like my ideal, and I recognize that may not be doable this week. Thanks.

DR. KLIBANSKY: Let me just -- Let's just respond for a second.

DR. REICHERT: Absolutely.

DR. KLIBANSKY: I feel like having a new index that, honestly, I haven't seen until today, to me feels like outside of this process, and so I could do it, but I'm sort of surprised that that's coming up. Also, looking at the map of where that survey operates, it's pretty -- It's operating in a pretty different location than where most of the catch is coming from, and so that might be a concern, and so most of the catch is coming from Florida, and that survey is indexing, you know, mostly off of South Carolina.

DR. REICHERT: Nikolai, I absolutely understand, and I think that's kind of what Alexei was mentioning earlier. You know, we have a terms of reference, and this was an index that was earlier not used, and so that -- Genny had her hand up, and so please respond.

DR. NESSLAGE: Yes, and I totally get why you might be squeamish about bringing in a new data source for an operational. I am too. The reason why I'm even suggesting it is because, as Alexei indicated, our job as the SSC is to figure out what the scientific uncertainty is, in order to set management advice, and, right now, the handline and longline indices are, as you just said, going to be weighted mostly towards where the fishery is in Florida, in general, and I know you're using all of the data for the South Atlantic, but it's going to be weighted towards Florida.

You could -- It's the opposite of the short bottom longline survey, which is going to be weighted towards South Carolina, and so we don't have an index for blueline that represents the population, and so what do we, as an SSC, do then to try and characterize uncertainty and set ABCs, and so I think what we're trying to do is add some of that process, or I guess observational -- It's both, really, right? Into this to try and characterize the true uncertainty, and get a better ABC, and not to try and say this is the best thing we should do, if this were a research track assessment, but to try and -- You can still say that the base run is this or that, but for us to be able to try and say what the true uncertainty is, to set the OFL, I think we need something more, and this provides an alternate reality that's not unreasonable.

It's just from a different part of the stock that's saying something different, and so it's a what if the whole population is trending more like South Carolina than Florida, because, as you've said, and I agree with you, having seen it for both golden and blueline now, that those handline and longline CPUE indices no longer represent trends in relative abundance from 2007 forward.

I agree completely with that, and so, if that's the case, then what are the trends in abundance for this stock, and, without knowing that, we can't rely on a production model, and so, honestly, from my point of view, if we can't try and get a realistic envelope around what the uncertainty is coming out of this assessment, I wouldn't have much -- Put much faith in this model, even though I think you've done a bang-up job, and so thanks, Nikolai.

DR. REICHERT: I'm struggling with this, because we've gone through this -- We have gone through this rabbit hole before, while, during the SSC meetings, we come up with, you know, other interpretations asking for additional runs, and I don't want to end up with another lengthy discussion on Thursday, and, also, we have to keep an eye on the terms of reference and the decisions that were made in previous assessments, and so I want to be very sensitive to that. I saw Erik put his hand up. Erik, go ahead.

DR. WILLIAMS: Yes, and I was going to speak exactly to that point, Marcel, that, you know, recognize this is a SEDAR assessment, that went through a process, had terms of reference, went through topical working group meetings, generated a report based on this model construct that was decided in SEDAR 50. In a sense, this is what you get, in terms of making your decision.

If we start to go too far down the road of throwing more data at this, and, actually, even rerunning the model I think is outside the process. I mean, maybe others have a different opinion, but I think rerunning the model at this point would be outside the process. Rerunning projections, that's fine, because it's still based on this base model that was vetted through the SEDAR process, but I think going down the road of alternate assessment runs really runs afoul of that process, and I think then you're down the path of either going back to the drawing board, and asking for a new assessment, or just, if you're that uncomfortable, rejecting this assessment.

DR. REICHERT: Thanks, Erik. So anyone to that point? One thing we can do is go through our review action points and see where that leads us. In the meantime, still, I want to -- Well, I guess point number one, or we will probably very quickly get to the decision, in terms of how and if we can use this to formulate fishing level recommendations to the council.

In the meantime, I think what I'm hearing from the committee, and correct me if I'm wrong, is that there are some concerns. The main concern is the magnitude and the direction of the population biomass, and so keep that in the back of your mind, because, as I said earlier, that's ultimately probably going to be the basis of our recommendations, and so a good plan?

The plan is to go through the review assessment bullet points that Judd put up there, and then we can see where that discussion leads us, and so, the first bullet is does the assessment address the terms of reference to the SSC's satisfaction? Anyone disagree with the fact that it addresses the terms of reference, and the terms of reference were in the briefing book, and so the consensus is that this addresses the terms of reference? I'm seeing nodding around the room, and so that's our consensus.

The next question is does the assessment -- Is the assessment consistent with best scientific information available guidance and practices? I will open the floor. We discussed the uncertainties, but do we feel that this assessment is the best scientific information available, given the information that went into the stock assessment? Genny.

DR. NESSLAGE: I appreciate that there's not a lot of information available, the IA part of it. I don't know that it's best practice to run a production model with that many years of no indices, and so, even though I respect the fact that that's exactly what Nikolai was asked to do, and so this is not Nikolai's fault, by any stretch of the imagination, but it's just a general best practice that I would not do this, and I don't think there's any evidence in the performance evaluation literature for surplus production models would suggest that this is a good approach.

DR. REICHERT: Alexei.

DR. SHAROV: I'm not sure if I clearly heard everything that Genny said, but I think that we agree. Just the -- Here, we're exceeding the limits of what the surplus production model can offer us. So, in this case, unfortunately, we're in the position where it is not helpful, and it's not informative.

DR. REICHERT: Helpful and informative to the SSC to develop fishing level recommendations.

DR. SHAROV: Right. Based on -- Yes, to develop recommendations based on the model results, and based on the projections that come out of this model, which at this point becomes so uncertain that we have no confidence in those estimates, and so, yes. Unfortunately, I don't like it. I mean, I don't like saying this, right, and I don't want us to be in this situation, but it looks like the poor alternatives that we may have, the menu of DLMs, et cetera, or whatever else, might be at least -- May have more reasonable assumptions and consequences than this. If somebody could argue against this and still, you know, offer that the results of this particular model are useful, I would be happy to hear that, and hopefully agree.

DR. REICHERT: So this -- I may need people to help me with my recollection here, and so this is the same model that was used in the previous assessment, and we accepted the previous assessment, correct? Genny. What I'm asking is in terms of justification and, for the SSC, is what made us feel less confident about this model than the previous assessment, and what is different? Genny, and then Kai.

DR. NESSLAGE: The number of years now has --

DR. REICHERT: Fred, we have you online. Okay. Genny, Kai, and then Fred. Sorry.

DR. NESSLAGE: Sorry if I jumped in. The number of years now has increased, right, with no indices, and then you add onto that projections for the ABCs, and now you've got even more years without indices. At some point, when do we say no, and so it was more of a hope that we would eventually get a new fishery-independent index in there, and the placeholder is how kind of how I felt at the time, but, obviously, that that hasn't -- You know, we have an operational assessment, and no interest in adding indices this week, and so I think we're kind of at the point where I'm feeling really queasy about it.

DR. LORENZEN: Yes, and I don't have much to add other than that. I think, you know, not only is it the number of years, and like was it thirteen now, or so, but it's also the fact that the model thinks that there should have been a big increase over that that period of time, and so we're not looking at something that has been -- Is sort of projected to be stable and not much change, and, if we had indices for this period, it would actually allow us to estimate those parameters a lot better probably, because there would now be contrast in that time series, but we're, you know, projecting out of -- You know, modeling out from a short time period, where there hasn't been much, much contrast, and we're doing that now thirteen years away from any actual index data.

DR. REICHERT: Thank you. I mean, this is important for documenting the decision here. Fred, go ahead.

DR. SERCHUK: Thank you, Chair. I think we have to look at the terms of reference that we've been provided, and, if we want to deviate, or we want to suggest other things that have been looked at, I think we need to really look at -- You know, update the approved SEDAR 50 Atlantic bluefish tile model with previously provided data, adding all new and recent available data sufficient for use in a stock assessment, data providers, and so on and so forth.

I think we have to relate any of our concerns at this point to what the terms of reference were for the operational assessment. Other things that we're recommending I think may be outside of this, and so I think we have a process here that, if we're going to highlight issues that are outside the terms of reference, we have to be very careful in doing that, and give a really strong recommendation why now that we're adding something that wasn't in the terms of reference. Thank you, Chair.

DR. REICHERT: Thanks, Fred, and I correct me if I'm wrong. I assume that you were addressing the point we were making earlier, or not necessarily what we just put on the board, correct? I just want to make sure I understand.

DR. SERCHUK: I just want to make sure that we're not being so critical of assessment by bringing in sources of information that should have been looked at that were not part of the terms of reference for the operational assessment. Thank you.

DR. REICHERT: Thank you, and I agree. Amy, go ahead.

DR. SCHUELLER: Thanks. To that point really, and, I mean, we had a discussion about this before it went on the schedule, and the SSC had recommended not to put it on the schedule until the new survey was available, and we cited all of these things that we're saying right now, and so I don't think this is news. I think it's like we could probably cite our old, you know, minutes from one of the other meetings that we had where we discussed this. I don't -- I don't know if you guys -- I don't remember when exactly that was, but we did have this conversation already.

DR. REICHERT: Yes, and I think, Amy, that was after the subgroup of the SSC reviewed the -- That was after we reviewed that the new longline survey. Thank you, and I agree with you. Anything else relative to this bullet point? Is there any other any other things we should document to support that statement, and, again, we can come back to that. Dustin.

MR. ADDIS: Are we suggesting the surplus production model is not an appropriate modeling platform to use for this assessment, and, if we're saying that, what would be more appropriate to use?

DR. REICHERT: Steve.

DR. TURNER: It seems to me we're saying that surplus production may be useful with longer-term indices of abundance, and we're expecting that in a year or two, I think, with the fishery-independent survey, and, if we previously recommended to the council that they wait on doing this assessment until we had sufficient data, I think this is a reflection of the difficulty of the choice that was made to try to do an assessment on an index of abundance that's fifteen to twenty years old, and only catch after that is quite -- It leads to huge uncertainty, which is what we're dealing with.

DR. REICHERT: Chip.

DR. COLLIER: So a couple reasons why this was asked for. One, blueline tilefish has been exceeding their ACL, both commercial and recreational, for a number of years, and so, with them exceeding the ACL, there is concern that they could be getting into that range where they might

be approaching overfishing. In fact, one year, overfishing was occurring. It was mainly due to some of the recreational landings, but, yes, that's definitely a concern that's been going on for this population since the terminal year of the of the assessment.

Then, if you look into the terms of reference, it does say add all new and additional information that is appropriate for this assessment. It did not constrain them to say you can only use indices of abundance from the previous assessment. If there's information that could have been used to support the conclusions of this, I think it should have been included. I agree with you that it's all very concerning that there is not much information for you all to make a decision on. There's no index of abundance. There's nothing additional that was provided, but we were pretty vague, and pretty loose, on the terms of reference, based on the guidance of the SSC trying to get as much information as possible.

DR. REICHERT: So where does that leave us, because I think Dustin made a good comment, and I think it's good to clarify that, as the committee. I'm not sure if we should -- If we can provide an alternative, because that's not -- Currently not that -- We can capture that under like recommendations, or research recommendations, or what to do with the next assessment, and that also goes back to what Amy just mentioned, and we hopefully will have a new fishery-independent index that can be included, but where does that leave us now? Fred.

DR. SCHARF: Marcel, just a question for Nikolai, if he's still there, and a point of clarification. In SEDAR 92, near the very end, it says, for the northern region, the analytical team applied the same suite of data-limited approaches applied in the southern region, and so what was the DLM tools analysis applied in the southern region, and was that evaluated relative to the results of this model, in terms of catch level recommendations?

DR. KLIBANSKY: Fred, I'm here. You may be -- If you're looking at the SEDAR 92 report, that may be some vestigial text. I didn't -- I didn't apply any DLM approaches to the south, but, in SEDAR 50 we applied, you know the same sets in both places, and, if that's in the report, that's an error that may have left -- You know, I started with the SEDAR 50 report, when writing the SEDAR 92 report, and so it may have been something that, you know, was left in there.

DR. REICHERT: Thank you. Nikolai. Back to my question for the committee. Are we saying here -- Can you increase that font a little bit? Is the committee saying that we cannot use the outcome of this assessment to provide fishing level recommendations to the council? I would like to hear from the members. Alexei, Genny. Genny. Alexee.

DR. NESSLAGE: Thank you. I think the model, as-is, I don't think should be used. Personally, as I've mentioned, I think there are things that could be done in the next couple days to remedy that, and potentially convince me that this could be used, but, if that's not doable -- I'm not sure why. It's a production model, and it shouldn't take too long to run, but I recognize there are other things on folks' plates, and so -- But, if not, I -- I don't -- I would not support using it.

DR. REICHERT: Alexei.

DR. SHAROV: Well, by the design, by the idea, of a surplus production model, you have to have either the corresponding effort with which this catch was derived or the relative index of

abundance. If you don't, then your model is not working, and it hasn't been working for ten-plus years, and so it was just translating the past information into the future.

Would we have approved the statistical catch-at-age model run through 2023 if we had no age information since 2007? Well, then make your decision whether you would agree with this is the best scientific information available or not.

DR. REICHERT: I see people nodding. Anyone disagree with that? So, in essence, we are rejecting this assessment, the outcome of the model, unless things can be remedied, Genny, and do you feel that the runs that you are requesting may remedy, because they are not addressing the concerns that Alexei just raised.

DR. NESSLAGE: If we could include that alternate index, it would provide -- What is it, 1995 to -- Sorry, and what were the years on that index? It's almost thirty years of data, toward the end of the whole time series, and that would totally address Alexei's concern, and my concern, and so I think -- I hate to see Nikolai's time wasted, having done this.

DR. REICHERT: I agree, but, also, you know, we also need to be sensitive to the comments Erik Williams just made, and, you know, we can certainly recommend this, and I mentioned earlier that data that we showed you has not yet been fully evaluated, and so that's a that's a caveat there, also. Wally.

DR. BUBLEY: Yes, and I will say, with that index though, is that it -- I mean, there are shortcomings with it, and, I mean, I think the only reason it's being looked at is because there's nothing else, but, outside of the last couple of years, where we increase the effort and increased the -- Expanded the range of it, and it's still a relatively small area, and very inconsistent, in terms of sample size, and so it's -- It's there, and, I mean, it's better than nothing, but it's definitely -- It has got its drawbacks.

DR. REICHERT: Erik, I show your hand up. Go ahead.

DR. WILLIAMS: Yes, and, to that point, the SEDAR 50 report will document that we examined all the fishery-independent data during that assessment, and came to the conclusion that none of the fishery-independent surveys sampled sufficiently to be used to produce a meaningful index of abundance, and so, yes, that's documented in SEDAR 50.

DR. REICHERT: Thanks, Erik. Alexei.

DR. SHAROV: I have a question for Nikolai, and I didn't see all the supporting documents for the assessment, but I wonder if there was any information on the recreational CPUE that was supplied through this update, or looked at, and so, you know, I could quickly look at just the time series of landings and like, just taken together, say for the South Atlantic, they seem to just fluctuate, you know, within about the -- You know, about the same sort of level of removals with, you know, being zigzag, and so with ups and downs.

This is not a frequent species that is intercepted, but, nonetheless, I think, when people go on trips like this, they are likely to report this species as the target species. You know, like, when you go

on a trip, and you interviewed your -- You mentioned, you know, whether which was your species target number one, and number two.

With this fishery, it's likely to be a target, and so my point is was there any attempt, or was there an opportunity, to attempt to calculate recreational CPUE, given the MRIP data, which might, again -- I assume it should have been looked at, and, if it's not presented, that's most likely it wasn't produced, or it couldn't be produced, but I wonder if there is still an opportunity for that, and not between now and Thursday, and I understand, but, Nikolai, was there anything of that sort available?

DR. KLIBANSKY: You're asking if we looked at developing an MRIP CPUE index for this assessment?

DR. SHAROV: Yes.

DR. KLIBANSKY: No, and I guess I would have to look back at SEDAR 50, to figure out if that was even considered then, and it definitely obviously wasn't -- You know, there was a headboat index that was considered and run in some of the SEDAR 50 models, but ultimately was not used, and, you know, there was a bunch more sensitivities where we included the headboat index, and models with the two fishery-dependent commercial indices, but it was not -- It was not preferred, and I don't remember the details of why, but we didn't look at that.

I mean, partly, you know, we -- You know, I think they put this assessment in the schedule, and we looked at thinking about what could be done, and based on, you know, our knowledge of the available indices, and what had happened in SEDAR 50, and thinking about what would be -- You know, what you would update in an operational assessment, you know, we put together the schedule and developed the topical working group for landings, and so, based on what we knew about the data from SEDAR 50, there wasn't an effort put into, you know, developing new indices. I think likely because, you know, we're all anticipating the results of the SADL survey, which is, you know, ongoing, and we have a few years of, but not enough to use for an index of abundance, just to provide a little bit of background on why we use the data that we used, but, to get back to your original question, no, we didn't look into an MRIP index.

DR. SHAROV: All right. Thank you.

DR. KLIBANSKY: I think we have rarely used MRIP indices in any of our current assessments, and I'm not sure, but --

DR. REICHERT: Thank you, Nikolai. All right, and so let's take a ten-minute break, and, looking at the agenda, let's -- Judd and I and Wally will talk a little bit. We need to be sensitive to Dr. Jen Loch's time. She's here to present the SMILE project. She won't be here tomorrow, and so let's take a ten-minute break, and, when we come back, I'll have a suggestion to the committee, in terms of how we proceed this afternoon and how and when to pick up the blueline tilefish discussion.

For now, Nikolai, thank you so much for all your work and answering the questions. I'm not sure what your time commitment is, and we may talk with you on Thursday, but we may get in touch with you later, if we resume this blueline tilefish conversation. Okay. Let's take a ten-minute break, and then we'll come back at 4:30.

(Whereupon, a recess was taken.)

DR. REICHERT: Welcome back. The current plan is we move to Agenda Item 4, SMILE Methods and Data Products Updates. After that, we'll briefly come back to blueline tilefish and see if we can make a couple of decisions, and based on that -- That should not be a very -- I hope that's not going to be a very lengthy discussion, because we have to give -- If there's anything we want Nikolai to do, we have to give him guidance today, so that he has some time to do that. We cannot wait until Thursday morning.

You all have taken a look at the agenda. Tomorrow, we have black sea bass, which is another very simple discussion tomorrow, and so that's why I would like to come back to blueline tilefish today and see if we can provide some clear guidance, and so, with that, I'll hand it over to Chip. Chip, go ahead.

SMILE METHODS AND DATA PRODUCTS UPDATE

DR. COLLIER: Thank you, Marcel. I'll give a brief introduction to this project. The South Atlantic Fishery Management Council gets, or has been applying for, a grant through the Coral Reef Conservation Program, and, when we did our most recent grant, we had included this project here. It's called SMILE, Size Matters Innovative Length Estimates, in the request for proposals.

It was funded, and so we've been working with REEF, as well as the other partners that you see up there, in order to do this citizen science project, and so what we want to do, before this project wraps up, is we would like the SSC to at least see the information, see the proposed methods that are going to be used to potentially analyze some of the length, and make sure that we're on the right path.

You know, not saying that we're going to have these finalized, and Jen is, obviously, going to be showing some preliminary information here, but we want to make sure we're on the right path as the final product gets developed. Hopefully it's going to have everything that you all recommend in there, and it's going to be a robust dataset, and the reason for this is prior to -- The grant is going to end prior to your next meeting, and so we want to make sure we're on the right path. Please give any guidance along those ways, but I think this is a very intriguing way to use citizen science and maybe collect some length data from some fish, at least down in south Florida, and so, Jen.

DR. LOCH: Thank you, Chip, and thank you all for your time, especially at the end of the day, and so that was a great overview, just kind of a higher-level overview of the talk and about the project so far, and so, yes, we've been partnering with the council on this, along with all of the other crucial partners, for the success of this project that you see on the screen, such as our data management partners, the NOAA CRCP funding that Chip mentioned, and at UC San Diego and Scripps Institute of Oceanography, who do a lot of the camera -- They basically do the camera development and the image processing development on the backend.

First, I would like to introduce who we are, as REEF, and then I'll get into the SMILE project, and how we kind of fit into this project, and then leave some time for discussion with you all to get that feedback that Chip mentioned.

REEF stands for Reef Environmental Education Foundation. We're an international conservation organization that organizes and manages the largest marine life sightings database in the world, and this is a fish-based database, and so it's kind of akin to doing bird watching with Audubon, so to speak. We do this with fish, and our mission is to help preserve marine biodiversity, through engagement with the public, citizen scientists, education, and scientific partnerships, such as this one.

We do that using recreational divers, which have historically been an underutilized source of data collection, but can be a really valuable source to help fill some of these important data gaps, for especially data-limited fisheries and so, in this image, it just shows a worldwide map of where fish surveys are performed. For the focus of this project, and this talk, we work within that yellow region, in the South Atlantic region, but it predominantly covers the tropical western Atlantic.

What REEF is best known for is its volunteer fish survey project, which is in its thirty-first year, and it basically works by training citizen scientists in fish ID in the different regions that they would be performing a survey, and they do this through the roving diver method, where they assess relative abundance and diversity of fishes throughout the duration of their dive, and so they'll go around, and they'll identify different fish species, and then they categorize their relative abundance, based on four bins of single, few, many or abundant, and they would supply this information into an online publicly-available database, and we also classify those surveys based on novice surveyors or expert surveyors.

People would work their way up through their fish ID, with trainings, through the number of surveys, as well as being tested on their fish ID knowledge, and so this infographic just highlights some of our work. We have a membership of over 85,000 citizen scientists. Of that, there are 17,000 active surveyors, and, in our thirty-one-year history, we've produced over 300,000 reef fish surveys.

This has been contributed to over 130 scientific publications. As I mentioned, these are publicly-available data, and, here, I just highlight some of the main publicly-available products, but you can also always reach out to our director for more specific datasets, but it reports relative abundance and diversity of all fishes that that diver encounters, and you can summarize reports based on a geographic region. You can also report them based on the species, and so some of those metrics include density, and, for our purposes, it's a measure of how many individuals are reported in one of those bins of abundance, and so, in the equation there, the “S” stands for single, “F” stands for few, “M” is many, and “A” is abundant, divided by the total number of surveys for that species.

We also have a sighting frequency metric to measure how often that species is observed, and so how many times that species is reported over the total number of surveys. There's also abundance scores, which is a metric of sighting frequency and density, and, again, they report novice versus expert surveyors, and so data can also be filtered. It can be filtered by location and species, as I mentioned, and divers also report their dive metadata, and so they would be giving us information on things like visibility and current, predominant benthic habitat, how long their dive was, and those types of things come along with the fish surveys.

As I mentioned, we have a really long history of doing this, and it's been contributed to many scientific publications, but I want to highlight one of those that came out last year, which is

specifically looking at the success, basically, of the REEF surveys to track reef fish populations relative to professional methods.

In red is the REEF surveys, and then in blue is the NOAA reef visual census, or RVC method, tracked over time, and so there is a lot of agreement between these two methods. They did this for eighty-five species, and so this is just highlighting four of them.

There is some variability between species, and, actually, that's kind of expected, based on these methods, and so we see that the REEF surveys actually tend to capture cryptic species a little bit better, whereas the RVC method might capture the more conspicuous species a little bit better. However, the good news is that there is the highest agreement with the large-bodied solitary species, which tend to be of fishing priority or, you know, management priority.

I think I borrowed these items from Julia, just to kind of highlight how this REEF history, and this SMILE project that I'll get into, really fits into what the citizen science group at the council is doing, and so it meets a citizen science research priority. REEF has this really long history of doing exactly that, with a citizen science approach, while addressing needs for fisheries management and assessments, particularly for data-limited species, is the area that I've highlighted on this figure, and how we can contribute to some of these data gaps.

I certainly don't need to tell this audience how important size data is for fish, and, while REEF has been doing a great job over time collecting data on relative abundance and diversity, we actually do not collect size data, and so this is a method for us to do that, because we know professional length estimation methods can be really resource-limited, and, also, if it's a fishery-dependent method especially, it's really limited on species and sizes.

If we task our divers who are out there all the time, on various reefs and in other regions, that are already collecting data, can they do a little bit more for us, and so SMILE, Size Matters Innovative Length Estimates, is an in-situ tool that citizen scientists can use to collect fish measurements using a camera, and so the goal of this is to complement the existing reef fish survey, and it also doesn't require that people become experts in fish ID, because we're only asking them to do this for like a dozen species. It will also improve future stock assessments, hopefully, for these data-limited species, by giving you guys some size data that may be needed, and help to inform your management and conservation efforts.

The way that we do this is with the Fish Sense Lite camera, which, for our listening audience too, I have one in my hand, but it's on the screen. This is using an Olympus TG6 camera, which is what's inside this housing. This is a typical, commonly used camera. It's an easy-to-use camera. It's point-and-shoot, and so it really requires very little training for a diver to use it, and we've slightly modified it by -- Well, we keep it in its typical underwater housing, and then we have a wide-angle lens, a detachable wide-angle lens, and we hope to eradicate the need for that in the future, but, right now, it's to reduce distortion on the edges of the images.

Then the highlight of it is our laser that is in a mount on the camera, and so this is in a known fixed position on this camera, and the camera, the housing, and the lens are all calibrated with each other, and so our engineers at UC San Diego and at Scripps know that relationship between the laser, the camera, the lens, and so forth.

The way that it works is we provide some brief training to our citizen scientists. We have webinars, and so we don't even need to be in-person to do the training, which talks about how to use the camera, the camera settings, because it needs to be in burst mode, so that we can capture multiple images of each fish, to build our most accurate length estimation that we can.

They get training on the species and best practices for use, and then, before citizen scientists take it out on their dives, they're just kind of given a brief dockside introduction to using the camera, and handling it, before they're underwater, and they report that it takes about one to two dives getting comfortable using the camera, but, ultimately, the images that they collect are always still useful. It's just for them probably capturing more images, with the more dives that they do it on, because of like getting used to tracking the laser on the fish.

It's kind of like playing laser tag underwater with fish, and it kind of makes a dive a little bit more interesting. We ask that they get the laser as lateral to a fish, and central to their body as possible, but it doesn't have to be perfect, and it is a moving target, and so it's never going to be perfect.

It has been used by citizen scientists to collect images of eleven target species, that I'll get into, and then for, you know, pilot testing this tool, we pair it with stereo-video cameras, which are a dual GoPro system that work with, you know, like triangulating, just like your eyes do, to estimate length with the Event Measure software, and so we do this on what I call paired dives, where somebody with a stereo-video follows somebody with a SMILE camera, to get the same fish in the same frames, in the same images, as well as on roving dives, so we can compare length frequency distributions between the two camera systems, and, for a known area, we do thirty--meter belt transects, but, for the data that I'll show you for preliminary data, I'll just focus on the paired dives.

This has been focused in the Florida Keys for this project. We have a stakeholder panel that advises on methods such as species and site selection, and that includes individuals from government agencies, academia, nonprofit, industry, and citizen scientists. They also give us some feedback on end users, how we can -- What kind of data would be of interest, and that's, of course, what we're here for you guys as well, to get feedback on that.

We also meet with our partners that were shown on the first slide monthly, and we do a stakeholder meeting at least annually, to give project updates and get this feedback, and so we've focused our research pilot testing on Alligator Reef in the Upper Florida Keys. This is off Islamorada, if you have any familiarity with it.

It is a sanctuary preservation area, or a SPA, as they call it in the Florida Keys National Marine Sanctuary. The red polygon is the current protected area for Alligator Reef. The yellow area is the extension that has been proposed under the restoration blueprint, and so, hopefully, in any future rounds, we can get that coverage of the reef down to the ninety-foot contour, but it also gives us a neat opportunity to look at any ecological differences between, you know, protected areas and non-protected areas that have fish presence and lengths for these species that I'll show you now.

This is our curated list of target species, because, again, we don't want to over-task a diver to take pictures of everything on the reef. We want it to be usable data that's of interest to, you know,

stock assessors and managers, and highlight some of the ecologically and economically-important species, which is what we have with the top group.

We ask divers to get any of the large groupers, but, in the Florida Keys, that's going to be black grouper, Nassau, red grouper, and goliath grouper. We also have hogfish, gray/mangrove snapper, and mutton snapper, and then, for like an ecological indicator in the Florida Keys, we wanted some herbivorous and occasional coralivorous species, and so we have four selected parrotfish species, the rainbow parrotfish, which is that orange and green species, the blue parrotfish, the kind of powdery blue, with a blunt forehead, the stoplight parrotfish, which is without a doubt the most common species that divers are going to encounter, and the midnight parrotfish, the darker blue.

We also ask divers to get images of those species at any length, and so we do not discriminate on length at all. We want to get as big of a range as they can encounter, but, again, it's probably stoplights that represent that biggest distribution for us.

A little bit about how the single laser method works, and you can pretend those numbers on the bottom line up better with my grid, and, without being able to animate this, I'll walk you through this figure as best as I can, as a visual representation of how they do this with a single laser.

The single laser is in a fixed position, a known position on the camera. The engineers know where to expect that laser, but we also have the camera settings set up to the raw image file format, and so they need that information in the raw file to help compute the length, but, basically, it works with depth of field, and so the objects that are farther away appear smaller, and those that are closer up appear larger, and so, when this image is farther away, that empty circle is the position that that fish had and therefore where the laser was positioned on the image.

The engineers can find the location of that laser. It's X, Y, and Z coordinates, to estimate basically how far away the object is from the camera. When that fish shifts closer, which is shown with the red dot, a little bit to the left, the position of that laser shifts, and so this is just a representation. It's not exactly where they find the lasers, and so that would tell them that the laser is closer now, so they can get an estimation of the distance between the subject and the camera.

They then have an AI workflow, that is built to compute the length basically by finding the head and tail of that fish, and then finding the number of pixels that that fish takes up within the image, and that's really a big component from that raw file, ad so they locate the laser, to estimate how far away that fish is from the camera, find the head and tail, and they can compute the fish length within that.

We match this up with the stereo-video data, as I mentioned, and so this is just an example of what that looks like. We measure fish within both channels, and we do fork length for both this and the SMILE or the Fish Sense Lite camera, because that's our plane, straight through the middle of the fish, and so we report it in fork length in millimeters, and so we're comparing these two technologies, one that is a known technology that's used by professional scientists and this newer tool, and, again, the advantage of this newer tool is that it is not expensive. It's not bulky. A recreational diver can easily use it, and they can do it while doing these fish surveys for us.

In addition to length, that's the primary data product that we have. We also have other metadata along with this, which is the date and time and location of the length, basically, all these imagery

data that produce these lengths. Some dives, we were able to get a GPS track, and so we can even basically find where that fish was on that reef, very specifically. We probably wouldn't make that publicly-available data, of course. We don't want somebody going and taking out our black grouper, for example.

We have bottom time, camera number, diver name, and then the typical dive conditions of temperature, depth, visibility, current, sea state, primary benthic habitat, all of the typical things that REEF already does in its publicly-available dataset.

This is an example figure, that has a lot going on, but these are paired tests, and so there's sixty-six individual fish on here. The bottom X-axis is just those individual fish, and so you don't need to worry about the details. It's what species, individual, and reef that they were found on. The Y-axis is the mean fork length for that. The tan colors are this novel Fish Sense Lite camera, our new tool that we're testing, whereas the blue is the existing stereo-video system, and so there is a lot of variability within that.

The stereo-video tends to measure a little bit larger at times, variability between individuals, I mean, but there is a lot of agreement between the two camera systems, and so, statistically, they are not different from each other, and so, statistically, they're comparable camera systems to measure length. We do have some outliers, as expected, and, again, the stereo-video tends to measure a little bit larger, and I can talk more about that.

This next figure is a length frequency distribution panel, and so Panel A, at the top-left, is all the fish that you saw on the previous slide, and so now I have fork length on the X-axis, their frequency on the Y. The same color setup. The stereo-video is in blue, and the Fish Sense Lite, the new camera, is in ta, and the vertical dashed bars are the means for each of those camera systems.

There is no statistical difference between them, for all the fish, as well as by each of these species, but stereo-video does tend to measure a little bit larger, or the Fish Sense Lite measures lower, and I guess depends on your outlook, and, if you move through the panel, we see that that difference is a little bit bigger, of course, with a smaller sample size, and so Panel B has midnight parrotfish, Panel C is gray snapper, which are kind of hit or miss. If you hit gray snapper, you're probably on a school of gray snapper, and so they're it’s like either they're few, rare, or super abundant, and so, on this day, they weren't super abundant.

Hogfish is in panel D, and so you see like the means get closer together, for the two camera systems, with a greater sample size. The same for Panel E, which is the stoplight parrotfish, even less of a difference between them, with the frequency in which we encounter stoplights, and then the blue parrotfish in Panel F, and so that trend still is kind of across-the-board with our different species. Some variability with sample size, and maybe even the species themselves, that we look to continue to tease out as we process more of these data with the Fish Sense Lite cameras.

Then here I have a length regression comparison between the two camera systems, and so this is mean lengths, and, basically, we can take multiple lengths with these images, both through stereo-video and the Fish Sense Lite camera, and so there's a lot of agreement between these two camera systems, and, as we continue to process data, and as we do it with known-size objects, that I'll talk about in a second, we hope to continue to build into this length regression and make these camera comparisons and strengthen that data and that interpretation.

This last figure is probably maybe a question that you had, when I'm saying that one system is bigger than the other, which is how do we know which one is true to size, and so we do that with known objects, and so we take out fake fish in a pool, take them out on the reef, just to confuse the live fish, and we take pictures of those with the Fish Sense Lite cameras, as well as the stereo-video.

This is another area that we're continuing to process, now that we have a lot more of these Fish Sense Lite cameras, trying to get it across the multiple camera systems, but, here, in blue, we have stereo-video, two systems for that, and then one of the Fish Sense Lite, in tan, and then the horizontal dotted line here is the known size for that fish model, and so they're actually pretty close with a known-sized object. Stereo-video is, again, slightly larger, but there's no statistical difference between the camera systems, and, again, preliminary data that we'll continue to build on and process.

One of the challenges that we have for this project is with our lasers, and with just basically the laser being robust enough, and we have a laser flooding issue, and so, after we've been through several models of lasers, we're building our own, and so we're making an encased laser that has the ability to be a single laser, and continue to operate the way that we do, or in a dual parallel basically laser caliber format. The advantage of doing a laser caliber is that we would not need to do a dive slate calibration slate underwater.

So, right now, at the start and end of our dives, our divers take a picture of a dive slate, that has known measurements on it, just to see if there's been any laser drift that occurs between usage, or even throughout the dive, and so the dual operation would hopefully eliminate that task.

It would also have a rechargeable battery, since the turning on the laser seems to be where it seems to flood, and here's just kind of an example too of what that laser looks like from afar, in some perfect visibility of a room, but it can vary just a little bit, based on the visibility, and we've developed a more robust mount, and that's continuing to be done with backscatter, and, as we scale this project up, and move out of this pilot phase, we also hope to have a model that can be adaptable to other camera systems, so that, down the road, citizen scientists can just purchase a laser mount and system.

We would eliminate the need for this, you know, tight calibration between the housing and the camera and things like that, and citizen scientists can ultimately bring it out on the reefs and take even more pictures for us, and so those are some of the goals that we have for improving the hardware of this process.

This project can't be done without the citizen science component, and, so far, we've had forty-six different volunteers that have come out to do these research pilot testing dives with us. Many of them are repeat divers, and so they enjoy using the camera so much that they come back out with us, and they've performed over 295 dives. We were out in the Keys last week, and they've gone on about eight REEF survey trips now, and so REEF also hosts these survey trips around the world, that people can go and pay to do REEF surveys and engage in citizen science. In the tropical western Atlantic, we also send the cameras out on these trips, and so this is another opportunity to expand our data reach, but also our citizen science engagement.

We're also starting to work with local dive operators, to get this in the hands more opportunistically, so that they can start working with their clientele, with very minimal training and guidance, and, again, just that's the beauty of also having a few target species, is that people can learn them quickly and still get involved. We've also produced a formal survey, with our colleagues at Colorado State University, and some folks at Florida Fish and Wildlife Conservation Commission, to examine motivators and barriers to participation, in this project specifically, but also conservation technology projects more broadly.

Then, even when divers have used the camera, they'll do a very similar survey afterwards, but we also ask questions about their user experience with the camera, how it's performing, and, also, it will give us some idea of the target audience for our demographics for that, or how we can continue to build that project, and expand it, and get it into the hands of more divers.

That just asks questions about like what's your level of interest in using the cameras part of this project, broader questions about participating in marine science monitoring, and how much impact people think they would have on fisheries management and policy in doing so, what are the different things that motivate them to participate in these projects, which they're given a bunch of different options, such as it being fun and learning new technology and doing something new to fisheries management and policy and science, and then there's even like open-ended, where they can fill in their own answer. We started rolling that survey out. It's going to go out even more so in bulk next week, and so we look forward to getting the responses from that.

We also engage citizen scientists not only in diving and in doing surveys for us, but we also are having them help us on the backend, with image processing, and they also like to see what the images are like, and so this also lets them kind of see the product, but we have the AI workflow, but to machine -- You know, to train the machine learning, we have to manually identify and annotate these images, and so, so far, citizen scientists have annotated 60,000 images of fish.

They've located the lasers for us. They're moving into head and tail identification, so that, ultimately, the system can more automatically do that, and that can help us get through this kind of backlog of data, and then the left-hand figure is an example of what it would look like for them to also identify the fish species, and so our REEF surveyors, especially the expert ones, are very good at fish identification, and so, as we move into another project for them -- This is all done within Label Studio. They'll be able to also mark the different species that are highlighted by that laser, so we can train the system to hopefully do it all in one for us.

We also collaborate with data management partners. This is, obviously, not the Florida Keys, but, with SECOORA and Axiom, we will be building a data visualization of the data, so you can kind of see where the different species and lengths are distributed, but, again, without being too specific of where people would find these certain species, and have a data application and management platform, and so, as we scale it up, we're looking to have something where divers can upload their photos, and so it kind of takes us out of that process every single time, but also have it so that there's a management accessibility to it. REEF has a history of doing that, like I've mentioned, with our publicly-accessible data, and so, ultimately, having it get into the hands of our end users, so that it is really accessible.

In summary, the camera systems that we've tested are comparable to each other to generate lengths.

The stereo-video tends to measure larger than the Fish Sense Lite, but we're continuing to tease that out as we process the data that we have from all these laser images. Troubleshooting hardware challenges, such as with the laser mount and the laser longevity, basically, and our software challenges just with getting the process more automated and building that tool up.

We've had a positive citizen scientist response with working on the project and using the cameras. They all find it to be really fun, and they find it exciting to be a part of this project, and, lastly, as I've just mentioned, we would have the data publicly available, just as we do for the volunteer fish survey project that we already do, but would certainly look at feedback for what people are looking for in the data and how that accessibility may be -- You know, what ways people would want to have that, and so, with that, I'm wrapping it up.

This is an example of our -- Not an example, but this is our infographic flyer that we've produced that highlights all this information in one nice package, and also has direct access to our contact and our website, for people to get more information, and, with that, I'm happy to answer any questions that you guys have for me, and then we -- I have some discussion questions, and we may not get to all of them, I understand, but lay them all out on the table for you.

DR. REICHERT: Thanks, Jen.

DR. LOCH: Thank you.

DR. REICHERT: Really cool project. I have a quick question, and I may have misunderstood, and so the position -- When you use a single laser, the position of that laser dot in your frame is an estimate of the distance?

DR. LOCH: Correct.

DR. REICHERT: Okay.

DR. LOCH: Exactly.

DR. REICHERT: Thank you.

DR. LOCH: It's basically used as a scaler, so they can figure out how far away.

DR. REICHERT: Dustin.

MR. ADDIS: No yellowtail snapper in there?

DR. LOCH: There are there are lots of yellowtail snapper out there, and so sometimes people take pictures of yellowtail snapper, but it didn't make the final cut of the list, but we're happy to get feedback on that. We know the list of species is not permanent. We expect that to be a fluid thing, based on the needs that, you know, your group has.

MR. ADDIS: We just do assessments on yellowtail, and so I was just curious.

DR. LOCH: Yes, and I think that was the feedback that we probably got from Chip and Julia. They like the laser though. They chase it like a cat. You probably saw there we've had both red and green lasers. That's another thing that we have just worked with, based on the laser light attenuation and things like that in the water, and so they like the green one sometimes, and they like the red one. It just kind of depends on the day and the fish.

DR. REICHERT: Thanks. Any other questions, or comments. So what are some of the questions -- Sorry. Genny.

DR. NESSLAGE: Just very quickly, s anyone diving on artificial reefs or sunken boats, et cetera, and do you mark whether it's natural or artificial?

DR. LOCH: I do. Yes. I was just on City of Washington last week, and so, yes, I am market if it's artificial, and then, when I do it with stereo-video, whatever fish I'm measuring, I can mark the bottom habitat, and so that's something we've discussed to for moving it down the road. We need to get through this AI automation process, but we might be able to get it to identify hardbottom, versus sand and coral rubble and artificial. That would be cool, right?

DR. REICHERT: Very cool. Alexei.

DR. SHAROV: So, with this particular project, you've mostly focused on developing methodology and measuring the size of the fish, or not only measuring, but also estimating density, and if the density was also part of this, did you compare your methodology, or maybe base your methodology, on other surveys, like for example, and I'm not saying that this is a standard, but the survey in the Dry Tortugas that it's been done on the biannual basis, et cetera.

DR. LOCH: Yes, and we haven't -- I haven't directly use the data to estimate density yet, but that's something that we know could be done, but we also -- That's maybe some of the feedback for you guys with potential repeat sightings of individual fish and things of that nature. We would -- You know, we report how many cameras are in the water as well, so we can make any of those count -- You know, feed that into our estimation of density, and calculations, because we know divers are probably going to encounter similar fish.

We hope to move it into the Dry Tortugas especially, and that's a very attractive place, to me, to be able to test the cameras, but there's also too the level of catchability, and so we know it's not -- We know divers are not going to get every stoplight parrotfish on the reef. I know that from processing stereo-video too, because I have to have it in both cameras, in order to measure a fish, so there's definitely caveats to both types of technology, but, yes, this -- We call that kind of a catchability, like how effective is it at representing all the individuals.

DR. REICHERT: Jeff.

DR. BUCKEL: Interesting talk. Really cool stuff. Thanks for the presentation. I also appreciate the validation, with the fake fish, and I wonder if there's an opportunity -- Like there could be -- That's like the ideal situation, maybe, that they're holding in, and it's not moving. I wonder if there's any opportunity to pair some of the reef fish volunteers with the someone that's spearfishing, right, so then you can actually validate it on a real fish.

DR. LOCH: I agree.

DR. BUCKEL: I think that would be -- That might help with the -- You know, if folks weren't 100 percent convinced, seeing that type of validation might be useful.

DR. LOCH: That might be something we can do, because our primary dive charter operator that we go out with is a spearfishing charter, and so, ironically, they do spear grouper that we're trying to measure in the offseason, and not on the SPAs, of course, but that's that is an opportunity, as sad as it may be to take a picture of it and then off it goes, but certainly, because we know, you know, the rounder shape to a fish would be a little different than the fake fish that we're using, of course.

DR. REICHERT: Jim.

MR. GARTLAND: So I think this is awesome.

DR. LOCH: Thanks.

MR. GARTLAND: Just regarding the first part there with the methodology, and you had mentioned the catchability, and I'm thinking more of like the selectivity of the diver, right, and like do you go after the cool big one kind of thing, and you are recording at least who is taking which pictures, correct?

DR. LOCH: Yes, and they get a little self-conscious about that.

MR. GARTLAND: But if you just made it like Diver 1, Diver 2, Diver 3, whatever, we could probably -- Using these things in an assessment, we can probably account for that, with some sort of random effective diver.

DR. LOCH: Exactly.

MR. GARTLAND: To account for the for the selectivity of the diver, but it would be interesting to let a diver go and do their thing, and then maybe have a follow up of like, okay, I'm going to try to get as much of everything as I can, to get an idea of what that selectivity would look like for a general diver.

DR. LOCH: Right.

MR. GARTLAND: Those were my thoughts.

DR. LOCH: Yes, and that's something we want to compare, and we don't -- I don't think we have quite enough people that are so far doing both reef surveys and the camera, but that's something that I look to compare, once we have a bulk amount of data from the images to do, is to compare somebody who is doing a reef fish survey to somebody who's not and seeing if there is a difference in that capability. There likely is, but they're also gathering other information for us at the same time, and so that is a caveat, but --

MR. GARTLAND: So, just to follow-up on that, one of the things that we have trouble with in fishery-independent surveys is classifying maturity stages of fish, right, immature, mature, all this, and so what we do is we have a bunch of people classify the maturity, and then do histology to get truth.

DR. LOCH: Nice.

MR. GARTLAND: Where I'm going with this is I'm wondering if you can -- You know, you have the REEF survey going, and now you're taking pictures of things, and can you start to get error rates and fish identification. You know what I'm saying? Like using the images, and like you have truth now on the camera, and you have what someone called something. I mean, granted, the ones that you included for the camera are common, more common.

DR. LOCH: Right.

MR. GARTLAND: So they're less likely to be messed up, but, for the more rarer things, that might be worth using that to get some idea of misidentification error rates, like we would with gonads.

DR. LOCH: Right. Yes, and we do -- Just kind of speak, to touch on that, I guess, we do report too if it's like the juvenile, versus initial phase, versus terminal, for the parrotfish at least, and so we can also get it for that. It's a little bit harder for the other species. Yes, and that's a great idea.

DR. REICHERT: Thanks. I had a similar thought. I think, in terms of the usefulness for stock assessment and management, especially for stock assessments, I think that randomization is really important, or, if that's not the case, if you can get a handle on the bias. If you can determine bias, then you can deal with it.

DR. LOCH: Right.

DR. REICHERT: So that's -- To answer one of your questions there, I think that's really important for the use and stock assessments. To get a true size frequency of a species, you need to know that your sample is random.

DR. LOCH: Right.

DR. REICHERT: Or at least have an idea of the bias.

DR. LOCH: Right.

DR. REICHERT: So I think that's what -- For me, it would be the best boost in confidence in the in the data and usefulness for stock.

DR. LOCH: Okay. Great.

DR. REICHERT: Then, in terms of repeat sightings of fish, do you ask divers not to avoid, if they know that they've taken a picture of fish X?

DR. LOCH: Yes. It's just hard with most species, and this is one of those questions as a group, the partner working group ,that we come back to, is how do we deal with that, and so I do ask them, you know, if you saw -- Especially the, you know, more solitary species, like a black grouper, and, if you saw that fish earlier in the dive, and you're pretty confident it's it again, especially with their site fidelity, try not to take a picture of that, or, if you didn't feel like you got good images before, and you're doing it again, that you've reported that to us, so we know it is the same fish. Grouper, we also take screenshots of, so we can work that into our facial recognition project for grouper, and so they can be handled a little more.

Things like midnight parrotfish, and mangrove snapper, that school, you know, do we care if we're getting the same one again, with, you know, the caveat, knowing that that can happen, or that there's several cameras in the water, r is that something that we should address some other way, and it's just one of those things we come back to, because it's -- We shoot in burst mode, and, if you hit a school of mangrove snapper, that person is going to move on to the next fish as quickly as possible, and so the timestamp isn't even super reliable to tell us that it's a new individual.

DR. REICHERT: Anyone else to Bullet Point 1?

DR. DUMAS: I just wanted to follow up on the random sampling issue that Marcel was talking about. I think it would be interesting to work with a statistician and think about these citizen science divers going out there and collecting these data, and so if you were -- What type of sampling plan is that, right, and so suppose you had a -- Suppose you had, you know, a grid of sites, and you think of that grid of sites, and then a grid of times where you could go out and sample each site, and so then you took a random sample of grid locations and times, and that's your random sample.

Then you look at where the your citizen science divers actually went, in which grid, or cell, did they go, and at what time did they go, and the places and times that your citizen science divers go might not match up with the cells and times that were selected in your random sample, but they will be in some of them, and then the one -- The grid locations and cells where citizens science divers happened not to go, those are missing values in your random sample of cells, locations, and times, and so, you know, how many missing values can you handle and still have a pretty good random sample?

DR. LOCH: Right.

DR. DUMAS: How could you design a random sampling, you know, stratified random sampling plan, or some type of sampling plan, that then you could overlay where your divers actually went, and then, where they didn't go, those are missing values, and how could you make a sampling plan good enough that it would work with where your citizen science divers go that it would be a sufficiently good sample to be useful for stock assessment. I think that's a really interesting statistical question.

DR. LOCH: Okay.

DR. DUMAS: For citizen science in general.

DR. LOCH: Yes, because, obviously, they'll go where the dive sites are.

DR. DUMAS: Right. Gridding out those dive sites in, you know, latitude, longitude, and time, a three-dimensional grid, and a random sample. If you were designing a random sample, and you can send scientific divers there, you know, you could pick a sample. Now, your citizen science divers aren't going to go to those locations, but some of them will, by chance.

DR. LOCH: Right.

DR. DUMAS: So do you have a sufficient number of those so that you can still get a pretty good sample, considering where they don't go are missing values in your random sample? I don't know. I don't know. I think that's an interesting statistical question to bring up with your statisticians and see if you could come up with a sampling plan that would work.

DR. LOCH: Right, and I think RVC operates on that same premise, where it's like randomly-chosen cells, right, at times, and so even just kind of supplementing that data, or doing a comparison with their data. Anyway, yes.

DR. DUMAS: Something to think about. Thanks.

DR. LOCH: Thank you.

DR. REICHERT: Jim.

MR. GARTLAND: Just briefly to that, and so I like that idea. It's a good idea. Another avenue to think about might be looking at the like fishery-dependent data literature, right, because we make indices all the time from, well, in the Northeast, commercial landings, right, and those aren't random. We're not calling cells that weren't fished NAs. We just deal with it, and so that might be another avenue look at too, where you might be able to use more of the dataset that way.

DR. LOCH: Right.

MR. GARTLAND: So maybe both approaches, and just look at them and see which one gives a result that that feels more defendable, I guess.

DR. LOCH: Okay.

DR. REICHERT: Thanks.

DR. LOCH: Thank you, yes.

DR. REICHERT: Are there any species -- Dustin mentioned yellowtail. Are there any other species that we, as an SSC, think could be useful to add to that list? Are those the only species that you analyze, or target or --

DR. LOCH: They are the ones that we target, but you always find other things in there from citizen scientists, and they -- You know, they worry, sometimes, about providing like the right data, but I tell them like you're taking a picture of it, and we can confirm that it's wrong or right. We can not use it, or we can include it and supplement it as another length, but, yes, like schoolmaster and

stuff sneak in there all the time, or they -- I don't know if they get bored, and they start taking pictures, or what they do, but other things do slip in there.

DR. REICHERT: Dustin, go ahead.

MR. ADDIS: Sorry. Are the counts being done simultaneously with the length capture?

DR. LOCH: For some divers, yes, and so some divers will do the REEF survey. Is that what you mean?

MR. ADDIS: Yes.

DR. LOCH: Yes, and so some will perform both, and so that gives us an indicator too of if it can directly fit into that program, or is this just another opportunity for people to get involved that don't want to learn 300 species, and do a reef survey, but we have done -- I almost always have a REEF surveyor that's doing both that's out on the reef with us.

MR. ADDIS: In regard to the repeat sightings. I suppose, if you're doing counts, and you measure something that exceeds the count, obviously, you would fall back to the count, rather than if you measured the same fish five times or something.

DR. LOCH: Yes.

MR. ADDIS: A QA/QC type thing.

DR. LOCH: Yes.

DR. REICHERT: Thanks.

DR. LOCH: That's -- I mean, that challenge does come up with the stereo-video as well, and so it's, I think, just an imagery question, in my opinion, that what do we do with that, unless people are -- You know, if you're drift diving, that's not as much of an issue, because you're likely moving away from where they were, but -- Unless there's a school following you, I guess, following the lasers.

DR. REICHERT: In terms of data sources, I think, if you're asking stock assessors, their answer is going to be as much as possible. Everything available. Of course, the things that you already mentioned, species composition, density, length, and I think it's really cool if, ultimately, you guys can get information on the habitat, and so that -- Anything else that any one of you guys can think of that would be -- That you can foresee would be useful in stock assessment and management? I think this is a pretty extensive -- I mean, it's a short list, but it's a pretty extensive list, in terms of data. Dustin.

MR. ADDIS: I think there's a strength in this dataset, because it's spatially broad, and so you can see length distributions in different areas and depths, and I think that can be really useful. Sometimes quantitatively, but qualitatively for sure.

DR. LOCH: Yes, and I can even go back to that list too, if it's helpful. Yes, and not every single camera system, but I try to pair it with everybody's team has a dive computer, and so we're also getting depth and temperature throughout the course of the dive, with a timestamp that can overlay with the timestamp on the camera. Sure, they're not exactly perfect, but they're close enough

DR. REICHERT: Then the related issues, and the last one you mentioned is the data, and was it data availability, or data accessibility?

DR. LOCH: Yes, and is there any like --

DR. REICHERT: Preferences, what do you mean with that?

DR. LOCH: Is there any like system, or process, that you guys like for sharing data with each other, or getting data access, as we start to move forward to that, looking to build like a platform for accessibility for it, if there's any considerations that we need to keep in mind for that.

DR. REICHERT: I'm not sure how to answer that question. I know, within SEDAR we've gone to some standardization. Chip.

DR. COLLIER: So one of the partners on this is SECOORA, and they like to have data visualizations available, and so, you know, what would be most valuable to you for like a first cut of saying I need to dive in this data maybe a little bit deeper, you know, and is it sample size by year, or is it the -- Is it a map of where the fish have been observed, and different things like that I think would be useful in trying to figure out, all right, a quick cut, can I use this dataset at all, and then you would be able to get access to the data, maybe by requesting the information from the appropriate people, but not having, Jen, not having all the information posted out there.

DR. LOCH: Right.

DR. REICHERT: What I can think of is species location, maybe a size distribution, I think, as a first cut list, and is this is this data -- Should I request more data. Anyone else?

DR. COLLIER: Maybe like a heatmap of like along a reef tract. or something like that, on where samples were taken, and number of fish, and then maybe a plot of length over time, mean length over time, or something along those lines.

DR. REICHERT: And species names. Jeff.

DR. BUCKEL: I think this gets back to some of the survey design that we were talking about, but I could see that heatmap coming out, and, right, there's popular places to dive, and all the blanks come from these three grid cells, and there's 100 grid cells that cover the yellowtail distribution, where FWC is doing the stock assessment, and so we're getting to the same issue, right, of this -- All the data is coming from only 10 percent of the population, and so maybe that can help, if that's -- If SECOORA or somebody is keeping these -- You know, if the ideal is to have this many, you know, fish sizes per grid cell, and there's some heatmap that citizen scientists can look at and say I'm going to go -- I'm going to go to this, and nobody has done any yellowtail lengths from this grid.

DR. LOCH: Right.

DR. BUCKEL: I'm going to -- I'm going to hit that spot, and they get the satisfaction of seeing it go from red to green.

DR. LOCH: Yes. There's definitely some like that. Absolutely.

DR. BUCKEL: So that may help the data better -- Get the -- You had mentioned the spatial aspect is great but it -- There may be some way to improve it by having some real-time feedback to the scientists.

DR. LOCH: Yes, and I like that.

DR. REICHERT: Julia.

MS. BYRD: I wanted to say -- So Alli Cadelmo, who works with Jen, with REEF, is listening in, and she's been texting me a few things that I just wanted to kind of share with the group. One was the mention of yellowtail snapper and that they're very abundant in kind of places where REEF samplers are diving for this project, but would yellowtail snapper be -- Would it be helpful to add yellowtail snapper to this sort of project, or is there enough other -- They're less data-limited than some of the other species included, and so having more feedback from you guys on whether yellowtail snapper may be a good addition I think would be helpful.

DR. REICHERT: Dustin, can you --

MR. ADDIS: The members of my stock assessment team would say yes.

DR. LOCH: Then do you want like every yellowtail snapper?

MR. ADDIS: No, because I know that they school in large numbers, and, so, you know, I don't know. It's hard to give throw out a sample size or something.

DR. LOCH: Yes.

MR. ADDIS: You know, like twenty or --

DR. LOCH: Yes. I know. I get that, for sure, and they're definitely not hard to access.

MR. ADDIS: Yes, and so it's easy pick easy pickings, I'm sure

DR. LOCH: I mean, that's another one too that we can validate with fishing, and so that may be a good study species for that, for validating with a known live, you know, fish that's been caught.

DR. REICHERT: Steve, real quick, to that point?

DR. TURNER: Yes. To that point. I think it would be useful to see a comparison of this sort of citizen-collected data with fishery-dependent data, and so that yellowtail might be a good system to start with, because you could get a lot of observations, and you can compare the two datasets,

to give us reassurance that the information is or is not reflective of what might be going on in the population.

DR. REICHERT: Thank you.

MS. BYRD: Okay. Just a couple more. One thing Alli also said is the kind of earlier conversation about doing statistical tests on random sampling, and that sort of thing, she said the REEF folks may be able to do that with their historic REEF survey dataset, and she said one of the team members may have already started. Bryce may have already started -- May have done some work on that area, and so I just wanted to mention that as well.

Then she also mentioned they did -- So this is back to kind of measuring items of known length, and you all -- I think it was Jeff who mentioned trying -- Maybe doing that with spearfishing some, and so live fish instead of just fake fish, and she said they did some speared lionfish testing with another prototype of the camera, but do you all think that would be worthwhile doing again, and I guess they do kind of lionfish derbies, and things like that, and so that may be an easy species to try to do it on, and so do you all think that would be useful to do it again with the kind of current prototype of the SMILE camera?

DR. REICHERT: Yes, I think that would be useful, possibly, and I'm not sure. That's more a question for you guys.

DR. LOCH: Yes, and I just -- I have to get with Alli on those sites, too. We don't encounter them as much currently in Alligator, but, obviously, we're expanding that. We've also taken it out in the Keys, Key Largo plenty as well, and so, yes, that might just be a site selective thing, but, if it's but if it's a representative fish, it may not be a species of interest to you guys, but, in terms of the validation portion, if that seems suitable, we'll explore that.

DR. REICHERT: Thank you, Jen. Good discussion, and good conversation. Jason, real quick. We really need to move on.

MR. WALSH: Yes, and sorry. I just had -- I thought -- I think it would be interesting to follow-up on your questions at the end, where you're asking people their motivation, because having fifty people do 300 dives is incredible, I think, and, as we are trying to get more and more people involved in citizen science, and having more and more difficulty keeping people coming back, I think knowing what motivates them would be very helpful.

DR. LOCH: Okay. Great.

DR. REICHERT: Thanks, Jason. Good point. Before I forget, let's go to public comment, or is there anyone who would like to make a public comment? Is there anyone online? Judd, I know you're catching up with notes.

DR. CURTIS: No hands online.

DR. REICHERT: No public comment. Jen, thank you very much for that presentation. Very cool stuff. Erik, or Vivian, are you still online, and are you willing to do the precision threshold working group updates, or should we come back to that later?

DR. WILLIAMS: We could do it now, if you really want to stretch it out. That's fine, and, if possible, it would be better to probably pull up the presentation up on your end.

DR. REICHERT: Yes, and that would be good, and I'm going to tell the SSC that we may go a little long tonight, this afternoon, just to get through that blueline tile fish stuff afterwards, and so, Erik, are you going to present this?

DR. WILLIAMS: Yes.

DR. REICHERT: Okay. Go ahead.

SEFSC PRECISION THRESHOLD WORKGROUP UPDATE

DR. WILLIAMS: All right. This is just an update on where we are with this MRIP Threshold Working Group. You've been briefed a couple times on this. Since the last briefing, we've had a couple meetings, one in January, where we sort of ironed out some terms of reference and decided what kind of review structure would be done.

This was kind of mostly driven by the MRIP folks, and OST, and we ultimately decided on some CIE reviewers, probably two, an MRIP survey statistical consultant and then possibly a stock assessment scientist, and then we had another meeting recently here in March, and, in that meeting, we were talking a little more about what the review structure would look like, and when it might happen, and I think we're leaning now towards having that review in quarter four of this year, if everything goes right, and we're still wrapping up the documentation, but it's pretty close to being complete.

I think you we've briefed you on what this is going to entail, likely, and just sort of a review of that. What we're working on is a method that would actually smooth the catch rate, rather than just final catches, and there's some reasons for that, that I won't go into now, that will be in the report, but by doing -- By smoothing the catch rates, they seem to produce better estimates on a couple fronts, a couple metrics we were looking at.

By doing this, also, the OST and MRIP are developing some code that should be pretty easily used by most people that are familiar with the MRIP data, and it should be able to improve precision, in most cases, but we don't guarantee it's going to work in all, and we didn't exhaustively try it on everything that we could, but we did sort of work it out on many different species, including species in the South Atlantic and the Gulf of America. Sorry to have to say that.

Next steps are sort of, once it's peer reviewed, then we'll start to roll out the report and the method and the code, and, again, a note here is it's not a silver-bullet approach, but it should help in reducing some PSEs, hopefully below 50 percent, which is kind of a target for some of these rare-event species and the cases that we're worried about.

The next stages are -In the immediate future, it’s finalize the documentation, and then we have to establish the review panel, but we have to say that's all contingent on available resources, and, with

all that's going on, there's no guarantee of that, and so just a lot of uncertainty right now, and I think that's it.

DR. REICHERT: Thanks, Erik, and thanks for sticking with us today. We appreciate the update. Any of the SSC members have any questions for Erik, or clarifications? Chip.

DR. COLLIER: Given that you're smoothing, I'm wondering how you're going to be treating zeroes. Are they no longer going to be -- Because I can imagine some are going to be real zeroes, and some might not be real zeroes. Is there any consideration on how those would be addressed, because that has very low PSEs.

DR. WILLIAMS In the sense that -- Yes, I don't think -- We're not doing anything special with zeroes, I guess is the simplest answer. It's just a smoothing of the catch rate if -- You know, by combining across years, in theory, you're kind of minimizing the effect of, you know, either extremely low values or extremely high values, and those could be near zero. One wave might include a zero in that averaging, and so, in that sense, you kind of are treating zeros, I think, in the way you were asking the question.

DR. COLLIER: Thank you.

DR. REICHERT: Thanks, Erik. Anyone else? Okay. Before we go, any members of the public have a comment, or a question?

DR. SHAROV: Maybe it's too late, but I'm a little bit confused. Erik, why is there a need to go down to a wave level, and would smoothing be useful when, you know, for so many species, that the catch rates are really seasonal, because of, you know, either the biology of the fish or the behavior of the anglers, and so would smoothing be actually helpful, or the opposite?

DR. WILLIAMS: In general, so a lot of simulation work went into this, and without -- You know, actually not even recalling all the details, and exactly all the simulation tests we did, this just turned -- You know, sort of basically smoothing on a three-year average across the catch rate, at the smallest level we can get down to, seemed to be the best approach to avoid potential bias, and so there is -- There's some methods, even some smoothing effort methods, that actually result in a slight bias, and so this -- Getting down to the smallest level I think eliminated some of that bias.

The tradeoff there was you're not necessarily getting as big gains as you might with some other techniques, in terms of the total reduction of the PSE, and I think what we were most concerned about was avoiding some potential bias and focusing mostly on, okay, what method can just reduce the PSE, and it might not be as much as we would like, but it's a reduction in the PSE, in the end, and it should be unbiased.

DR. SHAROV: Thanks, Erik. Well, it looks like there's a lot of work that has been done, and so we're -- I guess we'll be looking forward to the report. Thank you.

DR. REICHERT: Thank you. Again, thanks, Erik. We appreciate you sticking with it, and there were no public comments, no one online.

DR. CURTIS: Not seeing any hands raised online.

SEDAR 92: ATLANTIC BLUELINE TILEFISH SOUTHERN REGION MODEL (CONT.)

DR. REICHERT: Okay. Thank you. So I want to briefly go back to blueline tilefish, and, again, I'm sorry I'm keeping you guys here, but let me scroll back here real quick. Blueline tilefish, what I've heard is that the SSC was leaning towards not recommending the outcome of the assessment for fishing level recommendations, and please correct me if I'm interpreting this incorrectly.

It seems like this is a case where we feel that the assessment is best scientific information. However, it's not suitable for us to provide fishing recommendations to the council. We talked about the justification for this. That was in blue there above. Perhaps we need a little more justification, and we can formulate that later.

Also, as Amy mentioned earlier, the SSC has been on record recommending earlier to postpone the assessment until the SADL survey, and that's that deepwater longline survey data, would become available, and that would address the fact that we don't have an index, and so that would add an index at the tail-end of the assessment.

We discussed -- We looked at that fishery-independent short bottom longline survey. We discussed that. From what I've read from the discussion, it was that we currently do not recommend using that data, or including the data, in new runs, because the data is not yet evaluated, and the sample size remains generally low.

Also, in the previous assessment, this index was not recommended for use, and so there are a variety of reasons why we do not recommend using that, or trying to include it in another model run, whether or not that's feasible or not, based on comments of Erik and others, because we also realized that additional assessment modeling cannot be accomplished in the short-term, and so, again, back to Erik's comments.

So, if that is the case, I have a hard time seeing any additional requests for Nikolai, but maybe I'm wrong, and so I really would like to see some feedback, and then, of course, the big question is what is our alternative? Can we still recommend a fishing level recommendation, or not, and what are our recommendations in terms of moving forward, and one of them, obviously, is an assessment that includes the SADL survey. That's, in short, kind of my summary of what I've heard. Please correct me, or provide additional comments, or recommendations. Alexei, and then, Jeff.

DR. SHAROV: Forgive me for calling this a face-saving approach, but, for example, a run of the model that stops either at 2007, or nearby, and I think it covers still the range of the stock status from unfished to probably, you know, the most heavily exploited through its history, right, and so it covers sort of the available range.

I know that, you know, we always say, well, that the MSY and FMSY estimates are not necessarily good estimates. It's the ratio of B over, you know, B infinity is what is better estimated. Nonetheless, we are, you know, currently using those BMSY estimates, and FMSY estimates, in the report, and so we're using this and defining the ratio of the current biomass over the BMSY, et cetera, and so we are using the BMSY.

One thing that you could do is essentially look at the time series of the removals for the period of say 2010 through 2023, or whatever is available, and compare those landings to the BMSY, and suppose that the overall distribution, their means, et cetera, are at or below the BMSY.

That will give you some argument to state, well, here is an estimate of BMSY that was derived by the model for the period, which is usable, right, and here is the level of removals that are not exceeding the level of the BMSY that we estimate with the model that stops at the end of the period where it's estimable, and, therefore, you can make a reasonable argument that, if the removals have not exceeded the BMSY level, then you have some sort of measure where this stock is likely to be, and then step from there. Alternatively, we're falling down to DLM, or whatever the alternative approach is. I don't know. I mean, it's a suggestion on the fly, but, yes, trying to save the use of the surplus production.

DR. REICHERT: Okay. Well, that would be like an alternative approach for our recommendations, and so we have an opportunity to come back to this on Thursday morning, and so that could be a recommendation that we can discuss, or explore, further on Thursday. It gives us an opportunity. It's the end of the day, and so I'm trying to wrap my head around what you just said, and so it would be good for me to kind of think about it a little bit, and maybe for other members too, and so, again, we have an opportunity to come back to this on Thursday. Why I'm bringing this up now is that doesn't require Nikolai to do an additional analysis. We have all the information available to look at that.

DR. SHAROV: I mean, the cleanest would be to run the model through 2007 or so, and the model parameter estimates, including BMSY, would be the ones to compare it to, because, otherwise, supposedly, the period after 2007, where we have only catches, does not contribute to the parameter estimation, but I'm not 100 percent sure how it's going to look like in the model, but maybe you're going to come up with the same estimates, or maybe not. I haven't seen the code. So, technically, it would require running the shortened version of the model, and, again, if this is total nonsense, just tell me this is total nonsense, and we'll move on.

DR. REICHERT: Okay. Don't we, in essence, have that? Again, it's late in the day, but don't we, in essence, have that in the previous stock assessment, or closer to it? I'm trying to -- Again, I'm trying to figure out what, if anything, we should request from Nikolai. Okay. Chip.

DR. COLLIER: Just a reminder that the previous assessment was done in CHTS units, and this one is going to be done in FES units, and so that's --

DR. REICHERT: Thanks for that, Chip. Okay, and so we don't, and so what's the pleasure of the group? Before we recess today, we need to come -- If there's anything that we want Nikolai to do, we need to come up with that list and recommendations before we recess today. Jim, I know you have the solution to all our problems.

MR. GARTLAND: False. Just thinking about what Alexei said, it's a good idea, but I think all we were talking about here, over the last little bit, is ways to test -- Like this is a -- What do you talk about, building a rickety bridge sometimes? This is a very rickety bridge, right, by extending it out as far as we have. No offense to the assessment people. It's just the data we have.

All we're looking at now is, well, wait, how rickety is this rickety bridge, but all we're doing -- Like, if we see that it isn't that bad, are we still going to be comfortable with having an assessment model where the index ends in the late 2000s, and we're out now to 2023? Probably not, right? We're probably back in the same position we're in.

That said, we probably can't do additional runs, just given the constraints of the SEDAR process and the TORs, and I understand all that stuff as well, and so it would seem, to me, that we're dancing around, yes, we don't really want to use this assessment to make catch projections, and so, if that's how all of our gut is feeling, that's probably what we should do.

Then, in terms of what do we do, in terms of recommendations, I think we're in a situation where, if we're saying we can't use this, it's effectively, okay, what would we do if we were here right now and didn't have a stock assessment at all? That's what we have to ask ourselves, and then that's how we go forward.

Then just one last thing, and it's all been rolling around in my brain. When you were talking about we need more justification for the blue text that's kind of up near the top of the screen, Amy said, earlier in the day that this had been discussed before, and I think this was before my time, but this had been discussed before, and so I think what we should do is probably review what we as a body have talked about before, because probably the justification that we want for right there is probably in that discussion, or at least parts of it, and that's all I had.

DR. REICHERT: Yes, and, again, we have an opportunity to discuss this a little further on Thursday. This also allows us to kind of look at some of those previous recommendations, but the bottom line is, at this point, based on the consensus decision that we just made, there are no additional requests for Nikolai. Jim.

MR. GARTLAND: I would say that is correct, because we don't have any -- Because we don’t feel like we can trust the model, there's no sense in running different types of projections on that, and so I would say, at least from my perspective, there's nothing to ask of Nikolai.

DR. REICHERT: I just want to make sure that there's consensus of that, because we can't go back on tomorrow, or Thursday, and say, oh, Nikolai, we actually want you to do this, and so is everyone comfortable with that? Genny.

DR. NESSLAGE: Just for the record, there's what we want and what we're going to get, to be very frank, and so I just want it to be clear in our report that we did request certain things, or we thought about requesting it, and it was --

DR. REICHERT: We realized --

DR. NESSLAGE: We were informed that that's not possible, and so I just want to make sure that that's -- There's a distinction there. It's subtle, but I just want to make sure it's captured in the notes. Thanks.

DR. REICHERT: Thank you, and that's why I mentioned earlier, you know, that -- Well, yes, we need to make sure that that's reflected in our report, and I'm hoping that you all will help us formulate some of that language. Steve.

DR. TURNER: I'm certainly comfortable with saying we're not asking for more model runs. The question I would ask the chair is, if we are going to do some simple calculations to come up with some advice, is it better for us to be making those calculations, or should we ask the people with the existing data to make those calculations?

DR. REICHERT: My answer to that is it depends on what we're asking. If it is anything more than a simple calculation on the back of the envelope, I'm comfortable as an SSC to do that, but we are -- I hate to go into the realm of the SSC starting to do analysis. We've talked about that in the past, and we've always resisted doing that, and so I know this may not be a satisfactory answer, but that's where I am. Genny, you had your hand up, maybe, or no?

DR. NESSLAGE: I guess I'm still -- Before we break and say nothing for Nikolai, I just want to make sure that we know what we're doing, because we've got -- He's averaging two runs. They have two different terminal years. Which BMSY are we going to use, and how are we going to -- Are we going to add any uncertainty in it? The details, we should probably work that out. The uncertainty around that is based on bootstrapping. Is that going to change the -- I don't think it changes the answer, but my brain -- I've been up for a long time today, and so --

DR. REICHERT: Fred, I saw you had your hand up, maybe, to that point.

DR. SERCHUK: I did. I'm just wondering, given that we say the assessment is not suitable for providing projections of fishing level recommendations, which I agree with, what's a manager supposed to do in the future now? How are they supposed to proceed? Are they supposed to just keep the status quo? Are they supposed to somehow not move from where they are? Is there going to be a group set up to maybe get another way in the future? We have to provide a little bit more, because, if I were a manager, I'm saying, okay, you know, we've to update the assessment, which was done, and now it's rejected. Can you provide us some idea of how to move forward?

DR. REICHERT: Thank you, Fred, and I have Alexei and Judd, or Judd and Alexei, to that point, but I agree, Fred. That's why I said the first thing was to make sure that Nikolai knows what to do. Then, as an SSC, we need to come up with alternatives, and we have Thursday. We have some time on Thursday to address that, and that goes to your point.

Also, if the SSC does not provide any recommendations to the council, what will effectively happen is that the current ABC will remain in place, and that is also something that we should discuss in terms of risk, whether or not we are comfortable with that. That may put us in a conundrum, but, anyway, Judd to that point, and then Alexei.

DR. CURTIS: Yes, exactly to that point, and so there is a protocol for the procedure on what happens if the SSC decides not to accept the assessment as it is, or elements of the assessment, right, and we saw this with Spanish mackerel. We decided the base model run was okay, but we did not like the projections output and adopted a different methodology for coming up with an ABC recommendation.

In this case, if the SSC decides that this assessment, the base model, is not suitable, then it falls back to the previous assessment to look at what the catch level recommendations were for the last assessment. In this case -- Or updating the last assessment. Excuse me. In this case, this is exactly

what was done, right? This was an update of the last assessment model run, and so there is no differential there, and so you would be rejecting that option as well.

The third option then is coming up with a new, or a different, approach for generating catch-level advice, be it the third highest landings approach, or an MSY approach, whatever it is, from assessment output, or from some other alternative method, like Alexei has put forth, and, if nothing can be decided then, and no recommendation is made, as Marcel stated, it goes back to the status quo, which is whatever catch level recommendations were made by the SSC last time the assessment was reviewed and catch level recommendations were made, and so that's kind of the framework of the box that we're in.

I think some healthy discussion on what are some of the risks involved, should we not adopt, or should the SSC not select, another -- An updated catch level recommendation and maintain what the status quo is would be helpful for the council's discussion.

DR. REICHERT: Alexei.

DR. SHAROV: I guess pretty much similar information. I was looking at the document that was also in our background materials, ABC control rule categories, and so, if we do not accept this assessment, then we don't have a formal stock assessment, right, and so the table says -- That's Table 2.1.1.1.2, ABC control role categories, Category 4, no formal stock assessment accepted to provide OFL and ABC recommendations, and so then how ABC determination is supposed to be completed. It says the OFL and ABC will be developed according to the strategy proposed by the SSC's Data-Limited Working Group, Appendix 1. The SSC will attempt to estimate OFL and its uncertainty using available data, applicable methods, and expert judgment. That's what we're supposed to do.

DR. REICHERT: Thanks, Alexei, and that was actually the next step. Judd and I talked about that. Judd was going to give us a brief overview. The problem with that, and we have discussed this in the past, is that, with the new ABC control rule, Category 1 is pretty well fleshed out, and then, when you move towards Category 4, it's less fleshed out, to a point, where, you know, as you just read, it largely depends on what we think, and our judgment, and so we've talked about, in the past, that it would be helpful to develop a more consistent approach to Category 2, 3, and 4.

Unfortunately, we're not there just yet, and so this is one of the stocks that I was kind of afraid would either end up -- Would definitely not -- Well, would likely not end up in Category 1, but then what to do, and so you're absolutely right. Shep, good to hear from you.

MR. GRIMES: Okay. Thank you, Mr. Chairman. I just wanted to advise, based on your last question, or I guess ask that, you know, whichever way you go, at the end of the day, or at the end of the meeting, you're clear that you're either providing an ABC recommendation or you can't provide an ABC recommendation, a new one, or, you know, you can't provide a new one, and you're standing by the past one, just so we know what the final recommendation, or final decision, of the SSC at the end of the day is. Thanks. Not the day, but the meeting really, but thank you.

DR. REICHERT: Thanks, Shep, and I agree, and, in addition, we need to make sure that we document some justification for our decision, and so no additional requests to Nikolai, which is important. We discussed potential approaches. Let's think about this, and come back to that. If

we have time tomorrow, we'll do that, but we will come back to this on Thursday and see if we can formulate a recommendation to council and, as Shep said, whether or not, or if we can, or not can, provide a new ABC recommendation to the council. Anne.

MS. MARKWITH: So I completely agree with everything that was just said. I just had a question for the discussion on Thursday, because, if the intent is we may have to go with Category 4, or we have to have that discussion on risk, and what we would recommend as an SSC, are we still going to see -- Because a lot of the conversation earlier, after Nikolai was done, revolved around the length frequencies and the ages, and are we still going to see that data, because I do think that plays into the discussion of risk.

DR. REICHERT: What's the pleasure of the group? What would you like to see that could possibly help the committee to formulate an ABC or determine whether or not we can recommend an ABC? Length frequency, in the trends report, there's a length frequency of blueline tilefish, the short bottom longline, I think Tracey -- So there is some information. I'm not sure where other length frequency information would possibly come from, whether that's available.

MS. MARKWITH: There's no size limit on blue line, correct, or is there? I can't remember, because you could look at commercial comps too, because, theoretically, they would land small and large fish. I don't know, but I can't remember if there's a -- I have two questions. One is, is the data available? Two, how would that help us determining -- Or how would that help us with this decision, and that goes back to the effort in getting that data, and then, if it's not really helpful, then we may want to concentrate on something else. Alexei.

DR. SHAROV: I don't know if there is -- Like length information. I don't know if it's easily available. It was available and analyzed at the SEDAR 50, right? Since SEDAR 92, right, was an update, I would hope that the length information was also compiled, and so, if it was, and it could be quickly run through, but just simply -- You know, either plotting the quick plots of size frequencies, or calculating the mean length, or median length, whatever is appropriate to characterize the -- I would think, initially --

What I was asking earlier is that is there any additional information on the parameters of the stock that we could look at in collectively, you know, sort of absorbing, synthesizing, all the information, like length, the average length, or whatever suggests that there was no increase in fishing mortality, right? I mean, if there is no notable decline in the mean length, right, or, if there is no notable truncation in the length distribution, you could make that inference.

Just by itself, it's not a compelling argument, but, collectively, with whatever else -- The fishery-independent index that we looked at today, yes, it was not, you know, peer reviewed, et cetera, but I think there is a sufficient background that we've heard about reasonable reliability of the survey, which, of course, could be, you know, later discussed in greater detail, but, as it is, it could be also added up to whatever number of sources of information we could have to put them together, which might help you in making a decision on how we make the recommendation on the ABC, and is this additional information compelling, or sufficient, to either move into DLM or make any other recommendation, just given what we already have,

DR. REICHERT: Well, I agree. I'm just struggling with there is someone who needs to compile that information, and, you know, again, how useful it is, right, and let's recess, and, tomorrow

morning, we will start discussing black sea bass. That gives us an opportunity to kind of think a little bit about that, and, if anyone comes up, tonight or tomorrow, with possible information, or data, that could be useful for us to help formulate that ABC, then let's discuss that, and then we can come back to that on Thursday, and so I may briefly tomorrow kind of regroup on blueline tilefish and see if we collectively came up with this brilliant solution that solves all problems. Thank you for sticking with it. It's late. We'll recess, and we'll reconvene tomorrow at 8:30. Thank you all.

(Whereupon, the meeting recessed on April 15, 2025.)

- - -

APRIL 16, 2025

WEDNESDAY MORNING SESSION

- - -

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Town & Country Inn in Charleston, South Carolina on April 16, 2025, and was called to order by Dr. Marcel Reichert.

DR. REICHERT: Okay. Welcome to the second day of the South Atlantic Fishery Management Council's SSC meeting. We have a lot to go through today. We start with the black sea bass stock assessment update, and then we have the SERFS trends report. I really hope we can complete that by lunch, and then, this afternoon, we talk about Ecospace and the dolphin management strategy evaluation, and so let's start with black sea bass.

We have a lot of people assigned to this, because I expected a lot of discussion. The documents can be found in Attachment 6a to e. Jeff, Fred Scharf, Jie, Kai, Anne, Genny, Christina, and Fred Serchuk were assigned. I want to remind the committee that we kind of should look at this as a new assessment, and that we will be using the new ABC control rule, which is different from what we've done before, and so we'll be looking at the new ABC control rule, and Judd will give a brief overview, or summary, and then that's followed by Matt Vincent's assessment presentation. Judd.

SEDAR 76U: BLACK SEA BASS STOCK ASSESSMENT UPDATE

DR. CURTIS: Thanks, Marcel. So you see, in the list of attachments, we've got the SEDAR 76 update and presentation that Matt will provide. Down in Attachment 6d, we have the stock risk ratings matrix that we need to go through for black sea bass, given that we need to apply the new ABC control rule to this assessment, and then Attachment 3e, which is the ABC control rule tables that were briefly brought up yesterday during the blueline tilefish discussion, and so I would like to get through all the presentation from Matt Vincent and all the Q&A from the SSC before we move into the stock risk ratings matrix, if that's all right, Chair.

DR. REICHERT: Sounds like a good plan to me, and Matt is online?

DR. VINCENT: Yes, I'm here.

DR. REICHERT: Thanks, Matt. Thanks for joining us. I'll let you and Judd manage the presentation.

DR. CURTIS: All right. Matt, I've given you presenter control, and we're seeing your SEDAR 76 update presentation screen. Take it away.

DR. VINCENT: We're going to go through a summary of the work I've been doing, for those who weren't here when this all started back in April of 2023, two years ago now, and so we conducted SEDAR 76, and it found that the stock was overfished and overfishing, but it was using an F of maximum landed yield, and so it was the F that maximizes just your landings, and it didn't account for discards, and it used a mean recruitment model.

However, the SSC had some issue with that F of MLY, and so we transitioned into using a different reference point in July of 2023, where we were using an F of 0.1, but then we also had wanted to fit to the 2020 landings and discards in the projections that were conducted at that time. However, when we fit to those landings and discards, there was an F that was very high. It was about three, or something like that, in 2022, and there were concerns that that F might be unreasonably high, and so the suggestion was to use the average F for projections in the interim period, which was 2022 through 2025.

Then, moving on to October 2, 2023, we had a supplementary meeting that was just focused on black sea bass, and we proposed changing the SPR calculations so that they were done in mature biomass only. Previously, they had been done in female fecundity, and so we had switched to that and proposed using a 40 percent SPR, and then used the new 30 percent P*.

We then did projections that made the assumption that the current discards would remain at levels that were consistent with the average of the last three years, and so then we conducted these projections and presented them in October 24, 2023, and we used that SPR 40 percent, found that it was overfished, but not overfishing, and then did some rebuilding projections with a ten-year timeframe given. Using the mean recruitment model, it allowed the population to rebuild within that ten years.

We also did some short-term and long-term recruitment estimates, or projections with the short-term and long-term average recruitment scenario, and then an autocorrelated recruitment scenario, both with scenarios with the F discards at the current and then F of the landings set to zero.

Moving on to February of 2024, we decided that the OFL scenario would be the long-term recruitment, with the F at the discards in the current landings, or at the current levels, and then the F in the landings was enough that gave a 70 percent probability of rebuilding within ten years. The ABC scenario was then decided to be the same F as in the OFL, but then using the recent average recruitment model.

Then, in March of 2024, we presented these projections to the council. They came back to us with a request, that we presented in July of 2024, where they requested minimum size limits of eleven inches, twelve inches, and thirteen inches, and then additional scenarios where they had a closed season and wanted to do some reallocation of the discards to landings. The SSC decided that it

would be sufficient to show that the recreational discards exceeded the landings for the recreational sector.

Then, in October of last year, we concluded -- We did some additional projections and concluded that the projections don't really match with the trends that have been observed for 2022 and 2023, where the trends report had suggested that the population was continuing to decline, but the projections were predicting that they would be rebuilding, and so there was a request for some enhanced projections, or using any available data to update the projections to provide updated ABC and OFL projections.

That leads to this assessment. We pretty much did an update assessment. We made some minor changes to the data processing, primarily to the length and age composition, which are outlined in the report, but those changes are pretty minor, and then we extended the terminal year to 2023.

The major changes that we made were to the model. The first was there was a comment about the selectivity for the MRIP, or the general recreational, and it was fully selected at age-eight, whereas the headboat was fully selected at age-six, and this was due to a discrepancy between the age composition from the headboat fleet and the length composition from the general recreational fleet. Therefore, we decided that we would share the selectivity between these two fisheries, or these two fleets, and then the -- Yes, that we would share this activity. We followed the general principle that, if age compositions were available for one of those fleets, then we would drop the length composition from the general recreational and from the headboat.

The next major change was that we used a Beverton-Holt stock-recruitment relationship, and, with this stock-recruitment relationship, we estimated the steepness and the R0 parameter, and we'll get into some more details about that later.

Additionally, the recruitment in the last two years were calculated from the Beverton-Holt stock-recruitment relationship. However, we used the mean recruitment deviate from the time period 2014 to 2021 within that calculation of recruitment. Then the F reference point for FMSY, for this assessment, are calculated based on the total harvest, in weight, and so that includes both landings and discards, and we've updated some of the plots to show the resulting discard and landing amounts.

On to the updated data, and, as I previously said, the new terminal year was 2023, and landings and discards were available for all fleets through this year. We also were able to update the combined video and trap index and re-standardize that. Also, age and length compositions were updated for the entire time series, and some of the methods were changed, but they followed what was actually presented in SEDAR 56, but had been slightly incorrectly implemented, and so there's minor changes, but, overall, it didn't make a very large difference.

So on to the results of the assessment model, and we'll jump right into probably what will be the most controversial, and is the biggest change, was the use of the Beverton-Holt stock-recruitment relationship. We can see that it generally follows the line pretty well. Up here is this high recruitment, in 2009, and then it's been generally decreasing. I should note that these last two years aren't actually fit by the model. They're just shown as a reference.

On the right, we have the likelihood profile for the steepness parameter, and we can see that it's quite smooth, which is a good sign, and it's quite well-defined, and you have a very well-defined minimum, and it seems to be influenced primarily by the penalties on the stock-recruitment relationship and then other data components at the lower end, and so, generally, this is a good sign, and it seems like we can estimate this parameter fairly well.

Moving on to the actual recruitment estimated by the model, we can see that the deviates has been, in general, around the line prior to the mid-2010s, and then, after 2014, we see a low value in these recruitment deviates. However, these recruitment deviates are actually higher than what was estimated in the SEDAR 76, which had values that went down close to negative-two. I think it was like negative-1.9, or something like that, but, in general, the actual estimated recruitment numbers are pretty similar, and, actually, the RMSY from this model is slightly higher than the value that was used, or that was estimated, from the mean recruitment model. I think that value was about 8.1 times ten to the seventh, and so it would be slightly less than this, but not much change overall.

Moving on to the fit to the landings, we have very good fit for all the commercial. On the left, we have the commercial trawl. In the middle, we have the commercial handline, and on the right is the commercial pots, and, as you can see, the model does a pretty good job of fitting these commercial landings.

Now moving on to the recreational landings. On the left, we have the headboat landings, and, on the right, we have the general recreational landings. It does have some difficulty estimating some of these peaks, but, overall, it does a pretty good job of estimating these landings.

Moving on to the fits to the discards, on the left is the headboat, in the middle is the combined commercial for the headboats, or the handline and the pots, and on the right is the general recreational, and, overall, once again, we have a pretty good fit to these landings, as we would expect.

Looking at these combined landings and discards, up in the top-left, we have landings and discards by weight, and we can see that the largest proportion is attributed, in the most recent years, to the landings from the MRIP. However, the second largest proportion is from the discards from the MRIP, and we can see that, in terms of weight, it takes up about 30 percent, a little bit more than 30 percent, but, if we look down here on the bottom-right, in terms of numbers, the numbers of discards is more than 50 percent of the numbers of fish that -- Dead discards make up more than 50 percent of the mortality for this fishery.

Moving on to some additional diagnostics, these are the fit to the fishery-dependent indices. On the left is a commercial handline, and we can see that it's a pretty good fit, and the model passes the runs test. On the right, we have the fit to the headboat, and, once again, the model passes the runs test.

In the next slide, these are the fit to the fishery-independent indices, and, on the left, we have the SERFS index. We see that it has a decent fit to the model, but it doesn't fit some of these high values. Unfortunately, it doesn't pass the runs test at the 0.05 level, but it does pass it at the 0.01 level, but, just because it doesn't pass one test, it isn't enough cause for concern for this model, and it could be better, but it isn't a terrible thing.

Moving on to the MARMAP blackfish trap, we, once again, have a pretty good fit, and it also passes the runs test. Moving on to the fit to the age and length composition, this is the age composition on the left and the length composition on the right for the MARMAP blackfish trap. As we saw in SEDAR 76, there's kind of a conflict between the age composition and the length composition, where the peaks don't really line up, and, in this case, the length composition overweights, or overpowers, the age composition, because there's larger sample sizes in the length composition, and more years, whereas there's only one year of age composition for this independent index, fishery-independent index.

Moving on to the SERFS age composition, we can see that it's a pretty good fit overall, across all the years, and this is a pretty good sign. Looking at the selectivities, they're, once again, pretty similar to what was estimated in SEDAR 76, where we have a dome selectivity for the SERFS, but asymptotic for MARMAP.

This is the fit to the commercial handline. The age composition is on the left, and the length composition is on the right. Note that there are different time periods where the length compositions occur earlier than the age compositions on the left. We can see that there's really good fits to the age composition from the commercial handline, and there's reasonably good fit to length comps, but length comps are generally very difficult to fit to.

Moving on to the fits for the commercial pots, or commercial traps, we, once again, have pretty good fits to the age comps. They're probably better in the later time periods than they are in this earlier time period, but we also have reasonable fits to the length composition for these pots, though we might not be estimating some of the higher values in this time period, and so we did see a slight change in the selectivity for the commercial lines, commercial handline selectivity.

In the previous assessment, we saw more of a change between the different years. I think this might be attributed to the slight changes in the methodology for the length composition, and so we don't see as much of a change between the implementation of the different size limits across these time periods as we do in the commercial pots selectivity, shown on the right.

Moving on to the fits to the headboat age and length compositions, and so on the left is the age compositions, and on the right is the length compositions. Overall, we have pretty good fits to both the age and the lengths, though we don’t have a great -- We aren't doing a great job of estimating this high peak right at that minimum size limit, which was a difficulty in the previous assessment as well.

Moving on to the general recreational length composition, we can see that this -- We only include lengths up to 2006. Actually, it might even be 2002, and we can see it does a reasonable job of fitting to these length compositions, and so, once again, we shared the selectivity between the headboat and the general recreational selectivity, to make more reasonable selectivity curves for that general recreational selectivity, and we can see that, with the implementation of the minimum size limit, we have a shifting to older ages in the population.

This plot shows the fit to the pooled length comps for the headboat discards across the three different time periods. We seem to be underestimating some of these smaller fish, and overestimating these larger fish, in this first time period, but do generally a good job in the next

two time periods, but we don't really see much of a difference, even though there has been an increase in that minimum size limit, and so, as a result, we don't really have much of a change.

Actually, we have a slight decrease in the selectivity for that general recreational and headboat selectivity. On the left, we have the combined -- Or we have the discard selectivity for the commercial fishery, and this 2009 is when we had the closed season, and so we included -- We weighted the discards from the closed season and the open season, and so these high values at these older ages are result of discards from the closed season, and so, overall, these are the weighted selectivities for the terminal three years, where landings is on the left, discards is on the right, and then the total weighted selectivity.

In the previous assessment, we had the big spike that occurred at, I think, age-three, and then declined at age-four, and then increased again at later ages. This time, we don't see that, and it's a more reasonable curve, that seems to make a little bit more sense, and I think this is --That's primarily due to we don't have that older -- The shift to the right from the general recreational selectivity that was previously there is now aligned with the selectivity from the headboat fishery.

Moving on to the abundance trends over time, we can see that the majority of the population has been age-zero, for the majority of the time period, or for the entirety of the time period, but we have seen a decline in the older ages primarily, or particularly in the late 2010s, and this becomes a little bit more apparent in the weights, where we really had a loss of fish older than age-five and six in the middle of 2010s.

Then we had that big year class of 2009, which kind of came through here, and then they've subsided as well, but, overall, we've seen this general decline in the biomass and abundance of the population since around 2011 and 2012.

This is shown, once again, in terms of spawning stock biomass on the left, and we have reference points for SSB MSY. This plot suggests that the population has been below SSB MSY since the mid 1980s, but has been above the MSST, except for a couple of years in the late 2000s, but then it really only dropped below the MSST in 2015. Then, on the right, we have the plot of B over BMSY, which shows some similar trends.

This plot shows the fishing mortality at age, and we can see that there are slight shifts whenever there is a change in the size limit, which increases the fishing mortality on a couple older ages, and decreases the fishing mortality on younger ages. We can also see that there's this big increase in fishing mortality in the terminal year, or the terminal two years, of the assessment, and it's primarily due to fishing mortality, due to landings in MRIP. There's also an increasing component due to the discards from the MRIP, or the general recreational fishery.

This plot shows the equilibrium harvest. This one -- This plot isn't provided in the one that was provided. I added it this morning, because I realized the plot that was provided is in terms of numbers. This plot shows the equilibrium harvest in terms of weight, and so that's where you get your FMSY value here, and you can see the corresponding equilibrium landings and then the equilibrium discards.

I presented an alternative FMSY, which maximizes the number of fish caught, and you can see that this actually has a lower weight, harvest, and it results in less landings, but it increases the

number of dead discards, which we can see on this plot, where the Y-axis is in terms of numbers, and you can see that this FMSY N maximizes the number of fish that are caught in the equilibrium.

Moving on to the spawning potential ratio, the previous assessment had used the F 40 percent. Looking at the FMSY that comes from the spawner-stock-recruitment relationship, it actually gives a spawner potential ratio of 61 percent, and so this -- It's -- Which is more than double what was previously used, which was 30 percent. In terms of yield per recruit, it doesn't really have a maximum, which makes it difficult to use yield per recruit, but, luckily, we're using FMSY and don't have to worry about those things.

Moving on to the phase plot, we can see that the population has jumped around quite, or has been generally declining, and so it's at a very high overfished state, both in terms of a very low SSB and a very high overfishing, with a very high F mortality, both in terms of the absolute value of F and its relative value compared to MSY.

Moving on to the age structure, the black line shows the equilibrium, based on F, or FMSY, what you would expect in an equilibrium scenario, and we have plots across the different decades. The plot on the left just shows every two years for the last ten years of the assessment model, to kind of give a more in-depth -- To show how the population has declined, where we had very high recruitment in 2013, but very, very low adult abundance, and then we can kind of see that recruitment working its way through, and having a decline in both the abundance for both the recruits and the adults over time, and so we have the terminal year, where we have very low recruitment and very low adult abundance. You can see that across, and that has changed quite a bit throughout time as well.

Moving on to the likelihood profile for the log R0, we can see that it has a pretty well-defined minimum, and we did test values that were below eighteen, but none of them converged and had parameter estimates that were either near the bounds or non-positive definite Hessians.

In terms of the retrospective analysis, this model had a pretty good -- Or it didn't show any retrospective trends in any of your parameters. You might have had a slight trend in your apical F, where you have a slightly increasing value of F, but, in general, the values were within the range that were expected for a short-lived species.

In terms of sensitivity to natural mortality, when we used the low value, that was the lowest value used in the MCBE analysis, we saw that there was a very high -- There was an increase in F and that the SSB over MSST went to the lower bound. This result was because this model estimated a very, very high R0, that was close to the upper bound, which would have been excluded, or which is excluded from the MCBE analysis, which I'll show a little bit later.

Then this is the sensitivity to the discards, where if you have a higher discard mortality rate, our fishing mortality would actually be higher than what our base model is suggesting, and, conversely, if you have a lower discard mortality, fishing mortality would also be lower, and you would have -- The resulting SSB over MSST would also be similar, corresponding to those fishing mortality values.

This is a comparison to the previous stock assessment. The black line is this update, and then this purple line is the SEDAR 76, which was previously reviewed. We can see that it has slightly

higher values for the beginning of the time series, but, starting around 2015, these fishing mortality estimates actually aligned quite well, and are pretty similar to other stock assessments earlier in the time series. However, there is a bit of difference between the SSB over MSST, where we have generally lower values earlier in the time series, but, in the mid-1990s through 2010, they're about the same, but we don't have as large of an increase following 2010, with those very large recruitment years, but, overall, it does decline to a similar level as SEDAR 76 in that terminal year of 2021.

Moving on to the MCBE, we did a bootstraps analysis, where we did a multinomial resampling of the length and age compositions, based on the sample sizes that were provided, and then we also applied multiplicative lognormal error to the indices and the removals. We also included uncertainty in the fixed parameters of natural mortality, and this was drawn from a uniform distribution of 0.2 to 0.6, based on what was done in SEDAR 76.

We also included different fixed values of discard mortality, which were drawn from fleet-specific truncated gamma distributions, which were also determined in SEDAR 76, and we also used index weightings, which were between those two values shown, as was done in SEDAR 56 and SEDAR 76.

We fit 4,000 models. Of those, 83.6 percent of them converged, with parameters away from the bounds, and so, some of the models that didn't converge, a lot of them were at low values of M, and so this black line shows all the values that were drawn and fixed in test models, and the blue line shows the models that actually converged, and, at low values of M, we did have quite a few models that did not converge, and, generally, they were excluded from the MCBE, because the R0 parameter was close to the upper bound of twenty. Here are the plots of the SSB over MSST and SSB over SSB MSY. In general, we can see that the population is below that MSST in those terminal years.

This is the uncertainty plot of F over FMSY. In general, we've had a relatively high fishing mortality, that has increased since the mid-2000s, and then is increasing quite dramatically in the last couple of years, and so this plot shows a whole bunch of the different benchmarks. As you can see, quite a lot of them are long-tailed.

I think this is a combination of your mean recruitment parameter and your steepness parameter, which are both estimated by the model, and, when some of them combine, they can result in very long tails, with very high estimates of FMSY, and your MSY values as well, and also because SSB MSY can be very high, with a very high R0 value.

Moving on to the management quantities, 99.7 percent of the MCBE analysis show that the population is below the MSST value, and that 89.3 percent show that overfishing is occurring. All of the models show that the population is below the SSB at MS, and so this is essentially showing the same thing that I said on the previous slide, but in a slightly different plot, where you have the densities instead of the dots and the 3D shape plot.

Moving on, this is the status of indicators, which we'll probably go back to looking at in previous things. I tried to include some additional information, such as TMSY, which is this is your total harvest, total MSY harvest, and so this is a combination of discards and landings, both in terms of

thousands of pounds and dead fish, and we also provide the discards and the MSY values in both of those, to hopefully help with management decisions.

A summary of the assessment results, the stock is overfished, and, as said, by 99.7 percent of the MCBE runs, and overfishing is likely occurring. Natural mortality and discard mortality are both important sources of uncertainty over the stock -- Or the stock status is robust to the values of ranges used in the assessment. In general, we've had a pattern of low recruitment since 2014, but it appears that there is an increase in mortality across all ages in this time period as well.

So we -- Also, the main point was to conduct projections, and so we made some changes to that, based on the assessment results, and so we use the Beverton-Holt stock-recruitment relationship for recruitment forecasting, and so, for recruitments from 2004 to 2028, we assumed that the --

DR. REICHERT: Matt, can I -- Perhaps it would be good to see if you can answer some questions the committee has before we start talking about projections.

DR. VINCENT: Sure.

DR. REICHERT: Is that okay with you?

DR. VINCENT: Yes.

DR. REICHERT: Okay. Then we can pick up the projections once we are done with our discussion.

DR. VINCENT: Okay.

DR. REICHERT: Okay. Thanks. So, again, before we go to the projections, any questions the committee has relative to the stock assessment? Jie, and then Kai, and then Genny.

DR. CAO: Thanks, Matt, for the presentation. I think it's a well-done assessment. Nice model fit. I'm just curious about one of the changes you made to this assessment, because, previously, a mean recruitment model was used. I guess my question is what's the thought process of changing from a mean recruitment model to a B-H model, and, I guess, have you tried the B-H model previously, because I think I would interested in knowing if there's any changes made to this assessment that suddenly made this model -- That it now has the ability to estimate the steepness parameter, but I'm a big fan of using a functional relationship, especially when it comes to the projection.

DR. VINCENT: Thanks for that question, and so, in the SEDAR 76, we did attempt to use the Beverton-Holt stock-recruitment relationship. However, when we did a likelihood profile in that assessment, it was relatively flat, between about 0.4 and 0.6, and so we didn't have a very well-defined likelihood minimum, and then there was some concerns that the recent trend in the recruitment might be what was causing that recruitment, but I think that should be what is used to estimate the --

The recruitment should be what is used to estimate the steepness parameter, and so I think that was the big change, between -- I think adding those a couple additional years of data allowed a better

estimation of that steepness parameter, and that's why we switched to using the Beverton-Holt stock-recruitment relationship instead of the mean recruitment.

Also, personally, I think it does a better job of forecasting as well, and it does fit to those -- The data, it doesn't have quite as large negative deviates as the mean recruitment model, and so it suggests that it might be fitting better as well.

DR. REICHERT: Kai.

DR. LORENZEN: Thanks, Matt. That's a clear presentation, and it's a follow-on directly from the last question about the stock-recruitment relationship. First, I'm wondering, and did you do a sensitivity run using the mean recruitment model that we could see, just so we get a better idea of what the impact is of making that change? The second question is it looked like you estimated a steepness of 0.4, or something, and what was the steepness estimate?

DR. VINCENT: I think it was 0.39, or something like that.

DR. LORENZEN: Which is almost bizarrely low for, you know, a stock like this, and so my underlying concern about the use of the Beverton and Holt here is that, basically, the assumption there is that you're looking at a stationary relationship, and I think we have many reasons to believe that that is probably not the case, but we're looking at a change in the stock-recruitment relationship that underlies the recent sort of declines in recruitment, in which case that relationship would not really be -- You can estimate it from the data, but it's not actually estimating a stationary sort of stock-recruitment relationship, and so that's my main concern there, but I think it would be interesting to see, if you did do a sensitivity run, you know, what the impact of the change to using that functional relationship was. Thank you.

DR. VINCENT: I don't have it on hand, but, yes, I did run those models. Would you want to see it in terms of a comparison of the biomass estimates, or do you want to do it in terms of B over BMSY, or -- Well, it would be B over MSY, versus the proxy, and I don't know if you want to try to compare those apples to oranges, or if you just wanted to do biomass, or abundance, or --

DR. LORENZEN: I think biomass and F would be great.

DR. VINCENT: Okay.

DR. LORENZEN: If you have that. Thank you.

DR. VINCENT: I don't have them on hand, but I could pull them together.

DR. LORENZEN: Yes, and I think that would help our discussion, probably. Thank you.

DR. REICHERT: Genny, and then Fred.

DR. NESSLAGE: Thank you. The more I look at this, the more I'm growing increasingly suspicious that this sudden change that occurs in recruitment 2013 and 2014 forward may be at least in part an artifact of the commercial data. Is it possible, Judd, to pull up Figure 39 from Matt's report, and the reason I say this is that it looks as though, at least to my eye, and please, Matt,

correct me if I'm wrong, and I'm trying to find it myself here, that commercial lines start to spike in that -- They start to spike in that year.

Then, on page 28 of your report, you address that the issue of -- The fact that commercial logbooks have had no discards for any species. Up to 70 percent of those trips recorded had absolutely no discards reported, which seems suspicious. I think we've talked about this extensively before, and then you say this resulted in a decrease in the estimated number of fish discarded from the commercial lines for the entire time series, compared to the values used in SEDAR 56 and 76. A lack of reported discards from the commercial fisheries could appear as recruitment failure in the assessment model, because these dead fish would not be recorded at all within the model. I was wondering if you could speak to that. Thanks.

DR. VINCENT: Yes, and that's -- I think the report says it quite well, but, yes, if you have an unaccounted for mortality source in the model, like a large number of dead discards that aren't reported, or even just a lower estimate of discard mortality rate, if these are fixed incorrectly in the model, then those fish would actually be recruits, but, because the model doesn't see them at all, then the only way that the population can appear to be declining is through a decline in recruitment, whereas it would actually -- If those models, or if those landings, were included into the model, then it would be an increase in fishing mortality, and so then that would be what would be causing the decline, is an increase in fishing mortality, instead of a decline in what appears to be recruitment, due to a missing source of landings or discards.

DR. NESSLAGE: Thank you. That's really helpful, and, just for those who are looking at Figure 39, it's that red bit on the bottom is commercial lines. Thank you for pulling that up too, Matt. I think this is something we can't ignore, before we start going into complex ecological explanations for why this model shows a sudden change. I think we need to seriously consider this as a potential source of major uncertainty. Thanks.

DR. REICHERT: Thanks, Genny. Fred.

DR. SERCHUK: I have a question about movement patterns. One of the things that we're seeing, particularly up north, is that fish that were -- Black sea bass that were typically not found in great numbers are now seeing fish moving up into waters that previously were too cold, but now the temperatures have warmed up so that we're getting fish migrating from the south. Is there any evidence that patterns -- Because of the warmings of the water further north, that fish may be leaving the southern regions, particularly in the South Atlantic?

DR. VINCENT: So, just to be clear, these are two distinct stocks that you're talking about. There is a genetic difference between the stocks in the north Atlantic and in the South Atlantic, which this assessment is based on. There's also different management between the two regions, and so Erik and I have looked at the SERFS index quite extensively, and have plotted up how that has changed over time, and you can see that there is a decline in abundance, both in the southern extent and in the northern extent, in equal proportions.

However, there was just generally more fish up near North Carolina than there were down near Florida, and so there are more fish remaining up near North Carolina than there are near Florida, but, in general, the decline has been pretty even across the entire distribution in the South Atlantic,

and so I don't think there is any proof of this movement hypothesis, and though there is in the northern stock.

Sure, they are moving into previously -- Areas that they weren't previously, but I think that we have to keep in mind that it is a different stock, and we're talking about very different things, and very different management between the two, and so I don't think there is much proof, or evidence, for this movement hypothesis, and the data doesn't seem to be showing that, in terms of we would expect to -- If there was a range shift, or -- I mean, fish don't move -- Those fish don't move very much, right? Most of the tagging studies on this fish have shown that the fish don't move more than, what is it, fifty kilometers, or something like that, and so the expectation of them to be moving north just doesn't match with their biology, because, even in the northern stock, you see seasonal shifts, right, from offshore to inshore, but we don't see that in the southern stock at all.

DR. SERCHUK: Thank you.

DR. REICHERT: Matt, if I may ask a follow-up question. That genetic work, can you remind me how -- When that was done?

DR. VINCENT: I don't recall. Sorry.

DR. REICHERT: Anyone else, maybe, and the question --

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

DR. REICHERT: That was published in 2014. Okay, because one of the questions I had -- Like, yes, those were two distinct populations, but that may have changed, because of the changes we've seen in the population, and so I'm just trying to think this through.

DR. VINCENT: I think there's kind of a gap between the two around Hatteras, right, where there -- You don't have an abundance of any black sea bass, and, if there was a range expansion, we would expect to start to see them, and Nikolai probably knows this better, but there's -- The SEAMAP trawl, I think, samples in that area, and I don't think they've seen a shift, or the presence, of black sea bass in that gap between those two stocks, and so, if there was a range expansion, or range shift, you would expect to start to see them in that previously-unoccupied space, but I don't think that they're there, but somebody with more knowledge could correct me if I'm wrong.

DR. REICHERT: Thanks, Matt. I was also thinking about larval transport, but Chip came to the table. Maybe, Chip, to that point.

DR. COLLIER: Well, I would say we have the experts in the room, right? We have geneticists in the room, as well as people that are working on SEAMAP and MARMAP, but they just gave a presentation, at the seminar series, that talked about black sea bass, and one of the potential barriers for gene flow would be the different spawning seasons that they have. The northern stock has a summer spawning season, and the southern stock has a winter spawning season, and so that one seems like it's a pretty hard barrier to cross, and there's probably some mixing of the stock.

I think, if you looked at those genetic studies that were done back in 2014, when they were done, there were some individuals that looked like they might come down here, but they might not be -- They might be caught in the fishery, but they might not be mixing with the spawning stock.

DR. REICHERT: Thanks, Chip. That's very helpful. Go ahead.

DR. COLLIER: The other thing, and, you know, it gets a little bit confusing, because we're talking multiple stocks, and moving and all that, but when we're hearing the fishermen talk quite a bit is the presence of black sea bass off of Florida has really decreased quite a bit, and so maybe it's some temperature changes down there that are causing those, and, you know, we have the Ecospace model that's going to be looking at that in a little bit more detail, and you'll be talking about that model a little bit later.

DR. REICHERT: Thank you, Chip. Wally.

DR. BUBLEY: Just following up on that, along with that presentation that Tracey gave, we've laid out -- So the South Carolina Department of Natural Resources has collected fin clips from Massachusetts down through Florida as well, to look at this again. Unfortunately, it's no use to us now, because it's still -- We're going through the process of processing and analyzing the data, but it should be in the near future. We'll have a little more updated picture as to what's happening, whether there is some shift northward or if it's just getting smushed up against that biogeographic border.

DR. VINCENT: Wally, will you be comparing it to the previously-published papers using the same genetic methods, or will you be -- I guess I'm curious, and how are you going to get a baseline to compare it to?

DR. BUBLEY: Tanya Darden, who is involved in that study, she's coming to the table. Tanya, if you briefly could introduce yourself.

DR. DARDEN: Good morning. Tanya Darden, with South Carolina DNR, at the Research Institute, and I was just going to comment that we are not using the same methods that the prior genetic work is using, that have been published, and those have primarily been microsatellite-based data, and some have been sequencing data, but the patterns are the same, and that's what we'll compare it to.

We did an internal study that was more looking at historic impacts on black sea bass, and decreases in diversity over time. In 2015, we finished that up, and that was using a microsatellite panel, and we're using that same microsatellite panel that we used during that study for the current study, and so we will have baseline data from within DNR in order to compare it to, but the pattern should be comparable across both. The benefit of the microsatellite is that will have both maternal and paternal tracing over the mitochondrial work that's been done previously.

DR. REICHERT: Thank you, Tanya.

MR. GARTLAND: Just one last thing to add to that. On the NEMAP survey that we have, we don't see a whole lot of black sea bass south of Delaware Bay. We see some, but not a lot, and not really much of a trend through time.

DR. REICHERT: Alexei.

DR. SHAROV: Are we done with this section, the genetic structure, et cetera?

DR. REICHERT: Yes, I think so, and so ahead, Alexei.

DR. SHAROV: Thank you, Matt. This assessment really looks good. The data -- The model fits the data so well that, you know, sometimes you would wish that every stock looked like this, except for the end result, right, and so, first, a clarification. The F values that you report in the graphs, like the F to FMSY ratio, et cetera, I assume these are the full Fs, the Fs on the ages with the selectivity of one. Is that correct?

DR. VINCENT: Yes.

DR. SHAROV: Okay. Thank you. Secondly, going back to the terminal year estimate, do you have any confidence in your estimate of F and SSB, and particularly, of course, I'm jumping on the F being over FMSY, a tenfold ratio, and would you be able to defend this, and can we sort of do like imaginary back calculation? How did we arrive to the F as high as that, because it's obviously unrealistic. We all probably would agree to that, and so would you think then that we're likely to underestimate the biomass?

DR. VINCENT: Yes, and that's a good question, and so, yes, when we did this assessment, yes, we were -- I was a little surprised at how high that F was in the terminal year. If you look at it by age though, you can see that it's mostly on these older fish, older than age-six, and so it's suggesting -- Or, actually, older than age-five, and so it's suggesting that there's not many of your old large fish, and that anything above that thirteen-inch size limit are going to be very, very rare, and very scarce, but you're going to have a very high fishing pressure on them, and so -- I think the -- What? The amount of fishing pressure that has been on black sea bass has been quite high, and it is very hard to find fish that are above that size limit, and so I don't think it's outside the realm of possibility.

It might be slightly higher than it might actually be, but I don't think -- I think you're getting your estimates of SSB and F at age from your observed age compositions and the declining trend in your SERFS index, which has been quite precipitous, and is at its lowest value that it has ever been, and so, generally, I think, in stock assessments, when you have high F values, these are generally better estimated than when you have low F values, and so they generally have a higher certainty around a high F value than it does around a low F value. I don't necessarily think -- Even though it is a very high value, and does have some uncertainty in it, I think it is defensible, if that answers -- I don't know if that answers all the questions that you proposed, but --

DR. SHAROV: Thank you. Yes. Thank you very much. I hear your reasoning. That's what I wanted to hear. I might not agree with you on this, probably, because, yes, if this is a very high F on the older ages, but we are using a single selectivity curve for the -- Well, single, and I mean for the latest period of years, and so they're all fixed and relative to each other.

Therefore, if your F on the older ages, with a selectivity of one, is very high, then the Fs on the younger ages group would be a fraction of that, and so it also would be much higher than it used

to be, you know, two, three, five, ten years ago, right, because we have the selectivity curve set for a certain time period, and so that would still seem, to me, unrealistically high.

DR. VINCENT: The large F that we're seeing is -- In this plot, it's actually -- It's not the apical F that I had said previously. This is the sum of the Fs from the different components, and so it might not -- It might be high. It will be higher than what the apical F is, because it's summing across the discards, which are at lower values than at the higher values, and you can see that the largest proportion of this F is from the MRIP, or the general recreational.

If we scroll up to the selectivity for the general recreational, at the end of the time series, you can see that at age zero to age three, it's essentially very low, right? It's zero, almost, up to age-two, right, and so we aren't really seeing that high F until age-three, or later, and so there are quite a lot of the population that isn't being influenced by that very high F that we're seeing from that recreational fishing, but then we have a lower value of fishing from the discard mortality, which is then focused on those younger ages, if that makes sense. I'll have to double-check what the phase plots are in, but I think those ones -- If they're at a value of 3.5, and I think they'll also be in the -- I'll have to double-check what the phase plots are in.

DR. SHAROV: All right. to save the time, I will not, you know, continue the dialogue back and forth on this. I think we're both made points that would serve as the food for thought. Where I wanted to extend it is that because, at least myself personally, I don't think that these Fs are realistic. Therefore, something else had to lead to this.

So, yes, if there is the data point as to that the Z has increased, then, therefore, it is possible that, you know, the way we arrived to these high Fs is -- Either we have their own selectivity curve, that has changed in a more recent period, and we did not explore this, because we're using only selectivity from 2013 and up, or there is a change in the natural mortality, which, obviously, your sensitivities are showing that, when you use a higher M, then your F to FMSY ratios are much lower, and you would, you know, get a very different picture of the stock, and the reason, or what is driving it, considering that it seems that there is evidence that the recruitment has been low, but we are estimating recruitment at age-one as being low, but it is likely -- Because it's still, you know, based on the life -- On the history of each year class exploitation.

This low recruitment could have occurred not just at the youngest stage, you know, from zero to age-one, but if there was -- For whatever biological reasons, there was an increase in the natural mortality at the age-one or two, that essentially contributes to our estimate of the low recruitment.

So, in other words, I see possible reasons that we're attributing a lot of this mortality to F, where it could be actually attributed to M, and indirect sort of information tells us that it is possible. I understand that it is impossible within the framework of this model currently to show this, or, I mean, we could show hypothetically, but prove it would be impossible, but, given the impossibility of the F that we're estimating for the terminal year, I think at least we should be thinking of where there are alternative explanations, and how that plays into the interpretation of uncertainty, and whether we can use the terminal year for the projections, or should we not use it, maybe, and do a step back, possibly, or something else?

DR. VINCENT: So some clarifications. We generally use the geometric mean of the last three years of fishing mortality, to allow for that uncertainty in those terminal three years. I would say,

also, that we do test that uncertainty in that M in the MCBE analysis, through the different sensitivities, with different fixed rates of natural mortality, and a lot of them are at higher rates than the base model, given that figure, this figure that I showed, right?

The base model is at like 3.8, and so, actually, the majority of them are actually at higher values, that actually converge, and so, in this uncertainty analysis -- Even with this uncertainty analysis, all of the models suggest that the population is overfished, and is undergoing overfishing, and so, even though we might have a very high value in the terminal year of the base model, all of the uncertainty in the MCBE analysis still suggests that overfishing is occurring, and the stock is overfished, and so I guess -- I think we've addressed that concern of there might be some change, or a higher value of M, than what we're using, but I think the result stays the same of the stock being overfished and overfishing occurring.

DR. REICHERT: Alexei, to that point, and then I have Erik and Genny.

DR. SHAROV: Yes. Thank you, Matt. I agree with you that the overall results, in terms of the overall trend of the population and population status, are such as you just described, but I focused on the specific estimates for the terminal year, and maybe the preceding year. My suspicion is that there are processes that we're not accounting for, and those processes are leading us to the estimates that are highly uncertain, the terminal year estimates, and I'm not confident about the usage of specifically those estimates, but that would be for the SCC discussion. That's my only point I was making, but, for the status of the stock in general, I agree with you.

DR. REICHERT: Thanks, Alexei. Erik.

DR. WILLIAMS: Thanks. Just to chime-in on this, Alexei's discussion was really good, and I think it's pertinent, because, you know, one of the things I've experienced over the years -- When I used to work on rockfish stock assessments, which were in similar situations like this, where they were getting to extremely low values, the model starts to have trouble to sort of explain it if you don't have near perfect data.

It does try to jump to other causes, and, in this case, it's jumping to fishing mortality as explaining the decline in these last few years, and Alexei is exactly right. It could be some other mechanism. It could be increasing M on the older ages. It could even be density-dependent selectivity, I think, is another possible cause that we neglect often. You know, we fix these selectivities through time, but, when you start getting to really low stock values, those selectivity curves probably should be adjusted for sort of the dropping population structure.

I would just add that, yes, I think Alexei is right. We should be careful about the sort of terminal estimates, but I do think that, you know, whether we drop that last year, or increase the number of years that we compute a geometric mean for the F, there should be some skepticism in that very last year, and maybe even the year before, because, yes, it's kind of -- You can see the model is trying to dump all this missing mortality into fishing, and that's what these models are sort of hinged on, if you think about it.

These are fishery models. They expect that the fishery removals are affecting the population, and, when those get out of alignment, you see this kind of result, which tells you that there is possibly something else missing in the model, and as Genny said, it could be missing removals that we're

not accounting for. As Alexei said, it could be increasing natural mortality, and we could not distinguish between those two. Either one of those hypotheses could be correct, but what we do definitively have, and I don't want folks to lose sight of that, is this declining index, that just continues to decline, and so how we explain that decline, sure, is up for some debate, but we cannot deny the fact that this stock is essentially in freefall.

DR. REICHERT: Thanks, Erik. I have Genny, and then Kai.

DR. NESSLAGE: I'll just pile on and agree with everything that Alexei and Erik have said. Looking at Table 2, I don't see any evidence for a sudden spike in anything.

DR. REICHERT: Genny, Table 2 in the report?

DR. NESSLAGE: In the report. Sorry. Table 2 in the report. Just looking at the landings and the discard time series, I don't see anything that should cause, you know, this sudden spike in the terminal year. I agree we would have no idea what exactly is going on, but I suspect -- I would find it odd that there would be a sudden increase in mortality in one year that would suddenly cause this.

I think the model is just very confused about what's going on. It doesn't have enough information in that terminal, and so, yes, I would completely agree that we need to do some sort of at least averaging, if not disregarding the terminal year. We're getting to very low sizes here, very little information, and I'll stop there.

DR. REICHERT: Thanks, Genny. Kai.

DR LORENZEN: I'm just coming back to the stock-recruitment relationship and the extent to which that assumption may play into those patterns in the last few years, and, you know, coming back to -- I think it would be really interesting to see a sensitivity run with the model that was used before the mean recruitment model, and so I remain unconvinced that it's really appropriate to estimate the stock-recruitment relationship from these data, if there's something other than, you know, a stationary relationship that’s sort of driving that decline in the last ten years or so.

DR. REICHERT: Thanks, Kai. Any other questions for Matt? Anne, and then Genny.

MS. MARKWITH: So I just had a question about the logic relative to the change and how the selectivities were treated for the rec fishery, where headboat and general rec were combined, and, at face value for the landings, it's not as concerning, but it's concerning for the discards, because, where headboats and private rec tend to operate -- It's a difference in fishing, and so the likelihood of the private rec having a higher selectivity for ages-zero, one, and two is probably going to be higher than the headboat, and I just am trying to understand that logic there, especially when a lot of the comments we've heard is the discards are coming from either the inside or state ocean waters, and we know that's where the smaller fish are, and so I was just trying to get a handle on the logic there.

DR. REICHERT: Thanks, Anne. Matt.

DR. VINCENT: Yes, and thanks for that question. We only have discard lengths from the headboat. We don't actually have any lengths from the general rec for the discarded fish, and so that's why we shared -- We previously shared that selectivity in the original SEDAR 76, and we just don't have any information for those shore-based discards, for the length frequency of those discards from the private sector, and so we only have those from observers on the headboats, and that's where the data comes from. If we had other information, we would include it, but we don't, and so that was what the rationale behind that decision was.

The change that we made was to the landed -- To combine the landed headboat and the landed general recreational, and we combined these two because we assumed that they were both on -- Or they both had the same minimum size limit, and the only difference that was being caused by this was because of the growth curve difference, and the model not being able to be able to differentiate the two, essentially, and be able to pick up on that, that they're fishing really right at that minimum size limit very well.

There's a very large amount of variability in that length at age, whereas the model just kind of uses the mean length at age, and that's why you had that shift to the older ages for the general recreational in the previous assessment, and we didn't think that was very reasonable, or rational, and so we decided to combine them, so that they had the same age structure, based on the otoliths from the headboat, which seems to fit better than the length comps anyways. I hope that answered the question.

DR. NESSLAGE: It did. Thanks. I've got to think a little bit more. Thanks.

DR. REICHERT: Thanks, Genny. Judd.

DR. CURTIS: Thanks, Marcel. Just to kind of address some of Anne's questions, and talk about it, so we don't have that discard data for the inland and shore mode available. There was some indication, from advisory panel members, when we were discussing black sea bass a couple of weeks ago, that, you know, the majority of these fish being discarded from those inland and shore mode areas are between like three and ten inches only, which equates to nine inches, nine-and-a-half inches, is about an age-two-year-old fish, and so, if the selectivity curves aren't accounting for those zero and one-age fishes from the shore mode, that might be influential, as you all have discussed.

DR. REICHERT: Thanks for that clarification, Judd. Any other questions for Matt at this point? Seeing none in the room, it is 9:50. Let's take a ten-minute break, and we'll come back at 10:00. Before we break, let's do public comment. Any comments online or otherwise?

DR. CURTIS: Anyone online, if you would like to make public comment, please raise your hand, and we'll call on you. I'm not seeing any hands, Chair.

DR. REICHERT: Seeing no hands, I'm looking around the room. Anyone who wants to make -- Trish, I think we see your hand up.

MS. MURPHEY: This is just a question. Sitting here listening to all the discussion, which, by the way, every time I sit on the SSC, I'm always learning something, and so, you know, I appreciate all the knowledge in that room, but kind of what crossed my mind, listening to all the discussion,

was between the fact that what Genny brought up, the commercial guys reporting no discards, which can be, you know, I agree, suspicious.

The lack of discard information from the shore, the crazy high F, and could all that missing -- What I would call missing data, would that model be interpreting that as the high natural mortality, which then causes the not converging discussion you guys are having? Is that a possibility, that that's just -- Because you were saying that the lack of discards makes the model think there's no fish, therefore, lower recruitment. Anyway, if you understood that question, but I just kind of wondered if it's misinterpreting the lack of discard data as natural mortality.

DR. VINCENT: So natural mortality is fixed in the model at a value that's constant over time. It changes with age. It's very high at the -- Or it's higher at the youngest ages, and then gradually levels out, and is pretty fairly constant over the couple oldest ages, but, yes, like I said, it's constant over time, and so, if there's a trend in natural mortality over time, the model isn't trying to pick that up, or isn't able to pick that up at all, and so, no, I don't think -- I would just say no, to try to respond to that question.

DR. REICHERT: Thanks, Matt.

MS. MURPHEY: All right. Thanks.

DR. REICHERT: Thanks, Trish. Appreciate your comment. Anyone else? Seeing none, let's come back at 10:05. Thanks.

(Whereupon, a recess was taken.)

DR. REICHERT: All right. Let's resume the discussion. I briefly talked with Judd and Wally, and I think it may be -- Or that's what I'm going to propose to the committee, to continue the discussion, rather than move into the projections, based on what we discussed thus far.

I tried to kind of summarize this in my head a little bit. There were two assumptions in the model, all models, and one was the close population, and we discussed that, and all evidence points to the fact that this can be considered a close stock.

The issue of stationarity was brought up by Kai, and so we started discussing that a little bit, and then the other concerns we have had were the high F in the terminal year, or terminal years, changing selectivity, and I think there were one or two that are slipping my mind, and so, if anyone wants to jolt my memory, then please do so, and so that's what I would like to propose, is to continue the discussion about the model.

We also talked a little bit about maybe going to the bullet points, but I think what we have had, kind of this more free-flowing discussion, I thought was very useful, and so I would like to continue that for now, and so I would like to open the floor to further discussion, in particular about the concerns that we had and how much that may hamper us providing fishing level recommendations to the council, where that leaves us, and then also start thinking about -- I wrote one down, and I think it was the Kai's request to see a sensitivity run using mean recruitment. What other runs we may want to see, and then we can ask Matt if that's feasible for Thursday,

when we will come back to additional runs and potential projections, and so that's where I think we are now, and so I'm opening the floor. Genny.

DR. NESSLAGE: Thanks. I guess I'm wondering if it would be possible to assume some sort of average discard rate for the commercial fishery and do an alternative run, where the discards are assumed based on some average rate from previous years. I'm not as familiar with the dataset as Matt is, and so he could probably inform us as to what that appropriate timeframe would be, as to when the logbook stopped being super -- Or informative, but I think I would like to see that, if for no other reason to see if that kind of brings that F down at all, and, if so, that might increase my confidence in using those Fs in the terminal years for setting management specs, but I guess I would -- You know, we would need to see how the model performs with that, and if that's something that could be done, if there's issues I haven't thought about, with regards to implementing that run, I would love to hear any feedback from the center. Thank you.

DR. REICHERT: Thank you. I see Erik Williams has his hand up. This may be a question for Matt. Erik, perhaps to that point, or maybe another point.

DR. WILLIAMS: No, and it is to that point, and I just want to recognize that what this model is revealing, in the last year, is an incongruency between the removals and the index drop. In other words, the index is dropping at a precipitous rate, such that the removals, as we have them, do not fully explain that drop.

It's also got declining recruitment, and the reason that happens in the last year is you don't have any subsequent age comp data to tell it that the removals could not be the cause of that precipitous decline in the last couple of years. What mediates that is, when you have more age comps in the later years, the model says, oh, wait, and really high F couldn't have explained it, because the age comps aren't truncating rapidly, like the F would suggest, because, at that high level F, you would expect the next year's age comp to show a severe truncation, but that's not happening.

Really, what this points out is exactly what Alexei was discussing, and that is there is clearly some hidden mortality going on here. The problem is we don't know what that is. It could be M, or it could be missing removals, and we can't distinguish those two. We can try, and I would -- I'm almost certain you could do a run, with some sort of increasing discards, or increasing removals, that would make that F look better, but I don't think that would answer it, because the ultimate problem is that could also equally be explained with an increasing M over time, and so I just want to caution, in the sense that we're at a point with this model that I don't think you're going to get an answer as to exactly what's going on.

The answer is that there is something else going on. We just don't know what it is, and I would be worried about using a model fit to distinguish between the possible hypotheses that might be going on, in terms of where the missing mortality is occurring, and so just offer that.

DR. REICHERT: Thanks, Erik. So, if I translate what you're saying, and please tell me if I'm wrong, given a low population size, the only way the model can explain that is by increasing that fishing mortality, because it doesn't have any other ways to explain that, other than maybe changing natural mortality, or maybe some other things, and is that a fair translation of what you just said?

DR. WILLIAMS: It is. When you think about these models, when we hold natural mortality constant, and we hold selectivity constant, for the most part, what you're left with is only two mechanisms to cause population changes, and that is F and recruitment, and recruitment is a time delay effect, and so, you know, you put in a low recruitment in one year, and it takes, you know, two or three more years subsequent to see the effects of that, and so recruitment can't alone respond to quick, rapid drops in the index, and so the only mechanism the model tends to turn to is, oh, well, then it has to be removals, and, when the data doesn't reflect that, the model starts to run into problems.

If you look at these age comps over time, they're not shifting very much. In fact, they're shifting very little. There's like a slight indication in the around 2020, I think, or 2018, and I don't know. I would have to look at a plot I made earlier that shows that maybe there's a suggestion of declining recruitment, but then the age comps actually kind of recover a little, which then tells me that there is definitely some hidden mortality, that we're just missing in this model, that's causing this population decline.

DR. REICHERT: Thank you. Jim.

MR. GARTLAND: Just thinking about it, it seems, to me, that it's almost a mild situation of what we had yesterday, we're limited by missing, or incomplete, data, in terms of -- Very mild, right? Sea bass have a ton of data, but there are certain pieces that are missing that are tripping us up.

So is this a case where -- I mean, I agree with Genny. It would be cool to see like what if we tried this, or what if we tried that, but I also agree with Erik that we're not going to be able to put our finger on which one is causing the problem, at least to satisfy ourselves that we're certain that that's causing the problem, and so is this a case where we have to move forward, and, because we have these missing pieces, account for it in scientific uncertainty, because we're uncertain?

DR. REICHERT: Go ahead.

MR. GARTLAND: But I do really like the idea of testing the recruitment, the Beverton-Holt versus the mean. I think that's a really good idea.

DR. REICHERT: No, and I agree, and this is something we talked about before with black sea bass. Obviously, it's not the first time we are discussing this, and, obviously, I think, the more we look at this, the more we -- Or I come to the conclusion that it's not necessarily or just fishing pressure that is causing this problem. It also means, and that's something that, you know, we really need to discuss, is then how do we frame that, in terms of our recommendations to the council, if fishing -- If there's something else going on. Judd.

DR. CURTIS: Just to address Jim's point, right, thinking of the ABC control rule, right, there's mechanisms built in for the SSC to adjust that default P*, you use that approach to account for that additional uncertainty, and you can use other mechanisms outside of the P* approach, as we've done before, and was talked about during blueline tilefish, to characterize that uncertainty for making your catch level recommendations, and so just consider those options are all on the table.

DR. REICHERT: Kai.

DR. LORENZEN: You know, so the projections are one thing, but the other thing is that, you know, those super high F values in the last couple of years also, of course, drives the determination of overfishing, and so I do think we need to keep looking at those a bit more carefully, because it's not only about the projections, and it also affects the status determination, probably.

You know, in a bigger picture, as, you know, Erik pointed out, of course, because we are sort of assuming that fishing drives the dynamics, and that's also why, you know, we call it overfished, even though it may be depleted, as a result of, you know, environmental changes, and so on, and so, I mean, that's the framework we're in, but, yes, I am -- You know, like everyone else, I don't believe in those very high F values in the last couple of years, and I do think that maybe the assumption of the stock-recruitment relationship has more to do with the dynamics in the last few years than maybe is completely apparent, and so I, you know, would really love to see that sensitivity run that we've already requested as the average recruitment model.

DR. REICHERT: Judd.

DR. CURTIS: Kai, just for clarification, when you're using the main recruitment model, are you thinking over the entire time series, or is there a different recruitment stanza that you would request, like the last ten years?

DR. LORENZEN: It's just basically -- I mean, it's the model that was used before the update, right?

DR. VINCENT: Kai, if you want to see that, if you want to let me share my screen, I've run the model, and they're identical.

DR. LORENZEN: Okay. Great.

DR. VINCENT: Pretty much.

DR. REICHERT: That would be awesome. Thank you, Matt.

DR. CURTIS: All right. Let me fire you up here, Matt.

DR. VINCENT: All right. I've got the right screen up, and so, on the left, this is the dots are the estimates of abundance from the Beverton-Holt model, is these dots, and the red line is the estimates from the mean recruitment model. We can see -- So the difference is that, in the terminal year, the last two years, the mean recruitment is set at the average from 2014 to 2019, at that average mean recruitment value, whereas, in the previous one, it was the deviates, and so that's why you have the difference in this abundance and those previous two years.

In terms of SSB, they're pretty much identical. There's a tiny bit of difference at the beginning of the time series, and then, moving on to fishing mortality, this is the fishing mortality. Once again, the dots are the Beverton-Holt model, and the red line is the R0 model, and so the mean recruitment model, and so you have a tiny bit of slightly lower -- I mean, it's, what, 0.31, versus 0.3, or -- Sorry. 3.1, versus three, and so there is a very tiny difference in that terminal year, but, overall, you've got pretty much consistency between those two.

I really think that that terminal year is really estimating that decline in the recruitment, or -- Sorry. The decline in the index is what's driving that high F, is because you have such a low decline in the index, and so that's how -- Even though the landings don't change much, because that index drops, and the landings stay the same, that the model attributes the -- In order to keep that high level of landings, with a declining biomass index, that the F has to go high, in order to meet those landings, and so that's why I think there is such a high F, even though it might be slightly higher than reasonable, but I think we saw such high Fs in other places, like when cod -- The Fs were that high for cod, and other places, and o I don't -- I don't know.

I think it might be on the high end, but I guess I don't share the complete sentiment that it's completely unreasonable, but I hope that alleviates your concern about the stock-recruitment relationship, because it really doesn't make much of a difference.

DR. REICHERT: Thanks, Matt, but it still means that, whether you use the Beverton-Holt or constant recruitment, we still are faced with the problem that the model is trying to explain that low biomass by this very, very high fishing mortality, and I think the question for us is whether we feel that that's reasonable, and, you know, Erik addressed some of that earlier, and so I think that's still one of the issues that I'm struggling with a little bit. That goes back to this population is at such low levels that perhaps the model doesn't behave the way it should be anymore, if I -- That's just my translation to what was said earlier. Erik.

DR. WILLIAMS: Yes, and, you know, I'm not an -- I sometimes have good solutions for these problems, but one might be because this -- Clearly, it seems this F is biased. You know, if you believe that F is somewhat proportional to effort, which it kind of is in many cases, then what this is suggesting is a tremendous increase in effort too, essentially, and that -- There's no evidence for that, and so I think we can kind of rule that out.

You know, effort has not increased that much, and if you look to the -- Look at the years prior to the last two years, you can see that F is kind of stable, or maybe slightly declining, and I think that's a reasonable place to start, for at least using F in projections, and that's just recognizing that, you know, what we hope the model at least still has right is sort of the age structure in the terminal year and sort of the biomass level in the terminal year. What it's getting wrong is the source of the mortality, and it's attributing it all to fishing, and that's just not the case.

Then, with that in mind, you would have to recognize that then projections that you did under that, where you say took the average of the, you know, three years prior to 2021, that there's likely an underestimate -- An overestimate of the population, and -- Because you're not -- You're not continuing to force that decline through fishing, and you're just -- You're saying that fishing is not the cause, but you're not giving it another source of decline, but that's probably good enough, because let's step back and look at the big picture here.

This stock is clearly in trouble. Something has to be done, and, you know, we need to be careful of seeking out perfection for the sake of missing a clear and obvious reaction that managers should probably have to this severe decline.

DR. REICHERT: Thanks, Erik. Anyone? Fred, go ahead.

DR. SERCHUK: I couldn't agree more with Erik. I mean, if you start looking at the introduction, I've never seen a sentence that said projections with fishing mortality of landings set to zero and fishing mortality of discards at current rates suggest that population would not rebuild after a hundred years. Clearly, you know, that's outrageous, and I think it's being -- That's a function of using these last two points in the projection, and so I think we need to take an average of the last three or four years, from maybe 2020 to 2015, something like that, to go into the recruitment projections.

Otherwise, I just think we're going to lose all credibility here. You know, it would take twenty-two years to recover, with a 50 percent probability with biomass, or twenty-six years to recover with a 70 percent probability, and the population with landings set to zero, okay, and fishing mortality at current levels would not even rebuild after a hundred years. You know, we're going to lose all credibility. That just doesn't make any sense, and so there's something happening that we can't capture, but we have to think about, well, you know, what is reasonable, and I think the way it's been used here, in using these last data points, is not reasonable. Thank you.

DR. REICHERT: Thanks, Fred. Yes, and I'm struggling with that too, but I'm not convinced that that will get us into a rebuilding schedule that is reasonable. All indications are, and I may be wrong, but all indications are that rebuilding, with a variety of scenarios, will be very difficult, if not impossible, but so are you proposing to the committee to use what is the -- Whatever range of years, and you propose to use that as the F for the projections, and like say -- Whatever it is.

DR. SERCHUK: Yes.

DR. REICHERT: So three years, and that would be 2021, 2020, and 2019, perhaps, as an alternative, to stay consistent with the last three years, or the three-year timespan that we traditionally use for projections?

DR. SERCHUK: That would be my first -- That would be my first suggestion. Let's see what it looks like.

DR. REICHERT: Thanks, and so that's a recommendation that Fred put on the table. Chip came to the table. Chip.

DR. COLLIER: It sounds like you guys are narrowing down pieces, and I just want a little bit more discussion, because I'm not clear exactly where everybody felt on the MSY versus an MSY proxy. You know, a lot of it hinges on that one plot of we came down to a good estimate of MSY for the steepness, and is that truly a good estimate of MSY, and, if the stock is changing productivity through time, is MSY an appropriate value to use, and I just want to make sure we have discussions, because we're going to be asked about that, as staff, and we want to be able to have a good answer for the public, when they come asking those questions.

DR. REICHERT: Thanks, Chip, and that goes back to the Kai, to the point Kai made earlier. Kai, go ahead.

DR. LORENZEN: Actually, firstly, I wanted to thank Matt for doing that sensitivity. I think that was very, very useful. I have sort of a follow-up question to that, and it's about the -- It's actually Figure 59 in the report, and I think you showed that earlier, but I can't find it in the presentation

right now. It's the comparison of the SSB over MSST projections from the different models, and from the --

DR. REICHERT: Kai, do you have, by any chance, the PDF page, so people can

DR. LORENZEN: It's 123 in the update assessment report.

DR. REICHERT: That's in the assessment report, so people can follow that. Thanks.

DR. LORENZEN: Yes, and we had -- I think Matt had shown it. Is it -- It's that one. Okay. The update has a somewhat different pattern there of biomass over, and so it's less of an increase in the around 2010 and so on, and it's sort of quite a different pattern, in a sense, and I had assumed that's probably because of, you know, using the stock-recruit relationship.

Now, what you showed us just now was that, you know, for the biomass estimates, it didn't really make much difference whether you use the stock-recruitment relationship or the mean recruitment model, and so then my question is why -- Do you have any sense why the update -- You know, if the only changes are you have like two additional years, and you have, you know, done some modification, I remember, to the way the composition data was processed also, and so my question is why does the biomass pattern look so different from the previous assessments? Is it the extra two years, or is it -- Why is that, and you may or may not know, but it just continues to puzzle me a little bit.

DR. REICHERT: Matt, are you able to --

DR. VINCENT: I'm thinking.

DR. REICHERT: That's perfectly fine. I think we're all -- We're all thinking.

DR. VINCENT: I think part of it might be due to the change in your denominator, because you're -- No, that wouldn't make sense. That would just shift it up and down, but that might, actually, because if this -- If the black line shifted up higher, right, it might still look pretty similar, except in these last couple of years, right, and like the decline isn't quite as much, but it does mirror it, right, for most of it, and it's just shifted down, and I think that's due to the change in the MSY, versus the SPR.

DR. LORENZEN: Okay, and so it didn't come back. Okay.

DR. VINCENT: But it does change these last -- It does change the decline some, and I don't have a great explanation for that.

DR. LORENZEN: Yes, but I think you're right. I think you're on the right track. I think it's the change in the MSST, which, you know, comes out of the using the MSY and BMSY, rather than the proxy, and I think that is something that needs more discussion. That was, yes, helpful, again. Thank you.

DR. REICHERT: Thanks, Kai. Thanks, Matt. Any other comments, or discussion, because, at some point, we'll have to come up with, okay, what are we going to do? What are we going to do

with this, and one of the things, and, again, I'm trying to wrap my head around -- If we are -- If we're looking at the F, we can go back to an earlier period, but, you know, and, as some of us said, and as Erik has indicated, it is an indication that something is going on with the model that cannot capture what's happening in the population.

Yes, we can go back, if we are confident that those -- The F values from those years that Fred proposed are indeed reasonable to use, and, to be honest, I don't know the answer to that right now, and then, also, to Chip's point, perhaps we can discuss that a little bit, in terms of our confidence in the estimate of steepness relative to the stock-recruit curve and what we discussed earlier.

Initially, when I looked at the profiles, I think we've seen worse in stock assessments, and accepted it without much discussion. We always had some discussion, and so, if we are looking at that, and are uncomfortable with that, then I think we need to have a little bit of discussion. That's separate from the issue of the stationarity of the stock-recruit curve that, again, Kai brought up earlier. So, but, anyway, Kai, please.

DR. LORENZEN: Well, I think it's not quite separate, in the sense that this is a case where I think we may have a pattern of non-stationarity that gives us something that looks like a really good stock-recruitment fit, and so, if you just look at the diagnostics, that looks reasonable, but, if you think about that -- Because you can't, with this information, really diagnose whether or not you're looking at a stationary relationship.

I think that's why we're a bit stuck, and so we need to basically use some external knowledge, and understanding, to judge whether we think it's reasonable to use these data as they are to estimate something and then say it's a stationary relationship.

I think one thing that gives me, in addition to -- I think that we seem to know there are environmental changes that likely impinge on recruitment. It’s the very low value of steepness that it estimates that seems somewhat unrealistic. I'm trying to think of other stocks that would have a steepness of point-three-something, but that's, you know, just an indicator that maybe we're not looking at something that is a stationary relationship, but it so happens that the pattern gives us the impression that there's a strong relationship, right?

DR. REICHERT: Thanks for that, Kai, and that's what I was trying to get at, you know, in terms of documenting our thinking, or our concerns, a little better than we have. Genny.

DR. NESSLAGE: I'm probably going to be the sole dissenting voice here, but I'm looking at the fishing mortality rate estimates for this from the stock assessment, and Fs, since 2004, have been approaching one, for an animal that lives to age-eleven or more, and at what point are we going to -- Let me take that back.

Is it not possible that we can completely overfish a stock, and cause recruitment failure, through fishing alone? I think we've gotten into this mode where we see recruitment failure, and we think it must be environmental, because there's climate change going on, and I will say that on record, but this stock has undergone extreme fishing pressure, for decades, and this may be a result of our action, maybe exacerbated by climate change, but I really don't like the way the discussion is going, because I feel like it's saying that, if we were able to magically release fishing pressure, this

stock could not return, and that scares me, because I think many of these stocks could have potential for rebuild if we were able to get control of fishing effort. Thank you.

DR. REICHERT: Thanks, Genny, and I think it's important to have that on the record, too. I would like to hear from some of the SSC members that -- I don't want to put anyone on the spot, but that we haven't heard from that much, relative to the discussion we've had, and, in particular, to the point that Genny just brought up. Amy.

DR. SCHUELLER: Genny, you're not the sole dissenting voice, because I agree with you. I think that this species is very well monitored by the SERFS index, and, I mean, I would say like, of all the species that are caught by the SERFS survey, this one seems to probably be the best monitored, and so the fact that there is a massive decline in the index I think is a huge indicator, to me, that the stock is declining, and I also agree.

I mean, I don't understand. I don't have as much reservation about those high Fs in the terminal years, because I just think, cumulatively, the Fs over the last two decades have been high, too high, for this stock, and you can't just keep doing that forever. If you keep doing that forever, eventually the stock is going down, down, down, and then, if the fishing effort is the same, the Fs have to go higher, higher, higher.

I mean, it's not that shocking that that's how this looks, and I agree. I think that, if the fishing effort was controlled, there's no reason this stock couldn't rebuild, and so I'm with you. I mean, either way, something has to be done too, and so we can't keep delaying.

DR. REICHERT: And I completely agree with you and Genny in that, and that's why I said, earlier, we have to -- At the end of this meeting, we have to provide the council with fishing recommendations. I think -- I still think it's a combination of factors, including fishing pressure, but it's also, I think, environmental issues, and changes, are playing a role too, and it's not -- So the problem is to what extent is one or the other determining these low biomass, the low biomass in black sea bass. Genny. Jim.

MR. GARTLAND: I just see it as a why not both, right? I mean, if you have high fishing pressure and environmental conditions that may be becoming suboptimal, it's almost like they're working together to cause the problem, right, and in terms of, you know, what do we do about it, there's only one that we can make recommendations on to try to improve the situation. The other one, we can't.

DR. REICHERT: Amy.

DR. SCHUELLER: Yes, and I just -- I don't know. I'm not sure what the evidence is for environmental reasons for this, and so, I mean, we all acknowledge that there is, you know, environmental changes happening that have impacts on populations, but, you know, this species is found in the Gulf of Mexico too. It's -- You know, Matt made the statement that they looked at the index information across the distribution, and that there's an even decline across the distribution.

There's not a movement one way or the other, and so I don't know what the evidence is for an environmental impact here. Regardless, there's only one knob on the panel to change, and that's

fishing mortality. I mean, even if we were convinced that this is completely environmental, we still have to reduce fishing effort.

DR. REICHERT: Thanks, Amy. Chip came to the table, and, in the meantime, Judd, if you could bring up that fishing mortality plot again.

DR. COLLIER: I just wanted to point out that Kevin Craig, from the Science Center, along with Anna Vaz, gave a presentation to the SSC, and, in that presentation, it documented that environmental factors are the likely cause of increased mortality for black sea bass.

DR. SCHARF: Chip, can you expand on that a little bit more?

DR. COLLIER: I'll send the presentation to you all. I mean, it was a year ago, I think, that it was given, but, yes, and I'll put it in the chat.

DR. REICHERT: Correct me if I'm wrong, and that was the presentation where they were looking at fish with different reproductive strategies, summer and winter spawners, and they were looking at whether or not a variety of factors played a role in the low recruitment, and I think that, if I'm correct, the conclusion was that it was likely due to environmental factors. I think they looked at fishing pressure in that paper too, if I remember correctly. Genny.

DR. NESSLAGE: If my memory serves, the SSC had several recommendations for alternative analyses that they did not run, that we know of. Thank you for that correction.

DR. REICHERT: Fred.

DR. SCHARF: Yes, and so I remember that as well, and the one -- You know, they had some life history traits in common, you know, and seasonality in their spawning in common too, but these are also all species that are all part of the same complex, that have experienced increased discard mortality and increased -- You know, had similar, you know, fishing mortality histories, where they've got, over the last two decades, you know, over FMSYs approaching two, you know, for most of those stocks, and so, yes, I don't think that, you know, making the conclusion that environmental factors alone are what are driving this, you know, is prudent.

DR. REICHERT: Jie.

DR. CAO: Well, I just want to make a comment on the terminal F estimates. Well, I'm not too surprised to see high terminal F estimates. Perhaps it's too high to believe, but, if you look at the landings, total landings, in the past few years it's increasing, and then you look at the abundance index, particularly the SERFS abundance index, and it continues to decline. When you have increasing landings, and a decreasing abundance index, what do you expect the model to tell you? High fishing mortality rate. Perhaps it's not that high, but I think we -- I just don't want to rule out the possibility that the terminal F is high. I guess that's my comment.

DR. REICHERT: Thank you, Jie. So these are total -- These are total landings and discard, and you said -- Yes, they have increased in the last -- That's what I was looking at earlier, looking at this graph and total fishing mortality, and explain -- I hope someone can explain, and I felt that I was kind of out of proportion, in terms of the high F, and if you look at the actual landings, but I

may be missing a point there. In other words, that landings in the last couple of years have not increased so much to explain that high F, and that goes back to what Erik said earlier about the model, but maybe I'm wrong. I would love to hear from other SSC members. Jie.

DR. CAO: Yes, and it's not increasing significantly, but you have to look at -- When you look at the estimate of fishing mortality, you have to look at the landings in conjunction with the population size. In other words, it's the abundance of biomass, and so, when you have an abundance index that tells you the population size is decreasing, and then you have a stable, or slightly increased, landings, that will give you -- The model, of course, will give you high fishing mortality.

DR. REICHERT: Thanks. That makes sense. I appreciate that. Anyone else? Jie.

DR. CAO: One thing I'm not completely understanding is you have -- So we have four abundance indices. Except the SERFS, the other three are having an uptick trend in the last couple of years, and so I guess my question is how the model is able to explain the different trend in the last few years. I guess it might be related to the selectivity of the parameters in the model.

DR. VINCENT: If you look closely at the X-axis here, this -- The fishery-dependent indices end in 2010, and this other index here ends in 1987, I think it is, and so the SERFS index is the only index at the end of the time period, in 2023.

DR. REICHERT: Thanks for that clarification, Matt. Chip has a correction.

DR. COLLIER: So, in that presentation, they indicated it was both fishing and environmental factors for black sea bass. I got it wrong, but, yes, you guys had a lot of discussion on the model. They looked at several different things in it, but it's one of those species of the winter spawners that seem to be having low recruitment. Other species in the complex that spawned during the summer were not having the same issues.

DR. REICHERT: Thanks, Chip, for that correction, and so that presentation indicated that both fishing as well as environmental factors may play the role.

DR. CURTIS: The source for that document, Chip posted in the chat, and that was from our April 2024 meeting and briefing book, if you would like to reference it.

DR. REICHERT: Okay. Genny.

DR. NESSLAGE: I probably need to study this PowerPoint again more carefully, but it's possible that winter spawners are more challenged by fishing pressure, and not that the environment has changed, and so we know that certain animals are more vulnerable, those with, you know, later maturity, longer lifespans, et cetera.

Winter spawning might be one of those factors. If we were to do our susceptibility, probably, the susceptibility chart again, then maybe winter spawners is something that we would say makes them more susceptible to overfishing, but are we convinced that it's a trend in the environment, again, that's causing it? The environment may be making it more challenging for winter spawners,

because it's harder to spawn in winter and get your recruits out there, but the one thing that's obvious in the trend is fishing pressure. Thanks.

DR. REICHERT: Thanks, Genny. Anne.

MS. MARKWITH: So my brain is still stuck on the general rec discards, and I guess I have a hypothetical question. We know, based on the projections, and we haven't gotten there yet, but, when you read the report, we know if F -- Pretty much if there's a moratorium on fishing pressure, but fishing pressure on discard stays the same, we can't rebuild the stock, and so discards obviously have a huge impact on the stock.

If the selectivity for the general rec discards is off, and so it should be selecting higher for those ages-one and two, how -- Hypothetically, if we had that data, how would that -- Do we think that would affect the biomass, and is there a way we can get that data? Are there proxies that states have, whether it's in their independent sampling or something that -- Yes, it may not be rec hook-and-line, but it's at least interacting with the same size fish, to get those length frequencies, or if there's tagging data or something, because I'm just trying to understand how that would affect it, particularly since the influence of the discards is pretty high on the rebuild.

DR. VINCENT: Is that a question for me?

MS. MARKWITH: Or anybody who can answer it.

DR. REICHERT: That was just what I was going to ask, if -- Well, Matt, do you have an answer, or can you address that, or is that something that needs to come from somewhere else?

DR. VINCEN: I'm trying to think of how these ones are estimated. I know that the last three are estimated based on those discards. I think the first one, or first two, might be based on some assumptions, and we could potentially try a sensitivity run, where we fix certain ages at a value, but I'm not entirely sure what that value would be, and -- Yes, we could make something up, and try some sensitivities, but I don't know. If we have better data, I would definitely incorporate it, but I don't know. I definitely appreciate the point, and I definitely think it is something that I will look into, but I don't -- I'm not sure a way forward for this meeting.

DR. REICHERT: So does anyone know of any sources that Matt could potentially use? Okay. I don't see any. Alexei and Chris have their hands up, but to that point, do you have, or is that in terms of data sources or --

DR. SHAROV: To that point, if you're looking for the source, and I'm not the one, and I'm just a speculator, right, and so I'll speculate. I mean, before we do this, we need a hypothesis, right, a reason to think of why the discards might be off. I mean, is it are we underreporting, or anglers underreporting, that they're not remembering what, or how much, of particular age groups maybe?

Discards are always a very sensitive issue, because, unless they're corroborated with observers, they're totally -- I mean, these are the numbers that are not observed. These are all recalls from the anglers, how many fish they released, and so there is -- You know, the PSEs are high, but they're only reflecting the uncertainty in terms of the variability of responses, but there is a true uncertainty there where, you know, how many actually fish were released, right, and that we're not

accounting for, unless we have observed trips with, you know, with the independent observers, who are actually counting. I thought the idea was that if we are like underestimating the discards, right, and is that correct?

DR. REICHERT: Anne.

MS. MARKWITH: So I guess, when you look at the selectivity curves, because it's -- For the discards, it's how headboats and general rec operate are different, and so it might be underestimating -- I guess that's right. Underestimating the age-one and age-two, and so those smaller fish that you tend to see in state and inside waters, and, when you look at the MRIP data, the discard to landings ratio is ridiculously high for those areas, and so, if we're not accounting for the weight or the ages properly, I don't -- I guess I'm trying to figure out how that would affect SSB and that -- Like just knowing how that fishery operates in state waters, because I would expect much higher selectivity of ones and twos.

DR. SHAROV: Right and so, if you would expect a higher selectivity, then that would mean, for the given level of removals as we estimated -- What we've estimated is removed at this younger ages. It's the higher proportion of fish that is removed, and so there should have been then less left. I think that that should be leading to a lower estimate abundance overall in the lower biomass, if the logic is correct, but we're doing it on the fly, but at least understanding the direction where it could go might be helpful.

DR. REICHERT: Chris.

DR. DUMAS: One of the things I've heard today is that there appears to be general consensus that the SERFS index tracks abundance pretty well, at least for black sea bass, and so I've got two comments, one for sort of our current problems, and discussion, and one -- Another comment for going forward.

For our current issue, our current problem, it seems to be one of the large questions is, you know, how much are fishing and discards contributing to mortality and how much is natural mortality contributing to mortality, and would it be possible to stratify the SERFS locations, in terms of which ones have been experiencing large -- Which ones have been experiencing increases in fishing pressure, and which ones have been experiencing constant or decreasing fishing pressure, and look at differences, changes in abundance, across those two different strata, to help distinguish whether it could be fishing and discard mortality that's contributing to the discard -- To the decrease in abundance or whether it's natural mortality.

I don't know if we have -- We could look at our SERFS locations, and sort of partition them into locations where there's, you know, a lot of fishing pressure, or increasing fishing pressure and other locations where there's sort of constant or decreasing fishing pressure, and then look at the trends in abundance across those two partitions and see if that tells us anything. That's one.

Going forward, and this won't help us today, but, going forward, we could do adaptive management, and so we could do an experiment. We could shut down fishing for some SERFS locations, and allow constant or increasing fishing pressure in some other SERFS locations, and then see what happens, and that would help us distinguish between natural mortality, as it affects

abundance, versus the fishing pressure, both landings and discards, it seems to me. What do you guys think?

DR. REICHERT: I may need Chip or Judd to chime-in here. In terms of -- Because that would mean a change in regulations, to not allow fishing in one area and allow fishing in another. I'm not sure whether that is possible within the current management in the South Atlantic, but I may be wrong.

Relative to your first point, we may -- Well, I think we have that data. I'm not sure how easy it would be for us to pull that out, or for whoever had that data to pull it up and for us to look at, and so feasibility there, especially during this meeting, may -- I can't answer that question, but that may be a little much. Another -- Well, maybe, moving forward, we can pick that up later, and so remind me to do that. Jim, I saw your hand up, and then Wally.

MR. GARTLAND: I think that long-term experiment you're talking about is really cool, but I think a problem, an issue, with that might be, because these are mixed fisheries, if you do that, where you -- In the areas where you either leave it alone, or you said increase, we might wind up creating problems for something else, unintentionally. I think that would -- I think it's an awesome idea, and a really cool experiment, but I think it only works if you're dealing with, quote, single-species fisheries, I think.

DR. REICHERT: Thanks, Jim, and I -- To that point, I also thought -- I'm not sure what eventually will come out of that, but, the amendment for red snapper, a couple of the options propose some closed areas over Florida, and, initially, I thought that may help black sea bass, but, unfortunately, they're pretty much gone, if I believe what the fishermen and others have said. The densities of black sea bass over Florida are very low, and so I'm not sure how much that's going to help. Wally.

DR. BUBLEY: I think one of the issues with that as well might be if the natural mortality that we're talking about is more geared towards kind of recruitment mortality, as opposed to smaller, like already recruited individuals. I don't think they're recruiting to the -- Like they're not self-recruiting to their location, and so, I mean, you're probably going to have movement of the recruits in between, and so it's going to muddy everything up.

DR. REICHERT: Thanks, Wally. Alexei.

DR. SHAROV: Mr. Chair, I just wanted to ask you to remind us, and what is the focus? I mean, what are we discussing right now? I mean, I think I'm losing -- Honestly, where are we drifting?

DR. REICHERT: Well, where we are drifting -- This all goes back to, are we -- What are we going to use, ultimately, as our ABC recommendations to the council, and the reason I wanted to have that conversation before we were talking about projections is because I thought that perhaps we may ask Matt to run some different set of projections, and so I thought, before we go into an extensive discussion on that, and so that's -- That's why we're discussing this, and what are our concerns?

Basically, that first bullet point, and are we comfortable using this model as the basis for projections, or for the basis of our fishing level recommendations to the council, and I feel we are kind of going back and forth, in terms of, yes, we are comfortable, but then we also discussed that

there are some pretty significant concerns, within the committee, about the model, and about some of the outcomes, and also about some of the assumptions, like the stationarity that we discussed earlier.

I would love to hear from the committee about the confidence in the model, in terms of the use to base our ABC recommendations on, or to move forward with projections, and, if so, what projections we are going -- Are those projections currently available, or are we requesting additional projections that we can discuss on Thursday morning, so we can go back to the council and provide ABC recommendations.

The conundrum there is -- Again, that's why I was trying to kind of have more discussion about the model, is that, if we look at the current projections, rebuilding would be very difficult, if not impossible, and then, again, that goes back to the committee of what do we do, because the only tool that we, and the council, basically have is F.

If F is not going to get there, then what is our recommendation to the council, and that's why I think it's very important to really discuss the model, and that's where we are. Does that make sense, and, you know, again, how do we move forward? Are we comfortable with the model? If not, what needs to be done, realizing that this is not the first time we've looked at the black sea bass model.

That's why I also would feel very uncomfortable not providing any type of recommendations to the council at this meeting, because we've been there before, and, to be honest, a lot of the issues that we are discussing today were known during our previous review of the previous assessment. I agree that, in terms of the modeling, this is an improvement over what we've seen earlier, but I think, if I hear the committee correctly, there's still a lot of concerns about what was presented, based on the discussion that we heard, and Genny and Amy made good points.

Sometimes we assume that, well, it's not really fishing mortality. I personally think that it's a combination of fishing mortality and environmental factors that got us here, because I was looking at fishing mortality, and, well, that goes back to what has that level been. If that level has been -- If the fishing pressure has been relatively high, over a long period of time, then I agree fishing pressure is a significant factor. I'm not sure what the relative importance is of one over the other. I don't know, and, again, I hope that that makes sense to where we are and the direction we need to go. Jim.

MR. GARTLAND: The one thing that I think we could look at, Matt just did for us, which was the difference in the Beverton-Holt versus the mean recruitment, and I could be wrong, but it seems like the sticking point, for a lot of us, is the 2023 number for F, right? We're starting to think that, well, yes, it's probably high, but maybe it's not that high, and so would it be possible to do a projection? I don't know if this is legal or not, but a projection that averages 2021, 2022, and then 2022 again. Do you know what I'm saying?

DR. REICHERT: For what?

MR. GARTLAND: When you want to do a projection, when you want to use an F, and so, instead of using the average of 2023, 2022, and 2021, can you use 2021, 2022, and then 2022 again, because 2022 is up, right, and so that would indicate a slightly higher fishing mortality, which,

given the reduction in the index, and the slight increase in the landings, probably is not unreasonable, but then, given that the terminal year is the one that we're worried about, and the comments made earlier about not having an age structure beyond the terminal year to inform that terminal year F, is it allowable, and would it make sense to average 2021, 2022, and then 2022 again, and so you're double-weighting 2022, basically.

DR. REICHERT: I think it's technically possible. I think we would need a strong justification of that. I have Erik, or, Judd, to that point.

DR. CURTIS: Yes, and so it could be doable. I think, the way it's written into the language for calculating F is that geometric mean over a three-year period, and so you could change the stanza from 2020 to 2022, to be inclusive of a three-year period. Double-counting a single year would probably be problematic.

DR. REICHERT: I have Erik, Steve, and Kai. Erik, go ahead.

DR. WILLIAMS: Yes, and I was just going to comment that I think we might be getting a little too hung up on projecting the F, when probably the bigger issue is how are we going to project recruitment, and so, I mean, I think, either way -- I mean, if you look at the trend, and look at how we might project recruitment, it looks like it's going to continue to decline, potentially. Well, it certainly will, because you've got a lot of declining recruitments that are still working their way through the age structure, and so this stock is going to, in the immediate future, continue to decline.

So, you know, debating about what the F projection should be is kind of almost irrelevant, because what is going to matter is how does that F need to be adjusted under a declining recruitment, and a continually declining stock, right, and so, I mean, maybe that's the solution right now, is focus more on the what's going to happen with future recruitment, and what's going to happen with the future stock, and it's going to decline, no doubts about it, which means, you know, if catches remain the same, as Jie pointed out, it will result in higher and higher and higher Fs, and so, in the end, our ABC is in landings and discards. I mean, we work with F, but those numbers are just simply going to have to be reduced, right, and so I don't know. Maybe I'm oversimplifying.

DR. REICHERT: Thanks, Erik. Steve, and then Kai.

DR. TURNER: I just -- In terms of procedure, I would prefer to -- I would prefer to focus on the question you initially discussed, before we work on projections, because I have comments on projections that I'm holding off on, and I would prefer that we make a decision, as hard as it is, on benchmarks and then move into the projections. Thank you.

DR. REICHERT: Thanks for that, Steve. Kai.

DR. LORENZEN: Yes, and I just wanted to come back to the dreaded stock-recruitment relationship, and the question of what is sort of driving that, and if we can go back to page 6 in the presentation, and I just wanted to look at that relationship, once more, and point out that, really, there's a big temporal pattern here, where, basically, from around 2013, recruits per spawner took a really, really big nosedive.

You can see they're going down to probably just almost half of what the recruits per spawner were then, and so there was no -- This was -- Until around 2016, this was within the previous sort of normal range of spawner abundance, right, and so you can see there's a really, really big drop in the recruits per spawner, and then it sort of continued on a downward trend, but it does really seem that, you know, what kicked off that big nosedive was a decline in recruits per spawner, rather than a decline in spawning stock biomass at the time. I mean, obviously, one then drove the other, but I think it's quite striking, when you look at this pattern.

DR. REICHERT: Thanks, Kai. Jared.

DR. FLOWERS: I just kind of have overall kind of thoughts on kind of all this, and, I mean, I agree that I think it is a combination of overfishing and, you know, just some fishing effort and then environmental, and I'm not so sure about the magnitude of those terminal Fs, but I do agree fishing is high.

One thing, going back to the environmental side, and looking at the paper that we were presented before, you know, and not to kick this hornet's nest, but red snapper was one of those species. Abundance has increased, and they were one of the species that tended to benefit from warmer climate conditions, and so it's kind of probably confounded reasoning, but black sea bass are going down, and red snapper are going up, and, you know, there's not direct, you know, like predation or anything like that, but, you know, there could be interspecific competition, and one of the things -- Correct me if I'm wrong, but, with the SERFS data, a lot of those high black sea bass sites, like in north Florida and south Georgia, as sea bass were going away, red snapper were increasing in numbers.

I would just wonder if that is -- In one hand, it's an indicator that there is that kind of climate shift going on, there is environmental factors going on, but, you know, then, again, is the index being affected by red snapper displacing black sea bass, and just not being picked up by the survey anymore, or are they just being directly out-competed, and so I was just kind of thinking about it, looking at the data here, and I know Tracey has presented that, I think to us, and I've seen it through SEAMAP stuff, and so I could be kind of confounding where I've seen it, but, yes, I do remember kind of that the black sea bass were disappearing, and the red snapper were kind of filling that area.

DR. REICHERT: Thanks, Jared. Alexei.

DR. SHAROV: Going back to your principal question, Mr. Chair, of do we have confidence in this model, and could it be used for projections, and then making decisions on ABCs, I think we have, you know, sufficient confidence in the model itself, and, overall, it performs well. We do have concerns, or I do have concerns, with the estimates for, you know, the terminal year, and so, if like midterm, or short-term, projections did matter to us, then I would be strongly opposed to, you know, starting the projections from the terminal year, because I feel it's certainly very biased, but, overall, given the status of this stock, and the projection results that I have seen, and we will be going through them, I hope, it seems to me that it really doesn't matter much in the long term.

I mean, if we will start projections from the year 2023, or 2022, the overall effect, and what F is required to rebuild the stock, probably would be the same. That is that the major conclusion from the projections was that stopping all landings, and continuing with current discards, would not

allow for rebuilding of the population, and so we have to look at, you know, the procedures that we have, and what do we do in this case, right, but I think the model has confidence, and we should be proceeding into consideration of the projection results and then having a discussion on how to deal with the results by themselves.

DR. REICHERT: Thanks, Alexei. One open question I still have is the one that I believe Chip brought up, and that is the use of FMSY or a proxy. Kai.

DR. LORENZEN: Well, it won't surprise anyone that I sort of think I'm more comfortable with the proxy than using the MSY, in this case, because of concerns about the stock-recruitment relationship.

DR. REICHERT: Sorry, and can you repeat that?

DR. LORENZEN: So I would be more comfortable using the proxy than the MSY here, just because of the concerns I have about the stock-recruitment relationship.

DR. REICHERT: Anyone else to that point, and the justification would be the points that you made earlier about the stock-recruitment relationship, the non-stationarity? Okay. It may be because we're talking about the same thing, but, you know, the fishery-independent index took a nosedive, you know, at that same time, but that's maybe where the signal of that low recruitment is coming from, also. Alexei.

DR. SHAROV: I just wanted to support Kai's suggestion, and I follow his point about the -- Well, that the information that we've obtained regarding the level of recruitment and the low spawning stock size is probably because of these not normal events, you know, something new from the state of the population in the different -- The state of productivity, and so I agree with that, but, on the other hand, how else do we get the information on stock productivity, low abundance, rather than to have it at the low abundance and measuring recruitment?

In other words, these are the rare events when we brought -- Or the population came down that low, and now we have a measure of recruitment. If the same happened fifty years ago, with the level of recruitment at this low level of SSB, would it have been the same or not, and I think Kai is arguing that probably not, that we're facing something different, or the population is in a different state, and so it's not representative of true stock-recruitment relationship. Is that your argument, right?

DR. LORENZEN: Yes. Essentially, that's it. You know, this is a sort of chicken-and-egg situation, right? I mean, I'm not sure we can conclusively decide that, but, you know, on the weight of what I see in front of me, I would not take this as the stock-recruitment relationship of the stock, and, you know, default to the proxy.

DR. REICHERT: Wally.

DR. BUBLEY: Going along with that, I think part of this though, if you're looking at the stock-recruit curve, is why is that population level low? I mean, the cause of it. If it's fishing pressure, that's one thing. If it's a recruitment failure, it's another thing, and so you have to take that into

account, like talking about getting a low level and then being able to apply it. It's the cause of that low level of stock size is going to play a factor in that.

DR. REICHERT: Thanks, Wally. Amy.

DR. SCHUELLER: Yes, and I don't think I agree. I mean, I -- So the likelihood profile for this isn't too bad. I actually don't think the fit to that stock-recruitment curve is that bad. I don't fall in the camp that life history dictates what the steepness value should be, because I don't think that there's good evidence for that. I mean, I assess forage species that have had, in the past, estimated steepness values that are similar to this, and so I just don't understand, I guess, or agree, with the reasonings behind this, because I don't feel like there's enough evidence, and then what is the proxy?

I mean, if we were going to go to a proxy, I feel like that brings up a whole other conversation. You know, I know, on the books, there's a value, but it seems like, when we are estimating MSY, in general, the SPR values that are recommended to pair with that are much higher, and so I think, if we're going to go with a proxy, what is the value, and it's not 30 percent.

DR. REICHERT: Thanks, Amy. Judd.

DR. CURTIS: So I just want to -- Let me just bring it back a step here, and we're kind of getting caught in the minutiae of things. If you'll recall, trying to avoid where we ended up two years ago, right, and so, initially the 76 model was able to estimate MSY, and then, for reasons that we're talking about again in this meeting, we decided a proxy approach would be appropriate.

Several different SPR proxy runs were taken and reviewed by the SSC, right, with, ultimately, the same conclusions, being that it's ultimately based on whatever that recruitment regime assumption is. If it returns to the long-term average, then it's good. If it stays at that recent average, it's never going to rebuild, no matter which proxy, if you estimate MSY benchmarks, you use, and so that's of concern.

It doesn't seem, whichever scenario you're using, you're going to be able to rebuild to that initial benchmark, under the current recruitment regime, right, and so I'm trying to refocus the SSC a little bit, to try to discuss then what are some alternative solutions that we can suggest to the council to take that maybe gets us out of this box, this iterative box, going back and forth, and in a circular pattern as well, and so keep in mind there -- You know, we've seen presentations on like these dynamic benchmarks, from Jeremy Collie, at the National SSC meeting as well, and this has been used now with the most current update of the red snapper assessment too, and it has been recommended before as a potential option, right, from the center.

If we're unable to -- If we don't know what that benchmark is, or think it's changed through time, then we can't identify where it's at, but what we can control, as has been stated, is that fishing effort, right, and so, if the SSC can decide what an appropriate level of fishing effort is to recommend to the council that then is not going to result in continued overfishing, I think that would be maybe an approach to consider, as opposed to trying to think about this rebuilding target and benchmarks and appropriate proxies or estimates of MSY. Thanks.

DR. REICHERT: Thanks, Judd. Please hold your thoughts. I want to take a five minute biological break, and then we come back to this, and, Judd, thank you. I had a similar thought, in terms of, you know, moving us forward and remind the committee about some of our previous conversations we've had, and so let's take a five-minute break. We'll come back at 11:35. Thank you.

(Whereupon, a recess was taken.)

DR. REICHERT: Thank you for coming back, and so where we are is we ended up with discussion about using a proxy, or not. That may have significant consequences. Judd mentioned that we've been there before. Not everyone was in agreement with going to a proxy, and so I would like to hear from committee members. On the other hand, where is that getting us, in terms of -- Again, going back to our recommendation to the council, is that, you know, we continue -- I think we continue to be in that conundrum of low biomass and what we should, or can, recommend to the council. Alexei.

DR. SHAROV: Yes, and so, just on the discussion of using the SPR versus the FMSY that was estimated, you know, from the model, I think maybe what would be helpful is if Matt has the -- Just the recruiter over SSB ratio, the time series, to see if the productivity has been changing, like falling down, for example. Like, if we are to use the FMSY, based on Matt's calculation, that's equivalent to an SPR of 61 percent, and that seems, to me, really high for a species that, you know, matures between age-one and two.

Having as a target SPR of 60 percent, that it would seem to be more appropriate to -- That high percent SPR as a target probably is more appropriate for long-lived species with low mortality, late maturation, et cetera. It doesn't seem to match with what the biology of the black sea bass is, and an argument -- Amy is not agreeing with Kai's logic.

She doesn't see the sort of support for not using -- I think that the idea here is that the FMSY presumably is reflective of the overall, you know, potential productivity of the stock in the long-term, given some prevailing conditions, which we think are changing now, and the population is moving from one sort of stage, or status, of productivity to another, you know, or at least since 2010, or something like this.

That is the reason that, you know, using that stock-recruitment relationship, that is essentially estimated within this transition period, when the stock has been falling and falling and falling, might not be truly representative of what it's capable for, but the counter argument would be that, if the stock is really changing, because of the environment, and it's moving into the low productivity stage, with a low, consistent low recruitment, that is going to be a different stock-recruitment relationship anyways, even if it's still Beverton-Holt and whatever, but, for that reason, the SPR approach seemed to be sort of more consistent. That is, you know, like it keeps us away from those assumptions, right? We're just looking at the proportion of the fecundity that we'll keep in the water no matter what.

DR. REICHERT: Thanks Alexei. I think Matt put something on screen. Is that correct? Is that what you were asking Alexei? Matt, can you -- I'm not sure if it's possible to increase the size of that graph just a little bit.

DR. VINCENT: So this is a plot of the recruits divided by the SSB in that year. Potentially, you would maybe want to do it the opposite, or you might want to lag the SSB by one year, but this was just on the fly, but, yes, it's recruits per SSB. Let me see if I can -- I can make it thicker.

DR. REICHERT: Go ahead Alexei.

DR. SHAROV: It looks like productivity has dropped on the per unit of biomass after 2010, but not as dramatic as, you know, maybe we would have expected, and it's sort of rising towards the sort of the long-term mean in the past year, and so I don't see a compelling evidence of the significant reduction in productivity, but possibly some.

DR. REICHERT: Kai.

DR. LORENZEN: Thank you, and so I have to look at that in the context of the stock-recruitment relationship, right, and so you would expect -- As you get to low biomass, you would expect the spawners per recruit to be increasing, right, but what's -- Because of the stock-recruitment relationship, but what's happening here is that, you know, we -- There's this really big drop that sort of precedes, and coincides, with the reduction in biomass that starts in the sort of early 2010s, right?

You can see that there's just a really big, big drop, and it's the lowest spawners -- The lowest recruits per spawner in the early 2010s, 2015, and so before -- You know, which then coincides with a reduction in the biomass, but it does seem -- I mean, there's very much a drop there, and then it increases because, you know, you're at a very low spawner abundance then, and so you would expect some sort of density dependence to kick in, but it's still -- If you consider that, you know, we're at very low spawner abundance now, clearly, and the recruits per spawner are only just creeping back to maybe the long-term average that we had, at much higher spawner abundance previously.

DR. SHAROV: But this plot has to be multidimensional, and, here, we're looking only at the effect of the SSB, but there is this unknown driving environmental force that creates this drops, and we don't have it here, but it's there. We're just not showing it, or we don't see it, but we have to keep that in mind.

DR. REICHERT: I have Amy, and then Fred. Amy, go ahead.

DR. SCHUELLER: Yes, and so, if we put some uncertainty bounds on this, then we wouldn't probably do this.

DR. REICHERT: Sorry, and can you repeat that?

DR. SCHUELLER: I said, if you put some uncertainty bounds on this, so if we had a, you know, gray area around these values, such that it gave us an idea of the uncertainty surrounding this, I don't think that we would say there was any trend. I think that it looks flat, from my perspective, especially if I'm sitting here thinking about uncertainty.

DR. REICHERT: Thanks, Amy. Fred.

DR. SCHARF: So, just to that point, I agree, but I think you could also say that about the stock-recruit relationship itself, and so, if you put some gray bars around it, it probably would look flat, but given --

You know, just to reiterate what Kai was saying, is that, before you see a change, a reduction in stock biomass, you see a big reduction in recruits per spawner, that suggests lower productivity in the stock, and then, even in the most recent years, when the stock is at its lowest in the time series, you're seeing this creep back toward the long-term average, but if the stock really had -- That's where the compensatory reserve should be the highest. You would think that the recruits per spawner would far up -- Or shoot over that long-term average, and it's not, and so it's still compromised. It suggests that the stock's productivity, in this last decade, is lower than it has been in the history of the stock.

DR. REICHERT: So where does it leave us? Kai.

DR. LORENZEN: Well, you mentioned, or someone mentioned, and was it Judd, Jeremy Collie's adapting to changing productivity presentation. I mean, this seems to be a good candidate to sort of take that approach, but I'm not sure we can do that right now, with what we have in front of us, and so, just in principle, it seems this might be one that's relevant.

DR. REICHERT: Thanks. Yes, and, you know, in terms of our recommendations, or research recommendations, that will fall under that. Back to the question. Is the -- Where is the committee in terms of using a proxy rather than the estimated MSY, and I still have heard different arguments, and so I would like us to make that decision. I don't see any hands up. Alexei.

DR. SHAROV: I'm not going to influence any of your opinions. I just wanted to say, whatever we choose, it wouldn't matter within the next twenty years or so, and so just make a decision, I mean, with respect to the --

DR. REICHERT: Well, it -- Erik, I saw your hand up. Well, it does make a difference, because it has the strong potential to change stock status, and so that's -- It's not completely irrelevant, whether we use this proxy or use the MSY. Erik.

DR. WILLIAMS: Yes, and so Kyle and I have been working on this issue of, you know, what is the best proxy, and one of the estimators that's out there is the Xiao paper from 2020, and, if you use the life history predictors, and the modeling that's in that paper, for black sea bass, it comes out to 50 percent, but that's just one estimate. It's that Xiao paper specifically. You know, there's a whole lot of estimators out there, potentially, and there's meta-analyses and so forth, but, if you want an estimate that uses some life history parameters as a predictor, then it comes out at 50 percent with that Xiao model.

DR. REICHERT: Thanks for that, Erik. Okay. Proxy or not? I mean, that's where we are, and we make decisions by consensus. Jim.

MR. GARTLAND: Would it be inconsistent for us to say that we accept the assessment the way it is, with the Beverton-Holt stock-recruitment in it, and then say, no, no, but we want to use a proxy? If we accept the assessment, and we have that in there, shouldn't -- Do we need to stay consistent with ourselves? I think we had a similar discussion when we had the South and Gulf

joint meeting, right, that we accepted the assessments with Beverton-Holt in it, and then we wanted to jump right away to a proxy, because it was so rare for the Beverton-Holt to actually work in a lot of these assessments, and so, if we choose to go with a proxy, are we being inconsistent with ourselves?

DR. REICHERT: I do not think we are. Genny.

DR. NESSLAGE: Could you go to the assessment report, Figure 40, please? It shows the landings by fishery, and it has a -- PDF page 104. Thank you It shows the landings trends over time by fishery. It shows the landings trends over time by fishery, and there's a dashed line, which, if I'm reading this correctly, is the MSY. Looking at this, we were exceeding MSY all the way through to 2014, when magically something happened in this stock, and it crashed. If we had fished below MSY, maybe that wouldn't have happened, and so I'm fine with MSY. Am I misreading? You're giving me a crazy look.

DR. REICHERT: Well, no, and so you say we were fishing above MSY through 2014?

DR. NESSLAGE: The landings were greater than MSY, according to this graph, through what looks like 2014. There were several years where it was below, and there's several years where it was above, right, and there's uncertainty in MRIP, et cetera, et cetera, and so we were probably fishing around, or above, or slightly below, MSY for many -- Most of the time series. If we hadn't done that, it's very possible this stock might not have crashed, and so MSY might not be that bad an indicator, if we actually didn't fish at or above it. That's my point.

DR. REICHERT: Kai.

DR. LORENZEN: Yes and so maybe, I mean, we've been fishing near MSY. I can see that, but that should not lead to a dramatic stock collapse.

DR. NESSLAGE: Given all of the uncertainties in this stock, you think it follows a logistic population trend? Fine. Whatever you guys want. I wash my hands of this.

DR. REICHERT: No. Well, that's -- So and help me. Help me to wrap my head around this. So you're saying we've been fishing above or below MSY since 1992, the whole time, and the population kind of was relatively stable, and we got the increase, because of that big year class, and then it collapsed.

DR. NESSLAGE: Right, and so what Kai and I are arguing about is that, technically, you can fish above MSY, and it will not cause population crash. It needs to be at fishing -- The exploitation rate needs to be at the population growth rate for it to collapse, but, given all the uncertainties in this stock, and these stock assessments in general, and MRIP in particular, it's very possible that -- I just -- This doesn't look good, from a general fishing -- This gives me great heartburn. Am I -- Maybe no one else has that heartburn, and so I'll stop.

DR. REICHERT: Alexei.

DR. SHAROV: When you say it doesn't look good, what doesn't look good? In other words, are you saying that the FMSY -- Well, all right. What is it about FMSY and MSY that you think is wrong? Can you --

DR. NESSLAGE: Oh, I don't think it's wrong . I think if we had actually responded back then, even using the current, what they're proposing as the reference point, we might have been able to change the trajectory. I don't know, but --

DR. SHAROV: Well, are you in favor of FMSY, I mean, using the FMSY from the model?

DR. NESSLAGE: I think it's fine. It's fine enough.

DR. REICHERT: I've got Fred, and then Chip.

DR. SCHARF: So just to add to what Genny was saying, you know, in the model, the FMSY is 0.315, and, if you look at the average F since 2004, and not including the last two years, and not including 2022 and 2023, but just including 2004 to 2021, which is eighteen years, the average F for that eighteen-year period is 0.631, which is exactly double the FMSY, and so, basically, for almost two decades, we've been fishing at twice the FMS.

DR. REICHERT: Chip.

DR. COLLIER: So I don't disagree. However, the picture that the council has been provided is totally different than that. They went into a rebuilding plan, I believe, in 2008, and rebuilt the stock by 2016, and that was based on CHTS units, right, and so the council has been responding to assessments in the past.

The story has been changing as the inputs have been changing, and so it's -- There's definitely a lot of management actions that have been going on for black sea bass. We have changes in size limits, restricted areas for fishing. I mean, it's a lot of restrictions. You can no longer use those trawls that you saw in the early part of the time series, and so, yes, things have happened. The council has not let this go uncontrolled, but this is a different story than what they've been told in the past.

DR. REICHERT: Genny.

DR. NESSLAGE: Thank you for that clarification, and I'm sorry if I was being flippant there, and so I apologize to the council, and to the folks in the fishery. I guess, given this new picture, my perception of how things have changed, assuming that the new recreational estimates are correct --

DR. VINCENT: Genny, can I explain? So, in the previous plot -- Well, so the MSY is composed of -- Well, the fishing mortality at MSY is composed of both the fishing mortality and the discard mortality, and so, in the previous plot, this is just the plot of the MSY landings, and so I don't know if I have a plot that has the total.

Well, the landings and discard numbers doesn't have the total plot in there, and so I would need to re-plot it, but you do see that the increase in discards exceeds that discard mortality in around 2011,

or 2012, when we do see the decline in the abundance, and you're also fishing at a relatively high value as well in the FMSY, and so you're exceeding both. You need to exceed both the FMSY and landings, or the catch in landings and the discards in landings, to technically be above that FMSY, if that makes sense, and so I probably needed to make another figure that has this one, that has a line here, and I just -- I didn't, but I would presume that it exceeds it somewhere around the 2011, or somewhere like that, but it would -- I don't know. I would have to make the plot.

DR. REICHERT: Amy, I know you have your hand up, but, Genny, to that point, and then I'll go to Amy.

DR. NESSLAGE: Sure. Thank you, and so thank you very much, Matt. So, in this plot you're showing here, then this is indicating that the fishery is responding to the management measures that the council has set, and they are discarding a lot of animals, correct, a lot of fish. If they're discarding that many fish, how can there be a recruitment failure, and so something is off.

DR. REICHERT: Amy.

DR. SCHUELLER: Genny, that's dead discards, and so I don't know what the discard mortality rate number is. I mean, I think what Matt was trying to say is that, if you had a figure that had discards and landings on it together with the MSY value, then it would accurately reflect the F values that Fred summarized, and that's not why I originally raised my hand, but --

DR. REICHERT: Okay. Go ahead, Amy.

DR. SCHUELLER: I mean, I originally raised my hand because I agree with Genny. I think that FMSY seems appropriate, and it seems like the fishing mortality rate has been above that level, and, hence, we could have a stock collapse, and I mean, this is like, you know, poster child reasons why we have an OFL, and then we're supposed to have a buffer for ABC, and then, you know, there should be buffers for other, you know, management actions and stuff, because we should be acknowledging uncertainties, and so when we're --

Not we, because, I mean, we set the ABC, but then, when ACLs become the ABC, that, you know, doesn't accurately reflect uncertainties that we've had in these assessments over time. and so it puts you sort of in a riskier position, and this can be the end result of that, and so I just wanted to like -- This is a risk thing, too. Like, generally, the risks are higher, given the way that things have been set up, and so it's not surprising that, in some circumstances, we're going to have unfavorable results.

DR. REICHERT: Thanks, Amy. Alexei.

DR. SHAROV: I think I agree with using the FMSY from this model, and I think Jim mostly convinced me with his argument that, if we are, you know, confident with the assessment, and the assessment approach, then our reference points, ideally, should be consistent with the methods we estimate the population and the way we model recruitment, and out of this comes the FMSY estimate.

My reservations were partly shared with Kai, that we're not very confident about the stock-recruitment relationship, because -- Well, we were able to fit the stock-recruitment curve only

because of the significant population decline, with the reasons not clearly learned and understood, and whether this is truly representative of the productivity of the stock in general, we don't know, but we'll never have ideal data.

This is our first sort of apparent estimate of the FMSY, given the whole history of the stock. Obviously, if we were able to go beyond 1980, and we had thirty years or more of data, with the stock being much closer to the unfished state, probably the FMSY, and definitely the MSY estimate, would have been different, but, from where we are now, that probably would be a safe bet, and, honestly, again, just to repeat, if we take SPR 30, or SPR 40, it would not change much our next steps, with respect to the ABCs, but I'm in support of using the MSY, at the moment.

DR. REICHERT: Thank you. Except, and I'm not sure about SPR 50, but except for the fact that the stock status may change, but anyone -- So we are back to a recommendation by some members to use the estimated FMSY in the model, rather than a proxy. Anyone that disagrees? Kai, you're thinking, or you're okay, because you were one of the people that were initially proposing a proxy. I don't want to put you on the spot, but sorry.

DR. LORENZEN: I still have the same concerns, and reasons, but, you know, I'm not going to die on this hill.

DR. REICHERT: Well, as I said earlier, we are making decisions by consensus, and so -- But you're right. Given the concerns ,and, again, we have assigned a relatively large number of people to this agenda item, and so we really count on you to flesh out some of those notes, and arguments, and so please help us getting that on paper.

Okay, and so that's a decision. Are there -- Let's see, and what time is it? It's 12:05. Let's break for lunch. Are we okay with coming back at 1:15, rather than 1:30? That gives us an extra fifteen minutes. We still have a couple of presentations to go through this afternoon. I also feel we're not entirely done with black sea bass, and so we may come back to black sea bass. I'll talk with Judd and Wally about how to approach the afternoon agenda, and we'll come back. 1:15 is okay with everyone? Okay. We'll recess until 1:15. Thanks, everyone, for your contributions.

(Whereupon, a recess was taken.)

DR. REICHERT: Welcome back. So, Judd, Wally, and I were talking a little bit about our agenda. Let me pull it up real quick, and so we have a hard stop at 1:30 for the MSE, or the Ecopath, and so I would like for us to spend the next ten or fifteen minutes summarizing where we are with black sea bass, and, in particular, please think about that. What are we going to ask of Matt? He needs to know of any additional runs, so he can start working on that and we can discuss that tomorrow.

Then we go to the SERFS update, and then it’s a little up in the air. We’ll have a break, and it’s a little up in the air what we will do, in terms of the rest of the day, and so we’ll update the committee on that after our afternoon break. Any questions, comments, or recommendations there? So, going back to black sea bass, Kai, you requested that sensitivity run with mean recruitment, but Matt showed some of that, and so is that no longer a request?

DR. LORENZEN: No, and, I mean, that was fulfilled.

DR. REICHERT: Thank you. Then the other thing I had on my list was the recommendation that I believe Fred made about using -- I don't have it here, but it's on the screen there, using the 2020 to 2022 as an F, as an alternate projection. There's still some other conditions of the projections that we may need to talk a little bit about. I'm asking the committee if they still want to see that.

Fred, I'm not sure if you're back from lunch yet, but is that something -- If we do that, we also need to kind of take a look at the justification for that, but we talked about that extensively, and then were there any other requests? Anne, I remember you mentioning some of the information on discards, whether that's available. I'm not sure that's a question for Matt. I don't think Matt has that information, and so that should come from other sources, which may be a little bit too much of a lift. Do you agree with that?

MS. MARKWITH: Yes, and I agree with that, because I'm not exactly sure what's available, or what the best proxy would be for that, the link frequencies to calculate all that, and so it would be nice to see, but I also don't know what sort of numbers to give them to run a selectivity, if you were just to choose numbers, either.

DR. REICHERT: Thank you. Fred.

DR. SERCHUK: Yes, and you had my recommendation correct, in terms of what I think is appropriate for using for the Fs.

DR. REICHERT: Thank you, and so that's a request on the books. Is there any other guidance that we -- I have to be honest with you that my brain is still a little fried, and are there any other conditions that would go with that, in terms of running the projections? Fred.

DR. SCHARF: So, just to clarify what Fred's request was, it was to use the F, the average, or the average over from 2020 to 2022 as current, F current, because they run a projection with F current, which uses 2021 to 2023, I assume, right, and it's the average over those three years, and it's like a geometric mean for 2021 to 2023, and so Fred's request would be to just shift back by a year, and use that for F current?

DR. REICHERT: Yes, and keep the rest of the approach the same.

DR. SCHARF: Okay.

DR. REICHERT: I was talking with Judd, real quick, and so this would provide the OFL at a 50 percent probability of --

DR. CURTIS: Yes, and the OFL represents, typically, to use a P* approach of 50 percent, right, and then the -- That would represent the OFL, and then, from that value, the SSC would apply the ABC control rule to come up with a P* that would represent the ABC value.

DR. REICHERT: Anything else? Steve.

DR. TURNER: Yes, and we have to specify recruitment, correct, what recruitment they're going to project? So then my recommendation would be to look at the pattern in recruitment over many

years, and follow that trend, rather than assume a mean, because a mean doesn't follow the current trend, and so I'm suggesting we use declining recruitment in the projections, because, if you look at Figure 28 in the -- Recruitment is declining pretty steadily.

DR. REICHERT: Yes, and, again, correct me if I'm wrong, but, to remind the committee, traditionally, what we've used for the OFL is the long-term recruitment. That's based on the working group that presented their findings a while back, and then, for the projections, we use the short-term recruitment. That's what we traditionally have done, and so, if I'm hearing you well, that's what you are recommending, or not?

DR. TURNER: Yes. For the short-term recruitments, that's what I would be recommending.

DR. REICHERT: For the projections, but, for the OFL, we use long-term recruitment.

DR. TURNER: No, for the projections.

DR. REICHERT: Sorry?

DR. TURNER: For the projections.

DR. REICHERT: Yes, and so that's consistent with what we've done in the past. Anything else? I'm not sure if Matt is back.

DR. VINCENT: I'm here.

DR. REICHERT: Okay. Thanks. So does that makes sense, Matt? Please speak up if you think that -- Well, if you have any comments, or questions, about what we are requesting.

DR. VINCENT: So I guess I never went through what was done in those projections. In those projections, what was done is we took the Beverton-Holt stock-recruitment relationship and then predicted, based on the spawning stock biomass, but then applied the negative deviate from 2014 -- The mean negative deviate, or just the mean deviate, from 2014 to 2021, and those were all the negative values that showed that trend, and so I guess I'm not sure. Are you -- So it doesn't use a mean value, and so it uses that deviate, and then it applies an additional random deviate on top of the negative average deviate, and so, I guess, if you're suggesting following a decline, are you expecting that I fit another like linear model through that decline, and just extend it downwards towards zero, or -- I guess I'm not entirely clear on what the recommendation is.

DR. REICHERT: Jim, to that point.

MR. GARTLAND: I think, and I could be wrong, but we might've gotten stuck on what we have typically done, and, if we're using the Beverton-Holt, and we're assuming everything's cool, and we're going with the MSY, I think, in my opinion, Matt, what you did is the right way to go.

DR. REICHERT: Agreed. Steve.

DR. TURNER: Yes, and that's fine, and he has my ideas incorporated in the way he's projecting, and so that's fine.

DR. REICHERT: All clear, Matt?

DR. VINCENT: Okay. Yes, and stick with what I did, and just change the F to 2020 to 2022.

DR. REICHERT: Thank you. Before we go to the presentation, I just want to make sure we provide guidance to you, so we are not doing that at the last moment, although it -- Any other requests for Matt? Seeing none, I think that's clear. I think we only have one run that we are requesting of you right now. Okay, and then we'll come back to that tomorrow morning, like following the agenda. Steve.

DR. TURNER: Is that what Matt has done, and is it in the final part of the presentation we haven't looked at yet?

DR. REICHERT: I don't think it is. Matt, can you --

DR. TURNER: Not with the average F though, obviously.

DR. REICHERT: Matt, the 2020 to 2022, that's not a projection you've run before, right, and so that's not in any of the reports, or presentations, correct? That's my understanding.

DR. VINCENT: No, and we calculated the 2020 -- Or F current as 2021 through 2023, as the terminal three years of the assessment, and so what I presented. So are you -- I guess you said there's only one scenario that you want, and so you only want the F current, with that changed in that, or do you want all of the projections that I've done, and just changing the interim time period to the shifted F current?

DR. REICHERT: We are thinking, Matt.

DR. VINCENT: Okay.

DR. REICHERT: Jim.

MR. GARTLAND: If you've already done them, I think they're certainly worth looking at, and I think all we're saying is plus one, which is the F 2020 to F 2022 option, and so everything you've done, plus that one little bit more.

DR. VINCENT: As the projection F in the future, across all years, or just for the interim, I guess is my question. So like, essentially, you're just requesting a slightly different F current scenario, because -- Or do you want the interim F in that to be changed, and then also have like an F zero scenario or a P*scenario, that type of thing as well?

DR. REICHERT: Okay. I think I know what you're asking, and so you're talking about 2023, and what to use there? Is that what you mean with the interim year?

DR. VINCENT: Yes, the interim years. Sorry. The interim years are 2024 and 2025, where we assume that we are going to continue fishing at the current level, which would be -- Which I did as the geometric mean of 2021 through 2023.

DR. REICHERT: Judd, and then I'll go to you. Yes, and I think -- Well, Judd, go ahead.

DR. CURTIS: Yes, and so I think you just shift that geometric mean of years to 2020 to 2022, to represent F current. 2023 would then also be a third interim year, along with -- So 2023, 2024, and 2025, with projections beginning in 2026, and likely we would need the same scenarios, where F would equal zero, and the rebuilding scenarios, as well as the P* scenarios.

DR. VINCENT: Okay, and so, if we go down that road, then you would be providing one less year to the council of projections, because only -- For the short-term projections for five years, following your own rules, and so, you would be -- Because, if 2023 is going to be a projection, then it would then be a projection year, right, or am I misinterpreting?

DR. REICHERT: No, I think you're right. I think that would be the consequence of this decision, and I'm looking around the table. Everyone clear what we are asking, and comfortable with what we're asking, and, Matt, that's doable, and you know what we are asking?

DR. VINCENT: I believe so, yes.

DR. REICHERT: Thank you so much. All right. Then, unless I see hands around the table, we'll move to another agenda item. Jeff, go ahead.

DR. BUCKEL: Matt, in the prior projections, the F discards was equal to F current, and I noticed that you have both. You've done some of these without F current equal to F discard. The last projection has that, but that was something that we had decided to write that -- When we go to these lower landings, it's the discards are likely at least stay at the F current.

DR. VINCENT: Yes, and so I guess I -- So, when I did these projections, I just started with the F zero landings and the F discards at F current, and, since that scenario didn't even allow rebuilding, I just wasn't even sure where to go from there, and so I just then proceeded with the P* projections, which assume that you have to decrease both discards and F current, but I guess I wasn't entirely sure how to proceed, since the F current, or the F discards at F current, doesn't allow the rebuilding, even with the landings at a zero fishing mortality, and so, yes, if you have an alternative suggestion of how to do that, or what -- An alternative suggestion, let me know.

DR. BUCKEL: Yes, and I think it would depend on the management action that goes into place to reduce the harvest. If it's not, you know, a complete hooks out of the water, then we know that we're still going to have the discards, and that -- Right, and we talked about F current in kind of a -- You know, it's better than the F discard going to zero, and so that's where we had landed on the prior projections for black sea bass. I think we would still be there, unless there's going to be a management action that we're all hooks are out of the water.

DR. REICHERT: Does that clarify it, Matt?

DR. VINCENT: Yes and no. Like I understand the rationale behind it, but, I mean, I don't know what scenarios -- Like so you want me to do P* scenarios with the F current, to show -- I guess I'm not entirely sure what -- Yes, and I guess I'm confused.

DR. REICHERT: Jeff.

DR. BUCKEL: I think what we did before, and folks correct me if I'm wrong, that, for the projections for discards, it would be F current, and so that's -- All your other scenarios for landings would change, based on all the different things you have, but -- For F harvest, or F landings, and then F discards would equal F current.

DR. REICHERT: Correct me if I'm wrong, because we don't know how that management will look like, and that's part of that.

DR. BUCKEL: Right, and so, if the council sees that, and I think that's the way things have worked for the last several decades. If they choose to go with hooks out of the water, then there would be different projections, right, but, right now, the way things have gone, it's -- We haven't had the hooks out.

DR. REICHERT: Does that make sense, Matt, and, again, Matt is thinking.

DR. VINCENT: Yes, and I guess, to me, it just doesn't make sense to do, because, I mean, the projections with zero landings doesn't rebuild, and so, even at that scenario, it doesn't allow it rebuilding. Doing these additional other projections, with a higher F on the landings, but then the discards at the F current, you're never going to rebuild either, and so I guess I'm just curious why -- Like I can do them.

Sure, I can do that, but, to me, it just seems like wasted effort, but I definitely understand that the assumption is that the F discards are going to remain the same, if we don't take a certain management action to address the discards, but I don't think -- Well, that is an option that the council can do, right? Like we've made the assumption that they won't, but I think that's not necessarily a valid assumption that they have to not change the discard fishing mortality.

DR. REICHERT: Jeff.

DR. BUCKEL: I think any projections of discards where it's assumed that the F is going to go to track the landings F, you would let the council know that that's under a hooks out of the water, when the projections are presented, but maybe -- If it's not all hooks out of the water, then you're going to get something different for the F discard.

DR. VINCENT: Yes, and, when we present that, we'll present what the percentage reduction in discards is needed, along with the reduction in landings, and I think, under the scenarios presented in the 2026, it would be like a 93 percent reduction in discards is what's needed under those scenarios, is what the previous projections -- It might change a little bit under these new projections.

DR. BUCKEL: Thank you.

DR. REICHERT: I've got Mike, and I just want to remind us that we really need to go to that presentation, because of the time the presenters have, and so Mike.

DR. SCHMIDTKE: I'll try to be brief, but I just wanted to remind that, even in a council hooks-out-of-the-water scenario, depending on the year, half or more of the recreational releases occur in state waters, which is not the council's jurisdiction, and the council would not be setting management for those within three-mile or inland waters.

DR. REICHERT: Thanks, Mike. Okay. One last time. Matt, you're good, or you still have questions, because I don't want to leave this while you are still uncertain of what's asked of you.

DR. VINCENT: I'll just run a whole bunch of different combinations and let you pick.

DR. REICHERT: All right. Well, I appreciate that, and, you know, just so you know, I really also appreciate the conundrum we are collectively in, and that includes you, and so thanks, and we will possibly -- I hope we have some time later to come back to -- Today to come back to a black sea bass. All right.

With that, let's go to Agenda Item 8, Ecospace Module for Reef Fish. Let me scroll to my overview here, real quick. Documents are in Attachment 8a and b, and Jared, Chris, Jim, and Alexei are assigned to this agenda item, and we will get an overview presented by Lauren, and I believe that Dave is online, in order to answer any questions that we may have.

DR. CURTIS: Dave, I've unmuted you on your end. Do you want to test your audio, so you can chime-in.

DR. CHAGARIS: Yes. Can you hear me?

DR. REICHERT: Yes. Loud and clear.

DR. CHAGARIS: All right. Thank you.

DR. REICHERT: All right.

ECOSPACE MODULE FOR REEF FISH ECOPATH WITH ECOSIM MODEL

MS. GENTRY: Can everybody hear me? Okay. Hi, guys. I'm Lauren Gentry, from the Florida Fish and Wildlife Research Institute, and, today, I'm here to give an update from the SSC's ecosystem model team, which consists of myself and Luke McEachron from the FWRI Center for Spatial Analysis, Shanae Allen from the FWRI stock assessment group, Dave Chagaris, from the University of Florida, and Chip Collier from council staff.

We're really here just to show you how the model looks right now, what we're doing with it, and get some updates on next steps. Let's see if I can just -- Okay, and so the main goal for today is to bring you all up-to-speed on what we've been doing to build out the spatial components of this model, what we plan to do to finish it, and use it, and to get your feedback on those two parts.

I'm going to try to leave plenty of time at the end for discussion, because the feedback that you guys give is going to be what makes this model actually work, and so, first, we'll cover some

background of how we got here, go through the specific spatial data that we've been compiling for this model, and then talk about next steps.

DR. CHAGARIS: Lauren, sorry to interrupt you. For those of us online, we're seeing your presentation mode screen, or the presenter screen.

MS. GENTRY: We're seeing the other one here, and Judd already -- Judd abandoned us. Let's see if we can just -- Mike is going to help with this. Everyone online, we're just going through some technical difficulties. We'll be right back.

DR. REICHERT: Is this better, Dave?

DR. CHAGARIS: There it goes. It looks good now. Thank you.

DR. SCHMIDTKE: The webinar is broadcasting the presentation mode, but, in the room, we'll see the notes section, and so, if you want to just see the presentation mode, just log on to the webinar.

DR. REICHERT: For those on the webinar, we are still trying to solve a little technical issue here, and so bear with us. So we are good? All right. I think we've resolved the problem, and so, Lauren, go ahead.

MS. GENTRY: All right. After a little technical mastery from Judd. All right. Folks online, are you seeing the whole screen for the presentation? Yes? All right. Perfect. Okay then. All right. A quick overview of EwE then, since it's been a couple of years since you guys have seen these presentations, and so this is the Ecopath with Ecosim and Ecospace modeling framework, and each of the names is a module in the software that builds on the last, and then each has its own uses too.

Ecopath builds a mass balance snapshot of the ecosystem, using static information about one point in time in one place, and so, for our models, that's 1995 in the South Atlantic managed area, and, from this, you can find indicators about how the ecosystem is being driven, like key species, competition, things like that. Then, in Ecosim, you can add in time series of things like biomass, or catch, or fisheries indices, and this is where vulnerabilities, which are -- A vulnerability is kind of in a nutshell in these models. It's how vulnerable each prey is to each predator. Those vulnerabilities mediate all the interactions in Ecosim.

Then Ecosim can make biomass predictions into the future, for each group, so that you can run scenarios to see potential winners and losers at some future time point, or in the past, I suppose. Then lastly is Ecospace, which builds a spatial module on top of all the other parts, but with spatially-explicit data, like static maps of like habitat and depth, and things that don't change, or dynamic maps, like monthly temperature, or primary productivity, and it runs the Ecosim model in each grid cell of the Ecospace model, with biomass able to move between cells, depending on how suitable that cell is for that species.

Then what you get out is a biomass, or a catch time series, for each grid cell, and that turns out into like a time series of maps, essentially, and so this is a lot to take in, for people who don't work with this regularly, and so I did try to use those round logos, the blue, yellow, green logos at the top, throughout the presentation, so you'll know which things come from Ecopath, Ecosim, or

Ecospace, and, also, all of those figures that are inside the boxes, the inset figures, those are directly from EwE, and like that's what it looks like. It wasn't built to be beautiful, and so, any figure you like, the model team gets credit for that, and everything else -- That's the software's fault.

Now, the original model started out some twenty-five-ish years ago, at this point, with forty-eight groups, and a group can be -- In these models, a group can be a single species, like a spiny lobster, or it can be a functional group, like benthic crustaceans or something like that. You can bundle together a lot of things.

Well, this first model was mostly managed species, and it was established by Tom Okey and Roger Pugliese, as a framework for the council to build upon as needed, which they did. Over the years, they added more species, more groups, more priorities, things like that, and it was used to explore ecosystem dynamics, and a lot of you guys in the room were involved along the way.

Then, after about twenty years of use and expansion, the current modeling team was established, and what we call the big model was taken to its current state, and so this is the South Atlantic region ecosystem model, but mostly we just call it the big model, and its current state is 140 groups, representing seven-hundred-plus species, and hundreds and hundreds of data sources. These days, this SAR model, or big model, is still used as a data repository, and we're also using it for some predator-prey analyses for the Habitat AP, but, back in 2021, we did use it to examine the potential impacts of red snapper high recruitment.

The question was what would happen to vulnerable species if red snapper rebuilt to a much higher biomass than kind of previously expected, and so, to examine that, we created two future scenarios in Ecosim, with two different recruitment/biomass scenarios from SEDAR 73. In purple, that's the historical slower red snapper rebuilding rate, on the bottom there, versus, in pink, the faster recent rebuilding rate, and we found that this increased biomass of red snapper, just between the end of the purple line and the end of the pink line, that resulted in a 4 percent decrease in the black sea bass population in 2044, as a result of both competition and direct predation.

When we stress tested this, we made black sea bass like 25 percent of the red snapper diet, and we increased fishing pressure on black sea bass like sevenfold, and we just couldn't move the needle to see red snapper having a meaningful impact on really any of the groups, because negative 4 percent -- Like that's within the margin of error for one of these models.

Now, these results did match up with similar analyses that have been done in the Gulf of Mexico, and it also makes sense that a generalist predator is going to be maybe unlikely to drive down an already low availability prey, and these results were reviewed here by the SSC, but we gave the caveat, at the time, that this is just Ecosim, and it assumes that all of the species are evenly distributed in space, but this big model is just too big to run with Ecospace. That’s -- It’s impossible to do it.

That led us to the next generation of South Atlantic models, which is the South Atlantic Reef Fish Model, or SARF, and so SARF is a medium-sized model of mostly the same data from the original model, from the big model, but we've compressed it down into forty-one groups, and it's featuring the main snapper grouper species, now with age structure, and that means that we can model the babies, the juvenile, and the adults all separately from each other.

These specific groups were chosen as a combination of council request, of catch rankings, economic rankings, and importance as predator or prey, and having a stock assessment in good standing too, and I think that was another criteria.

Each of the groups highlighted in green was then assigned three age stanzas or --They're called age stanzas, and they're age classes, based on ontological shifts, habitat shifts, fecundity, and the age and size at which they are fully selected by the fishery, and then, just before we move on, another phrase you guys may have heard about this one is you might have heard us calling it the MICE model. MICE is Models of Intermediate Complexity for Ecosystem assessments, and that's just a general term in EwE modeling, and so, if you've heard us use that phrase in the past, or hear us use it today, the MICE model, that's this, and that's the SARF model. MICE is just a general term.

Other aspects of this model are, let's see, the fishing fleets. We chose fishing fleets by taking all of the fleet designations used by the stock assessments, and we ranked them by highest catch for the groups in the model. One addition to this is that we've recently found that capturing all the spatial dynamics for a few of these species is going to require time series of fishing effort that is specific to that species, and not just to the fleet as a whole, and so, for those groups, we are going to add species-specific fleets, as needed. Right now it's looking like it might just be red snapper and black sea bass, but we'll see how it works for the other ones, too.

The diets were all combined and compressed from the big model, and then some small adjustments have been made during model tuning and as new data has come in. Ecopath landings and discards were taken from stock assessments, where available, and then MRIP and ACCSP, when stock assessments, where available, and then, for Ecosim, for this SARF model, the time series were built almost entirely from the indices of abundance from the stock assessments, plus the, you know, SERFS indices of abundance, and I think not included on this list, but it should be, and I think there's one more from the SEAMAP group. I think we have a shrimp index of abundance in there, too.

For these stock assessments, we did use all of the updated ones, and so the ones that were updated from, what was it, CHTS to FES numbers, those updates, and then the most recent red snapper update from, what was that, last fall, I think, and so, yes, we've got all of the most recent approved stock assessments in there.

After Ecosim calibration, in which those vulnerabilities I mentioned before are adjusted to help the model projections fit the best time -- Or best fit the time series, we got these model fits here, and they turned out pretty well. The solid lines are the biomass projections from Ecosim, and the squares are the biomass projections from the stock assessments.

The tiny little diamonds, that are kind of hard to see, those are the different indices of abundance, and, unfortunately, in EwE, multiple indices are all the same color within each group, and so what we're really looking for, when we look at these fits, is fitting to those biomass estimates, which are the squares, and just the general trend of the abundance indices.

As expected, not every bump and dip in the data is going to be reflected in these model projections, but, for the most part, we're able to capture the major trends in the biomass, and, while the majority of the uses of the SARF model aren't going to be using just Ecosim by itself, Ecospace does run

the Ecosim model in each grid cell, and so it's important to get these fits right before we move on to Ecospace calibration. Another thing to note is that these are the projections without those species-specific fishing fleets, and so these should get even a little bit better as we add those in.

Now, before we go onto the spatial data, one thing that the SSC model workgroup mentioned, during our review last year, was they wanted to see if that red snapper predation analysis looked the same in the SARF model as it did in the big model, to see if we're still capturing the same dynamics in the new one, and so some of you guys may actually remember the figures on the left.

That's from the red snapper analysis, but, if you don't remember, the blue lines are the stock assessment biomass predictions for red snapper from SEDAR 73, and those are all the way out to 2044, and the top panel is the rebuilding biomass under long-term average red snapper recruitment, which was Scenario 7, and then the bottom panel, that blue line, is the rebuilding scenario under the high recent recruitment, which was Scenario 13, I think.

Then, the purple and the pink lines on top of them, those are the same biomass scenarios as projected by the big model, and so all we did to get the two different ones is we just changed the vulnerabilities, to simulate that high red snapper recruitment rate, when we did the high recruitment scenario, and so we did the same thing again. That's the panels on the right-hand side.

The blue lines are the same stock assessment projections, and the purple and the pink lines are the SARF Ecosim projections, and so, again, this time, the only difference between the two scenarios is that the vulnerabilities of the juvenile red snapper have been increased, simulating a higher recruitment rate for the red snapper, and so, for our two scenarios, we were in fact able to pretty closely mimic at least the final biomass in the assessment projections.

The idea then is that we run those two scenarios all the way out to 2044, with the only difference being the higher red snapper biomass. Then we can compare the biomass of all of the other groups, to see who the winners and losers are as a result of just that increase in red snapper that's shown by the black area, or the black arrow. Sorry.

The results were pretty similar between the big model results and the new MICE model, or, sorry, the SARF model results. On the left is our biggest winners and losers graph from the scenario testing with the big model, and on the right are the results from the SARF model, and so the X-axis down there -- That's the percent difference in each group's biomass when red snapper has a higher biomass, and, most importantly, the scale of the results are the same. The percent changes from, what's that, like negative 5 to positive 3 percent, or something, and you'll notice that there's more brown bars on the right-hand side.

That's just because there were only five winners total, which is to be expected when you, you know, limit the number of groups that you have to work with, and so the groups marked with an asterisk -- Those represent groups that are prey items in the diets of at least one of the red snapper age groups, and it seems like all of the winners in the newest analysis are present due to release of predation pressure, which means that they were being fed upon by one of the loser groups.

The losers seem to -- Just like last time, again, these are a mix of groups that are eaten by red snapper, have one of their younger age groups eaten by red snapper, or are competing with red snapper for prey, and remember too that this is only looking at the difference at the very end of

those scenarios. A bigger effect would probably be seen if you were to look at like the cumulative twenty-year impact of the higher biomass, and it's also worth pointing out that all three of the black sea bass age stanzas are sensitive to the increased red snapper biomass. It's not much, and it's a very small percentage, but it's there.

That is why this is not the last time we're going to do this analysis. This was really just to check that Ecosim was giving us the same magnitude of results as the big model one. This was just kind of a verification step, you know. However, these results have the same caveat as before, which is that Ecosim assumes that all groups are equally distributed in space, which we know they're not, right, and so that means that those results could change if the interactions were constrained spatially, and so we needed an Ecospace model.

When it was decided that we needed a spatial model, the first question we wanted to explore is what's happening with black sea bass, which seems to be a hot topic today, especially in north Florida and other areas, where they seem to be really struggling, and so we have four different hypotheses, which will each be simulated by four different scenarios, so we can look at the relative contributions of each of these drivers of the population patterns, which should get to some of the questions that you all were discussing earlier, but, first, before we can get to that part, we need you all's feedback on the structure and calibration of the Ecospace model, along with some info, if you guys have any, about how you would like to see each of these four scenarios structured.

Before we jump into the individual components of our Ecospace model, I, really quickly, wanted to explain why each of these parts is here, like why are we pulling all of this data, and how they all work together. One of the major components of Ecospace is the way it treats how favorable, or suitable, I think is the right term, how suitable each grid cell is for each species or group of species in the model.

Instead of a cell having a binary, like good or bad habitat variable, it can actually have a continuous habitat suitability factor that changes with every time step, and so you can have something static, like the percent coverage of reef, or the depth, or distance to shore, that doesn't change throughout the model, but you can also have values that change with each time step, like temperature or salinity.

Then each species, or group of species, in the model will have some affinity for a habitat, and so a fish's reef presence, or hardbottom preference, and that could be like 100 percent, but its seagrass preference is only 30 percent, or something. Then it will also have a functional response to each of the other variables, basically a curve kind of thing, predicting their presence at every value in the range of that variable, whether it's depth or temperature or salinity, whatever it is.

Then the value from the function that corresponds to the value for the cell, and so what is Y, given X, right, and that's multiplied across every variable you have for that cell, and that determines the habitat capacity of that cell, which corresponds to how much of the cell the fish can use for foraging. This means that biomass will gravitate towards cells with a higher habitat capacity and away from cells with a lower habitat capacity.

Then information like port locations and MPAs, that does the same thing, but for fishing effort. It directs where the effort is going to go, in the same way that these direct where the biomass is going to go, and so all of that to say that much of the effort, much of the work that goes into a detailed

Ecospace model, is determining the values of each grid cell and the functional responses of the fish to each variable. Then dispersal will tell the model how quickly each group can move to and from the cells, and the other parts on there we will get to as we get to them.

Most of the decisions for how these components were selected, and then how the data was treated, that was discussed in depth with the model workgroup, and are covered in the Ecospace SSC report that's in the briefing book, but, today, we still want to get the SSC's feedback on the structure of -- The main structure of the Ecospace model.

So, finally, into some spatial data. So, for the base map, the model team chose a twenty-three-square-kilometer resolution, as a compromise between being able to capture local level ecosystem dynamics and also the computational power needed to run thousands of simulations to get a well calibrated Ecospace model. We cut off the area to the north at the South Atlantic managed area, the shelf to the east, and then, what is that, like Port St. Lucie, I think, to the south, and these were the bounds of the most reliable data.

It also constrained the model's need to predict biomass way out into the far reaches, past the shelf, or down into the Keys, which is both a very different ecosystem, and it's also narrower than twenty-three kilometers, in a couple of places, and so, once we had our boundaries, the final depth map was pulled from the NOAA bathymetric database.

Next, we needed to figure out where natural reef is located in our area, which seems to be another big question in a lot of these groups, and, to that end, we met with the other groups that are working on similar questions, including the folks at the Greater Amberjack Count team, and so that's Josh Kilborn from USF and Ted Switzer, Sean Keenan and Justin Solomon, all from FWRI.

In the end -- We reviewed a couple of different data sources, and we decided to make two natural reef layers, one of predicted probability of hardbottom from a 2022 BOEM analysis and one of a universe of reef points compiled by the folks from the amberjack count.

We decided that these two reef layers, when we combined them together and scaled them, they give us the best range of values in our grid cell, allowing reef-associated species to really move about the habitat, and then, for the two that we didn't decide to use directly in the model, we did check that all of their main areas of hardbottom -- That those were covered by the ones that we did go with.

Now, we all know that artificial reefs have a pretty small footprint in the South Atlantic. We know now, thanks to Avery Paxton, and I think that was the paper, what, last year, that it's around two square kilometers, I think, for the whole South Atlantic. However, that small area plays a big ecological role, and we wanted to be able to reflect that some species in our model will be attracted to artificial reef, and so we still wanted to represent those reefs, to some extent.

To do that, we combined together NOAA's shipwreck and known obstruction points, each state's artificial reefs and points from that greater amberjack group's dataset that had been deemed artificial reef. Now, is this method likely to yield lots of repeats? Yes, and of course it is. That was actually kind of the point, and so we knew that this was a rough and ready way to calculate artificial reef coverage, but we also knew that we would be scaling it to a really tiny amount, and really just letting it serve to fill gaps between hardbottoms, so that our fish have some habitat

capacity in the areas where we know there's some kind of artificial reef there, but it's going to be a very, very small amount.

Another habitat layer we wanted to include is roughness, to give some texture to the habitat and distinguish really just roughly the flat areas, versus those with a lot more rugosity, and so, while we looked at a few different data sources and ways to measure rugosity, we ended up going with roughness from NOAA's global relief model, which gives us good coverage of the area and just enough variation to represent really big, major structural variations, like the shelf itself.

When you put it all together, this is what it looks like in Ecospace. We have our two hardbottom layers on top, artificial reefs and roughness on bottom, and, on the far-right, the entire habitat base map for the Ecospace model, and the shades of the colors are the proportion of the habitat in that grid cell. Sorry, and that's kind of hard to see on our projector in here.

While those habitat maps directly -- I guess direct the movement of the fish and the shrimp and everybody else in the model, we also need to direct where our fishing fleets go, and so, in Ecospace, fishing effort is partly calculated by distance from the port to the fishing ground, and so we selected our port locations based on major commercial ports as ranked by, I think, a NOAA review, all the headboat locations for the headboat fleet, and, for general recreational, we actually did look at the MRIP fishing access point data, and we tried to slice it a lot of different ways, so that we could try to rank where all of those recreational access points are, and, sort of no matter how we did it, the entire coastline ended up being on the list, and so we just went with entire coastline is the general -- Is the list of general rec ports.

Then, for the MPAs, we decided to include almost all the established federal MPAs, except for a handful that were just too little to include, since an MPA does have to be an entire grid cell in this model, and so I think there's a little bitty one off here in Charleston. That one didn't make the cut. The Oculina Experimental Closed Area and the spawning SMZs, those are all off the table, and then there's one down in the Keys too, I think East Hump, or something like that, and that's down in the Keys, and so that one didn't get included.

The closures here, when we put these MPAs into the model, they are specific to different fleets, and to seasons, and like a closed and open season, and to -- They are dynamic, meaning that they'll be introduced into the model simulations in the month and the year that they were first actually established.

The workgroup also asked if perhaps we could make our own fishing effort maps, and then artificially constrain them to reflect those little bitty MPAs that didn't make the cut. We're not sure if that will work, but we made the fishing effort maps, and then we'll just see what happens when we import them during calibration. If it works, that's a great idea.

Now, aside from MPAs, another dynamic data input into Ecospace are the spatial temporal environmental drivers, or ST drivers. They're basically a time series of maps that the model uses to calculate that habitat capacity for each cell, at each time step, as things like temperature or salinity change through time in that cell. We decided to use a data set created by the Copernicus Marine Service called GLORYS, which is the Global Ocean Physics Reanalysis.

From that, we chose monthly values for surface temperature, bottom temperature and chlorophyll A to drive our model projections, and, when we met with the SSC model workgroup about this, they brought up an excellent question, which is can this global dataset -- Is it going to capture our local level events, that we know are driving our ecosystem, and so, to that end, the workgroup, and a few other folks, put together a list of known events, all cold-water upwellings, that were documented in this area, and it was just a quick check, just to see if they were there.

We pulled up the maps from the years of the events, plus the year before and after, to see if anything jumped out around where this event was supposed to have happened, and, while I've just picked the easiest one for us to see here, and this was the 2003 coastwide upwelling, and so it was the entire coast, and so it's pretty easy to see on the map that that's in the data.

Even the smaller events, which were only one or two grid cells, were in fact captured in the data, all except one of the ones that we checked, which apparently only occurred for two or three days. It was a little cold-water upwelling off of Daytona, in a year that I don't remember, but, since it only lasted for a couple of days, we were satisfied that that's okay that that's not captured in the monthly data, but, all in all, we were pretty pleased. This is just a quick and dirty look at GLORYS, and so we were pretty confident that it is actually accurately representing local-level events.

Now for these, the environmental preference functions, I don't want to get too into the weeds with how these were actually made, but just to mention that, in order for the model to calculate a habitat capacity for each cell, it needs to know what range of values each fish. or each group, prefers or doesn't prefer, and so it needs a preference function, and we ended up creating a few different sets of these, from different data sources and different fitting methods.

Some were better, and some were worse for different species, mostly depending on how much data was behind that fish at that age, which that makes sense, and that's fine, and so what we're going to do is test all of these different sets of preference functions during Ecospace calibration, which gives -- To see which ones give us the best fits for each group. The next few slides include some preference functions, and those are the ones that are in the model right now, but those are going to be subject to change, depending on which ones end up being the best for each species.

Now, one of the things that the workgroup was interested in seeing was how much of the model area do these preference functions include or exclude for each species, and so like, if my preference function is that you're not going to see me much past fifty meters, then how much of the model area is going to be too deep for me, and, therefore, will have a very low habitat capacity, and I think it was either Marcel or Dave who had the great idea of overlaying the preference functions onto histograms of the values in the model, for either depth or temperature, so that you can kind of see where the cutoff is.

The easiest to do that with was depth. Shanae Allen made these, and so, to orient you to the figures, the blue lines in the foreground -- That's one set of preference functions that we have to work with, with the darkest blue line being the adult age groups, and so that's the preference functions for depth, for adult, all of these -- For all of the age stanzas for these different species.

Then, in the background, in either white or very light gray, is a histogram representing the proportion of grid cells of each depth bin in our base map. Sorry, Density. Density of grid cells

of each depth bin in our base map, and this helps us to visualize how much of the map, in sort of a quantitative sense, is available to each of these groups, given these preference functions.

Now we cut these off, these diagrams off, at 250 meters, just so they were easier to see the lines, but I added in this one diagram, the shark one, with the full histogram of depths, just so you can see how the depths are distributed, all the way out to the full 600 meters, which is where we cut off the shelf for the model.

For all the preference functions, whatever the value is at the end of the line, when you get to the far right-hand side of it, the model keeps that value constant out to the full range of depth, or temperature, or whatever it is, and so you can imagine all of these having a straight line, a straight, flat line, from wherever they end all the way out to the end of 600 meters. Somebody give me a nod when you've had enough time to take these in. I know that we stared at them for a while in our group. All right. Ready to move on?

Now slightly more difficult to wrap our heads around was temperature, because we know that the average temperatures of any point have shifted over the twenty-eight years of the model period, right, and, to visualize that, Shanae had the great idea to overlay a smooth histogram of the average bottom temperature values of each cell during the first five years of the model in green, and that's the green part, and so that's, what, 1995 to 1999, and to overlay it with the average bottom temperature values of each cell during the last five years of the model in yellow. That lets you visualize how the values for those temperatures have shifted over time.

I think the easiest to look at, for me at least, is July. You can just see it. Everything is shifted right a little bit, towards the warmer side, and so each panel is a different month, and the line on top of it, the line in the foreground, that is just the bottom temperature preference function for just the adult black sea bass. It was a lot to look at, and so we just chose the adult age stanza for this one.

This isn't necessarily a diagram to draw modeling conclusions from, but we thought that it was interesting to visualize the data this way, especially the bimodal temperature that's inshore, on the right, versus offshore on the cooler areas, and the pretty big shifts in temperature, especially in the winter months. If anyone wants to look at all of the other ones, especially with all three age stanzas over the top, we can take a look at those, maybe, if we have time today. If not, then we can send them to you.

Here's the same green and yellow monthly values for bottom temperature, but overlaid with the preference functions for adult red snapper, and so you can see how that function will constrain how much of the area is available to them in the winter, but then expand in the spring and summer, so that they have more area of the model that they can utilize. Does that all make sense? Yes? Excellent.

So this map -- Is the video playing? Yes. This map right here just shows you what it looks like when you put it all together, and so we have our habitat maps, and we have our depth map. We have our spatial temporal drivers of bottom temperature, and whatever else is driving this one. Then we have our preference functions to the depth and to the bottom temperature, and so, as you can see, as the video plays on, that, in the winter, the habitat capacity for whatever group this is, is contracting in the winter, and then, in the summer, it expands, as it has more habitat capacity. Does that all look good? Excellent.

Now, when you put that all together with biomass, this is what it looks like, and so this is just an example run. Don't worry about like what species it is or anything, and all the teeny tiny little black dots are some packet of biomass of our species, and you can see, although it's playing a little slowly, but you can see how, when the habitat capacity contracts, the number of little bitty black dots contracts, and then, when the habitat capacity expands, then they expand too, and so this is what it looks like to run Ecospace.

You just kind of stare at a lot of little black dots. I'm just kidding. That's not actually how we analyze the data or anything, but this is what it looks like, but how do you know if what we're looking at is matching up to how it should look? We can't just eyeball it, right, and so one way to do that is reference data, which we have been collecting far and wide, with the idea that we can import all these maps and trends into R, and then compare them spatially with our Ecospace outputs, and see if we're capturing the patterns and the concentrations that we do actually want to capture, see if they're spatially going where they should be going, and we can also do the same thing for a fishing effort.

Fishing effort is one of the outputs that you can get from Ecospace. Now, this is just one example, but, in black and white on the right-hand side, those are the average monthly maps of headboat vessel activity from, I think, the logbook data, and then we can use that to compare to our effort estimates, to make sure that our headboats are -- Sorry. Not our, but the model's headboats are going out, or not going out, and are going in the same seasonal pattern, and that they're going to the actual same areas as where we know the actual headboats go.

We have an ever-growing list of reference data for fishing effort. For recreational, we have MRIP, logbook trip data, and SEFHIER, and then catch and trip ticket data for commercial, and we can come back to discuss each of these at the end, if you guys want to look at it in-depth.

We can fit the spatial reference data in R, but we can also export those biomass maps, wrangle them back together into a single estimate, and then see how the biomass projections stack up against our stock assessment projections and those reference indices of abundance, and so these are similar to the Ecosim fits that we just looked at before, but now this is Ecospace, and so the first thing that we were happy to see is that the model is stable, which is always a good sign when you're starting out, right, and, second, we found that, even though this Ecospace model has barely been tuned or tinkered with at all yet, a number of the fits were decent right out of the gate.

To orient you to these graphs, the black lines are the biomass estimates from Ecospace through time, and, the colorful dots, those are the time series we're trying to fit to, same as in Ecosim. Blue is the biomass time series from the stock assessments, and, all of the other ones down below, those are indices of abundance, also from the stock assessments.

Now, as expected, we're not fitting all the bumps and lumps just yet, but, for a starting point, as a starting place before calibration, this was a pretty positive place to be. There's also an error here that I just noticed. Snowy grouper, on the bottom-right-hand side, it's light-blue trend should be purple. That's headboat trend. That just got color-coded wrong in R when I was making these figures. Marcel.

DR. REICHERT: A quick clarification. So this is Ecospace?

MS. GENTRY: Yes.

DR. REICHERT: So this is integrated over the entire region, or is this --

MS. GENTRY: Yes.

DR. REICHERT: Okay. Thanks.

MS. GENTRY: Absolutely, and so those were the good fits, that I chose to show you first. These are other fits that will need to be tuned a little bit better before calibration, and so these are all specifically groups that I chose for this that were fit very, very well in Ecosim, but, for any number of reasons, were just completely out of whack once you get into Ecospace.

However, each of those groups actually already responded to our first tuning step we did, which was add a red-snapper-specific fishing fleet. We're likely going to need to add a black sea bass fleet too, and maybe a few others, to really fine-tune their spatial dynamics, but even just adding that one fleet already gave some of these fits a bit of a nudge in the right direction, which is positive to see.

Finally, we wanted to show you all some of the biomass and effort projections. Again, some good and some bad. Remember, this model is not really tuned yet. To start with, here's the full adult red snapper biomass projection once we created the red snapper fishing fleet. There's really not much to look at right here, but you can see some seasonal fluctuations, some lighter colors in their low years, and then darker red as they rebound at the end. I'll let this play out for just a moment. You can see it gets a little lighter when they weren't doing so well, and then gets a little darker towards the end.

Next is adult black sea bass. This wasn't the best fit in Ecospace, but it did improve when we added the red snapper fleet, and it will improve further, certainly, when we add a black-sea-bass-specific fleet, but already we're seeing some central or north concentration there, some contraction in where they're going, though it doesn't seem to want to put them much further north, and so we'll need to examine that and make sure that these estimates are fitting any observed spatial data that we have for black sea bass and where they're going to.

Then, just to show you how the MPAs work, this is the fishing effort of the commercial other fleet in our model, which is primarily pots and traps, although there's some cast net and dip net catch in there too, and this video starts at 2006, just to show you how the MPAs enter. First the deepwater MPAs, then that deepwater coral HAPC, and then the flashing is the seasonal right whale closure that's popping up, and so I just wanted to show you guys how those dynamic MPAs work and how it's constraining the effort when the seasonal MPA is in effect.

Then, last, I wanted to show you why it's important to look at both the time series projections and the spatial outputs, because, for this one, snowy grouper had an okay fit in Ecospace already, but we have not explicitly linked these adult snowy grouper runs -- Or we haven't explicitly linked them to the deepwater MPAs, which is the blue squares on the right side there, but these preliminary runs have them concentrating right at those spots, and so we'll need to take a closer look at this during calibration, to see why they are really just huddling up around those MPAs.

We can do that by comparing it to data like the deepwater longline map. When things don't line up, like clearly, from the deepwater longline results, they're out on the shelf, and we're just not capturing that yet, right, and then we can say maybe we should reassess the depth or the bottom temperature preference functions and see if they're being overly constrained.

When we were looking at those before, and I think it was one of the snowy grouper, the depth function, and I think it was pretty narrow, from that one that I showed you, and so, if that ends up being the smoking gun, then we can just substitute in maybe a preference function from the deepwater longline data, or something like that, and see if that gives us maybe a wider range and a better spatial fit for snowy grouper.

Now, technically, we could say this is a stable model, and we can go straight into testing what's happening with black sea bass. We wouldn't do that though, but we could also tinker with it forever, and never be able to actually stop tinkering, in the pursuit of perfectly fitting all the data, which is something we would do, which is why we need you all's help deciding which to guide the formal Ecospace calibration, so that we know what we're fitting to, and then the workgroup can help us decide when the model, the whole model, is actually fit, which leads us to what we mean when we keep saying formal calibration.

Of course, we're going to start with a bit more manual tuning. We're going to add those species-specific fishing fleets, and we're going to do some more manual fitting, to get all the groups into at least a good place, but, after that, we'll start this formal calibration procedure in which we develop a cost function to evaluate the model fits.

Now, this is a pretty straightforward process for time series data, like the indices of abundance, but we need to think about how we can add spatial data into like a composite likelihood function. Then, once we get to that part, then we'll run it through a procedure that first identifies the most sensitive parameters and then estimates those parameters through an iterative approach.

Now, normally, we would say that this is a time-consuming procedure, changing just one value at a time, but we can accomplish this by running Ecospace in parallel, using R on a really large workstation, so that we can run thousands of simulations in a day. Interpreting those results is going to take more than a day, but this gives us the chance to test a wider range of values for each parameter and really properly assess the sensitivity of all the key components in this model and see how sensitive it is in the outputs to each of those changes.

Which brings us to you all. First, we would like to hear your thoughts on the structure of Ecospace, all those maps and drivers we went through. Is there anything really missing that you want to discuss, and then what are your thoughts on which time series and spatial reference data we should be prioritizing our fits to? Every little change has a tradeoff, when everything is interconnected, and sometimes fitting to one thing means unfitting to another thing, and so what are your priorities?

We can come back to this one for the discussion, but, first, I just quickly wanted to say thank you to our entire model team especially. They've all done more work than they signed up for, in pursuit of making this model and ecosystem-based fisheries management work, and thanks to the model workgroup and all the data providers and collaborators. Obviously, none of it could happen without them, and so, first, before we open up the discussion, I wanted to see if anyone else on the

model team has any big take-home points that they would like to add, and then we can start our discussion. Thanks.

DR. REICHERT: Thank you, Lauren. I have little to add, other than that this is a huge amount of work. It's really cool, and a very nice overview of where you guys are. It's a lot of work, over a long period of time, and so it's really nice to see where that effort is at the moment, and I know you guys have some tweaking to do, and some calibration to do, but I personally think this could be a really valuable tool, for us as an SSC, and for the council to take a look at, and, in particular, starting to look at species interactions, what happens under certain scenarios of one species relative to another, and so I want to thank you and your team for a tremendous amount of work, and so I just wanted to say that. I would like to open the floor for some questions, and clarifications, and then we can move into the discussion. Jim.

MR. GARTLAND: So, first, this is all really cool, and you're exactly right, Marcel. It's a ton of work. I just had a question, and so, just make sure I understand it correctly, it's a monthly time step, right?

MS. GENTRY: Yes.

MR. GARTLAND: That's what it's working at? For the ecological niche models that you all made, using the binomial GAMs, those were at kind of a broader temporal resolution, right, like kind of an overall, and like do you think it would be possible to do those -- I'm thinking about depth in particular, but with a bi-month interaction for species that migrate, and you would allow the depth curve for a given species to change monthly, and so, for example, if it comes inshore in the summertime, you know, your curve would move kind of inshore for the summer. Would that help in the Ecospace time series part of it all, to help with the movements, to get it closer to what is observed? Does that make sense?

MS. GENTRY: Absolutely. That's an amazing idea, and I am going to throw it to Dave Chagaris to see if preference functions can be added dynamically as a time series. Can those change over time, or is that a fixed value?

MR. GARTLAND: Just real quick, and I don't mean to change it across years, but maybe, just as a start, monthly, you know, to catch the seasonal dynamics.

DR. CHAGARIS: That's a good question, Jim, and it would certainly make sense to do so, but, right now, the model is --

MS. GENTRY: Dave, if you're speaking, we can't hear you.

DR. REICHERT: We're seeing if that's an issue on our end or --

DR. SCHUELLER: I can -- Can you hear me, because I can hear him on the webinar.

DR. CHAGARIS: Yes, and I'm unmuted.

DR. CURTIS: Okay. Try it now, Dave.

DR. CHAGARIS: Can you hear me? Maybe they can't hear you either, Amy.

DR. SCHUELLER: I guess not.

DR. REICHERT: We're trying to turn up the volume in the room, Dave. Bear with us for one second.

DR. CURTIS: Okay. Dave, try it now.

DR. CHAGARIS: Can you hear me now?

DR. REICHERT: Yes, and it's better. Go ahead.

DR. CHAGARIS: Okay, and so the question from Jim was about having like seasonal preference functions for depth, and it would certainly make sense to do so, but, currently, the model only allows for one preference function per habitat type, but the way that we've had to handle that in situations is you can actually load in a map of like habitat capacity values that maybe you computed externally, just to constrain the distributions seasonally, but they would still have the preference functions for like temperature and depth, but it would kind of shift this underlying capacity to constrain them nearshore and offshore, depending on certain months, and so there are kind of workarounds, to capture those dynamics, and those are things that we'll -- As we get into like the calibration, and really comparing the predictions with some of the spatial data, that will sort of add that complexity, as needed.

You know, if it becomes a critical, you know, shortcoming of the model, then there are ways to work around it, but, you know, capturing migration patterns just through temperature responses doesn't always work, because these things are migrating for other reasons as well, life history strategies and such, and so it's not really expected that, just by including a temperature or salinity function, we would capture all of these dynamics.

MR. GARTLAND: That makes sense. Thanks.

DR. REICHERT: Any other questions? Jie.

DR. CAO: Just a quick question. Thanks for a presentation. It's a pretty cool model. I just want to get clarified, and so, those functional response curves, so those curves are estimated external to the model, Ecospace, and it's not something that's estimated within the model?

MS. GENTRY: No, and those are estimated in R.

DR. CAO: Okay, and so I think it's important to get those curves right, because, essentially, that's how the model moved the fish around.

MS. GENTRY: That's driving the biomass movement.

DR. CAO: Yes, and so I guess that's just my quick question.

MS. GENTRY: Yes, and that's the reason too that we made a couple of different sets. We used a couple of different fits. We included -- We made one series where we had a roughness as a covariate, and we'll kind of be testing all of them out, to see which ones give us the best fits.

DR. REICHERT: Anyone else have any questions? Jason.

MR. WALSH: Yes, and I had a quick question. Great presentation. When you mentioned recreational ports, or entrance points, to go to the MPAs, you mentioned the whole coast as a place. Did you mean each inlet, or every inlet along the coast?

MS. GENTRY: So it essentially allows general recreational fishing effort to come from any of the grid cells that are bordering land in the model, and so not necessarily just inlets and things, but essentially the entire coastline, yes.

DR. REICHERT: Lauren, a quick clarifying question, and please remind me. The black sea bass right whale MPA, that's for the pot fishery only, correct?

MS. GENTRY: Yes.

DR. REICHERT: Okay. Thanks. Anyone else? So let's do the -- For the people on the webinar, Judd was solving a little technical issue, and so bear with us for one second. While Judd is pulling up the last slide of the presentation, so we can address some of the questions that Lauren put up there, which kind of moves us into the discussion, and so, before we do that, I want to see if there's any public comment on this agenda item. I know Judd is currently working on catching us up here. Are there any folks online or in the room now? Seeing none, and so there's no public comment.

Do we have any additional thoughts, or questions, or comments on the Ecospace structure, habitat maps, and the drivers? Seeing none right now, I think an important question for the team is what to calibrate to, and so I would like some feedback from the committee, in terms of what we feel are important datasets to consider. Dave, I see your hand raised. Go ahead.

DR. CHAGARIS: Yes, and I was just going to mention to the group that, as far as the spatial temporal drivers for this model, we're currently using that GLORYS dataset. That's -- You know, we could swap out those maps pretty easily. You know, we're aware that there's the downscaled MOM6 models that the NOAA AOML team has been producing, and there's been some other models coming out of NC State that we could also replace with what we're driving the model with currently.

It is -- You know, part of the reason that Lauren highlighted those cold-water upwelling events is because, if we believe bottom temperature is potentially important in this system, there might be a better oceanographic product out there than what we're using currently, and so I just wanted to kind of mention that, that some of these components are pretty easily interchangeable, and so, if there are better maps, or better models, out there we could use, we're certainly open to doing that.

DR. REICHERT: Thanks, Dave. I don't have any suggestions, or recommendations, to that point. I'm looking around the room. I don't see any hands raised there, and so, in terms of the calibration, does the committee have any thoughts, or recommendations, in terms of what data should be used for that calibration, or what to calibrate to?

You know, in terms of the SERFS video and trap maps, we all know that they catch certain species better than others, and so the selectivity curves for those species is probably critical, but I would argue, since it's a fishery-independent survey, that would be an important dataset. The South Atlantic deepwater longline maps, I think same is true there, although, of course, that's a lot newer survey. Anyone else? All of the above, perhaps? I'm not sure if that's a cop-out answer to the question. Lauren, what are you looking for, in terms of feedback from us?

MS. GENTRY: I suppose is there anything that jumps out to you all that you've seen in the past, either an index of abundance or a distribution map, where you said, well, that's not even close, and like that's -- Like don't use that, please, and so, rather than what should we calibrate to, what should we not calibrate to? Any feedback on that?

DR. CHAGARIS: If I can jump in here, too, I think that -- I don't know that we necessarily need specifics. I mean, a lot of the datasets that are used for these species are identified as part of the stock assessment process, and so we have a pretty good handle on those. I think, you know, for us at least, knowing what the SSC would like to see, as far as, you know, either fits to time series data, fits to regional time series data, and the fits to the spatial data, and so I guess what would the SSC like to see to really kind of evaluate the performance of this model?

You know, obviously, you want to see that it performs well over time and space, but are there more specific -- Or any general things, as far as is it capturing this distribution shift, and other potential metrics like centers of gravity, spatial distribution metrics that can potentially be compared with those that have already been developed and published in these other studies, and so it doesn't necessarily have to be specific datasets, but, in general, what would the SSC like to see to evaluate, you know, how well this model is doing?

DR. REICHERT: Anyone? Any feedback from the committee? Alexei.

DR. SHAROV: I don't know. I mean, it's just an overwhelming amount of information, you know. For me, it would take, you know, a number of days to digest it, to actually come up with something reasonable, but I think, earlier today, Chris was coming up with the great idea of looking at the differences in the black sea bass distribution in the SERFS survey, and whatever else other sources of information are available, that we could look at the changes in the distribution through time or say evaluate what the expected distribution of black sea bass is, you know, versus what the SERFS shows.

Just trying to tie it up to the question of the reduced recruitment and the potential driving forces, and are these environmental? Do we see any sort of spatial pattern, that they are disappearing in the south of Florida, and then marching northwards, et cetera, and so this is more like a specific example of what we would have loved to see, and explore, and not necessarily the suggested, you know, dataset or the methodology, but just sort of the concept that could be clearly tried and maybe would be really helpful.

DR. REICHERT: Thanks, Alexei. Lauren, to that point?

MS. GENTRY: Excellent point. I believe some of that center of distribution, or hotspot analysis, is being done right now by the South Carolina DNR group that's looking at the, I think, habitat and

genetic shifts in black sea bass, and so we already have on the books to meet with them, and get those maps from them, and use those as reference data, too. We're also planning to meet with Kevin Craig, and the low recruitment workgroup, to see how, or if, we can incorporate some of what they've found into our own reference data, or directly into the model, also.

DR. REICHERT: Thank you. Chip came to the table. Chip.

DR. COLLIER: Yes, and I think it would be important to look at Jie's work as well on changing distribution of several of these species, using that bass model that he developed. I think that would be good to look at.

DR. REICHERT: Thank you. Jie.

DR. CAO: I feel like there are two things are important for this model to calibrate to. One is the spatial pattern. The other thing is the spatially-aggregated abundance index. It doesn't have to be -- To match the absolute scale, but the relative trend over time, in terms of spatially-aggregated abundance. I think it would be nice to capture that trend. That's two things that are important to me, but whether it's calibrated to the raw data, like spatially-referenced survey data, or some model-based inference, like the map I can provide, I think that's something that can be discussed.

DR. REICHERT: Thank you, Jie. Anyone else at this point? Jeff.

DR. BUCKEL: You know, a lot of these surveys, like the SERFS, they have a universe of hardbottom that they have gotten over the years, and they continue to add to, but, when you compare that to some of the other predicted hardbottom, right, we don't have a map of known hardbottom throughout this region, and so these products that, Lauren, you presented -- A lot of those are predictions, where workgroups, experts, have gotten together.

They have predictions of hardbottom the SERFS doesn't sample, right, and it's not part of their universe, and so I guess that's the -- Maybe it's a question of -- You've got the SERFS that you're going to be calibrating to, but is that just going to be to where they have their hardbottom, or is there going to be some function then that you can say, okay, well, this is a relationship to hardbottom, and we have these other hardbottom maps that you talked about before, that then you'll predict reef fish in those areas that are non-SERFS sites.

DR. REICHERT: Yes, and that made me -- Thanks, Jeff. That made me think maybe the -- I'm trying to remember the type of data that may become available. The red snapper project may have some additional information relative to habitat. They did some surveys using video, and so that may help calibrate some of that live bottom or unconsolidated bottom.

DR. BUCKEL: So, yes, Marcel, and that's a good point. So two things there for that red snapper project that Will Patterson is leading. They are using the TNC product, that hardbottom -- That's the hardbottom surface layer, and then there was to get information on red snapper densities at non-SERFS sites, right, and you've got all the camera counts, and trap count data, that are coming from the SERFS sites, but then there's all the other area, and so what Will did for that was a random ROV survey throughout the region, and so, yes, that's another source of data that Lauren -- So ROV camera count data, and that has habitat data associated with it, but, because they were random, right, and most of this region is sand, I think it was a very small percentage that they saw

a hardbottom, but, you know, again, that gives you some areas where there's sand that you could compare to your hardbottom, to see if it matches.

DR. REICHERT: Dave, go ahead.

DR. CHAGARIS: Sorry. My hand was still up from last time.

DR. REICHERT: Okay. All right. Anything else? Lauren, again, thank you. Chip, go ahead.

DR. COLLIER: So, Lauren, I'm just wondering if you could go back to the four hypotheses, and maybe that can help some -- Maybe gather some additional questions, because I think these are potentially big questions on what might be going on in this population, and, you know, do you think we have the inputs in order to, you know, to begin asking, or begin answering, some of these questions? Do we have updated information on red snapper diets? I think South Carolina was thinking about doing some of that work. Are they -- Is that going on, or --

DR. REICHERT: Wally.

DR. BUBLEY: Currently, Kevin Spanik is working with a graduate student, and we had MARFIN funding to move forward with the project, to expand the project that was done, I don't know, how many years ago? Five or six? 2017, and so even more than that, but to expand the temporal range for some of those species of red snapper, and gag, that kind of thing.

DR. REICHERT: Correct me if I'm wrong, and there's two aspects here. One is, and correct me if I'm wrong, Lauren, for you guys to tweak the calibration, so that you can start exploring some of these questions, and so I assume these hypotheses are like the questions you will -- That you plan to explore after you're satisfied with the tweaking of the calibration, also.

MS. GENTRY: Absolutely. Yes, and so we will do a little bit more manual tweaking, and then we'll do the calibration, to get really good fits, essentially, and then what we'll do is build-out four separate scenarios in the model, and potentially even more, if we want to combine some of these effects together, and what we'll be exploring is sort of -- We know that all of these are likely to have some input, right, some impact on the current biomass, or the current population distribution, but what we want to explore is what is the relative impact of each one, and is any one of them like a really big smoking gun that -- You know, then maybe even do some future projections, to see, if that was no longer a problem, would they come back? Are the other problems a small enough problem that they can still rebuild?

DR. REICHERT: So does the committee have any other ideas for hypotheses? One that I'm thinking of, although I'm not quite sure how to frame that, is the effect of fishing pressure. It's something that we discussed extensively during this meeting, and perhaps look at some scenarios that may be what will happen in the future, but also perhaps in terms of explaining some of what we have seen in the stock assessment, you know, what-if scenarios, if something would have happened at some point in the past, and I'm just going to put that out to the committee. I personally think that would be probably good, and we may need to flesh that idea out a little better.

MS. GENTRY: Fishing pressure is sort of what we were getting at with the nearshore depletion. That was originally called overfishing, and then we weren't sure if they were technically overfished, or experiencing overfishing, and so we just changed the name.

DR. REICHERT: Well, but, in the model, you can specifically look at the interaction between perhaps some environmental impacts and fishing separately, which we are now struggling with here, because we know something is going on, but we can't really distinguish those two. That's what we -- So I think if that's worth thinking about a little further, and see if there's some exploration possible in that area, and, again, we may need to think about it a little more, but that's the only thing that I could think of in addition to these four here, and so, Lauren, thank you so much. I assume that we will continue to discuss this in the future.

I'm looking forward to the next iteration, and so, again, thank you for a tremendous amount of work. All right. Let's take a ten-minute break, and then we come back at ten past three, and we will, Judd, do the MSE. We will do the MSE presentation. Thank you, and, again, thank you, Lauren.

(Whereupon, a recess was taken.)

DR. REICHERT: Okay. Thank you, and so we will move on to Agenda Item Number 9, the Dolphinfish Management Strategy Evaluation Update. Attachment 9 is the presentation, and Fred Scharf, Fred Serchuk, and Jennifer and Steve are assigned to this agenda item, and I think it's Cassidy who is going to present the presentation.

DR. CURTIS: Yes, and we've got your title screen in presentation mode, Cassidy, and so take it away.

DOLPHINFISH MANAGEMENT STRATEGY EVALUATION (MSE) UPDATE

DR. PETERSON: Excellent. Thank you. So thanks, everyone, for giving us an opportunity to come and chat about the dolphin MSE. This is really the first opportunity to provide a review, out of two, and so hopefully we can get some good feedback. I do want to acknowledge that this is the work of many people, and it's a partnership between the Southeast Fisheries Science Center, the South Atlantic Fishery Management Council, SERO, some subject matter experts, and, of course, Blue Matter Science, who is contracted to work on this project, and none of this could have been done without all of the stakeholders, that have been really engaged throughout this process.

Once again, this is a first opportunity to provide feedback on the operating models, the uncertainty for our operating model grid, some initial feedback on performance metrics, and perspectives on management procedures, but we're primarily looking for feedback on the operating model and operating model uncertainties today. This is the first of two opportunities to provide feedback before hopefully we put this process in front of a CIE review, which we're hoping to do in early 2026.

A friendly reminder that the purpose of the dolphin MSE is to develop an empirical management procedure for dolphin in the U.S. Atlantic, and so an empirical management procedure has no population dynamics model. It's the indicator management procedure, and we're looking for this

MP to be a fully specified recipe for setting annual catch limits, along with additional management levers. We want to make sure that the management procedure is simulation tested to be robust to uncertainty, and that, in addition to meeting all Magnuson-Stevens mandated objectives, we're also doing our best to optimize stakeholder-defined management objectives.

I know you all are familiar with MSE, and so, just to quickly give a refresher, MSE is sort of the stress testing gauntlet that we use to develop and stress test management procedures before we enact them in real life. These five steps come from Andre Punt's best practices guidance, and so we start by identifying fishery-specific, stakeholder-defined management objectives. We then identify relevant uncertainties over which the management procedure should be robust.

We develop those uncertainties into a suite of operating models. These are our simulated true states of nature, and we make sure that we condition those operating models on available data, to make sure that the data we're generating in the simulation have the same statistical properties as data that we would expect to see in real life.

We identify management procedures that are responsive to stock dynamics. That's sort of the green highlighted steps on the graphic to the right, and so it includes the data we're collecting and the quality of those data. We analyze those data and the control rule, which specifies how our observed state of the stock is used to adaptively adjust management recommendations, and then it includes how those recommendations are implemented back into the stock, and including any types of implementation uncertainty that we need to consider.

Then we go ahead and we simulate multiple configurations of management procedures against multiple specifications of the different operating models into the future, and we measure management procedure performance. Performance is measured based on performance metrics, which are quantified based on the fishery-specific management objectives that are identified in step one, and this is our kind of flow chart of the project outlook.

Hopefully you've you remember seeing this before, but it started with a first round of stakeholder workshops in 2022 and 2023. We used those workshops to select a small group of stakeholders, who have been iteratively involved in this process ever since, and that was selected by council process in December 2023. We also used the feedback from the first round of workshops to structure our operating model, in sort of our initial management strategy evaluation, and so we're making sure that the MSE is appropriately complex to meet the needs of the stakeholders.

Blue Matter was onboarded in July 2024. We lost our previous lead analyst. He was hired by our Science Center, and so we were happy enough to be able to pull in Blue Matter, and they have sort of a base case operating model that's largely completed right now, and we're looking to sort of iteratively work with the SSC, the council, our small group of stakeholders, and our analysts to continue to build the MSE, to really refine it in an appropriate way for the stock, and build our management procedures that are going to be actionable and perform well for dolphin in this region.

Hopefully this will lead to an empirical management procedure that will be voted on for implementation, hopefully in March of 2026, and so, with our management procedures, we are facing a little bit of a challenge working with dolphin, just because of the nature of the dolphin life history. It's really variable, and also the nature of the dolphin fisheries, which are international, and so we don't have enough data to really conduct a meaningful stock assessment, and this is an

internationally-exploited resource, and so we don't have the capacity to really manage the entire resource ourselves.

We're looking for a management procedure that's really going to be able to predict the availability of dolphin that the South Atlantic will have in a given year, and then allocate it equitably to maximize the utilization of those fish across different regions and sectors. Right now, the fishery is managed with static catch limits, and so this graph, on the bottom-left, sort of shows that we have high variability in local availability of dolphin, and the static catch limit really limits our ability to work with the variable availability that we see for dolphin, and it doesn't ensure that we're really appropriately allocating between the different sectors and the regions.

We're looking to move towards a more adaptive approach, and that's sort of graphed on the bottom-right, that sort of adjusts management recommendations with the availability of dolphin that we see from year to year, making sure that we're not leaving anybody out or unfairly utilizing the resource.

We made sure to design the operating model based on the feedback that we heard from our stakeholders, and so one clear example of that is our stakeholders really outlined the regional differences in the fisheries and the stock dynamics, and, accordingly, the different management objectives that each region has, and so that led to this spatial design, which is plotted here on the right.

We can see that, along the U.S. east coast, we have four, primarily four, spatial areas, and that was designed based on stakeholder feedback, and all of this plot shows some of the other decisions that we made. We made it a seasonal time step to account for seasonal availability. We made sure that we have multiple fleets to account for the different regions and sectors and their different fishery dynamics.

It's going to be an age-based, or it is an age-based, operating model, to account for size-based management objectives. Stakeholders noted that they perceived changes in movement and availability over time, and so we're implementing the capacity to build in time-varying movement, and an important management objective is catch rates, and so we're making sure that we can account for that within the operating model as well. Here, I'm going to turn it over to Tom.

DR. CARRUTHERS: Hi, everybody. So, just to reiterate something that Cassidy said, I mean, if we're going to make an operating model, a system for testing management ideas, it's got to capture what we know about dolphinfish, but, also, it's got to be able to be flexible enough to include all the things that we're uncertain about, and so dolphinfish are really a challenging subject for MSE.

You know, they grow very quickly, they're highly fecund, and they're short lived. There's a high degree of natural variability. We've got to capture all that, but we also know they have this seasonal spatial distribution, both the fish, but also the fisheries operate spatially and seasonally.

They're subject to a wide range of different regulations, and potential regulations, and so we need to be able to be able to implement everything or think of ideas for, and test ideas for, things like bag limits and size limits and things like that, but, also, we need to account for things that we know could be occurring, but we can characterize poorly, like, for example, the degree of catches in the high seas areas.

When you talk to stakeholders and scientists, there's a really quite wide range of different theories, and ideas, that you would like your management to be robust to. For example, changes in future survival, fecundity, recruitment, changes in the spatial distribution of the resource, and maybe changes in the way that catches are reported, and so on, and so we've got to capture all this stuff in a system that's flexible, but also as best we can capture it empirically.

The system we're using to do this is a piece of open source software developed by the team here called OpenMSE. It's actually being used, I think, for your snapper grouper fishery, in that MSE. The good news is it's fully documented. Anyone can use it. It's currently under constant development. It's continually updated all the time, which means that it gets faster and better over time, and so that's what we chose to do. It also has the ability to do the spatial multi-fleet aspects, which is one of the more challenging aspects of this, including the sort of seasonal stuff, and so we're using OpenMSE.

The first thing we did was to try and gather whatever data that we had, and piggybacking off the excellent work of Matt Damiano, who was the initial person working on this MSE. What we had to do is make sure that we're capturing roughly the scale and the historical fishing dynamics, and so what we did was we fitted a statistical catch at length model to the various fleets, and it's really important that we can exactly match, or thereabouts, the historical exploitation.

That gives us the scale of the fishery, and it also makes sure that our management recommendations are all in the right sort of scale in projected years, and so the model matches that very well with the various fleets that we have.

We also wanted to make sure that we could capture, to the extent possible, any length-based selectivity that was apparent in the various fleets, and so this model was fitted to any length competition data that we could find, and it was also fitted to an abundance index. Just before we go onto the abundance index, just a note here that the model fitting is definitely something that is now working, and it's in the framework, but there are areas where it could be improved, and I think Cassidy included this slide, just to show you some areas where the model prediction, which is the red line, is not exactly matching observed mean length that we've seen in, for example, the U.S. commercial fishery, and so there's still work to be done, and there's still tweaks that could be made, but the good news is that all of these fits, and all the way that this is fitted, are all available to people, if they want them. These fitting reports and everything are something that's summarized and available online, and so you have the option of looking at these whenever you would like.

Now, about that index. As in other places, the approach here is to use a spatiotemporal model, VAST, to fit the seasonal spatial data that we have available. This is using the U.S. commercial data, and the idea here is to try and capture seasonality in the spatial distribution, and so the papers is right here, and fully documented, but, if you go to the next slide, what we really care about here is the summary of that, and that is, over time, the relative abundance in the various areas, and there are seven areas, in the various seven areas.

If you think about it, if we're trying to capture these spatial dynamics, we basically have four key attributes that we're after. The first one is we want to get to the fact that there is clearly an absolute difference in the abundance in each of these areas. If you look at the blue line for the SAR area,

it's substantially higher than that of other areas. We have to capture that absolute difference in stock distribution.

You also notice that there's seasonality in almost all of the indices developed here, and, for some of them, it's even bigger seasonality. The seasonal effect is even larger than other areas, and so there are three attributes right there, and then you'll also notice that there's a trend in these indices that means subsequent to, or after 2020, the indices are generally lower than they were beforehand.

We've got to somehow capture all of this in a spatial model, and that's actually quite challenging, because it's a model that not only has to describe all this, but it has to be able to generate it in the future, such that we capture these dynamics for projection years in a credible way, and, to do that, we had to do something new and a little bit bespoke.

Now, I'm sorry, and I'm not trying to be overly complicated here, but, if you have a look at the matrix you've got over here, but, Cassidy, with your laser pointer, could you highlight that vector, the vertical vector, next to the matrix? What you've got there is movement out of a distribution. That's winter 2019, and the 4.26 at the top is actually telling you the relative abundance predicted by VAST for that Area NED, and what happens is we have to develop a movement matrix such that, when that washes through it, we end up with a distribution at the end, which is the 2019 spring vector, and that's the horizontal one along the bottom, such that we end up with that VAST prediction on the way out.

Now, the way we did this was to develop a type of gravity model, and what that model does is it assigns weight to the various areas, but it also allows us to specify along the positive diagonal viscosity, which is a major uncertainty here, and so what we want to be able to do is create scenarios where we can capture these seasonal movement transitions, but also be able to hypothesize highly-viscous stocks, with not much exchange between areas, and those where there's almost free exchange, and so we developed a system of doing this, which turned out to be relatively robust.

So, for example, if you take the top-left panel here, this is moving from the fourth quarter in 2019 to the first quarter of 2020, and what we managed to do is fit exactly the VAST predicted index in 2020, the first quarter. Those black points were fitted exactly by the model, by optimizing for those gravity terms, and, in this case, trying to aim as close as we could to a 50 percent probability of staying in that each of the areas.

What we were able to do is say -- Do exactly the same fit for a high viscosity as well. The basic idea behind this is that we've got a statistical model for seasonal transitions, and that means we can generate uncertainty in those, and we can also capture them historically for use in projection.

So, for example, here is -- You can see the historical period has got the black points on it. These are just three areas. Let's take the top one, NED, and you can see the model fitting the black points. You've got three individual simulations here, showing you the uncertainty that we've captured in those seasonal transitions, and so, if you look at the top panel, you can see how well it's fitting the VAST model, but with that simulation, that estimation error, and then, in the future, we were able to sample historical years and then just regenerate their seasonal distribution, and so we're able to capture all four of those attributes we were after of the relative magnitude, the seasonality, the

difference in seasonality between areas, but also any trends that are happening with the underlying resource.

We basically have these four requirements, or these four parts, of this panel, and I think the next four slide transitions just put a tick next to each of these. Basically, we managed to come up with an operating model system that could do all the things we needed it to do, and, in doing so, create a -- Let's say a calculator for management advice, where we're able to put in management options, and then use this to generate future projections, and see how well they compare to one another.

This is just a note that, as part of this MSE, there's an essential document that goes with it, which is essentially a reproducible -- A script to ensure reproducibility. It's a text document called a trial specifications document, and what that does is it says all the decisions that have been made in the specification of the MSE, every decision about a model that's used, a data source that's included, and this is something of a living document. It will actually change as we add, and we decide upon performance metrics and things like that, but, for now, there is a centralized document which can actually provide a transparent account of how this MSE has been set up, and how the operating models work, and how the MPs work, and so on.

I think that's the last slide that I'm presenting on, but, as Cassidy said, we've basically created the framework now, and so what we actually have is an initial framework for doing MSE testing. What we need to do is make sure that the shape of that framework, in terms of operating models, management procedures, and performance metrics -- The shape of it is something that the group, the wider group of managers, stakeholders, and scientists think is appropriate. I'll hand it back to you, Cassidy. Thanks for going through the slides.

DR. PETERSON: Great. Thank you so much, Tom. So, before we move on, I do quickly want to remind us all of the roles and responsibilities of each of the different players throughout the MSE, and the major components of the MSE are including here, the management objectives, operating models, management procedures, and I've highlighted the SSC's role here in white.

So, basically, we're asking for the SSC to provide advice on the Magnuson-Stevens-mandated sort of must-pays, in terms of management objectives and associated risk tolerance. It will be more helpful to sort of put hard numbers on that, once we have some initial results to show, but that's really what we're looking for from the SSC in management objectives. For operating models, it's going to be really important to have the SSC adopt the models themselves as best available scientific information, or best scientific information available, and then, for the management procedures, we would really like the SSC to advise on what the management procedure structure and parameterization looks like.

Here is a rough draft timeline. It is subject to change, but the one thing I do want to point out is that we are here in spring SSC. We're at the first presentation of the MSE to the SSC, and we only have one more opportunity, in fall, before we move to the CIE review, and so we're really looking for feedback, particularly on the operating model structure, and hopefully, in fall, we'll be able to sign off on the operating model structure, and really highlight sort of the must-pay performance metrics in the fall, and get a sort of scientific sign-off on the framework before we move to CIE review, but your job is not done there, because, in the spring of next year, we'll need to come back and talk about exceptional circumstances provisions and timeline for management procedure and MSE review.

This is a really important step. Exceptional circumstance provisions really highlight the areas, or the times, where the management procedure can be overridden, because sort of the real-world dynamics stray into a scenario that we did not simulation test within the MSE, and so it's really important to have those in place when we adopt or implement a new management procedure, to make sure that our management procedure is performing as intended.

It will be great to briefly talk about some of the uncertainties that we're considering for the operating model grid. Remember that these are designed to ensure that the management procedure is robust. Basically, we have sort of our base case operating model, and any axis of uncertainty can be used to develop a separate operating model, or a different simulated scenario, and we can test the management procedure across all of the operating models, to make sure that, even though we don't know exactly, you know, what natural mortality looks like, for example, even if it's high or low, we built operating models to reflect both scenarios, and we know the management procedure can work in both.

Typically, we separate out the operating models into two categories. The first is the reference set. These are the operating models that are most important, that hold the key axes of uncertainty, and this is important distinction, because the reference set of operating models is what is used to tune, or calibrate, the management procedures. We also have the robustness set of operating models. These are uncertainties that are maybe harder to understand, or more what-if scenarios, and they're kind of akin to sensitivity runs. They can be used to differentiate between top performing candidate management procedures that both perform well in the reference set.

They're useful to help develop and inform exceptional circumstances protocols, and so, if we have a robustness scenario where the management procedure doesn't perform well, we can use that to define our exceptional circumstances, and it's used to test for future robustness, and so these are sensitivity runs that are important to see and understand, but they're not the scenarios that we're using to tune the management procedure.

We went to the stakeholders and asked for uncertainties that are really important in this system. They highlighted removals, and not just U.S. recreational removals, but also international removals. I don't think there are any mandates to report dolphin landings, definitely not through ICCAT, and so we do have some data limitations, in terms of what all the partnering countries are landing.

There's been proposals that movement patterns might be changing over time, or that they are different from what we conventionally consider, and so the ability to think about different movement patterns has been highlighted. Stakeholders reported enforcement challenges, specifically with size limits in the northern regions, and they highlighted some biophysical-driven and anthropogenic-driven changes in potential future availability, and catchability, and so it's important to consider availability that might change in the future.

They highlighted economic drivers of fishing that could change effort, and they also highlighted regional differences in post-release mortality and depredation, and so here's a few proposed scientific uncertainties to put in the reference operating model grid. These are the reference operating models that we're going to tune to.

National mortality is a really key one. As you can see on this plot from Schwenke and Buckel's paper, there's sort of two separate natural mortality configurations. For dolphin, if you do sort of a literature review, based on all of the best available information, it seems like the lower M is more appropriate for our system, for the South Atlantic, but it's important to consider a higher natural mortality level as well.

Future recruitment is always uncertain, and so we can think about prevailing conditions, or sort of a grand mean, across the entire time period. Steepness is always really hard to parameterize, and so productivity is an important axis of uncertainty. We talked a little bit about spatial distribution. We have those estimates from VAST, and we were hoping to get some expert judgment. That might be a little bit more challenging to implement, given the limitations of the expert judgment that we were able to obtain.

Then, as Tom mentioned earlier, movement viscosity, the probability of staying within those movement matrix, is an uncertainty we should consider, and we have some additional proposed uncertainties for the robustness operating models. Importantly, we're thinking about uncertainty in removals, both MRIP and international removals, and future non-stationarity, to really make sure that these management procedures are sort of future proof, and so thinking about shifts in future recruitment, distribution, availability, and changes in life history parameters. It would be great to get some feedback on this, once we're done.

We also want to highlight that we have been requested to use the MSE framework for some tactical management exploration, and so Regulatory Amendment 3 is considering changes to static management measures like size limits, bag limits, and vessel limits, and so we're planning to use this MSE framework to explore some of those in the short-term, as sort of an on-ramp to thinking about full feedback loop management procedures, and so we wanted to highlight that here.

Remember that these management procedures are going to be empirical management procedures, and so indicator-based, and this sort of table demonstrates some example candidate management procedure archetypes, and so the first two show index rate output and input metrics, and so these are designed to compare catch limits, and CPUEs, to approximate, or aim, to fish at a constant harvest rate. Thinking about output controls are managing things like catch limit, and input controls are things like limiting effort, or thinking about size or bag limits. For example, we can use index target methods, which basically identify a target value of your indicator of abundance.

This could potentially have occurred in the past, when the stock was deemed at a healthy state, or it could be some ideal target index level, and the management procedure is designed to move the index towards that target level. Similarly, index slope, you define an ideal slope and try to approximate the index with that constant slope, and so, if the stock was deemed healthy right now, you might target a slope of zero, so that you continue to achieve the same index every year.

Management objectives, remember that these reflect what we want to get out of the fishery now and in the future, and these are what we're using to define management procedure performance, and so we take conceptual management objectives, and these are things like we want to maximize catch, and we quantify them into operational management objectives, and an operational management objective would take maximizing catch and convert it into something like we want to make sure that our catch in a certain fleet exceeds X number of fish, or X number of pounds, every year, with at least a 90 percent probability, for the next thirty years.

We use that operational management objective to make sure that we are appropriately measuring that within our operating model, and we use that to define performance metrics. There's some tricks, and many, many different ways, that we can actually define performance metrics, and so that will be a conversation to have, but, ultimately, we're using these performance metrics to measure management procedure performance and sort of outlining the biological limitations and tradeoffs that are inherent in managing a natural resource.

We talked to stakeholders about what objectives they would like to see. They said things like maintaining access to the fishery and preventing fishery closures. Across the board, they preferred larger sizes. They generally preferred stability in regulations, and there were some clear regional and sector differences in objectives that we found when we went to the different regions. Some regions just wanted to sort of improve the consistency and reliability of the fishery, and they proposed sort of area-based management measures, or quotas, so that they wouldn't be penalized if another region exceeded their quota. Then there was definitely regional variability in whether conservation was a priority, versus maximizing landings, and whether or not the stakeholders were open to size limits.

In a lot of MSEs, we sort of have sort of three categories of generic management procedures. Those include status, yield, and stability, and these are things that we'll include in any MSE, but, because dolphin is not necessarily a generic fishery, there's a high, very, very high, component of recreational removals. We want to make sure that we have some management objectives that reflect the stakeholder-defined objectives for dolphin, and so these might be things like measuring catch rates, measuring fishing effort, or opportunity, and keeping track of the size of fish landed.

This is a poll, here on the right, that just demonstrates, from our small stakeholder group -- We asked them to rank, sort of preliminarily, what objectives are most important to them, and the number of landed fish is in fourth place, out of four. It was more important for them to ensure fishery sustainability, and to land quality fish, as well as to maintain high catch rates, instead of maximizing the number of fish landed.

These are a bunch of management objectives, but I've highlighted status, because that's really where the SSC is going to have the most input, I believe, in making sure that we are meeting our status objectives, and so I will pause here. I would love to hear feedback on the operating model, operating model grid, potential management procedures, and objectives, and, if you don't have thoughts now, please feel free to email me, but I hope we have some good discussion on this. Thanks.

DR. REICHERT: Thank you so much for that overview. I will open the floor to questions, or clarifications. Anyone? Kai, and then Alexei.

DR. LORENZEN: Yes, and thank you, Cassidy, and everyone, for that very interesting presentation. I'm sort of trying to wrap my head around exactly what you're trying to do with the fisheries. I'm a little confused, and so you mentioned initially there was a -- So one of the concerns is predicting the amount that is available, sort of, I guess, in the council area, and then there's a part about -- This is slide 7.

Then there's a part of maximizing the usage of those fish across sectors and the region, and so it seems -- From that, I'm taking it's not just, or not primarily, a sustainability question. It's a question about, you know, sort of ensuring that people in one place don't catch all the fish before the fish get to other places. Is that what I'm hearing, but it's sort of not very clear to me, at the moment, what that management question is.

I do like the diagram on the right, where the catch limit is modified to always be higher than the availability. It just seems to be the same as not having a catch limit, but, anyway, and so, coming back to the real question, it's so what are the main management challenges that this is really trying to address? Thank you.

DR. PETERSON: Thanks, Kai. This sort of impetus for this entire project really started back with public comment on Amendment 10, and we did some stakeholder participatory modeling with the dolphin fisheries, and we really found that the static catch limit is not meeting the needs of the stakeholders right now, and there's some very divisive differences of opinion on how the stock should be managed across the sort of U.S. east coast, and so it became really clear that the static catch limit is not meeting the needs of the fishermen, and there should be a better way to manage this fishery than a static catch limit.

That was sort of the impetus for this management procedure. It's going to look a little bit different because, again, we don't have a stock assessment, and we're not managing the entire stock. We're only managing sort of what's available to us every year, and so we can't think about a management procedure traditionally, but you're exactly right. We're looking to develop a management procedure that is going to make sure that allocation is equitable.

One example is -- I believe it was 2015 where abundance, local abundance, was really, really high, and quotas were exceeded very early in the year, such that, by the time the fish had migrated northwards, to the northern regions, the quota was filled, and, even though fish were readily available, they couldn't exploit them in a meaningful -- Or they couldn't exploit them at all, and so that's sort of the aim here, is to make sure that we have something that's going to be meeting the needs of the stakeholders.

DR. REICHERT: Thank you, Cassidy. Kai, as a follow-up?

DR. LORENZEN: No, and I think -- I guess one question would be for me, and so where does the catch limit come from, if we don't have an assessment, and is this one of those like mean plus two standard deviations or something, and this is just a -- It's kind of a near arbitrary. Yes? Okay.

DR. REICHERT: Yes, and that's what we came up with a long time ago, I believe, as an ABC, and I had a similar question, looking at that graph, because that basically means there's no management. You know, you assume, every year, that the available fish is higher than what you're catching, but I may be misinterpreting this slide. I know there was another hand up, and I forgot who it was. Alexei.

DR. SHAROV: Yes, and I had a question that I already found from a partial answer. I was going to ask about the operational model and the way we're -- The information was there that it's an open source, and fully reviewed, et cetera, et cetera, and so I wanted to ask where we could familiarize ourselves with the model, and details, et cetera, because there are, again here, an enormous amount

of details, but, yes, there was one slide with the website name, and I went on the website, and I do see that it looks like it is an open source online software, where you actually could do the modeling by yourself, or it's just open for any species. It looks like you can build up your own MSE, effectively, and is that --That's the way it's designed to be, right? Is my understanding correct?

DR. CARRUTHERS: That's correct. So OpenMSE is software that we use. It's currently used for about fifty, I think somewhere between fifty and seventy, MSE processes globally right now, and so it's flexible enough, and it's an R package. It's flexible enough that you can code your own MSE, and so that's correct.

So, for generic information about how that framework works, equations and so on, you can go to OpenMSE.com, but, for anything specific to dolphinfish, that is where the trial specification comes in, and we do have everything on a GitHub repository as well, and so that means that, once we've got through these stages, I can go back through and comment everything, and you guys can literally recreate this entire method from the GitHub for the dolphin MSC. It should be -- The script should just run in order, and you should be able to get all the same results, and so there's three places where it's documented, the website, the trial specifications, and the GitHub repository, which has all the code available to you.

DR. SHAROV: Great. Thank you so much, because, as you were going through the presentation, it seemed like it was extremely flexible, in offering so many different options that, you know, I thought somebody would really need to be a genius to design, you know, all the possible outcomes when you are, you know, trying to create the model that would fit all, you know, possible combinations that you would then later see, depending on the species and the fisheries you're trying to fit, and so it seemed to be a little bit too ambitious, but maybe it's not ambitious. Maybe it is exactly what it is designed to be. Is there any way that you could transfer all this information to us in five milliseconds?

DR. CARRUTHERS: So the other one you want to look at is the snapper grouper MSE that Adrian Hordyk is developing for the council, where he has basically up to ten different species. It's spatial, and he's got lots of different fleets and things, and so, yes, it's been developed, and its only limitation right now is very short-lived species, like shrimp and squid, but we've just developed a system for that, and so, you know, it's taken maybe twenty person years to develop. A lot of it has been done by my coauthors, Adrian Hordyk and Quang Nguyen. I can't really take full credit for it, but, yes, it's been a lot of work.

DR. SHAROV: Well, thank you so much.

DR. REICHERT: Thank you. Any other questions? While you guys are thinking, I had a couple of questions, and maybe it's just -- Those are just clarifications. When you are talking about U.S. commercial, I assume that you're talking about the regions that you are including here in your model, correct?

DR. CARRUTHERS: Yes, and so if you go to the -- Up two slides, Cassidy. That one, yes, and so these are the seven areas. I think that basically it's all the hard. It's basically everything except for NCA is being modeled, I believe.

DR. REICHERT: Okay. Then on -- I believe it's slide 10. I was struck by the spikiness of the catches.

DR. CARRUTHERS: That's by season. That's why it's spiky as heck, because that's the seasonal data, and so those are broken into quarters, and so you've got four points per quarter, and these catches were derived by -- From the previous MSE process, and so I didn't derive these. They were essentially given to me.

DR. REICHERT: So there are a number of quarters that have zero catches, and that is because the fishery was closed, or is that a function of -- Go ahead, Jim.

MR. GARTLAND: I mean, I think, for some of them, the fish just aren't there. For example, recreational north, probably where all those zeroes are are in wintertime, right, and so just we don't have fish up there then.

DR. REICHERT: That makes sense, and so thanks for that clarification, and so that the spikiness is basically a function of the seasonality of occurrence, and perhaps seasonality of the fishery, and I was thinking about what some -- I forgot who said it, but that, by the time the fish are available in certain areas, the fishery is closed, and so that's why I thought that -- Right, and that was the availability that was mentioned earlier, and like you want to make sure that access to this resource is available for everyone in the entire region, but --

DR. PETERSON: Right. Yes, and that only happened in one year. That was 2015, I think.

DR. REICHERT: Okay, and so that's not a commonly recurring issue.

DR. PETERSON: Right. Yes. The reason that this line is higher is because oftentimes the quota is not met for dolphin.

DR. REICHERT: Okay. Thank you.

DR. CARRUTHERS: I think a broad design consideration though is to do with the notion of seasonality in both the fisheries and the resource, and some hypotheses have got the resource moving northwards, for example, just as a scenario, and so it's really necessary to explicitly simulate the impact on that, the relative equity in those situations. I think people need to be able what those outcomes look like seasonally and spatially.

DR. REICHERT: Okay. Thanks. Kai, and then Steve.

DR. LORENZEN: So, the model areas here, they extend, obviously, outside the South Atlantic Council jurisdiction, into the Caribbean and to, I guess, the Mid-Atlantic, and so are those councils involved in the same process, and do those regions have, you know, catch limits that are set on a similar basis as ours, or some sort of value that is more or less pulled out of the long-term catch statistic?

DR. PETERSON: Good question. So, right now, we are including all of these areas, because they have meaningful removals that we need to account for. The Caribbean has proposed some management measures for dolphin, and I don't know -- I'll have to double-check on where they are

at in that process, but we're only building management procedures for the four regions along that are managed by the South Atlantic Council.

DR. REICHERT: Thank you. Fred. Sorry. Steve, and then Fred.

DR. TURNER: Cassidy, I think I heard you say that you were severely lacking information on the size composition of the catch, say the domestic longline fleet. Is that correct?

DR. PETERSON: We do have those data. We do have the length composition data for the U.S. commercial fisheries. Just generally speaking, I think the fisheries are data limited.

DR. TURNER: Okay. Thank you.

DR. REICHERT: Fred.

DR. SERCHUK: One thing that I noticed, on the graph that lists the catches in the different components, and one is the size of the scales on each of the graphs are different, okay, and that's the one on operating model exactly matches exploitation, and it looks like the -- Maybe the seasonality might be different in each of these groups, and so that's another thing that I think one needs to take into account when we're thinking about -- Probably the lower two graphs, recreational south and for-hire south. I just wanted to bring that to your attention, in terms of the -- How much cash comes from each of these regions, and they differ quite a bit, it seems to me. Thank you.

DR. PETERSON: Yes, and you're exactly right. That's absolutely correct.

DR. REICHERT: Genny.

DR. NESSLAGE: Thank you. Just a quick question, I guess, for council staff. Do we have -- Forgive me, and are there other species, or stocks, that we manage with a control role? My part B is, not having said it in on the council meetings and the advisory meetings, are these -- Are they open to this? It's a bit of a shock to the system, or it will be a shock to the system, when people don't really understand what that implies.

DR. COLLIER: Well, we do have one control rule out there, right, the ABC control rule. That's a form of this. It's along the lines, right? It's a way to reduce catch from an OFL recommendation, based on the stock assessment, but we don't have anything coming out of a management strategy evaluation right now to set catch levels, using a management procedure like is being proposed here, and, you know, we're going to have to work it through the system, in order to get everything done.

It's not conventional. We've got to figure out, or does the council want to get changes every two years, or do they want annual updates on this management procedure and harvest control rules, and so, yes, there's a lot to go through.

The Mid-Atlantic has been working on one. You're probably much more familiar with that than I am, but they're doing it for their recreational fishery for summer flounder, black sea bass, and scup, and so we're kind of thinking along those lines, as a potential way to get it through, but we're still a long way away from getting it through, and, you know, if the council's ready to do it. Yes, and

it's -- Hopefully they will. It seems like an interesting way to help manage the stock. We're hearing a lot from south Florida that things are not as good as they are. A plug for the seminar series coming up in May. We are going to be talking about dolphinfish, and so it will have some information for the North Carolina, for the northern area, and not just south Florida, and so they'll be talking about that a little bit more.

DR. REICHERT: Thanks, Chip. I see you have your hand up.

DR. CARRUTHERS: It was just a point out about the impetus behind these types of management procedures. The reason why these have become increasingly popular for commercial operations is because of seafood certification standards. It's worth reminding the council that, you know, and the members here that, you know, this is becoming now the de facto standard for getting the highest sort of certification for things like the Marine Stewardship Council certification, is that you have an operating model tested management procedure in place.

So whilst it can be, I think, hard to deal with the first iteration, it does have advantages in that regard, and another in that it could potentially give you responsive management for data-moderate and data-rich stocks, and a lesser assessment frequency, and so you can spend your time doing things which are -- You know, that require more work, or even investigate other species, and so this is growing as an endeavor, and it's being driven by those two considerations.

DR. REICHERT: Thanks, Tom. Before we move on to our discussion, I would like to see if there's any public comments. Shep, we see your hand up, but let's see if there's anyone wanting to make. Okay. No public comment. Shep, go ahead.

MR. GRIMES: Thank you, Mr. Chairman.

I just wanted to ask a question under the -- Maybe this is stepping over a bit much into management, but, once this is incorporated into the FMP, right, the whole purpose of having catch limits, and having the catch limit mechanism under the FMP, is to set a limit that prevents overfishing, but I don't see where that is addressed in this, and I wondered what our position and argument would be for how this approach prevents overfishing. Thank you.

DR. CARRUTHERS: I can answer.

DR. PETERSON: Go ahead, Tom. Go ahead.

DR. REICHERT: Go ahead, Tom. I was making notes, but, yes, go ahead.

DR. CARRUTHERS: Well, so there's two types of overfishing. There's the overfishing that you assess when you do a stock assessment, and you might be wrong. You might be wrong, but then there's the overfishing you assess through an MSE, which is the known overfishing in the model. The simulation model has got all these scenarios in it, and the overfishing is what is truly known in that model, and so the overfishing metric would be demonstrated here by the MSEs. It would be one of those performance metrics. It would say we don't overfish in all of these simulations, under all of these conditions, using this management procedure, and so it wouldn't be an explicit assessed overfishing, or not, because, as we've described, it's difficult to get a stock assessment

together. It would be an implicit that we don't overfish, using this rule, across all these scenarios, and so it would be addressed in a slightly different way.

MR. GRIMES: Can I ask a quick follow-up to that?

DR. REICHERT: Sure, Shep. Go ahead, and then I have Chris.

MR. GRIMES: Okay. Well so, going through it, I mean, I thought that -- I mean, a lot of what you're doing, you know, this is user-group driven, and we're looking at user group desires, and looking, you know, user satisfaction sort of stuff, and so those metrics -- Are those the metrics that we have to satisfy to determine that it's not undergoing overfishing? Thank you.

DR. CARRUTHERS: Okay, and so you can have any number of metrics for different considerations. Some could be legal requirements, like overfishing, and those are hard limits. If you have to demonstrate that you don't overfish in a high fraction of cases, that's a hard limit. It's a legal requirement. Then you would be down to let's say fifty different management options that you -- Then, between those, you still have to distinguish between those options, and what they provide you, and, very often, they provide tradeoffs between the various things that people care about, and then it's really up to managers to decide what management solution to pursue.

There are different types of performance metrics, and some of them are, as we were alluding to, hard limits, to do with legal requirements, and others are like-to-have things that you want to tradeoff, like stability and yield, versus the total amount of yield, and so on, and so there are different types of metrics, and the idea is to at least present all of them, and then, you know, managers can determine which ones are hard-nosed using a process called satisficing, and it's like, no, we can't go near those, because they do this, and then, of those, which one they would preferentially select, but we will develop -- It sounds quite confusing in this, but we'll develop tools. We've got apps available to help you explore those outcomes, which will hopefully make it a bit more user-friendly and easy to navigate.

DR. REICHERT: Thank you. Chris.

DR. DUMAS: So I'm an economist, and not a fish stock assessment scientist, but I can't see the forest for the trees. I think this is a really cool model, and I don't know -- I don't understand where it fits in the overall process. Is this supposed to someday replace the SEDAR process, or is this a component of the SEDAR process, or does this replace what Matt and Eric and Kyle do?

I don't understand where this is going to go in the current process, and I don’t know if this is just my misunderstanding, or this is general, if everyone else has the same questions, or whether I'm the only one, and, if there's some document I should read to understand this better, I would be glad to, but I don't get it, and this is not a criticism of the MSE approach or the model at all. I'm very supportive of MSE. I'm just not understanding how it fits in. Can someone help me? Thanks.

DR. REICHERT: I have to say I've been thinking along the same lines, and I'm still trying to kind of wrap my head around that. I have Jim, and then I saw Chip coming to the table.

DR. PETERSON: I can comment on that, quickly.

DR. REICHERT: Absolutely. Sorry. Go ahead, or Tom.

DR. PETERSON: Chris, thank you. That was a great question, and so this is kind of a unique scenario, because we don't have a stock assessment for dolphin, and so this is just replacing the average third highest catches from between a set of years that's really not doing anything to meet the needs of our stakeholders. In theory, management strategy evaluation, and management procedures, are used in combination with stock assessment to provide sort of more holistic management advice.

We sort of think of it in terms of management of fisheries is asking sort of three questions, which is, where are we now, where do we want to go, and how do we get there, and stock assessment is really good at telling us where we are now, but maybe it's not the best tool to tell us where we want to go and how do we get there, and that's where MSE comes in, and it incorporates stakeholder knowledge. It incorporates robustness to uncertainty, and it makes sure that we can manage through uncertainty in a way that accompanies stock assessment.

Stock assessments are telling us what is stock status, our best estimate of stock status, whereas MSE is telling us how we should manage in a way that's going to be robust, that's going to meet the needs of our stakeholders, and we are -- I'll say as an aside, sort of me, along with the rest of the national MSE working group, and so the MSE person at each different science center, and we collaborate. We're actually working on a document that hopefully will clarify some of the myths surrounding application of MSEs within sort of the U.S. council management framework. We're working on that, and so hopefully we'll be able to have that to share really soon. Thanks.

DR. DUMAS: Thanks. That's very helpful. For a fishery that has a stock assessment, how do you see this fitting with that? Would the stock assessment be an input to the MSE? Would stock assessment outputs be then inputs to the MSE, along with other inputs?

DR. CARRUTHERS: So there's two different ways it's going to happen, and so one of the problems with stock assessment is that it's hard to demonstrate robustness of a rule that's adaptive, and so very often what happens is people are worried that they haven't captured all that uncertainty, and so they want to do an MSE to test a rule, and sometimes that's just a harvest control.

In other ways, what they want to do is actually they want not to have fixed TACs. They want to have dynamic management advice, responsive management advice, and so what you do is use the stock assessment essentially is to update your operating model, and then you run a rule in the interim, like a harvest management procedure in the interim, and that gives you adaptive TACs every year, based on a very simple formula.

In many stock assessments, when we look at -- We peel the data back say six years, and we discover that the calibration to the index is the same, and so, even six years ago, we could have managed with a simple TAC rule, because the scale of the index relative to the assessment has been the same. In fact, we've wasted our time doing all these stock assessments. We could have just used a simple rule to give us adaptive management, and so there's different ways in which they can be put together, but one way is to lower the assessment frequency and increase the TAC responsiveness, essentially using the operating model way of testing those rules for dynamic advice in between doing a stock assessment.

DR. REICHERT: Thank you. I noticed a couple of hands up. I also want to remind the committee that we still have one agenda item to go, and so please keep that in the back of your mind, and I may close the discussion, because we have some other stuff to go through, but I also don't want to stop the discussion, because some of these points are really important for us to, A, understand, and, B, ultimately we'll be asked to, you know, see how this can help us provide recommendations to the council, and so I have Chip, and then Jim.

DR. COLLIER: Chris, you specifically asked about replacing SEDAR. We don't envision MSEs as replacing SEDAR, and so, in fact, for this one, it's kind of on the SEDAR schedule to review the operating model, because that is going to be essentially the stock assessment model for dolphin, right, and we want to make sure that any catch level recommendation that you all will be using, or this model will be using, will be in the best available information, and so, if these MSEs don't necessarily have -- Or it doesn't have a stock assessment to rely on it, we would like them to have like a CIE review, in order to make sure it's going to be good to base the catch levels on.

Then, for something like the snapper grouper MSE, we're not looking at adjusting the catch levels in there. What we're doing is looking at evaluating the management strategy, and is that going to be robust, and so there's going to be different ways that management strategies are used, management strategies evaluations are used, and there's other things that are going on.

Let's say carryover, or something like that, and that could be done through a management strategy evaluation, to see if the carryover that the council would like to do is going to put the stock at risk, and so it can do a variety of things. It's just we need to make sure we ask the right questions of it.

DR. REICHERT: Thanks for that clarification, Chip. Jim. Jim is good. Okay. Thank you, guys, for the overview. I am personally looking forward to the next time we see this. I think that document that you mentioned will be really helpful for us to look at that, and interpret some of that, and, again, I'm going to ask the SSC members who were assigned to help us write the report here and the feedback. So, again, thank you so much for the presentation, and being here, be it online.

DR. PETERSON: Thank you.

DR. REICHERT: So go ahead.

DR. SERCHUK: May I ask one last question, Mr. Chairman?

DR. REICHERT: Yes, and go ahead, Fred.

DR. SERCHUK: I'm a little bit confused about how the different areas of different fleets here, particularly the fleets outside of the south will mesh with whatever scenario we decide for our area. That is, we could be perfectly -- Here's a scenario, and maybe I'm misunderstanding it. We do exactly what was proposed for the areas that we have control over, but then we find out that the for-hire sector in the north, or the U.S. commercial, does it a completely different way, and so, even though we were well within the boundaries of our control rule, the stock suffered, because a different control rules used in a different area, based on a different understanding of what they were trying to achieve. Am I misunderstanding something here?

DR. REICHERT: I don't think you do. I may ask one of the presenters to comment, real quick.

DR. PETERSON: Yes. Absolutely, and so we're thinking about a control rule that's going to be for the entire east coast, because the South Atlantic Fishery Management Council manages dolphin throughout that entire range, and then, any sort of fishing activities that go on outside of this jurisdiction, that's an axis of uncertainty, because it's something that we don't have control over, and so we're going to build different scenarios of international fishing effort into our management strategy evaluation, to make sure that our management procedures will be robust to that uncertainty.

DR. SERCHUK: Thank you for that.

DR. REICHERT: Thank you so much. I appreciate that. Okay. Next, we move to the SERFS trend report. We'll take a five minute break, and then we'll ask Tracey to come to the table. Okay. Let's -- Since we're a little late, and Tracey has to leave, and so let's not have that five-minute break, and we'll ask Tracey to come to the table, and so sorry about the delays, Tracey.

DR. SMART: Sorry, and you guys are welcome to come to marine policy.

DR. REICHERT: So Tracey has teaching responsibilities. We'll all attend. Sorry about the confusion, guys. Go ahead. You can always do that.

DR. SMART: Well, it will take us a minute. It will probably take us a minute to set up anyway.

DR. REICHERT: In the meantime, the document is Attachment 7a and 7b. We didn't assign anyone, and so please make notes to help us, and, as I mentioned just now, Tracey will provide the overview. Go ahead, Tracey.

SERFS 2024 TRENDS REPORT

DR. SMART: All right. Thank you all for having us. I'm going to do some creative rearranging here on my magic napkin, in the interest of time, and I think most folks on the committee have seen a version of this presentation, have been a part of SEDARs and other groups that have gone over these surveys, and so we're going to skip a lot of that detail on the survey design, and we're going to get kind of right into data, and I apologize about the screen. We have some interesting mirroring of things, and so we're going to make this all up together. Great.

All right, and we are going to talk about the Southeast Reef Fish Survey and then our Coastal Trawl Survey. I'm going to skip survey design, and I'm going to skip talking about details on the 2024 activities. You all have copies of our reports and the presentation in the briefing book, but I am going to talk about our abundance, length, and distributions for selected species that are, you know, of most interest to this group and ones that we have decent data for. All right, and let me skip forward. Pretend you didn't see any of this stuff.

All right, and so we're going to show primarily three different data products for both the SERFS survey, and then some of the same data products for the Coastal Trawl Survey, the first being a map of distributions based on our catches. It's going to be represented as an interpolated heatmap,

where anything with a really warm color, in particular red, means high abundance inside of our gear that then came up with it.

So, in this case, it's, you know, for example, fish per trap hour. Anywhere in blue means there is really low abundance. Red is really high abundance inside of the traps. Anything in white is where we do not sample. The spatial footprints of the surveys are a little bit exaggerated, exaggerated quite a bit, in order to make it actually visible. For example, when you see the trawl survey, it's a very narrow strip.

The other thing that we'll show folks is two indices that have abundance. From the traps, we have both a catch index, which runs through 2024, a video index, which runs through 2023, starting at 2011. That came onboard when both the SEMAP and the SEFIS program started collaborating with MARMAP, and so, if you've heard of the MARMAP survey, MARMAP trap survey, it's this, but rebranded, and expanded, and new and improved, and so we have both our catch from within the traps as well as our videos.

If anyone really wants to practice their video reading, we call this one Wall of Vermillion. I'm happy to take guesses at the end of the presentation. All right, and so what these will look like is, on both of these graphs, you'll have the same setup, and there'll be layered, catch on top and video on bottom, so you can compare and contrast pretty easily, just visually. You'll have a mean value per year in the red line. The error around the estimates is in the gray shading, and then the black dots are nominal abundance, and so these are zero-inflated negative binomial standardized mean lines, in the red.

These are normalized to the long-term average, which is represented by a dashed line at one, twice the long-term average, and one over two is half the long-term average, and so this is skewed positive to negative, or above and below the one line, but it's floored at zero.

Then the other thing that we'll have for the trap catches, but not for the trawl survey, is our length compositions for our selected species. Again, this is based on the fish that actually come up inside of the trap, and we'll represent these in total length in inches per bin, and these are based on the annual catches each year, and so each year is independent from previous years.

The red line is our average total length. The green arrow, if we have it, represents where our commercial minimum size it is right now in the region, and the pink arrow will represent the total length at 50 percent maturity for females, just to give you an idea of where our trap catches are relative to some of the regulations, as well as whether or not they're sort of in that mature versus immature size range.

I'm going to start out with species that we have trap catch for, and plus video for at least some, and then I'll move into some video-only species. Starting with tomtate, which is our most abundant species in the trap catches, and our maps are for the most recent five years, from 2019 to 2024, minus the COVID year of 2020. These are really broadly distributed species, across the full survey range, with most of their hotspots sort of in that inshore to mid-shelf area.

Our catch -- Sorry, and we have catch only for tomtate. They're very difficult to read on the videos, very time consuming, but the most recent say eight to ten years have been just below or just around the long-term mean relative to the historical time period. Tomtate is a very consistent average

length over time. I always make the joke about it being a unit of measurement, and our trap catches are generally well above the size of maturity.

Vermilion snapper is another broad-ranging species in the survey, although their hotspots tend to be more South Carolina and North Carolina, and much more mid-shelf than tomtate, and our catches, in the last five to six years, have been right around -- Hovering right around the long-term mean, and the video index has been right around that long-term mean. You can see that truncated time series since we started the videos.

Our length of vermilion have increased over time, although they've been pretty steady for the last like seven or eight years. We used to have a lot more small vermilion in the traps, but they -- The trap catches are hovering right around that minimum size limit for commercial, and they're well above the size of female maturity. I've never seen an immature vermilion, if anyone has. Not alive anyways.

Black sea bass is our number-four-most abundant species in the traps, or number-three, and they generally have been a very broadly distributed shallow-water species, but now our hotspots are mostly Georgia, South Carolina, North Carolina. Our catch index, as you all have seen before, looks like this, with 2024 being the lowest year in the time series, and so that's an update from what Matt had this morning, and then Matt had the video index through 2023, as we see here. Our average size of black sea bass has gone up a little bit, probably most generally because we don't have quite as many small fish represented in the catches, and it's sitting right around the commercial minimum size limit and, again, well above the size of maturity.

Red snapper is one of our more southerly-distributed species, with the hotspots primarily off northern Florida and Georgia, and primarily shallow water, but, where they are a little bit more abundant, they actually cover pretty much the full range of the survey. In terms of depth, our catch has been increasing significantly over the years, as well as the video index, but it's sort of leveled out in the last couple of years.

Red snapper was really, really uncommon in the trap catch, and so our size distributions, in the last fifteen years, have really filled out, and we catch, you know, red snapper at thirty-five inches total length pretty regularly, but we do see a mix of size classes now, and this is also a good example of where you can see year classes moving through pretty well, and, generally, our red snapper are mature when we catch them in the traps.

Gray triggerfish is another really broadly-distributed species throughout the range, more sort of mid-shelf into deeper water, but also in some of the shallower areas. Our catch index has been kind of right around the long-term mean through 2010 to 2019. However, the last couple of years have been below the long-term mean, in both the catch and the video. Our average size of triggerfish has increased over time, but it's been pretty stable for the last seven or eight years, and it's sitting above the commercial minimum size limit, as well as, generally, our fish are mature by the time we catch them in the traps.

Stenotomus is more of a sort of ecosystem species. This includes both scup and longspine porgy, because they are difficult to tell in the traps, after they've been bounced around inside the mesh, and so they were a more broadly distributed species. Now they have sort of limited hot spots in

shallower water, in particular off of, you know, North Carolina, more so than some of the other areas.

Our catch has been going down, and we do not have a video index currently for Stenotomus, because, again, they can be pretty difficult to read, mixed in with a bunch of other fish, and so the last ten-plus years have been below normal. Our average size has increased, although, as you can see, in the most recent year, we've actually had a pretty -- A much broader representation of size classes, with a few more young, small Stenotomus, presumably young Stenotomus, in the trap catches, and they usually average above the size of maturity.

Red porgy is a little bit more limited, in terms of distribution, from about Georgia through southern North Carolina, particularly in sort of deeper water. Our catch index has decreased since about 2013, and the most recent few years have been below normal, both in terms of catch as well as the video index, and I do apologize. In the PDF of the presentation I sent Judd originally, I had gone a little copy happy with the vermilion snapper catch index, and so this is correct, and the report was correct.

Our average porgy size increased since the late 2000s, but it's been mostly pretty steady. I do want to note that it is sitting right around the commercial minimum size limit, well above typically the size of maturity, but I do want to note, in this most recent year, we really didn't have any small red porgy represented in the catches.

White grunt is a more northerly species, particularly off of southern North Carolina, and our catch has been hovering right around the long-term mean with the most recent years, either right at the long-term mean in the video index, or just below in the trap in the catch index. Our size distribution for white grunt is pretty broad. It's been a little bit variable over time, but mostly pretty steady, and we have a good representation of the various size classes, and they're typically mature by the time we catch them.

Gag grouper has actually jumped a little bit, in terms of the number that we caught this year versus the last probably ten or so years. They are much more limited, in terms of distribution within the survey, with hotspots sort of off of South Carolina and then into southern North Carolina. Our catch index has been hovering right around the long-term mean, with the last two years just above. The video index has been below the long-term mean for the video, but it's been up in the last two years, and that's probably the difference between the two, although they're still consistent, is probably because of that long-term time series sort of setting up how the average looks for the catch index.

Because gag is not incredibly encountered in the survey, our length compositions can be pretty variable, sometimes based on very few fish. It has filled out much better in the last couple of years, and I do want to note these small fish that have entered the catches in the most recent years, and gag is an interesting one, where our average catches, in the last five to eight years, have been below both the commercial minimum size limit and the size of female maturity.

Red grouper is another more limited distribution species in the survey, with sort of a split distribution, with hotspots off of Florida, as well as southern North Carolina, and our catch index was quite high in the 2000s, and below the long-term mean for about the last ten to twelve years. However, the last couple of years have seen an uptick, and that uptick was seen both in the catch

index as well as the video index, and, again, as -- Red grouper is another one of these species where it's a really good way to sort of visualize year classes moving through the population.

If you have too many fish, it's hard to see. If you don't have enough fish, it's hard to see, and with the most recent couple of years having these small fish, that seem to be getting bigger and bigger, in concert with that uptick in terms of the indices, and our average is sitting right around both the size at female maturity and the minimum size limit.

Almaco jack is kind of interesting. It's a species we hadn't actually created indices for for a very long time, because they weren't common enough, in terms of the catch. We do see them on the videos quite regularly. They have become more prevalent, enough that we actually have enough data to work with. They tend to be sort of in the center of the survey distribution, and in deeper water, and our catch index, not surprisingly, because we've had, you know, to work with the last couple of years, and the video index has been above normal, above the long-term mean, in the last few years.

The same with that increase, in terms of encounter rates and that increase in the indices. We also see an increase in the number of fish that we can draw on for the length comps, and so those have definitely filled out more, with both small and young fish represented, and there -- The average for the trap catch is above the minimum size limit for the commercial catch, but is below the estimated size of maturity for females. We currently don't have an estimate for size at maturity for females for this survey, because we just haven't had enough encounters yet, but we are working about it, and so we had to borrow that from another group.

All right, and scamp grouper is our final grouper, and our final trap catch fish for the day. Again, a more sort of limited distribution in the survey, with more isolated hotspots, but we do find them throughout the survey range, and our catch and our video index saw a decrease in the 2010s, although we've seen a little bit of an uptick in the last couple of years in both indices. It's a little bit more pronounced in the video, because of that shorter time series and less contrast from, you know, the 1990s and 2000s.

Our average size of scamp actually dropped quite a bit in the last couple of years, we think because of these small fish sort of coming into the trap catches, and you can see they really started showing up in 2023, and got a little bit bigger in 2024, and our average is right around the commercial minimum size limit, and we tend to get more fish that are above the size of female maturity.

All right, and we've got a couple of species that we don't encounter in the traps as frequently as some of these other ones, and so we haven't been able to create indices of abundance from the catch, but we do have video indices, and that's -- So we'll go over greater amberjack and mutton snapper, and so this is the greater AJs. The last couple of years have been above the long-term mean for the video index, and, for mutton snapper, higher than the long-term mean for the video index as well, and, because these are video-only species, we don't have matching length compositions at this time.

I do want to make a note of this, real quick, because I know you guys talked about it this morning. We worked with several other fishery-independent surveys throughout the east coast, ChesMMAP, NEAMAP, the Northeast Bottom Trawl Survey, as well as our Coastal Trawl Survey and SERFS

last year, to collect fin clips for black sea bass, and so you can see that distribution and where we're pulling fish from for our genetics project that Tanya mentioned earlier this morning.

All right, and I'm going to skip over that, and let's go into our trawl survey species, and, again, I'm going to skip over the details of the survey. I'm happy to answer questions, or Wally can answer questions, and let's go straight into some species.

The trawl survey serves as a really good age-zero and age-one index for a lot of species, both federally-managed as well as state-managed species, and so I'm going to highlight the mackerels, that are typically age-zero and age-one, although we do get up to age-three and four occasionally, and so you can see their distribution, with their hotspots for king mackerel off of northern Florida, as well as southern North Carolina, and their index has been sort of below average since a big recruitment class in about -- I want to say that's 2016, and then -- But a little bit of an uptick in the last year, since sort of our lowest numbers on record in 2022 and 2023.

Spanish mackerel is a little bit more broadly distributed, with hotspots more or less throughout the entire survey range, except for just south of Cape Hatteras, and their index has seen an uptick in the most recent year, after a pretty decent downtick after 2010.

White shrimp is another more broadly-distributed species in our trawl survey, with hotspots throughout the range, and our trawl catch indices have -- The index has gone up in the last five or six years, after some historically low numbers in the 2000s. Brown shrimp is sort of a more moderately-encountered species in the trawl survey, with more limited hotspots off of northern Florida, and Georgia, as well as southern North Carolina, up into that area off of Pamlico Sound, and our index has been down in the last couple of years, after some reasonably high years in the late 2010s.

Finally, pink penaeid shrimp, and this is a much more limited-encounter species. You get a few here and there between Florida and South Carolina, but really their hotspots are off of North Carolina, and off of Pamlico Sound, and our trawl catch is mostly pretty flat.

It's also pretty variable, especially in years with high estimates, with our most recent years being below or right around average, but, again, this is -- I would say this is probably the one that I would trust least for use, and, so far, it actually hasn't been used in any assessments, because of that variability and the limited spatial coverage in the survey, and, with that, I am happy to take any questions. I think I actually did it way faster than I meant to. It's the magic napkin. This is actually a video off of our new boat, the Lady Lillian, if anyone is interested.

DR. REICHERT: Thanks for the magic napkin. Thanks, Tracey, and, again, apologies for having you wait until the end of today. I'm always looking forward to this update. For me, it's also very encouraging that a number of species that we had, as a committee, concerns over have seen some evidence of smaller fish entering the traps. Others are still -- To me, it was also interesting, and I think it was -- Was it scup that was down? That's -- Remind me, and that's generally more northern, and this is kind of the southern part of their distribution?

DR. SMART: Yes, and this is kind of the southern part distribution. Our scup are also relatively small, compared to the Mid-Atlantic and Northeast scup. You know, hand-sized, rather than plate-sized, I would say.

DR. REICHERT: Yes. Any questions for Tracy, or clarifications? Fred.

DR. SCHARF: Okay, and so when the -- When you have the comparisons between the chevron traps and the video index, in almost all cases, they align really close. Red porgy is the exception, where the -- You know, the video trap shows this downward trend, since the early -- Like 2011 and 2012, whereas the chevron traps are increasing a little bit.

DR. SMART: Yes, and so, if you have the PDF that was on the website, and I apologize that -- I accidentally copied the rhomboplites, instead of the pagrus, and so it's been updated, and I sent Judd the correction, and the report is correct for red porgy, and so the trap catch is actually a downward trend, as well as the video.

DR. SCHARF: Okay. Never mind.

DR. SMART: I got a little click happy.

DR. CURTIS: Yes, and I'll be sure to post that, get that up on the website, the revised presentation, so you can review it.

DR. REICHERT: Thank you, Judd.

DR. SMART: It panicked me yesterday. I was like, oh, no.

DR. REICHERT: Again, thanks, Tracey. Can you pull up that -- I hate to interrupt this great video, but the black sea bass, the length frequency? Okay. Thank you. It looks like, in terms of the -- Of course, this is very difficult to see here, but there's -- In some of the other species, and let me turn it around. In some of the other species, we saw distinct changes in the distribution, and you mentioned, in some species, you can follow some cohorts. It looks like, in black sea bass, that stayed fairly consistent, that distribution in the traps.

DR. SMART: Yes, and I think there's kind of two things going on. If you have too many fish, and black sea bass is very, very common, it's really hard to see distinct cohorts, especially if that sort of recruitment is happening pretty regularly. The other thing is black sea bass, for the traps, they mostly retain age-two-plus. The littlest ones, age-zeroes, go right through the mesh, and so, the few times that we have them in, -- You can see a few scatterings of very, very small. Those tend to be ones where we have traps that are so full of other sizes that the little ones get kind of squished in between and get retained. Vermilion is kind of the same way, too. You bring it up, and you see this waterfall of red falling out of it, unless they are unlucky enough to get stuck.

DR. REICHERT: Yes, and that's part of the selectivity of the trap, but I was -- I looked at it earlier, but it looks like there's no clear signal, especially in the later years, about the changes in the size distribution, at least eyeballing this, and I know that there's a lot of caveats there, but, anyway, thanks. Then, for the index, unfortunately that trend has -- The downward trend has continued in the trap catches. Go ahead, Tracey.

DR. SMART: I was going to say that it is hard to see, but you can -- If you look really closely, these, the fattest bubbles, up until about 2008 and 2009, really are right at that cusp of where they

start no longer being retained in the traps, and then those bubbles tend to spread out more, into bigger and bigger length. It is hard to see, you know, because we don't have that retention, and we don't have a complementary, you know, smaller mesh that gets them regularly, and it makes it a little more hard to see.

DR. REICHERT: Okay. Thank you. Chris.

DR. DUMAS: Thanks. In the preceding slide to this one, and so the slide above, so all those trap locations in the map to the left -- Would it -- Do you have some feeling for which of those locations have higher fishing pressure and which ones have lower fishing pressure? Could you like, you know, partition those locations roughly by fishing pressure, into sort of high and low fishing pressure, and then make graphs like the ones on the right for low pressure locations, low fishing pressure locations, and high fishing pressure locations?

DR. SMART: I mean, my guess is, yes, it could be done, you know, either through NMFS statistical grids or see what else we have. I'm staring at Amy Dukes, and Chip Collier more so.

DR. REICHERT: I think the challenge is what is the resolution, because, in a lot of instances, we don't know where they're actually catching the fish, and I would argue that for -- But I may be completely off, but that, for black sea bass, there'll be -- They'll catch them throughout the region. I mean, there may be -- There may be differences in magnitude, but --

DR. DUMAS: Right, and if they -- You know, if some places were much higher fishing pressure, and others were lower, maybe that would be, you know, interesting to look at, with respect to our conversation earlier today about black sea bass, and also Matt -- Someone said, well, you know, black sea bass -- Maybe that would be harder, because black sea bass sort of disperse, but then didn't Matt also say earlier that they do disperse, but only like fifty miles?

He was giving a reason for why the southern stock of black sea bass is separate from the northern stock, and they do disperse, but not a super long way, and so maybe if you think of, you know, like a fifty-mile grid, a grid with fifty-mile-wide cells, and which ones of those are high fishing pressure and low fishing pressure, and sort of partition, and then make these graphs for each of those two partitions. I don't know, and it might be interesting, which is interesting to see with respect to trying to talk about the issues of is it discards or is it natural mortality that's causing the reduction in abundance.

DR. COLLIER: That's exactly what Ecospace is trying to do, and so it will have the temperature and all that information incorporated into it, and hopefully we can give you an answer in a few months.

DR. REICHERT: Yes, and that would be awesome.

DR. DUMAS: All right. Well, I might not be sleeping well at night until then, and so, as you get that, let me know.

DR. REICHERT: Jeff, or others, may chime-in here, and, yes, black sea bass is not a species that generally moves around a lot, and I'm not sure -- There were some studies done, in terms of movement, and so I have Jeff, and then Steve.

DR. BUCKEL: Yes, and I can comment on that, real quick. We tagged a lot of black sea bass off of North Carolina. Paul Rudershausen, in my group. has tagged a lot, I should say, and thousands of black sea bass, to look at discard mortality, and not movement, but none of those fishes have ever been captured north of Hatteras, to get to the stock question that was raised earlier, and then the movements that we do see are really small. They're not large scale. Like we also haven't seen any move to South Carolina, for example, and so just localized movements near where they're tagged.

DR. REICHERT: Thank you, Jeff, and, again, Tracey, thanks so much. We have a couple of people who may be able to answer some questions here. Steve, go ahead.

DR. TURNER: Before Tracey leaves, I wonder if there's an index of recruitment in this dataset, basically for say age-two or age-three, out of this dataset.

DR. REICHERT: For what species?

DR. TURNER: Black sea bass.

DR. REICHERT: The trawl survey, maybe?

DR. TURNER: No, and look at the length compositions.

DR. SMART: Yes, and so we actually just published a paper, utilizing our Coastal Trawl Survey, to see if we could create an index for age-zeroes. It's not great, because it's a soft-bottom survey. They are there. They're there throughout the range. It's just not a great-fitting index, and it doesn't have predictive power for the trap index that we know is really robust, but we did break out just the age-two, so we could clean up that data set for that comparison, and so there's definitely enough age-twos to get at that, and sort of back calculate year clustering, assuming nothing has happened in that timeframe.

DR. TURNER: I don't care about the age-zero year class. I care about twos and threes.

DR. SMART: It's pretty much the same as what this is.

DR. TURNER: You feed it into the stock assessment as age-two or age-three.

DR. REICHERT: Yes, and correct me if I'm wrong. No, and I agree, but correct me if I'm wrong. They mature at age-one, and it doesn't matter, but, I mean, in terms of a juvenile, it's not a juvenile recruitment. It's a more general recruitment signal, but that's probably what you're after.

DR. TURNER: I also look at this plot, and what Tracey said about the early years, and it looks to me like the later years reflect the decreasing recruitment that the stock assessment points out. You know, you can't tell from this, really, but there's bigger blobs at the bottom, on the left-hand side, and smaller on the right-hand side, and so, if you broke that out by age, it might tell you something about the reliability of the stock assessment, in terms of recruitment levels.

DR. REICHERT: That was based on the trawl survey or on the trap survey? Traps? Okay. Yes, that would -- I think maybe you guys can provide that paper. That would be that would be good to have, and so that's --That's kind of the answer to your question. Thanks, Steve. Okay. Anyone else? Jeff.

DR. BUCKEL: Yes, and great presentation, Tracey. Thank you. A question on the jack complex, and so you mentioned the almaco jack, which is in that complex, that they're increasing, and any information on other two, the banded rudderfish and the lesser, from the -- Do they go in the trap?

DR. BUBLEY: No.

DR. BUCKEL: How about the -- Do they do the video counts?

DR. BUBLEY: I don't think they count. I mean, lesser, I'm not sure we encounter them very much at all, or even if they would be comfortable distinguishing them on video. I'm not sure exactly what they would be looking for. Banded rudderfish, not that I'm aware of. I don't think it's one of the species they're counting, but it's not one that they put forth an index, because it's more in Nate's shop, and so we don't see the raw video data that often. It's just they basically create these indices, and then ship them our way, and then we present them together.

DR. BUCKEL: Thank you, and I was just curious, and, you know, the almacos are going up, and I was wondering if those other two species were, and we might have to revisit that jack complex ABC at some point, given the increase in almaco.

MUTTON SNAPPER AND YELLOWTAIL SNAPPER UPDATE

DR. REICHERT: Yes, and thanks, Jeff. Okay, and, also, I want to mention, you know, we've seen these updates on an annual basis, and I always find them very helpful for us to interpret what's happening and kind of get us a little -- Sometimes a little ahead of, you know, where we're going, in terms of our discussion, and so I hope I hope we can continue to do that, and so, again, thanks. This also, as with a lot of other studies, represents a huge amount of work, both by South Carolina DNR and the Science Center, and so all right.

What I am proposing is to get through a couple of other small items, or relatively short items, so that helps us having a little more time available tomorrow to revisit blueline tilefish and black sea bass. One of them is the review of the mutton snapper and yellowtail. I have a couple of slides to present, and then Judd will provide a brief update on SCS, and then we'll see where we are and probably recess until tomorrow.

The SEDAR update will do tomorrow, and then tomorrow I'll give everyone an update on how our agenda will look like for tomorrow morning, and so if you could pull up the -- Thank you, and so let's go to that point. Let me scroll to my -- Okay.

The mutton snapper and yellowtail snapper, maybe you remember there was a subgroup of the SSC that met with members of the Gulf SSC. Seven members were there, including Amy, who chaired the review workshop, Dustin, Jim, Fred Serchuk, Alexei, Steve, and myself. We

participated, and the report is available in attachment 15b. That meeting was in February, in Tampa.

The decisions were made by consensus, although the Gulf usually has motions, and, also, we were using, or scheduled to use the South Atlantic ABC control rule, and so, for both species, the assessment was considered the best scientific information available, and it felt appropriate for management advice. Both stocks are not undergoing overfishing, and are not overfished, and, based on the current adopted SPR, an FMSY proxy of 30 percent.

We discussed at length the ABC control rule, and how to approach that, and we decided to go for an alternative approach, and that was in part a result of the differences in the characterization of uncertainty in the OFL. In the end, the OFL -- We agreed to an OFL based on F 30 percent SPR, and an ABC based on 75 percent of 30 percent SPR, and that was for the 2026 to 2028 projections.

We discussed the SPR at length, and I'll come back to that in my last slide, and others please chime-in later, because I explained to the joint SSC members that the South Atlantic SSC just provided a recommendation to the South Atlantic Management Council to use an SPR 40 percent in general. We, nevertheless, agreed on an SPR 30 percent, and the justification was that both stocks have been managed at SPR 30 percent and saw an increase in stock biomass. In some instances, a significant increase. Also, the landings have not exceeded ACLs in recent years. Also, the age composition showed that older fish were still present, and so there was no evidence of changes in the age distribution due to fishing.

Also, it was mentioned that there are several closed areas that may provide a refuge for the population, and they may contribute to recruitment, and, also, again, after some considerable discussion, the combined committee felt that a life history, including gonogorism, and the fact that it's a subtropical species, may indicate an SPR of 30 percent may be more appropriate than SPR 40 percent, and so, collectively, we felt that this was a strong enough justification to use SPR 30 percent.

For recruitment, again, we had extensive discussion about what to use, and we ended up with a recommendation to use a geometric mean for mutton and the arithmetic mean for yellowtail of the most recent five years of recruitment, 1990 to 2023, to inform OFL and ABC projections, and I want to remind you that that was different than we are usually using.

We are usually using long-term recruitment for OFL, and then short-term recruitment for ABC, and so that was, again, a deviation from what we in South Atlantic usually use, and, also, it was mentioned that several of the stock assessment in the Gulf that were done by the Science Center used that long-term recruitment for OFL and short-term recruitment for ABC.

However, we felt that this was appropriate in this case, because management was likely not going to be in place until 2026, and the data showed the fishing levels in 2024 and 2025 were below the new ABC, and we felt that that added to an exploited biomass, and so there was sufficient buffer for that. However, we also said that that created some uncertainty, and we felt that the assessments should -- An update assessment should be conducted no later than five years, or actually every five years, to monitor, and, at the same time, to monitor stocks, including landings, index values, input from the AP stakeholders, et cetera, and to see if there were any signs of concern, given the biomass and the uncertainty, et cetera, and so five years.

Then the last -- I believe, the last slide was a recommendation. Because of the extensive discussions about the stock-recruitment relationship, and the uncertainty thereof, and the use of proxies, and also the use of the different recruitment regimes, there was a consensus statement, and I'm going to read that.

There was a need to collectively address the required precision to estimate steepness and discussion of the SPR proxy values, given a range of life history values among fish species. That combined committee recommended a follow-up joint meeting to address these topics, especially to allow for a consistent application of the agreed decision-making paradigm for present and future stock assessment.

The discussion was, and we had the same discussion here in this table this week, is, okay, you look at the uncertainty of steepness and, in some instances, it was decided that that was not good enough to estimate steepness, and then some members mentioned there were other stock assessment where you have the same distribution, and we were perfectly comfortable with using an estimate of steepness, and it seemed that there wasn't quite a lot of consistency in that determination.

We asked, and I think that is a recommendation, and, John Carmichael, correct me if I'm wrong, but a recommendation that you made to look at what happened, what decisions were made in past stock assessments, and look at the distribution around that estimate of steepness and what was the ultimate decision by this SSC, or other SSCs, in terms of whether or not to use a proxy or to use the estimate of steepness. I think that would be very helpful and it will probably get us out of the -- Hopefully get us out of the discussion, the ad hoc discussion, whether or not to accept the uncertainty around steepness.

Then as an update, the chair of the Gulf SSC emailed me and said that the Gulf Council, in their recent meeting, adopted the motion to develop this joint working group to look at the steepness estimate and the SPR proxy, and so I will -- If the committee agrees, I will bring this to the South Atlantic Fishery Management Council and see if we can make this happen. I think the consensus was, in the group, that it would be good to do this sooner rather than later, because this is an issue that will continue to come up, and so that completes my update, and I'm asking other members that were there, to see if they have any additional comments to that.

MR. ADDIS: I feel like we need criteria for these decisions to go with MSY or a proxy, and that should be part of this conversation, and I'm glad we're doing a joint meeting about that, but maybe it's more of a national idea.

DR. REICHERT: Thank you, and it kind of is a segue into what Judd is going to talk about next, because one of the things we mentioned there, and I think it was Luiz Barbieri who made that recommendation, to maybe make that part of the next national SSC meeting discussions, because we are not the only one that are struggling with that.

My comment to that is that I think that's an excellent idea, but that's not going to be until 2027, and I think we need to do something sooner, and it would be good to include other regions, but that also may complicate the organization of such a meeting that that may be postponed further, and so it's kind of a catch-22 there, in terms of when this can happen, and who else we are going to involve, but I was encouraged that the Gulf Council saw that need, and so hopefully we can

follow-up, and I will follow up with Mike Allen, who is the chair of the Gulf SSC, soon, to see, and also with council staff, obviously, to see how -- If and when and how we can make this work. Anyone else?

So these are basically the slides I will present to the council in June, and so that was a nice segue into SCS, unless there are any questions or comments to this update. We decided earlier that the outcome of this joint SSC review was going to be the review, and so there's no additional discussion on the review itself. Okay, and so that's the segue into the SCS. Judd, you want to take that over?

DR. CURTIS: Yes, and not seeing any hands online, Marcel, to address the mutton and yellowtail snapper.

DR. REICHERT: Do we need public comment, at least on the record? Any public comment to the overview of the mutton snapper and yellowtail snapper review? I don't see any hands in the room, and no one online? Okay. Thank you.

DR. CURTIS: No hands online.

DR. REICHERT: Okay. Judd, go ahead, and this is a brief update before we recess.

SCIENTIFIC COORDINATION SUBCOMMITTEE

DR CURTIS: Right, and so, without going into too much detail, we wanted to include just an agenda topic on the Scientific Coordination Subcommittee, to remind the SSC that the report for the SECS 8 final report is now available. That was included as Attachment 16 in your briefing book.

The planning has been underway for the ninth annual meeting for the Scientific Coordination Subcommittee, and that will be hosted by the Gulf Fishery Management Council, originally scheduled for sometime in the summer or fall 2026, but has been postponed to 2027, given the budget concerns. However, the planning team is still trying to get some ideas for general meeting themes and subtheme topic areas.

The planning team is planning to meet next week, and so, if there's any ideas, such as, you know, the coming up with a more prescriptive methodology for looking at MSY estimates, versus using proxies in stock assessments, these can be passed on to the planning team for discussion, and they will be presented to the CCC at their May meeting, but we still have some time to go there, and so I'm assuming there's going to be a little bit of time for refinement of those topics and ideas.

The Social and Economic Panel also got a crack at this, earlier this week, and provided a few suggestions. There was a consensus around the planning team that, in the SCS 8, we had a dedicated social and economic subtheme topic that was perceived to be very valuable, and would like to be continued at SCS 9, and so they're trying to maintain that structure for the next meeting as well.

If you have any ideas on a global theme, or any subtheme topic ideas, or just any contributions that could be passed on the planning team, please make a comment in the shared notes document, or think about it before now and when we need to submit the final report, and that's all I had, Chair.

DR. REICHERT: Thank you, Judd. Okay. Thank you, everyone. Let's recess, and reconvene tomorrow at 8:30, and, at that time, I will present the agenda for the rest of the meeting, and we'll take it from there. Thank you so much.

(Whereupon, the meeting recessed on April 16, 2025.)

- - -

APRIL 17, 2025

THURSDAY MORNING SESSION

- - -

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council reconvened at the Town & Country Inn in Charleston, South Carolina on April 17, 2025, and was called to order by Dr. Marcel Reichert.

DR. REICHERT: Welcome back to the April meeting of the SSC, South Atlantic SSC. Welcome back. Before we start, a couple of housekeeping remarks. We have five agenda items open. Obviously, the continuation of the black sea bass discussions and updated projections and the blueline discussions are key for us this morning. I would really like to leave this meeting with fishing level recommendations. Sorry, and we are addressing a little technical issue here.

DR. CURTIS: We're good.

SEDAR 92, 76U: ADDITIONAL PROJECTIONS AND CATCH LEVELS

DR. REICHERT: We're good, and so we have a lot to go through, but, obviously, black sea bass and blueline tilefish are key for us, and, as I mentioned just now, I really want to make sure that we leave this meeting with fishing level recommendations, or other recommendations, so the council can move forward.

We also have a SEDAR update, and so the proposal is to start with black sea bass. Depending on where that leads us, go to SEDAR, and then go to blueline, and then we'll see how much time we have available for the remaining agenda items. I also really would like to go through the report. We did not have time to do that last time, and that really complicated drafting the report for myself, Wally, and Judd, and I would really like some input from the committee during the meeting, because, ultimately, in June, I have to go to the council and present the SSC report, and it's not my report, or Judd's report, or Wally's report, it is our report, and so I'm relying heavily on those that are assigned, especially when we're talking about black sea bass.

I really -- We really rely heavily on you guys to help us drafting that report, with your notes you made yesterday, and we haven't received a lot of notes last night, and so we will probably go through the bullet points, and please speak up, and so let's go to black sea bass. Unless there are any questions, let's go to black sea bass, and let me move to the agenda item here. Give me one sec to pull it up.

Yesterday, we asked Matt to run a number of projections, and so, Judd, unless you have anything to add, let's see if Matt is available and ready to present those, the runs that we requested.

DR. VINCENT: Yes, I'm here.

DR. REICHERT: Thank you.

DR. CURTIS: Matt, I'm passing over presenter mode to you, and you should have it now, and, yes, we've got your screen projections.

DR. VINCENT: Okay, and so, this is what was requested, and so the projections are going to start projecting in 2023, and then, for the interim period, we're going to use the F current, which is the geometric mean of the F from 2020 through 2022.

Some additional comments about the projections and how they changed from SEDAR 76, the projections use a Beverton-Holt stock-recruitment forecast to predict the recruitment, but for years, and this should say 2023 through 2028, we assume that the Beverton-Holt relationship has a recent mean recruitment deviate, which is the average from 2014 through 2020, and it uses the average recruitment deviate, and then applies a stochastic recruitment deviate as well, to try to account for the negative recruitment deviates in the recent time periods. Actually, I didn't change the years, and so this actually goes through 2027, if you have projections that go past that, but most of the projections are going to end in 2027.

For the FMSY and P* scenarios, we'll assume that the discards reduce proportionally with landings. That number is wrong, and so, the projection scenarios that I did, I did an F current and FMSY at P* 30 percent for FMSY, and then some SPR, which I'll blow through, but -- Then some F0 and then an F landings, where the F for the landings is zero, but then using the F for the discards is the current value.

This order is not what I'm going to go through, so I've -- As I've just changed it recently, and so the first one I'm going to present is the F0, so that we could potentially set a rebuilding timeframe. The F starts at zero in 2027, and that's the first year -- 2027, and that's the first year that management would be implemented, and we set the removals and the discards to zero, to try to build -- Or to allow the stock to rebuild, and it exceeds 70 percent in 2048, and so I think that's a twenty-two-year minimum rebuilding timeframe, and there are the possibilities to extend that. We could talk about that later.

This was a plot of showing the survey predictions. This is actually for the F current scenario, and so the black line is what the model predicted, and then the blue line is the median from the MCBE results, and I wasn't able to add in what the base projections would be, but the median from the MCBE results are much higher than the terminal year of 2023, just to make you aware.

Then, onto the F0 for the landings, with the current discards rate, and so, this was -- In the previous assessment, we were able to set the landings to zero, with the current discards, and then the stock was able to rebuild.

In this scenario, we can see that it never exceeds 70 percent probability of exceeding SSB MSY, and so, as a result, I didn't really investigate any other scenarios with the discards at the current rate, because, if you can't even rebuild with the landings set to zero, I don't see the point in trying to increase the landings with the current discards, and so, this -- I don't know, and, to me, this means that there needs to be some action taken in order to reduce the mortality on the discards for black sea bass, at a minimum.

Then, we also did projections at FMSY, and so I was thinking that this could serve as our OFL scenario, but we only have -- Since we started in 2023, we only have a single year that the council would actually be able to use in these projections, and, as you can see, there is quite a big decrease in what the removals and the discards need to be, and this is a table that we could use for values later on.

Moving on to the P* 30 percent for FMSY, this also results in about a 70 percent below, or slightly more maybe, than the FMSY, and so, yes, you have an additional decrease in removals and discards, and so this is a table for your -- Of your values that you could use for the ABC, and so this value here is what we used to calculate the base value for the discards, and then compared it to what was observed, or what was predicted, for total discards in 2023 from the assessment model, and, from that, we get a 90 percent reduction in the discard numbers from 2023 are required in order to meet this, to allow this amount of landings, which would be 64,000 pounds.

Then we went on to an F 40 percent. As you can see, this actually allows for an increase in fishing mortality, and this is because quite a -- I think the majority of the MCBEs actually estimated F 40 percent at the upper bound, of a value of three, or something like that, and so that's why we have an increase in that fishing mortality, which is allowed, and it results in higher discards, but slightly lower -- Or about the same removals.

Then we did a P*for the F40, but it's similar results. Similarly, for the F 30 percent, this results in an even higher fishing mortality rate, consistent with what was done in the terminal -- What was estimated in the terminal year of the assessment, but an F of about three. Once again, this is because the majority of these F 30 percent were estimated being at that high value at the upper bound of three in the assessment model.

Then, additionally, we have projections for that P* 30 percent, for the F 30 percent, which reduces it slightly, but it's overall pretty similar, and then these were using the F current, which is the geometric mean from 2020 through 2022, and they seem pretty status quo, as we would expect.

Moving on to overall conclusions, the stock is still very overfished, and undergoing extreme overfishing. The addition of more years of data allowed us to estimate the steepness, and then the FMSY corresponds to an SPR of 61 percent, and so we need to do something to reduce the overfishing and prevent the continued decline of the stock, and the projections suggest that stopping all landings, but continuing even with the current discards, even at the lower rate from 2020 through 2022, would not allow the population to rebuild with a 70 percent probability. Okay. I went through that as fast as I could, to give you guys more time for discussions.

DR. REICHERT: Thank you, Matt. Questions, or comments, from the committee? Jie.

DR. CAO: Thanks, Matt, for the additional analysis. I'm trying to understand the implication of shifting years for calculating F current, and so, if I understand this correctly, and tell me if I'm wrong, when you shift the years, you basically abandon the estimate of 2023, and so, when you have 2023 in the estimation, the stock was experiencing that extreme high fishing mortality rate, and now 2023 is the first year in the projection, and the stock was experiencing a much lower fishing mortality rate, which is the average of 2020, 2021, and 2022, and that fishing mortality rate, the average fishing mortality rate, is even lower than 2022. I'm trying to understand what -- Does that put us in a much more optimistic position, in terms of where the projection starts?

DR. VINCENT: Yeah, and so, starting in 2023, your biomass is higher, because, in 2022, the index wasn't as low as it is in 2023, and your F -- Well, it's twofold, right? Both your SSB, or your biomass in abundance, is higher, and then your F is also lower, because you're averaging over the lower time periods, and so, yes, it is much more optimistic twofold.

DR. CAO: So the concerns I have here is two concerns. One is I think we -- Perhaps we agree with that the fishing mortality of 2023 is likely to be higher than fishing mortality in 2022, but what we're assuming, by shifting years, does not -- Yuu know, it's not consistent with that, and the other concern is, when you look at the updated SERFS abundance index, and you just saw the presentation, and there's an increase in the model-predicted abundance index for 2024, which is not -- Which is also not consistent with what we saw yesterday from Tracey's presentation, and so I guess I'm -- I guess that's something can be discussed, because that does put us in a much more optimistic position, like I said, in terms of where this projection starts, and so it basically gives it a head start.

DR. VINCENT: Jie, just to let you guys know, I also ran the projection starting in 2024, just in case this comment came up, and so those projections are available, if you change your mind.

DR. REICHERT: Anyone else? Alexei.

DR. SHAROV: Yes, and this is just a comment regarding the likelihood of rebuilding. We talked a little bit, a day ago, about the potential reasons for the changes in the recruitment pattern, and so we a little bit investigated it just as a function of the SSB. Everybody recognizes SSB is low, but there is -- There is quite a lot of indication that there is possibly -- There are possibly alternative factors affecting the environmental, be that, you know, changes in temperature or oceanic, you know, dynamics, et cetera.

If that is the case for the continuing decline in the recruitment, if that pattern continues into the future, then, obviously, our stock-recruitment relationship parameters are incorrect, and our BMSY estimate is incorrect. That is, we're likely to have the population that would be less productive, and, therefore, our BMSY target, and OFL, should be different but, at this point, we, obviously, cannot state as to how much, unless we just simply assume that say the last five years level of recruitment is the recruitment that we are to see into the future.

That could be investigated, but, beyond that -- Just we need to keep that in mind. Like, for example, when we looked at the possibility of rebuilding by having only discard F, so it went up,

but not as far, relative to the current target, right? It possibly could be -- If the new productivity regime is equal to the lower BMSY, then it probably would have recovered to a new BMSY, and so -- Well, at least we have to keep that in mind. Thank you.

DR. REICHERT: Anyone else? Okay. So where do we go from here? Judd, go ahead.

DR. CURTIS: Thanks, Matt, for running those additional projection scenarios. Can you go -- So we have the FMSY projection scenario here. Can you scroll over to the F 40 percent SPR scenario? Right, and so, using this F 40 proxy, which is what we investigated in the last review of the assessment, this changes our estimate of the FMSY benchmarks to where we're not undergoing overfishing anymore. Is that correct?

DR. VINCENT: Honestly, I didn't actually calculate that, and so I'm not sure, but I would suspect so, but -- Sorry, and I didn't have time to look it, but I don't understand why you would look at it. You have an FMSY. We've agreed that the steepness estimate should be use, and the NS 1 Guidelines say that, if you have an estimated steepness, you should use the MSY that is estimated from that and not use a proxy.

DR. CURTIS: Right. Yes, and you're absolutely correct. I just wanted to point out that, right, the FMSY, the estimated FMSY, from the update assessment then corresponds to a SPR of around 61 percent, you mentioned, but this committee has also considered F 40 percent in the past, in the last round of assessments, and F 30 percent SPR as well, which drastically changes where that benchmark threshold is, and changes the stock status determination, and so I just wanted to point that out, to allow for any discussion.

DR. REICHERT: Erik, I'm just taking some notes, and so I see you had your hand up. Before we do that, I have a question, and that is based -- Well, I have a comment first. Yes, that's all right, all true, but that goes back to the comment that I believe Kai made yesterday in terms of the stationarity of the system, or the recruitment.

My comment was, and that was also in your original report, I still have a hard time wrapping my head around what you call the extreme overfishing, because I do agree that overfishing may have played a role, but I still go back to the fact that something else is going on, and I'm thinking of -- It was a recent paper, but also what we've heard earlier about the -- I think Judd shared that, and we had a presentation by the recruitment, low recruitment, working group, that checked a bunch of boxes, and correct me if I'm wrong, but their conclusion, in the end, was that environmental factors need to be explored further, because that was -- In the list of options they explored was the one that stayed open, and so, again, correct me if I'm wrong, and so something else is going on.

This goes back to what I think we discussed earlier, and I asked that question, that the only way the model can explain the low population size is by fishing pressure, and, again, I may be wrong, but so I'm still kind of having a hard time wrapping my head around that, and, again, fishing may play a role, but I don't think that's exclusively what's driving the population. I have Erik Williams, and then Jim.

DR. WILLIAMS: Thanks. Thank you, Marcel. I want to just give some more insights, to hopefully help with this whole discussion, because it's starting to bounce around quite a bit, and

so I think the discussion of rebuilding is a separate one, and there are a lot of issues potentially there, and I think we should park that aside in this approach to this.

The immediate thing to address is how can we just do short-term projections, and I think we discussed, and I'm -- I mean, I can't recall my words exactly from yesterday, but I was trying to explain what's happening in 2023 in this model, and I think we're -- We went a little overboard with the idea of tossing it out completely for projections.

I think what I was trying to point out is the reason for that increasing F is that there is likely some other mortality occurring, and the model is attributing it all to fishing mortality, and so that means the F is probably incorrect, but what I would add is the estimate of the age structure in that last year is probably still good, because -- Just because the model has attributed the mortality to the wrong source, it doesn't mean that the biomass estimate is off, the numbers at age is off, and so forth, and so I think, when we look at projections, we should start with projections in 2024.

The trick is that we either are going to have to try to correct the hidden mortality, or just ignore it for now, but recognize that, if the hidden mortality continues, that all of our estimates will be biased slightly high, in terms of the projections, but I think that's a -- It's a bias that we can probably accept for now, because to try and explore exactly what it is -- We don't really have the data to tell us exactly where that hidden mortality is coming from, or even if it's just -- If it's just continued decline in recruitment, beyond what the model is estimating, but I think you have enough information in that 2023 year to start the projections in 2024, just with, you know, the different -- We're not going to use that F in 2023 for anything, and we're kind of going to toss that aside, but at least use the age structure that's estimated in that terminal year and go forward from there, and so that's that point.

Then I think -- I think try to focus on -- Let's see if we can get through the short-term projections, and then, yes, I think there's a whole conversation to have about the rebuilding, and Alexei definitely started to dive into that, and some of his points are valid, and so that would be my suggestion.

DR. REICHERT: Thanks, Erik. That's very helpful. Jim.

MR. GARTLAND: I just had two comments. The first one is, regardless of whether we start the projections in 2023 or 2024, the 2023 -- Starting in 2023 is kind of an interesting sensitivity analysis, if you want to think about it, because, regardless, even if -- In giving this stock kind of the benefit of the doubt, optimal conditions, whatever, the projections don't look great, right, and so there's the first part of it.

Then the second part is I totally agree, in terms of the hidden mortality, and the environmental influences could certainly be influencing what we're seeing here, but, at this point, we don't have any data on either one of them, and so it will almost seem like we need to move forward with what we have, and then maybe, in the notes or however, highlight those two as, at the very least, the main uncertainties, or major uncertainties, and perhaps even like research recommendations, or something like that, just so that we can keep moving forward.

DR. REICHERT: Thanks. Anyone else? So there is an approach on the table. Judd.

DR. CURTIS: Sorry. Just to pick up on what Erik is saying, I think, if the SSC can think about extracting the rebuilding threshold from, right, the more immediate ABC recommendations, that would be helpful for the discussion.

You know, consideration of a possible dynamic benchmark or something, as Alexei is alluding to is another discussion that we could have. That would then change where that benchmark might end up, but, as far as the stock condition concern is, right, if we can find a projection that is below what, you know, the F current is at this point, without consideration of rebuilding to that particular benchmark, then we are, in theory, rebuilding the stock, and maybe not in the same timeframe as these rebuilding scenarios, but there has been a proof of concept that that is an acceptable mechanism to show that you are preventing overfishing, and assisting in rebuilding the stock, per Magnuson's requirements, and, John Carmichael, to that point.

DR. REICHERT: Thank you. John.

MR. CARMICHAEL: Judd, you know, in talking about where you can go with rebuilding, and the idea of dynamic reference points is good, because the council has actually had discussions about this, largely coming from the agency, the Regional Office and the Science Center, and dealing with these problems in many of our snapper grouper species, where we just don't know what the future is holding.

Remember there was a lot of talk about that with scamp, when we were dealing with that, and the difficulties of getting a reference point that was considered good, when we had two stocks within that complex being assessed together, and it's been talked about in other species, it's been talked about some with like sea bass, because we just don't know, you know, and you get -- But you guys had a lot of discussions about things like is it a regime shift or not, and what's going on, and is productivity changing, and so, you know, to me, with what we're seeing, this is a perfect stock, where you just saying we can't tell you where this is going, but I felt like, in you all's discussion, you made a pretty strong case to say, but, you know, clearly the fishing mortality needs to be brought down, and the stock has been in decline.

You know, the long-term -- If you don't look at the last couple of years of those F's, as Erik was saying, because those are problematic, for a lot of reasons, you know, the longer-term F is around 0.6, for almost like fifteen years, and the stock has been in decline.

Your FMSY estimate is like 0.3. The F 40 percent estimate, that we had before, was one, and so I don't think anybody wants to go there, to an F of one, and promote a rising in F, and that was part of the problem with the last assessment, with where we are, but, you know, even -- If you went with something like that FMSY, you would essentially be imposing a 50 percent cut. You know, I think it's important to make sure we kind of, you know, know what the numbers are, so, you know, you can put that in perspective of what is this doing towards your ultimate goal of reducing the mortality.

You know, even like Dr. Porch, from the Science Center, when he has talked about this, and, you know, talked about the difficulties with projecting the rebuilding strategies that are demanded now under Magnuson, and they're so difficult, because we don't know where stocks are going, you know, and we've talked about something where you control fishing mortality, and you prevent overfishing, and you see where the population goes, and you update it.

You know, in this stock, we have a good index, which is something to go on. This seems to fit itself to something where lowering fishing mortality, monitoring the index, and, if the index starts to go up, then that would be a good sign. Then maybe we ask for a new assessment, to see if the index goes down. Well, that would -- If it continues to go down, that be another bad sign, and we would say, well, I guess we need another assessment pretty quick, to see how that's going, but, you know, I think if you guys are honest about what you can -- What you know about the stock, and where its productivity is going, it might help get this one in a place where it could actually use that kind of adaptive management.

If you don't have confidence in the equilibrium long-term, for a lot of reasons, like recruitment, then just state that, but, you know, really focus on these short-term projections, and trying to stop the bleeding of this population that's been going on as we've grappled with the prior assessment and then this assessment.

DR. REICHERT: Thanks, John. So, having heard that, what's our approach? I mean, Erik made some comments. Go ahead, Alexei. Absolutely.

DR. SHAROV: I just wanted to ask, because nothing stays in my memory more than like half an hour. I mean, we have the stock that is overfished, and overfishing is occurring. I think it looks like we've agreed on that, the assessment results, and so it has to go into the rebuilding schedule, correct? Is that right? I mean, so what do our books say? You know, what do we have to do? We have rules, right, and so, you know, in the simplest understanding, all right, the effort build would be, you know, the one that would rebuild the stock with a specified timeframe, and, all right, and then you tell me. Chip, help us out procedurally, and like what are we supposed to do, by the books?

DR. COLLIER: So, if you all say you cannot figure out what the overfished level is, recommend that. You know, if you're not comfortable with the overfished level, and that's going to be based on your productivity, I would say state that, and what we want to do is avoid overfishing. There's been simulations done, provided at the council level and to the SSC, that show that, if you prevent overfishing, you are going to rebuild to the productivity at some point, and so that should be the goal if you can't -- If you're not comfortable with the overfished level.

DR. REICHERT: Thank you, Chip, and I think that's kind of what Erik was telling us, you know, in terms of the rebuilding timeframe, and I agree with that. Let's concentrate on the short-term projections, in terms of our recommendation to the council, so the council has a tool, or something to work on, and also recommend that we -- You know, that whole -- The reason for the low recruitment, and hopefully, in the future, we'll get some more data, and we can also see where the population is going.

Other members, please speak up, especially based on the notes that you may have made yesterday. Where do we go from here? What is the committee -- What's the pleasure of the committee, in terms of our approach to at least set a short-term ABC that we can -- That I can take to the council and explain the issues with both the ABC, or the uncertainty of both the ABC and the rebuilding schedule. Jeff.

DR. BUCKEL: I like this approach of thinking about just not worrying about the rebuilding, because of all the uncertainty, and focus on, as John Carmichael said, stop the bleeding. We have an FMSY. It's lower than the current F current, and then we're going to buffer that with scientific uncertainty, so we can work on a P*, and so it's not going to be that FMSY, right, and it's going to be lower, because of the uncertainty that we have in that FMSY, and we move forward with that and to set an ABC to stop the bleeding.

When I was the chair, I presented several presentations on black sea bass, starting in April 2023, and so it's been two years ago. Our recommendation was to, you know, reduce discarding, by limiting effort, and then we provided ABCs in March of 2024. Those weren't implemented, and so we've had this chance where we could have -- You know, by now, we could -- In 2025, we could have reduced F, going into this fishing season, and we're not going to have it.

Other species that we -- You know, scamp and red grouper and gag, that are also in this winter spawning low recruitment, you know, we've reduced F, and we've seen, based on Tracey's presentation yesterday, there's signs of recruitment in those stocks, and it's unfortunate we didn't, you know, stop those landings and give -- You know, give black sea bass a chance, or that's what we -- Right? It's not going to happen this year. Now we're pushing it, and it looks like it'll be 2027, and that's just that missed opportunity of keeping some of that biomass out there, in case we do get those good conditions, to -- You know, to get a good recruitment.

I want to make sure we come out of this meeting with ABCs, so we can start protecting that spawning stock biomass, because we're -- As the stock-recruit curves show, we're really getting close to the origin, and we want to stop that. Thanks.

DR. REICHERT: Thanks, Jeff. Alexei.

DR. SHAROV: I just wanted to ask, Jeff, and so what are you proposing, as to how do we calculate it, and I'm sorry, and I didn't --

DR. BUCKEL: The FMSY, but then buffered with, right, our P*, and we could have a discussion if we want to -- We went through that process, and came up with a P* based on the last assessment, but I don't know, you know, if we want to revisit that.

DR. SHAROV: Right, and so you're proposing to apply FMSY to current estimate of the biomass, right, or numbers at age?

DR. BUCKEL: Yes.

DR. SHAROV: For the calculation of ABC, correct?

DR. BUCKEL: To get to -- To get an ABC.

DR. SHAROV: Which one are you proposing, the terminal one for the 2024 or 2023 or --

DR. BUCKEL: We can have discussion about that.

DR. SHAROV: Right. If I could just follow-up on this.

DR. REICHERT: Absolutely. Alexei.

DR. SHAROV: Erik earlier explained to us, you know, how the math should work, and that, you know, we probably should not be trusting the most recent year estimate of F, for the reasons that we mentioned many times, but he thinks that the biomass values are acceptable, but I think still they're very much biased low.

The reason for that is, yes, if we say we have maybe a total estimation of Z that includes a wrong estimate of F, right, an overestimated F, as we suspect, a fixed level of natural mortality, and it also includes the additional source of mortality that we're not accounting for. Well, if the actual F that derived the catch that we measured is substantially lower, and so that level of catch has been derived by a much smaller F value, so then adding the unknown source of mortality, predation or whatever environmental factor, plus that M that we've already included in there, should result in substantially higher biomass.

There should have been much more biomass in the stock, if the fishing mortality that generated the level of catch is smaller, say half of what we're estimating now, and so I am convinced that the biomass estimates are biased low, as long as we agree that the F that we're currently estimating is a very high F, and that there is another unknown factor in force. Since we don't have a direct evidence of that, I don't know if we could defend this position strongly, you know, with the facts, but the overall discussion through today and, you know, a day ago, I thought we sort of were agreeing on this.

Where that leads is that, yes, I mean, if we go with what Jeff proposed, then, yes, we will get an estimated potential ABC, right, but I think it's going to be biased low, and I cannot offer the mediation, I mean, like the remedy.

DR. REICHERT: Thank you for that, and, you know, I realize -- I recognize that, again trying to wrap my head around, yet that biomass is at historically low levels, and so, even if we are biasing the biomass lower than it may be, I would argue that that gives us a little extra buffer, in terms of biomass that may help rebuilding, ultimately rebuilding, and so I know where you're getting at, but, unless I'm completely misunderstanding this, this is not necessarily a big concern for me, because it's -- You know, in terms of buffer, it's not that we are even lower than we already are, and we may be a little higher. Do you know what I'm trying to say here?

DR. SHAROV: In the end, it's going to come up to the so many numbers of fish, or so many thousands of pounds, right, in weight, and it matters from which point you start, whether you apply it to ten million or to twenty million fish.

DR. REICHERT: I think I know what you're getting at, in terms of, if we recommend the ABC, that may be bias high. Okay. Thank you. Steve. I hadn't thought about that implication, but, yes, you're right. Sorry. Steve.

DR. TURNER: My simplistic understanding of the situation is that it looks like biomass took -- In the model information we were presented yesterday, that biomass took a fair step downwards in 2023, potentially associated with that very high F. We have an index that doesn't support that, and so my simplistic suggestion would be to start in 2022, based on the fact that we -- The index

is telling us something about 2023 then what we -- What the model is suggesting, and so I would be happy to have somebody shoot that down, but that would be a suggestion.

DR. REICHERT: Steve, can you clarify what you mean with start in 2022?

DR. TURNER: Basically, whatever we do with F, projecting in the near-term for the next two to four years, we start in 2022, with FMSY times P*, or whatever we should be using.

DR. REICHERT: Okay. Thank you. I saw Erik Williams had his hand up. Erik, go ahead.

DR. WILLIAMS: Thank you, Marcel, and sorry to come out like this, but I think everybody is interpreting this incorrectly. The biomass estimate is being driven largely by the index, and what -- Again, recall the dynamics of a stock assessment. It has the ability to adjust R, recruitment, and fishing mortality, and nothing else, and so, when your index is telling you the population has precipitously declined, it's going to chase that, which it properly should, because we believe this index is very robust, and so the way to get to that lower biomass in 2023 is to add more mortality to the model.

Well, it has no place to add that except to F, and so, if there's hidden mortality going on, it's going to falsely attribute the mortality that is out there to F, because it has no other place to attribute it, and so, in essence, when we drop that final F, and go to a different F, we are biasing everything higher. I mean -- Yes. Higher, so that our biomass estimates are actually, into the future, going to be higher than they probably should, because that hidden mortality is probably still going to be there, and we're basically erasing it away by reducing the F.

The reason -- I still think that's fine to do, because we really don't know where that hidden mortality is. We could put a bump-up in M, but that's making an assumption that there is this increase in M, when it could also equally be likely that there's an increase in unreported removals, or we incorrectly specified a discard mortality, or that's been going up. You know, there's a bunch of factors that could do that and so, anyways, I just want to point out that this is not biased in the way you were describing it. It's the opposite, and so, if we're going to go forward with an F from the lower years, we are definitely going to be overly optimistic, if that hidden mortality is continuing. Our projections will be slightly optimistic.

DR. REICHERT: Thanks, Erik, for that clarification. Jie.

DR. CAO: Thanks, Erik. I totally agree with you. That actually perfectly described my concerns. I think Erik did a much better job on explaining that. I think my point is that perhaps the model gets the future mortality estimate wrong, but gets the other parameters, or derived quantities right, for example, the biomass, and so my concern is, when you change the F estimates, you change the other estimates, like biomass, and so I think it's very important, for the projection -- I'm basically more comfortable with not abandoning the 2023 biomass estimates, at least.

DR. REICHERT: Thank you, Jie. Anyone else to those points? Okay, wand here does that leave us? What's the pleasure of the group? How should we move forward? Anyone? Chris.

DR. DUMAS: So I would like to just sort of summarize what I'm hearing up to this point, and so what I'm hearing is there's been an increase in overall mortality, from all sources, and apparently

a substantial portion of that increase in mortality was not due to fishing, per se, but to other sources of natural mortality. As a result of that, there's been a decline in stock abundance to very low levels, based on the historical record, very low levels, and this decline in stock abundance is based on a decline in an empirical abundance index, based on field data, data from the field, all right, from SERFS, and not from model estimates, but based on actual field data, and so we really believe that decline in stock abundance.

So, given that decline in stock abundance, the current level of fishing and discards are too high, given the current stock abundance level. We're not saying that fishermen have been all of a sudden fishing a lot more. We're saying there's been an increase in mortality, which drove down the stock abundance, and, because abundance is now low, the current level of fishing and discards are too high for the stock to remain stable, and so, therefore, you know, we'll have to somehow decrease what we have control over, which is the fishing effort and discards, fishing landings and discards.

From the model, we can project what will happen in the future, including a rebuilding plan, that will tell us what will happen if current conditions continue into the future. They may not, and there's a lot of uncertainty about what may happen in the future, but that's where we are, and that may be the best we can do, given the uncertainty and given what we know, and so that's what I'm hearing right now. Is that correct?

Based on that, we could go forward with trying to use the FMSY, like Jeff Buckel recommended, and adjusting that with P*, and try to get to an ABC, and, all else equal, I would tend to, you know, believe the results from the MCBE model, given that a lot of effort has gone into that, realizing that the estimated F in that model may be including not just mortality directly related to the fishermen's fishing effort, but also including some additional unknown sources of mortality, some additional natural mortality, that the model has to add to the F, because the model doesn't have anywhere else to put that mortality, but that additional mortality must exist, in order for us to see the declines in stock abundance that we're seeing based on the field data, right, and not on some model estimate, but based on the actual field data, and so that's what I'm seeing. I'm just trying to summarize. Does that seem consistent with what's been said so far?

DR. REICHERT: I believe so, and, you know, additional sources of mortality, but, yes, there may be other factors that may explain that low biomass, but, yes, I think that's the gist of where we are now, and so that's -- Yes, I think that's a good summary. Alexei.

DR. SHAROV: I'll continue to ask naive questions, and so I mean, that's fine. I mean, we certainly can estimate the ABC formally with this approach, and, while it's on the books, and we could do that, apply FMSY and the P* value, and then my expectation is that we're likely to come with an ABC level that would be probably less than currently estimated discards, but we say that's up to the management to decide as to how to deal with that, and is that correct? So we're not considering consequences, and the effects of the different components of removals on this, and, if that's the case, then, yes, I guess -- Yes. I mean, we have the procedure on the books.

DR. REICHERT: Yes, nd you're absolutely right. Our task is, as an SSC, to come up with an ABC. How that is then accomplished goes into the management realm. It doesn't mean that we shouldn't completely close our eyes to the consequences of our decisions, or recommendations, but that is indeed a management issue. Go ahead, Judd.

DR. CURTIS: A clarifying question, Alexei, and so you're saying we're using that FMSY estimate, buffered by uncertainty, proffered by Jeff for setting ABCs, and that's not inclusive of any of those additional sources of mortality, the cryptic mortality, potential environmental changes, and is that correct? I just wanted it for the notes.

DR. SHAROV: Yes, that's correct, because -- Well, we've estimated this FMSY, based on the whole history of stock exploitation. In other words -- Well, I mean, forgive me for saying this, but that you cannot be pregnant a little bit, and so, you know, if we said that the whole history of stock exploitation that we've used to estimate FMSY is representative of the stock productivity, and we're not changing anything in that respect, and we have a remark, to follow later, that there are possible sources of additional mortality, or whatever, but we're not addressing this directly in the calculation of the ABC, because, if we do, then that's going to be another day of discussion.

DR. REICHERT: Jim, I see your hand up, and so I just tried to -- So, by moving away from that last point -- What I'm hearing you say is, if we're moving away from that last point, we are not accounting for those additional sources of mortality that are included in that terminal year. That's an uncertainty in our estimate, correct? Is that what you're saying, or is it misinterpreting what you're saying?

DR. SHAROV: Right. Well, I mean, those additional sources, as Erik explained, they're included in our calculation, as part of the fishing mortality, and so they played their role in estimating the size of the stock, right, and then, for the projections, we're applying the FMSY that we think is the best estimate of the FMSY for the stock, right, overall, and then, for the uncertainty, we're applying the P* value as well.

DR. REICHERT: So I have Jim, and then Chris, and I want to remind us that time is ticking by, and so I just want to remind the committee that soon we have to come up with our recommendation, so we can move forward, and so please, Jim and Chris, and I don't want to stymie the discussion, but we also have to come up with a solution to the conundrum we are in.

MR. GARTLAND: I'll keep it brief. I just I wanted to kind of, I guess, support what Jeff's idea was of going with the FMSY with the P* of 30, and then, after hearing Erik make a few this this comment a few times, I think starting the projections -- Starting them after the terminal year I think is a good way to go, and so starting after 2023 is a good way to go.

Everything else -- It seems like a lot of our discussion is we're swirling around the uncertainties. I think we just need to specifically state very clearly what those uncertainties are, so that we can say we made this decision in the context of these uncertainties, and, if we can get information on these, going forward, we can revisit.

DR. REICHERT: Chris.

DR. DUMAS: Right, and so if I can summarize what I understood Alexei to say, and so, based on our recommendations, if the council decides that a decrease in catch is needed, a decrease in landings and discards is needed, because F includes both those landings and discards, but also other sources of mortality, if the council decreases landings and discards, that will decrease F, but not as much as we might think it will, because that F also includes other sources of mortality.

By decreasing landings and discards, F will go down some, but maybe not as much as we expect, due to that other mortality, and so, therefore, the stock may not rebuild as quickly as we think it would if F included only landings and discards and did not include that other mortality. Is that what you're saying, Alexei?

DR. SHAROV: Yes.

DR. DUMAS: Okay. Right, and so I think that's something that, if we decide to go forward with Jeff's recommendations, we could add on as just an additional description of implications that might occur, due to what Alexei just described.

DR. REICHERT: Thank you. Anyone else? Fred.

DR. SCHARF: So I had a question for Matt, if he's still here. The near-term projections for FMSY, or FMSY P*, they assume -- They include that the discard rate mirrors those rates? In other words, the directed F and the discard rate are the same in those projections?

DR. VINCENT: Yes. They're the same and -- Yes, you are correct.

DR. SCHARF: Okay. I think the other thing, you know, to Chris's point, and Alexei's point, and what Erik has brought up about this, you know, potentially hidden mortality, I think we also need to recognize that that hidden mortality could very well just be more F, right, and just maybe misspecified F, but it could very well just be all F, and I think, just broadly, you know, my perspective is, you know, I think that the -- A more accurate description of if we go with MSY P*, whatever we do, is that we're not stopping the bleeding, and we might be slowing it down, right?

Given that, you know, the projections with an F of zero don't have a 50 percent of rebuilding this stock for twenty-five years, right, and us recommending continued F has some real consequences, and so I think we need to acknowledge that, that, yes, in the short-term, you know, the projections near-term, if all things stay the same, assuming the discards come down at the same rate as the directed F, which is unlikely, that we're not likely to see any near-term recovery, but we'll be slowing down the death march.

DR. REICHERT: Well, I agree, and, the last point that Judd captured here, I agree with it, except that I don't agree with that it could wholly be contributed to F. I think we've seen evidence, in other presentations, that something else is going on, and so, with that caveat, I agree with that comment, but, anyway, that's my opinion, given other information that we've gotten, but, you know, it's all like potentially, maybe, and so, in that respect, there's enough caveats in built in there, but-- Fred.

DR. SCHARF: So, just to that point, I think, you know, when I read Matt's conclusion slide, I think the first statement is that the stock is very overfished, and undergoing extreme overfishing, and I agree.

I think that there's been plenty of evidence to suggest that there's other things contributing to where we are now, and so rather than -- You know, I know how we characterize things by definition as overfished, but it may be a more accurate description would be that the stock is heavily depleted, right, and, because of the low -- Because of the low current stock biomass, we are now undergoing

extreme overfishing, right, currently, right now, and so how we got here is one point, but we're here now, and we're at a place where, because the biomass is so low, that even small amounts of F represent extreme overfishing, and so I'm not sure that the 2023 F, you know, includes a lot of cryptic hidden mortality. It could, but it's also could be that that F is very real.

DR. TURNER: If the stock is going to continue to decline, I don't see how we can recommend any catch.

DR. REICHERT: Amy, go ahead.

DR. SCHUELLER: I was just going to say I just agree with everything that Fred just said. I have a hard time agreeing at all that this is something other than fishing mortality. I mean, we could say there are other possible sources of non-F-related drivers to biomass declines for every single species that we work on. We don't have anything more definitive for this than anything else, and that presentation that was given by the center basically said here's something we need to explore further.

It didn't give any definitive statement about what that environmental driver is, and so I don't know. I just feel like everybody is uncomfortable making a statement that the fishing mortality is too high, and so we're kind of looking for other reasons why the F might be that high, but the truth of the matter is, and Genny pointed this out yesterday, if we had all the landings and discards stacked, and we look at the total F over time, and I think Matt had an MCBE plot with the fishing mortality rate against the FMSY, and all of the last twenty years were over that value, and so it's not surprising that we're getting into a status where the stock size is very low, and even small amounts of F, as Fred just said, or small amounts of fishing effort, can lead to very high F levels. It's just not surprising, and, either way, we have to -- Whether this is fishing or some other aspect, we have to recommend reducing the fishing mortality rate.

DR. REICHERT: Thanks, Amy, and I don't disagree with your last point. I just -- Well, I repeat what I said earlier. I'm still somewhat uncomfortable attributing to what's happening now in the population exclusively to fishing pressure. That's all I'm saying. Fred Serchuk, and then I have Alexei.

DR. SERCHUK: It seems to me that the only way, in my view, that we can get a handle on this is to recommend a zero catch, and then see what has happened to the population, whether it does rebuild in the near-term or not, and, if it doesn't, then we can conclude that there's a source of mortality that's happening that's having a significant impact on the stock unrelated to fishing, and I think, if we don't, if we do anything less than that, we'll be at this -- Having this discussion for years ahead. Thank you.

DR. REICHERT: Thanks, Fred. Someone else had his hand up. Alexei.

DR. SHAROV: So I'll try very quickly. Taking the last year F estimates of about 3.2, and that's the full F, for the ages-three to four, and that's about the selectivity of about 0.4, that would be a bit less. In any case, it results in -- If you add the natural mortality, then you will end up with having only 1 percent of fish in the age class of, you know, ages-eight and older surviving within a year, or 90 percent of -- I mean, or 10 percent of fish surviving within a year for ages-three to four.

I cannot imagine the fishery to be so effective for this stock that is stretched, you know, from North Carolina down to Florida, thousands of miles, with the local reproduction, that you would expect that we drove it down to such low numbers, and they're still able to assemble themselves to provide sufficient density so that the anglers are going and catching the level of the catch they're catching, according to MRIP.

There is no fishery in the world that is as effective, with the exception if you would have like, you know, a migratory stock in a small river, where you could really like count and catch every single fish. Not in this case, but, getting back to the projections, yes, I mean, we could calculate ABC by applying FMSY to the current biomass level, whichever we choose, you know, whether it's 2024 or 2023, but remember we were facing, last year, a similar problem, when we tried to project forward and add the catch of the most recent year, and then we ended up that there is not enough fish in the population in order to support that catch, right, and so that was a clear indication that, you know, that our biomass estimates are not sufficient even to support the observed level of the harvest. Well, here's your answer.

DR. REICHERT: Thank you, Alexei. I see Amy has her hand up, and then I really would like to go back to clarifying, or formulating, that recommendation. I think there's consensus in the room of looking at Jeff's suggestion, and so let's make clear that we clarify that. Amy, go ahead.

DR. SCHUELLER: That was a residual hand, Marcel.

DR. REICHERT: Okay. Thanks, and so where are we with -- Sorry, and where are we with our recommendation, because if we -- Correct me if I'm wrong, Judd, and, if we want to go with the P*, we need to go through the new ABC control, and we have to go through the table, and so can we have, on the screen what our recommendation is? Can someone provide some language to clarify that? Is it on there somewhere already?

DR. VINCENT: Do you want me to stop sharing, or do you want me to pull up a document and start writing something?

DR. REICHERT: No, perhaps not yet.

DR. CURTIS: No, Matt, and you can leave your screen up. We've got a notes slide here that the SSC can view that's capturing the recommendations. It's helpful to have the slides with the projection scenarios up.

DR. REICHERT: Yes, and I apologize for the SSC members online. We'll bring this -- They can see that? Okay. You can see that in the Google Doc, correct?

DR. CURTIS: Yes.

DR. REICHERT: Thanks. 2022 -- Jeff, you have 2020 to 2022?

DR. BUCKEL: We could have some discussion on that. I hadn't thought about that through, given some earlier comments.

DR. REICHERT: Jim, go ahead.

MR. GARTLAND: I think, based on Erik Williams' comments, we were leaning toward 2021 to 2023, I believe.

DR. REICHERT: Yes, and I believe you're right.

DR. BUCKEL: For the end?

DR. REICHERT: Yes.

DR. BUCKEL: So FMSY will kick in at 2027?

DR. SCHARF: So 2027 is the earliest year that -- If we recommend an ABC based on FMSY P* 30 percent, 2027 is the first year that we could do that? It can't happen in 2026?

DR. REICHERT: That's a council question, but I think it's realistic to assume that management will be in place by 2027, but, I mean, Mike, maybe you can clarify that?

DR. SCHMIDTKE: Yes, and 2027 would be the first year that we could realistically get something in place, even in the fastest process that the council would have. It would still bleed into 2026, but it wouldn't be -- I don't think we really have a mechanism to get it in place by the beginning of 2026.

DR. REICHERT: I think -- Yes, and I would really like this committee to -- Well, let's complete this, and the years were, again -- Jim, you mentioned those?

MR. GARTLAND: Yes, and so I think -- Didn't we want to start to -- The stuff that Matt showed today I think started the projections at 2023, based on our discussion from yesterday, but I think, based on the information that Erik provided us, we wanted to start the projections in 2024, and so using the information from 2021 to 2023 to inform the projections from 2024 to whatever -- Whatever five years from that is.

DR. REICHERT: Can you repeat that? Judd was --

MR. GARTLAND: So maybe we could put something in there like based on projections starting in 2024. Is that sufficient?

DR. CURTIS: Well, so the first true projection would be in 2027, right? The other years would be interim years, based on F current rates.

MR. GARTLAND: Yes, and so that's not -- That's me still figuring this whole thing out, and so you could say starting with the first interim year being 2024, or something like that.

DR. REICHERT: Based on F current. Sorry, and we were trying to capture what Jim just said and what Jeff said earlier. Fred, go ahead.

DR. SCHARF: Never mind, and Judd just added it. The statement on F current using the three-year average that includes 2023, based on Jie's comments and Erik's comments.

DR. REICHERT: Yes, and that was exactly what we were discussing. So do we need -- So we need to go through the table? Judd. Well, continue what you were doing. Sorry. Steve.

DR. TURNER: I suggest we add, under this scenario, the stock would not be expected to recover unless future recruitments are substantially higher than projected by the Beverton-Holt model.

DR. REICHERT: Does that capture your comment?

DR. TURNER: I'm not sure I like the word “improves”, and, you know, “exceeds”, or “substantially exceeds”.

DR. REICHERT: Thanks, Steve. I know, but let's wordsmith this later. I just want to make sure that we capture the essence of your comment. Correct me if I'm wrong, and Judd is trying to move the recommendation to over to the other screen, so others can see this. We still -- I believe, we still need to go through the table, and I think that projection was in the -- Correct me if I'm wrong, but was in the original in the original projection that Matt provided us.

DR. VINCENT: Was that a question to me?

DR. REICHERT: No, and I'm just-- Sorry, Matt, and I was just mentioning that to the committee here, while Judd is moving over our notes, and I see hands up by Jeff and Alexei, but let's give Judd a moment to -- So this is where we are right now. Jeff, and then Alexei.

DR. BUCKEL: I just want to remind everyone that we had calculated a P* for black sea bass at our April 2023 meeting of 32.5. I don't remember the --

DR. REICHERT: That was based on our old ABC control rule, and we -- Go ahead, Judd.

DR. CURTIS: Yes, and that is based on the old control rule, or a hybrid approach, incorporating some of the new information. If the committee wishes to apply a P* approach, using the ABC control rule, we need to go through a stock risk rating to determine what that value is, and then compare that in this matrix against what the current biomass level is, to get this default P*, which we can do. We have the materials available to do, and that would just be an additional step.

DR. REICHERT: So the question is do we have -- I mean, if we want to provide a recommendation to the council, we have to go through that, because we need to -- We need to recommend our ratings to council, and the council and the AP can weigh-in too, and so I think we have to go through that. Alexei.

DR. SHAROV: Yes, and I'm a little bit confused, and so it’s just clarification. With the first statement, set OFL at FMSY, based on F current, how is FMSY related to F current, and why are we bringing the F current here for setting the OFL?

DR. BUCKEL: It's just in the wrong -- I think it's in the wrong place. It should come after the -- It's to be applied to the interim years of 2040 to 2060.

DR. SHAROV: Yes, and so you want to apply F current for the interim period, right, and so --

DR. REICHERT: Thanks for catching that, Alexei.

DR. SHAROV: Then the last sentence, the stock is not expected to recover in the current conditions, unless stock recruitment improves, given the current B-H model predictions, and not from the current --

DR. REICHERT: Judd is still trying to catch up, and so hold that thought for just a sec.

DR. CURTIS: Sorry, Alexei, and just playing catch-up. Can you repeat what you said about the B-H?

DR. REICHERT: I know this is wordsmithing, but I would recommend saying that the SSC recognizes, or realizes, that the stock is not expected -- That's a suggestion I have, but, Genny, go ahead.

DR. NESSLAGE: I'm not sure, and maybe -- If I am the only one, you can write that, but, if anyone else has any reservations about this, I think we should just admit that we have disagreement about the stock's capacity to rebuild, should fishing -- I think we should -- I would suggest, given disagreement among the SSC, that we should just say that there was a disagreement among the SSC as to whether the recruitment has -- Whether there's potential for recruitment rebound, should fishing pressure actually be released. We don't know.

DR. REICHERT: I'm comfortable with that. If fishing pressure is reduced, and is that what you're saying? That may not be in your Google Doc, but that's online, because -- Sorry, and what Judd is doing now is no longer on the Google Doc, but Judd moved the text over to the screen, so other members can see this, and so that's why you may be -- Those of you who are looking at the Google Doc may be missing some text, FYI. The Google Doc helps, and sometimes it doesn't. Genny.

DR. NESSLAGE: There was disagreement among the SSC on if the stock has the capacity to rebuild, should fishing effort be greatly reduced, or something like that, because that's what it would take, right? We just -- It's not saying that -- It is possible that there's environmental conditions, or it's both fishing and environmental conditions, but I don't want people to think that there isn't significant fishing pressure on this stock.

DR. REICHERT: Yes, and I agree, and, again, once we have the draft report ready for you guys, that's some of the detail -- Because we have -- We have the discussions on the record. That's some of the detail that I really hope that you guys can include. Okay, and so there's -- Chris.

DR. DUMAS: So, to Genny's comment, I agree that it's possible that, if we reduce or eliminate fishing pressure, that the stock might -- Current recruitment might be sufficient to rebuild the stock. I think, in the spirit of adaptive management, that I think all of us tend to support, it would be great if the council were able to implement whatever ABC we recommend in a way that had some areas with fishing effort and some without, so that it would be an experiment to see what effect fishing effort has, and so we could possibly partition the components of F in the model that are due to fishing effort, versus components of F might, that might be due to hidden other factors, one.

Then, two, so we could determine whether, with no fishing effort, current recruitment might be sufficient to rebuild the stock and help answer Genny's question. I think, if that were possible, to implement any regulations in a way that would lead to such an adaptive management type experiment, that that would be very informative going forward. Thanks.

DR. REICHERT: Yes, and I agree. However, that's all -- How to implement this is entirely the purview of the council, and so I agree it would be -- Scientifically, it would be a fantastic experiment. However, we need to be careful not to bleed into council's responsibility, and so I'm not quite sure how to capture that, or whether or not that should be part of our recommendations, but I do agree that, scientifically, that would be a really cool experiment.

That doesn't mean that we shouldn't recommend adaptive management. That's a different issue, but how that is then implemented, or materialized, is kind of the council's purview. So two things. We need to go through the table, and so let's do that, because that is an integral part of our recommendations to the council. Judd, if you can bring that table up, and, please, if I missed any hands, let me know.

DR. CURTIS: Okay. Thanks, Marcel. So you recall the drill from last time, in October, going through the stock risk ratings, and this helps inform the P* estimates, and, if you're recommending that the ABC for black sea bass be based on a P*, we need to come up with a preliminary score from the SSC, that then the council will approve, and the P* can be applied.

This was an attachment, and I forget the number exactly, but in your briefing book, and it shows the preliminary scores for black sea bass. You'll see, on the left, just to reorient you, the stock risk rating is made up of several different attribute categories, the first being biological attributes, the second human dimensions, and the third environmental, which we'll get down to.

Then there's a risk of overexploitation, either high, medium, or low, and then some default information pulled from stock assessments, from other sources of information, depending on the category, and then a default score, based on that information, and then the SSC -- The AP has already gone through this exercise. The SSC will go through each of these, and either agree or disagree with the default score that is listed, and, if there's any discrepancies, then add some comments into the notes for consideration by the council.

I'm going to try to go through this a little bit fast, just so that we can, in the interest of time -- If there's any dissent to the default scores, then just somebody raise your hand. Otherwise I'll assume that that default score holds.

So, for black sea bass estimated natural mortality from the two previous assessments, it was 0.38 and 0.375, resulting in a default score of two, medium risk of exploitation. The size of maturity for females fell from this range here, based on some information from a working paper in 2002, and that corresponded to ages of less than two years, making it a low risk of overexploitation, and so any concerns with the biological parameters? Marcel.

DR. REICHERT: Real quick, it was Attachment 6d, for those who want to follow it on their screen, because it's a little small there, and so that was in the late documents, just as an FYI. Thanks.

DR. CURTIS: Okay. Moving along to -- I can't -- Sorry, and it has to be smaller. I can't see the whole thing. The human dimensions attributes, the ability to regulate the fishery is based on how frequently the ACL has been exceeded for this fishery, and for each of the rec, commercial, and total ACLs, they were never exceeded in any of the years between the timeframe of 2020 to 2024, making the stock a low risk.

The potential for discard losses was deemed high. Information was taken from the assessment and then also the recreational discards from the MRIP survey. Commercial discards was taken from the last assessment, and, overall, commercial discards represented about 3.89 percent, and dead discards as a component of the total -- Sorry, and that should be "total removals", and not "total catch", and, for the proportion of dead discards, the total removals in the rec sector, it was approximately 74 percent, and so both indicate -- So, overall a high level -- A high risk of dead discards represented in the total removals, and so that's a one.

Annual commercial value between the years of 2019 and 2023, total revenue was -- Average annual revenue was 2.8 percent, and average total trip revenue was 11.3 percent, and so both falling into the medium risk category of two. Recreational desirability, the average percent for all trips targeting black sea bass, not inclusive of gray snapper, within snapper grouper was 13.2 percent, but overall was 2.2 percent, making it a two risk of -- A medium risk of overexploitation.

Social concerns, with limited information on these indicators available, and we took this information mostly from the fishery performance reports and AP input, and it seemed that there was only about four communities highly reliant on the commercial or recreational fishing, making it a low risk of overexploitation.

Then, lastly, the environmental attributes are an optional category, and so we did not include any information in the -- Or any default scores, but we do have some information, under the notes section, based on things that we've heard from the AP, from other studies, discussions that we've been -- Discussions at the table today, you know, regarding the potential range shifts, low recruitment issues, for whatever reason, and changes in Mid-Atlantic biomass that we've heard from other members, and the AP indicated that they thought range shifts were occurring as well, and opted for including an environmental attribute score into their score listing, and so I guess that's one area where we need SSC input to determine if you feel like including an environmental attribute score is necessary or not.

DR. REICHERT: Thank you, Judd, for that quick overview. I don't disagree -- I personally don't disagree with any of the scores. I would agree with the AP score on the environmental factors. Another question I had in my notes was on their ecosystem importance. I was struggling with that a little bit, the fact that other species are -- You know, is the intent other fish species, or other species in general, other managed species?

Obviously, when black sea bass was a lot more abundant, because of its abundance in the ecosystem, especially in the snapper grouper complex, it was a really important component, and so I'm not sure how to capture that, and whether the committee feels that that should get a score there, but at least I feel we should -- I agree with the score of the AP, and so I'll open this to discussion. Anyone disagree with a score of one that would -- That is similar to that of the AP? Seeing none, anyone feel strongly about adding a score under that first one, ecosystem importance?

DR. CURTIS: The way the environmental attribute scores work is, if any of those categories are considered to be important, and a one is added into it, then it will be a one for the category as a whole, and so, essentially, we can add notes into that, but it's moot whether, in the calculations, whether you add additional scores in those columns.

DR. REICHERT: Okay. Thank you, and so it really doesn't matter, except for the fact that it indicates that the committee feels that there is a significant ecosystem importance of black sea bass, and so, if it doesn't change the score, I recommend adding a one there under ecosystem importance. Anyone disagree with that? Genny.

DR. NESSLAGE: No, and I was waving about the previous one, but we can finish this one, the environmental variables one.

DR. REICHERT: Adding a one to the ecosystem importance? Okay. That doesn't change the overall score, but I think it's good for us to indicate that. Okay. Thank you. That means that our score is similar to that of the AP, our overall score. Genny.

DR. NESSLAGE: I worry about the wording in here. It says are other environmental variables causing negative effects on the stock? Do we know that for certain? Potentially, and I would love the word "potentially". That's very strong, and, once we start saying yes to these things, then it becomes the SSC said this and that, and I worry about these things.

I was just looking -- Amy and I were looking at the discards. Inshore has doubled. Offshore has halved. Something weird is going on, but the rec folks are able to find these fish, even if they're not showing up in your survey, and so either their effort has doubled or their recruitment is not what we think it is. Something else is going on, and I don't -- It's very possible it could be fishing still, and so I'm sorry that I'm digging in my heels there. I just -- If there's some way to massage that wording there.

DR. REICHERT: We went over this when we went through the -- When we reviewed this, and the -- Correct me if I'm wrong, and Chip is coming to the table, and I see Jim's hand up, but this is language that's in the FMP, and so we cannot change the -- I completely agree, and we actually discussed it, because there were a couple of other categories also where we said we really need some clarification there. I think we extensively discussed the social and economic factors, and we really thought that we need to clarify some language. Right now, we cannot. I know where you're coming -- What you're trying to say, and so Chip.

DR. COLLIER: Well, I struggle with the indication that there might not be information on this. There's a VAST model, that Jie has published, that indicates significant change since 2010 on the central abundance of black sea bass along the South Atlantic region. There's the Vecchio paper that indicates a change in distribution. There's the Craig et al., indicating that black sea bass are highly sensitive to potential changes in climate and other factors.

There's a bunch of information that's out there, that is all indicating there's environmental drivers for this species that is causing it, and then the last one is the one we've already talked about, the Craig et al. presentation that was delivered to this -- To the SSC. I would say that's a lot more information than we have for any other stock that we've looked at, and, I mean, it's a preponderance

of information. I don't know how much more you all would need to make a definitive statement, but it's -- Four papers is pretty strong.

DR. REICHERT: Genny.

DR. NESSLAGE: That means the model's misspecified.

DR. LORENZEN: That's what I was saying.

DR. NESSLAGE: So we need a spatial model for this stock, and so I don't know what's going on, and so, yes, okay. So, if that's the case, and that's what's going on record, then sure, and slap a one in there, but -- And I don't really trust the assessment at all.

DR. COLLIER: Hold on. A quick therapy session with Genny. She also identified a potential source, right? You know, I think you guys talked about discards being a really big issue for this, and that is another issue, and so I think you've identified one, and there's others that are out there, but it's -- There's a lot of things going on with black sea bass.

DR. REICHERT: Jim, and then Anne.

MR. GARTLAND: I'll make it brief, and so I know we can't change the wording there, where it says R, and I would -- I think "could" would be an awesome word, but we can't change that, but, in the notes section, could we just put a short blurb of like -- Because it looks like those notes are black-sea-bass specific, maybe that were added by the AP, and could we say something like the SSC acknowledges that environmental variables could be causing negative effects, so that we're -- You know what I'm saying? Like we -- It's a roundabout way of changing the wording. You just put it in the notes.

DR. REICHERT: Anne.

MS. MARKWITH: I had a different question entirely, if Genny wanted to --

DR. REICHERT: Yes, and Genny, to that point, and I'll come back to you, Anne.

DR. NESSLAGE: Yes, and I think where I'm getting stuck on is the negative, right, and so, if they're moving around within the South Atlantic, changing their distribution, and that's causing something odd going on, and so the model is very confused, and I'm confused, that's different than saying causing negative effects on the stock, and that's where I'm getting hung up, obviously, and so, yes, if we can add something to the notes to that effect, I would love that. Thank you.

DR. REICHERT: Judd is capturing that, and, again, we can also capture that in our report, and I think it would be good to add to our report that, once again, we went through this, and there may be a need to clarify some of the language in this table. Anne.

MS. MARKWITH: Chip, you may have to come back to the table. I'm sorry. I have a question about the recreational desirability, because what struck me was the difference in the percentages between overall rec trips and purely snapper grouper trips, and I know you told us this in October,

Chip, and I do not remember, and so I apologize. Directed trips, how is that calculated for sea bass?

DR. COLLIER: For this analysis, it is landings, plus prim one, prim two.

MS. MARKWITH: But not accounting for B2s at all, and so it's just harvest?

DR. COLLIER: Correct. For directed trips, yes.

MS. MARKWITH: Okay, because I guess, for me, and knowing discards are an issue, and knowing it almost -- The recreational desirability almost goes up, because their discards also play into whether or not they're actually -- I don't know, and I just think the discards go towards that recreational desirability, because they're probably discarding a lot of fish, whether they're targeting or not sea bass for harvest, and so -- But I might be completely thinking of that wrong, and, if I am, I apologize.

DR. REICHERT: Chip.

DR. COLLIER: No, and I think you are thinking about it correctly, but we're tried -- We tried to set up a general framework that would work for snapper grouper species, and you know, I think black sea bass, because of the distribution it has, where it is a lot of inshore catch, and there can be a lot of not necessarily targeted trips, but people still having a good time fishing, and releasing black sea bass, and so it's very different than having to take an offshore trip, and go twenty or thirty miles. Then you really want to catch something that you potentially bring back. It's -- To me, it's a very different mindset, or potentially a different mindset.

DR. REICHERT: Thank you. So we went through the table, and we have a score, and we're going to take a ten-minute break, so people can check out. When we come back, we'll finish up black sea bass, and, in the meantime, Judd and I, and Wally, will talk about the rest of this morning, and so thank you for that discussion thus far. We'll take a ten-minute break, and we'll come back at 10:25.

(Whereupon, a recess was taken.)

DR. REICHERT: All right. Thank you. Guys, come back to the table, please. I'm going to hand it over to Judd. We just went through the table, and so we have a risk score, and Judd will take it from there.

DR. CURTIS: Thanks, Marcel, and so, based on the feedback from the SSC, that results in a high stock risk rating for black sea bass, and, how this gets integrated into the control rule, I'll just briefly go over now, and so, if you recall, in the new control rule, we have these four different categories, and this pertains to the blueline tilefish, as well as Alexei alluded to when he was talking about the Category 4 stocks, but we'll get to that later.

The control rule summary table for the default risk tolerance levels, this is where the stock risk rating meets the biomass level from the assessment, and so for the stock risk rating of high, and then a low biomass estimate, we'd be looking at a default P* of 20 percent, and so that's a little bit different than the 30 percent scenario that Matt ran for black sea bass.

I think an approach here, and like the stock risk ratings are still contingent upon approval by the council in June, but the SSC can recommend that the ABC reflect the P*, with the approved stock risk ratings by the council, and approve that scenario for ABC recommendations.

DR. REICHERT: Okay. Clear to everyone? I'm seeing nods around the room. Any comments, questions, or disagreements relative to that approach? So, there will be a request to Matt to run those additional projections.

DR. VINCENT: It's running now.

DR. REICHERT: Thanks, Matt, and then that table can be -- That ABC table can be filled in.

DR. CURTIS: So, just to reflect that decision, I just added an edit here, that hopefully SSC is okay with, to set that ABC level of FMSY buffered by uncertainty of P* equal to 20 percent.

DR. REICHERT: Can you add to that based on the risk -- Whatever that table is, and based on the stock risk?

DR. DUMAS: Stock risk rating of high?

DR. REICHERT: Yes. Thank you. I would like to add there that the SSC -- That the SSC's recommendation is the high stock risk rating, and then that the ultimate decision is up to the council. I think it's important to reflect that in our report. Chris.

DR. DUMAS: And biomass rating of low?

DR. REICHERT: Yes. Thanks. Okay, and so I do quickly want to go through some of the action points. Some of that discussion is already captured, and so we'll move that into the appropriate action points, but especially the first two action points, and maybe you can bring up the -- Is it in the overview, or is this a separate document? Is this black sea bass?

DR. CURTIS: Yes.

DR. REICHERT: So we discussed that. The first one was a yes, and we can look at some of our earlier notes, to provide some additional language. The second one, I really need some feedback from the committee, because we went back and forth on that, I believe, and so what's the pleasure of the group? We used it, and so I would argue that, ultimately, we consider that BSIA, and consistent with the practices, although, and that will come back later, there's a lot of uncertainty, a lot of questions the committee had, but I just want to make sure that we are in agreement with that statement. Consistent. Yes.

Then so, again, we are using it, and so, ultimately, that's yes, and, again, we have earlier notes, and I hope that you guys can provide some additional ones to that, and then the next one -- Given that we accepted the assessment, then that answer should be yes, although, again, you know, we had lots of discussion about the relative -- The stock status, including our discussion of the SPR value, of the steepness value, and so I would say yes, but see previous notes. Chip.

DR. COLLIER: So there was some questions on -- We're talking black sea bass still, or we?

DR. REICHERT: Yes, and this is black sea bass. Yes, and believe me. I was looking at my notes, and I continuously mixed black sea bass with blueline.

DR. COLLIER: So there was questions, and, I mean, I feel like the SSC was very confident on overfishing, but there was questions on the overfished status, on that.

DR. REICHERT: The other way around. Overfished, but there were questions about overfishing.

DR. COLLIER: I thought it was the other way around, because you're not certain what's causing -- If it's non-stationarity, you can't define the overfished level, because productivity is changing. You can look at the age structure to understand overfishing, but maybe more discussion, because --

DR. REICHERT: Well, anyone? Jeff.

DR. BUCKEL: I believe prior discussions by the SSC has -- We concluded that the index is a good -- That it's a good index of the population size, and the recent 2024 catch value is 5 percent of the highest value, and so that, to me, tells us, if we're 5 percent of the peak, and that peak was during fishing, it wasn't prior to fishing, and that we're overfished, based on -- That was my conclusion from that, or, as Fred -- You know, we talked about that the reason that we got here may -- You know, there's the recruitment issue, and so it could be depleted, right, that language.

DR. REICHERT: Does that get to your comment?

DR. BUCKEL: Yes, I don't know if we want to have a qualifier in front of "decline", like "dramatic" or -- A 95 percent decline. That's just eyeballing it. Walter can provide the exact number.

DR. BUBLEY: Thanks.

DR. REICHERT: Okay. Anyone else? So, the next bullet point, I would like to capture here that we feel there's a very high level of uncertainty relative to predictions of future conditions. Anyone disagree? Sorry, and Judd is still capturing the --

DR. CURTIS: Well, if there's concerns, then it's not an outright yes, and so remove the "yes"?

DR. REICHERT: Yes, and, again, we can wordsmith this, in terms of uncertainty, and we've discussed, yesterday, a lot of the -- Well, we've discussed the uncertainty around whether or not reliable predictions of future conditions, because so much is unknown, and also given the low biomass. Anyone else? Alexei.

DR. SHAROV: I don't know where the overall opinion is for the SSC as a group, but, although the assessment results are convincing, I think that the projections are unreliable, and there is too much uncertainty. Unless we make a number of assumptions that -- You know, we, obviously, cannot guarantee that they would, you know, stay in place in the future, and so, formally, we can make projections, and we can even make a number of projections with different assumptions, but

it wouldn't have helped us with a certainty as to where the stock is going to be in the forthcoming years, and so I guess the short answer is no, because there is too much uncertainty, and then we can list why.

DR. REICHERT: The uncertainty is more uncertain than -- Thanks, Alexei, and, yes, please provide some language, so we can fill this out. Let's move to the next one. When I looked at that yesterday, I think we captured a lot of that already. I had a hard time with the list, the in order of greatest contribution to risk and overall assessment uncertainty and comments, and so I wasn't able to provide that list in order of the greatest contribution, and so please give us some guidance there, based on your notes and your recollection of the discussion.

We discussed discards, and so that's one, and we discussed the F at length. We discussed the low recruitment, and reasons for low recruitment, the unstationarity, and I'm not sure if that's a word, that Kai mentioned.

DR. LORENZEN: Non-stationarity.

DR. REICHERT: Thank you.

DR. LORENZEN: In recognition of the people who don't believe in it, potential, or possible, non-stationarity.

DR. BUCKEL: Natural mortality.

DR. REICHERT: Natural mortality, and, again, the non-stationarity in the natural mortality, and perhaps that may have changed over time. I mean, we don't know anything about that, but --

DR. BUCKEL: They did the sensitivity analysis, and the model was sensitive to both natural mortality and discard mortality.

DR. REICHERT: Which, you know, natural mortality -- We know natural mortality, and selectivity, those are always factors that are -- They usually affect, have a relatively high effect, on the outcome of the stock assessment, and then the other one was the considerable discussion we had in whether -- In the degree fishing pressure, or other factors, are an explanation for the low biomass. Genny, please, if you can provide some language there, that would be great.

DR. NESSLAGE: I'm fine with this. Again, I don't -- I'm not saying it's not happening. It's just I saw this committee going down the rabbit hole of saying it's all environmental, and that was scaring me, because there's way too much fishing pressure. Just to clarify, I think both could be going on, but we were going in a very dangerous direction.

There's a lot going on with this fishery still, and I would like to be more specific, if I may, on the top bullet, regarding discards. In particular, I would like to highlight this uncertainty in the commercial logbooks that is unacceptable, frankly, and this issue of, in the recreational fishery, inshore versus offshore effort, going and doubling in the opposite direction. Either something is off in MRIP estimation, or something interesting is going on with this sector of the fishery that is not being accounted for and might be confusing our understanding of what -- The impact of the fishery and the stock.

DR. REICHERT: Alexei, I see your hand up, and I agree with you. If I ever made an impression, or gave the impression, that I thought it was exclusively environmental, that's incorrect. I think both are -- I'm convinced both are playing a role, just the degree of we really do not know, I think, and, as Chip mentioned earlier, I think there's sufficient evidence to believe that environmental factors are playing a role. One of the other things, before I forget, and sorry, Alexei, is the selectivity, the change in selectivity, the rec selectivity, and that was a -- Isn't that the potential source of uncertainty? Alexei, go ahead.

DR. SHAROV: One thing that we didn't talk much, except that Erik mentioned it earlier today, is that the assessment results, and the model results, are very sensitive to the index of abundance, the SERFS index, and so the results are very much driven by it, and I think, from what I've heard, there is -- In general, people are convinced that this is a good index, and that is reflective of the changes, but, if there is any non-linearity in the relationship of the index with the population size, that could be potentially a source of bias as well. That is, if the population is not declining with the rate that the index is declining, because of the way we collect that data, it might be also a source of uncertainty.

DR. REICHERT: This is just the order in which we brought it up, and not necessarily the priority order. I have a hard time, because of what we don't know, to say, okay, this is more important than something else, but I would like to hear from the committee whether -- I'm perfectly happy to add a comment there to say that this is not in order of greatest contribution to the risk overall, but, basically -- Basically, because there's so much unknown. Fred, go ahead.

DR. SERCHUK: I think, for natural mortality and discard mortality, we need to say a little bit more, and perhaps it's something like natural mortality and discard mortality may be much higher than assumed. Thank you.

DR. REICHERT: I'm more comfortable saying higher, but that's just wordsmithing. Chris.

DR. DUMAS: When we say "non-stationarity", I think we should specify with respect to what.

DR. LORENZEN: Recruitment. The stock-recruitment relationship. I mean, to add to Alexei's point, I think it seems that -- Since a lot of the discarding seems to be -- If I remember correctly, it's in the shore mode, right, and, of course, the reef fish survey is in a very different place, in terms of the population distribution, and so it's possible that it's not entirely representative of what has happened over the whole area.

DR. REICHERT: Amy, go ahead.

DR. SCHUELLER: Yes, and I just wanted to clarify that. Non-linearity of the index with actual population biomass, and that's not non-linear equitably, meaning it seems like -- I almost said striped bass, but black sea bass have hyperstability in the upper end, meaning, if there's a lot of them, then they can cram a trap full, but, at the lower end, if there's not, I would assume that is more linear, and so it's actually the way maybe we would want it to be if we're at the low end of the population size. I just think we need to be a bit more specific there.

DR. REICHERT: Thanks, Amy. That's a good point, and we can clarify that, that concern. What I'm hearing you say is that concern may be less under a low population size, relative to high population size due to, what is it, trap saturation?

DR. SCHUELLER: Yes.

DR. REICHERT: Okay. Thanks, and we can -- Again, please help us. Kai.

DR. LORENZEN: That seems to be actually an interesting point, because we're using that index over a very wide range of abundance values, and so, if there is a concern that it's sort of non-linear at the high abundance end, that still means that it's not linear over the whole range of, you know, abundances that we've looked at.

DR. REICHERT: Yes, but then we have -- The video index may provide some information relative to that, although it's a baited trap, and so it may attract fish, but we have at least that comparison, and those patterns are very, very similar, but that doesn't completely answer the question, but it is a source of uncertainty.

DR. LORENZEN: Exactly. I think -- I mean, it's just a source of uncertainty that, given that we only really have one index.

DR. REICHERT: I can -- Please review that. What I can do is make two categories of important, what we feel are important sources of uncertainty, and then maybe some other sources of uncertainty. Okay. Thanks. Can we go to the next point? It is -- I want to remind the committee that it is ten to eleven, and we have some other stuff to go through. Steve.

DR. TURNER: I'll -- Perhaps, later, I'll take a look at discard logbooks question. I don't know if this assessment was one of the early assessments that used the alternative estimation methods, based on observer data, and so it might be better to say something like estimates of commercial discards, rather than discards from the logbooks. I understand the question about the logbooks, and if that --

DR. REICHERT: Thank you. Under there, we may want to make that comment that I think Genny had, that we are -- We are still struggling with some of the language on the table, but then we can refer to our previous meetings, where we made some recommendations to changing the language, realizing that that is in the fishery management plan, and so, right now, we cannot change the language. I will add some -- I made some notes, based on our discussion on applying the ABC control rule, and so I'll add that, and you guys can comment on that in the report. I think the monitoring --

DR. CURTIS: There was quite a bit of discussion on this point, and it would probably good to flesh out a little on this bullet.

DR. REICHERT: Yes. If I translate, part of our discussion is that the committee as a whole realizes that rebuilding, under the current conditions, is very unlikely within a -- Within a short timeframe, or whatever language you're going to be using.

DR. CURTIS: We did have that in the notes from the overall recommendation below, and so I just copied it there, as appropriate.

DR. REICHERT: Go down. I think these are the usual indicators. I think the index -- I would like to make a note that, given the importance of the index, that that is something that is very -- Can be very valuable in monitoring what's happening, and then landings are another one, but I think they're all -- They're included in here. I don't believe there's any other -- I don't -- I really don't think it's possible for us to recommend any trigger levels. Chris.

DR. DUMAS: Did we want to say something about trying to -- Try inshore versus offshore, to partition the --

DR. REICHERT: I think that would help, yes, to partition offshore, inshore and offshore, given the high landings, nearshore landings.

DR. DUMAS: And discards, or estimated discards.

DR. REICHERT: Yes. Genny.

DR. NESSLAGE: We want to say “catch: there, and not “landings”, right?

DR. REICHERT: Thank you. Yes. Research recommendations, we had a few during our discussion, and so, please, if you made notes, add them to that in our report. Guidance on the next assessment, I'm struggling with that, because I would like to see an assessment at least -- Or no longer than five years from now, to see what the biomass is doing. On the other hand, if the conditions stay the same, and the biomass stays really low, I am not sure -- Anyway, I'm struggling with that, what a new assessment would teach us, except for the fact that there are some issues that we raised relative to this assessment that could potentially be addressed in the next assessment, and so that's where I am, and so I would like to hear from the committee. Jeff.

DR. BUCKEL: A year ago, when we talked about this for SEDAR 76, we, we talked about an interim analysis, because the index does such a good job, or that's our belief, that it does a good job of tracking population abundance, and so that would be -- If folks still agree with that, there would be an interim analysis that would be conducted, and we said 2026, but, now that we're in -- That was a year ago, and so maybe it would be 2027, if folks still agree with that approach.

DR. REICHERT: I agree with that, and thanks for reminding us of that. That is a recommendation that we already have on the books, and we -- Then of course, there's -- Chris, I see your hand. Then, of course, there is the huge uncertainty relative to the update that Judd gave us earlier about staffing and similar issues. Chris.

DR. DUMAS: When we say index here, do we mean the SERFS fishery-independent abundance index? Is that the index you're talking about? I think we should -- I think we should specify that, just for future people reading this. Also, we said “index” earlier, up above, and I think we should say “SERFS index”.

DR. REICHERT: I would say SERFS index-based interim analysis.

DR. DUMAS: We also said “index” somewhere further above, and I think we should specify the SERFS index there, also.

DR. REICHERT: Yes, and we'll correct that. No, and I completely agree, and that's -- That's exactly something I personally ran into. When you go back to SSC reports, those details are really important if you're trying to figure out what was exactly discussed, without having to go through the entire minutes, and so thank you for that. A little more detail here and there is a lot -- Is better. Alexei, and then we really need to move on.

DR. SHAROV: I have suggestions on research recommendations. Are you accepting them now? It looks like we jumped on the --

DR. REICHERT: Yes, and I recommended to add that to the report.

DR. SHAROV: Okay.

DR. REICHERT: Then I send it out, and so send it in your notes to us, and then we can -- We send it out to the committee for review.

DR. SHAROV: Right.

DR. REICHERT: Rather than going through the details here.

DR. SHAROV: That's okay, but I'll just mention certainly investigations on reasons for reduced recruitment and whether this -- So the effect of the spawning stock versus the environmental factors. We had a discussion on the possible investigation of spatial differences, you know, like recruitment patterns, et cetera, changes in densities north and south, et cetera, and, you know, obviously, the potential reasons for increased mortality, and possibly like tagging experiments, that would allow us to estimate natural mortality rate. There are methods where you could separate fishing mortality and natural mortality and -- Well, anyways, so I just wanted to make a list of what we talked and then I'll suggest it.

DR. REICHERT: Thank you. Go ahead, Erik. I’m sorry, and I missed your hand on the screen.

DR. WILLIAMS: Thanks, and sorry to interrupt your discussion, but I would want to say, to the point about consider a SERFS-index-based interim analysis, I wouldn't go down that road. We don't have an established index-based method that's been approved and vetted and so forth. What I would say is, you know, you're asking for an interim assessment, and the question I have for you is are you asking it to actually update ABCs, or just do a health check, and there's -- You know, and leave it to the center to decide the best way to provide that? This is being a little too specific about the method, and I don't think we want to go down that road.

DR. REICHERT: I agree, but we did talk about interim analysis before, and so I'm asking the committee, and would -- Does the committee like to potentially see this as a health check or as the next assessment? That's a -- That's a valid question, and, as I said earlier, I'm struggling with that, because I'm not sure -- You know, depending on what the biomass is doing, I'm not sure how much additional information we would get, other than addressing some of the concerns that we had as a committee on this assessment. Anne.

MS. MARKWITH: So, actually, that was going to be my question was -- Because within -- If we're just looking for a pulse check, that's great, and I think those are important. What I struggle with is with all the uncertainties we identified relative to the assessment, and I guess this also gets a timing too, and knowing management probably won't go into place, and what is more appropriate?

Do we want to have an assessment where management has changed a bit under management, for us to be able to evaluate that, or do we want the pulse check, or do we want both, and I'm kind of like you, Marcel, and I don't necessarily know. I think a pulse check is important, but, if it's not changing, and Erik can definitely speak to this more, and, if it's not changing any of the inputs, is it as useful as we think it may be, especially with our concerns.

DR. REICHERT: Perhaps we can say we would like a pulse check, whatever shape that is, is materialized, and then maybe come back in 2027, 2026 or 2027, and just take a look at that, and then we can potentially recommend whether or not we feel that a next assessment would be useful to have, or something like that. Would that be a kind of an alternative? Okay, and we can -- We can drop some language to that effect. Okay. That completes where we are with black sea bass. Thank you so much. Steve. Sorry, and I missed that.

DR. TURNER: When will the new MRIP calculations be out, and they could have a substantial impact on selectivity patterns.

DR. CURTIS: Chip can correct if I'm wrong, but I believe they're working on the -- It's done. They're working on the analysis and the calibrations to the various historical time series this year, and it should be available for integration into assessments next year.

DR. REICHERT: We can request an update. Maybe not numbers, but an update of that, and that will -- Once we discuss, or provide a recommendation for a next assessment, we can take that into account. Thank you. Okay. Thanks, everyone. Give me two minutes to discuss with Judd and Wally where we're going next. We have blueline tilefish, and it is six minutes past eleven, and so give us two minutes, and we'll come back and propose a path forward. Thank you.

Okay, and let me go back to my overview. I think we came up with a plan. We will discuss blueline tilefish. Jennifer said she will provide the SEP report, and so you can -- The slides, and then -- Sorry. Go ahead.

DR. SWEENEY-TOOKES: I'll provide the SSC with slides summarizing the SEP report.

DR. REICHERT: The SEP report, yes, and so you can read that through at your leisure, and the SEP report will be attached to the SSC report. Thank you. FMP updates, the same thing, and that will be provided. You can read through it. Research planning, the same thing.

We just talked with Julie that we will move the SEDAR update to a next meeting, and we may briefly talk about the research planning, and maybe the working group, if we have time at the end, and so that's kind of the plan that leaves us the next half hour, or three-quarters of an hour, to discuss blueline tilefish. I want to remind the committee that we have a webinar in May, the week of May 26th, and so we have an opportunity to come back to that, but I really would like us to make

considerable progress today, before we leave the meeting, and we have a hard stop at noon, because of people's travel plans, and so that's the plan we currently have.

With that, let's go to blueline tilefish, and so let me move up to my blueline tilefish notes. I would really like some -- Again, some help from the committee. We talked about the biomass trajectory, the fact that the index was available from 1993, but ended in 2007. We also discussed another source of uncertainty was the narrowing confidence interval around F starting in 2011, and I think one of the questions we had is do we believe the FMSY estimate, and, in my notes, I had that we considered the -- Thus far, we considered the assessment BSIA, but not suitable for providing fishing level recommendations, and so I would like to kind of start the discussion there, and I open the floor. Erik Williams, is that still a hand up from the previous? Okay.

So that's where we kind of left it yesterday. We had lots of discussions about the uncertainty. I would like to see if we can at least come up with a path forward, in terms of our recommendation to the council.

I think it was Jeff who reminded us that we did make a recommendation earlier, when we were, and I forgot at what phase that was, when this assessment was discussed, and to postpone the assessment until the SADL index, or data, would become available, and so here we are. It wasn't you? Someone -- I thought someone made that point, relative to a previous recommendation from the SSC. Chip.

DR. COLLIER: Yes, and the SSC definitely made that point, that there was concern with trying to update the stock assessment without the SADL data available. However, it was also pointed out that, if you add this SADL data to this model, still there's that big gap in years, and the surplus production model is still not going to know what to do, and so we -- But Genny is indicating that it will sort it out.

DR. REICHERT: Genny.

DR. NESSLAGE: I think -- Well, I'm not sure exactly how ASPIC handles things, but you could do that. It certainly would be better than now.

DR. REICHERT: So perhaps it's -- Chip.

DR. COLLIER: The other reason that it was moved forward is because we are limited in number of assessment slots that we can get. There are several stocks that are overfished, or in rebuilding plans, and so we need -- We don't have enough resources, and so we -- Sometimes we have to fit an assessment in that's maybe not the most ideal, based on the data that's available, but it's trying to get as much as we can in the timeframe that we have. Unfortunately, we could not move blueline tilefish and golden tilefish, based on the SADL survey being available, because other high profile species are coming along this year, and next year, and so that's some of the thought process.

DR. REICHERT: Thanks, Chip, and, the comment you made that -- Actually, we were asked to comment on the timing of that assessment. We just didn't make a request. It was as a result of a -- To provide comments.

Then we were talking a little bit about the short bottom longline survey. Ultimately, we didn't request that, and I want to remind the committee that that was in SEDAR 50. That index was considered, but ultimately rejected, because of low M spatial distribution of the survey and consistency of that survey. I think there was another reason, that I forgot, and so that was the reason why we did not request a run.

Erik made a comment relative to rerunning the assessment with additional data streams that were not vetted, and, ultimately, I think that committee agreed, and then there was a request to add all three indices together, and, of course, because that one of those three was the short bottom longline survey, and, ultimately we did not request that run, and so we did not request any additional runs from Nikolai yesterday, if I remember correctly. Genny.

DR. NESSLAGE: No, and we were told it couldn't be done. That's different.

DR. REICHERT: Yes. Well, yes, and, Genny, go ahead.

DR. NESSLAGE: I believe it was also pointed out that the TORs were open to including new data, and so I'm not sure if we want -- Is everyone still comfortable saying that they addressed the TORs and that this is BSIA? There was an opportunity, a missed opportunity, here, I feel, and especially if we're not going to get another assessment for a long time. With a relatively simple model, a lot more could have been done, even this week, and I'm very disappointed in that. Thank you.

DR. REICHERT: Yes, and thank you, and I was just reading from the notes I was making, while I was also trying to listen to the conversation and following who put up his hand, and so, Jim, go ahead.

MR. GARTLAND: I know, and this kind of follows on to that, for this week, we couldn't include the short bottom longline. I know it was rejected from SEDAR 50, but just, in looking at it kind of afterhours the other day, in the future, I think it should at least be reconsidered, because we're talking about adding SADL. We have the indices from the 1990s and early 2000s.

If you look at the short bottom longline, even if it's not the best index ever created for blueline tiles, it could provide a nice bridge between the older indices and the new SADL survey indices, and so just something to think about for the future.

DR. REICHERT: Thank you, Jim. Nikolai, go ahead.

DR. KLIBANSKY: I guess I feel like it's worth clarifying, you know, my response to the other day. You know, the reason that we didn't update indices, or include any new indices, is completely dependent on the process that we've been following for SEDAR, which is that, you know, we made a schedule in 2023, and we came up with TORs. We had data scoping in, you know, last year, in April, and, at that time, I laid out what I was expecting was on the table to be updated, based on the TORs, based on the schedule.

The schedule is supposed to end with the report. It was supposed to start in April of last year and end in November of last year, where most of the time devoted to putting into that assessment was actually in the topical working group for the landings. There was about -- I think there were four

meetings, or maybe five meetings, to iron out the landings, and then, after that, you know, data deadlines, and like a short period of time for modeling and putting the report together, and so, you know, there was no clear place in there, as far as I was aware, to, you know, add or modify indices, and that was all out in the open, out in the, you know, public record.

So I was very surprised, earlier in the week to -- You know, and I will also note that no one suggested adding that index to me at any point during this assessment, and so we proceeded as I thought was expected to conduct an operational assessment, you know, updating the data that went into SEDAR 50 for the base model run, and then repeated all of the, you know, analyses that were used in the previous assessment, and so I was pretty surprised to see that index and then have it be proposed to add to the model at an SSC meeting.

To me, that seems like something to expect at, you know, an assessment workshop, if we're having an assessment workshop, and it was not a problem, you know, in terms of actually rerunning the model. We could rerun the model with all kinds of things, but it seemed, you know, just totally outside the process, to me, and so that was why I pushed back on doing that, and not that we couldn't do it, but it seemed outside of the SEDAR process for conducting an operational assessment, and it would likely change the assessment, you know, potentially in a substantial way, and so that was my rationale for not adding that index, in addition to what Marcel said about how that index had been rejected by the data experts at the data workshop, the index working group for SEDAR 50.

I kind of just wonder how it would look if -- What if I had just, you know, taken an index that had been rejected and run it during this operational assessment, that doesn't have an assessment workshop, and put it in. I would be very surprised if that -- That that would receive support here, and so I'll stop there, but that's basically -- You know, it's not an oversight. It's based on our understanding of how this process is supposed to work.

DR. REICHERT: Thank you for that clarification, Nikolai. I saw Genny's hand up, or not. So Nikolai, I have a question for you, and maybe -- This came up Tuesday, right? Tuesday, yes, and so did you guys discuss the biomass trend, the significant increase in biomass, and do you have any thoughts on that? I don't want to put you on the spot, but maybe there was a discussion amongst the team about that.

DR. KLIBANSKY: You just mean if we think that the biomass trend is realistic?

DR. REICHERT: Yes, or, you know, any -- Yes. In particular that, but in general, because I think on Tuesday, we discussed that -- You know, I know that the earlier years, you know, there's -- Well, anyway, if you look at it, and I know that it's visual, it looks like that the current biomass, or the trend of the current biomass, is reaching the unfished biomass, and I think that's where some of the committee members had some real heartburn over, and correct me if I'm wrong, and so I was wondering if you guys had talked about that.

DR. KLIBANSKY: Yes, and, I mean, I don't know that we talked about it at length, but, I mean, I think it kind of just comes down to this is a -- This is a simple model, and it's not -- You know, and we have no index data for a lot of the end years. It's not -- You know, it's not a, it's not a great situation to be in, and so I don't know that we have -- We don't have any, you know, additional

information. We didn't look at additional information to, you know, to add to the assessment to support it.

DR. REICHERT: Okay, because we are using that data, ultimately, or we would be using the data ultimately, to provide our fishing level recommendations. Anyway, and, anyone -- Sorry, Fred, and go ahead.

DR. SCHARF: So -- All right. So we -- I think the consensus, you know, from Tuesday, and I don't think the consensus is going to change that -- Given the fact that, you know, as you said, Nikolai, it's a simple model. It's a surplus production model. The surplus production model depends entirely on a time series of catch and effort data, which is only exists for about, you know, ten or twelve years in the middle of the time series, and so we have no data to support the end of the time series, and the removals have stayed pretty flat, and so there's really no additional information that supports, you know, three to sixfold increases in relative abundance, which is what the model predicts, and so the consensus was that the model isn't going to be useful from making management advice.

I don't think that we're going to change. At least that's my sense in the room, and so, I mean, we have another meeting in six weeks. Just charting -- You know, just charting a path forward, you know, I'm asking if there are two things that are possible that could be brought to us at that meeting, which is, one, another run with the model with the short bottom longline survey, given that that survey -- You know, again, it got -- It didn't get considered in SEDAR 92.

It was rejected in SEDAR 50, but the survey has been extended, and expanded, quite a bit since SEDAR 50, and so -- But, regardless that it wasn't considered, because it was part of an operational, is it possible to have that model run, where that's included, presented to us when we have our May webinar?

The other is since the data-limited toolbox was applied to the northern stock, is it possible to apply that to the southern stock and present those to us as well as, as alternative possibilities to make management advice? I'm just asking whether either or both of those pathways are possible for our May meeting.

DR. REICHERT: Thanks, Fred.

DR. KLIBANSKY: Yes, and I think probably. I just have to -- You know, keep in mind, and I'll take a quick look at my schedule, but I think it's -- You know, I think that's doable.

DR. REICHERT: Kai, and then Erik. Kai, go ahead.

DR. LORENZEN: No, and I just wanted to agree with Fred there. I think that that would be great to see, and, you know, at the moment, I find it difficult to convince myself that what we have in front of us is even BSIA, but I think, if we could have those additional runs, that would be -- I think, if we could have that, that additional information that would be really useful. Thank you.

DR. REICHERT: Erik.

DR. WILLIAMS: I appreciate Nikolai being eager to try and do the work, but the reality is this will have to be put in a formal request to the center. We are in a situation where we know our resources are about to decline significantly. They've already declined somewhat, but we have another wave coming, and we are constantly reevaluating what we can and cannot handle at this point, and there is no predictability at this point, in my view, of whether we could do this or not, but put in the formal request. We will take it as-is and with the understanding of where we are resource-wise.

DR. REICHERT: Jim.

MR. GARTLAND: So, if we're going to do that, and make a formal request, and given that SADL has a handful of years, should we throw that one in as well? If we're going to do it, do it all at once.

DR. REICHERT: Do we have enough -- No, I don't think we do. Do we have enough years?

DR. BUBLEY: As of right now, there's four years with that. We haven't made any efforts, in terms of standardizing that survey in any fashion. We have the data for those four years, but I don't think we feel comfortable until we get a little more.

DR. REICHERT: Yes, and I think I mentioned before that -- You know, again, I hate -- We've been in this position before, where we kind of go down the rabbit hole of, well, if we do this, then why don't we do that, and, if we do that, why don't we do that, and then, you know, you're getting into this endless loop, and so I think I mentioned that earlier, and so, yes, I would love to see that.

What I'm asking the committee, because this is important for how we move forward, whether we are -- Because I assume, Chip or Judd, that that request needs to come from the council, and not from the SSC, and so the SSC needs to provide -- Needs to request it from the council. That would be -- What's the formal procedure for something, and I know we went through that with Spanish mackerel, and, again, I do not want to get into a similar situation that we were in with Spanish mackerel.

DR. COLLIER: Yes, and so we're pretty flexible on the process for this. I think we could go to the chair of the council and the executive director, let them know what the SSC would like to do, in order to make a request for that May meeting.

DR. REICHERT: That's what I'm saying, and so it's basically our request, or recommendation, to the council, or council staff, and then that they will take -- But, ultimately, that needs to come from the council. Okay. Jim. Thanks for that clarification, Chip.

MR. GARTLAND: Just playing this out in my head, if we do that, and we get results, and it's approved, and the thing is run and we get results, what are we going to use them for? Are we going to use that to actually set our recommendations, or are we going to look at it and say, yes, it did change, but then still have to use some other method to try to set the catch.

If that's the case, I mean, you know, scientific curiosity says, yes, go for it, and I would even try SADL, too. I know it's only four years, but I would try it, but, that all said, if we're doing this and then we're going to say, cool, thanks, and then do something else anyway, is it worth everyone's

time to go through the request and make the run? It would be cool to do the run on the side, but, if it's not going to get us somewhere that we can see clearly, you know, clearly see that it's going to get us somewhere, are we better off just going with something else now?

DR. REICHERT: I completely agree, and, actually, that was my question to the committee. Where does it leave us now, and where would that potentially leave us later? Genny.

DR. NESSLAGE: The whole reason I started bringing that up was because I don't think we have an adequate idea of what the stock is, right, the stock status, stock size, uncertainty. I don't think with, what is it, sixteen years at the end of the time series without an index, we can make any determination with this model now, and so I don't know what the model performance will be like with additional indices, but, without it, we would have to do DLM, or average catch, or just randomly pick something, and so I think it's worth a shot, but maybe that's not answering your question.

DR. REICHERT: Jim, and then Fred,

MR. GARTLAND: So then, just real quick, the question I posed is would we actually be able to do something with it? It sounds like the answer you're saying is yes, and so then that means it's worth putting the request forward. I just wanted to make sure we weren't putting ourselves in the request, or a position, where we make a request, and it would come back, and, regardless of what came back, we couldn't use it anyway and would still have to do something else, and so maybe I wasn't clear the first time I posed it, but if it's one of those where we put the request forward, it's done, and we have -- There's at least a chance that we could use it to set the recommendations, then I think it's worth going after.

DR. REICHERT: Does that make sense? Fred.

DR. SCHARF: Yes, and, I mean, that was specifically why I asked if it was possible to apply the DLM toolbox, because, even if Nikolai is able to do another run and include the short bottom longline survey, and it doesn't improve our confidence, and our ability to set ABCs with the surplus production model, we would default to the DLM.

DR. REICHERT: Thank you, and, Chip, I see you've come to the table, and that is my concern, because, if we're using it, some could argue that, you know, we need to have a very strong justification why to use that index. It was earlier rejected because of N, because of geographic coverage, et cetera, and so, again, that -- No matter how we cut it, I foresee some extensive discussion, in terms of how reliable that would be and whether -- But I do not know. Chip, go ahead.

DR. COLLIER: So what Jim was saying made me think along the lines of, if we make this request and, like Erik said, you know, they might not have the staff resources in order to complete the request, and what would you all like to see as a worst-case scenario that staff could bring back? Genny had mentioned average catch.

We could bring that to you as well, just to make sure that we have something working in the background. Please let us know if you have any guidance on your absolute worst-case scenario, and, that way, we can -- Make it fairly simple, that Judd and I can do it. You know, we're not the

modelers in the room, and so, if we're having to fall back, we're having to fall back on council staff to do this, and make sure everybody is comfortable with at least having something to consider at the eleventh hour.

DR. REICHERT: Thank you, Chip. Very good point. So, Anne, and then I would like to kind of get us back to --

MS. MARKWITH: So this doesn't have to do with what Chip just said, but, if we're talking about including this index, because, with the TORs we do have that opportunity, and I guess my question would be would it give people more confidence that we might get something usable out of the model if there's overlap in the two indices, and I don't know if there's any overlap, because, if there is, maybe you could run some sort of correlations or something between the two that might give people more confidence to use the index. I think that would be justification, because, depending on how the indices are correlated, if there's overlap, I think that gives us a little more justification to say, yes, include it, but I don't know if there's overlap or not.

DR. REICHERT: So, real quick, Wally, can you comment on the when does that index start?

DR. BUBLEY: Yes, and so the first year we have any data for that is I believe 1996, and so it covers that time period, but, again, it's spotty, and so that's something you have to take into account.

DR. REICHERT: That's my concern, that we are going to use that and then look at that and say, you know, how reliable is it, and so I want to go back a little bit, because that was brought up. Earlier, we said this is a case where the assessment is considered best scientific information available, but not suitable for management.

What I'm hearing around the room now is that, given the data, it may not be BSIA, and so the model -- I would like confirmation about that, because then I would like to go back to our ABC control rule, and this is all part of our documentation. If we don't consider this BSIA, we end up with a situation where we do not have a formal stock assessment, and so then we can go to our category and see what is the charge of the SSC.

It's probably not going to help us a lot, but, at least in terms of our formal process, I would like to get that on the table, and so we are going back, in terms of our BSIA, and consider this assessment not BSIA, and that's a question I have for the committee, and I would like some comments to that, so then we can take that other step, because I've heard several people say, well, I'm very uncomfortable with, you know, the approach, given the data, and so BSIA or not BSIA, irrespective of whether we feel it's suitable for management recommendations, but, formally, it's good to at least have that on the record. Genny.

DR. NESSLAGE: If you're looking for language, I would say that the data are inadequate to update this previously-accepted model.

DR. REICHERT: As a result, we consider it not BSIA. Steve.

DR. TURNER: There is no data other than catch, and so the catch is insufficient. If we regard this alternative index as having been rejected, then there is no data, and so it's the best data available, but it's insufficient for developing management advice.

DR. REICHERT: Well, yes, and so do you disagree with the fact that this is not BSIA? That's my question.

DR. TURNER: If BSIA is data, then I disagree. I say it is -- We have the data that's available, the catch, and so that is available, and so that's the best scientific available, but that data -- That doesn't mean that the analysis is sufficient.

DR. REICHERT: So someone correct me, and BSIA is not just the data. It's also the model choice, and everything going with it. Correct me if I'm wrong, anyone, and so it's not just the data. It's the process, and so if we feel, for instance, that, given the data, perhaps a different model would be better science, then this is not BSIA. I'm hypothetical, just as an example, and so that's why I'm asking is the committee still considering this BSIA? Does that make sense?

DR. TURNER: Yes, and then I can agree it's not BSIA if they should have used -- If we should have recommended, or they should have used, basically a data-limited model.

DR. REICHERT: Any other comments relative to that? Is there -- Alexei.

DR. SHAROV: Yes, and it's not the best scientific information available, for the reasons that we've, you know, outlined pretty clearly, that the model is not anymore supported by the data that they are required for the reliable conclusions, and so that's it. Then, yes, the next step is a request.

If we agree that this alternative survey that we talk about is acceptable, then the request for the model run with an additional data source is reasonable, but, if not, then the next step is a DLM, and I also wanted to remind that there were some other sources of information that are potentially available, and we talked about them, that looking at -- Because we might end up still making sort of an expert judgment decision, and things like, as we talked, the size information of the catch, potentially the recreational catch rate, and this information is available, but needs to be dug out and processed, but, anyways, one step at a time. Not BSIA, as it stands.

DR. REICHERT: So I'm looking around the room. Anyone disagreeing with ultimately considering this not BSIA, and thus not suitable for management recommendations? I also want to remind the committee that that means that, if we look at the ABC controllable categories, this then brings us to Category 4.

This is the slide 2 in Attachment 3e. No formal stock assessment accepted to provide OFL and ABC recommendations, and then there's quite some text, and it basically comes down to we don't have a recommendation from the data-limited working group yet, and so it asks the SSC to attempt to estimate an OFL, and its uncertainty, using available data, applicable methods, and expert judgment. I think this comes back to our expert judgment, and there's some additional language there, and so what's going to -- Chip, what information would the SSC need in order to provide a recommendation to the council, and we can discuss this further during our webinar. What would be our approach?

That is provided, and so let me go back a step. If we request these additional runs, and what I heard is there was a consensus in the committee to request those additional runs through the council

to the Science Center, and so let's take that step first. The recommendation is for the council, council staff, to request exactly what runs? Alexei.

DR. SHAROV: Honestly, it would have been much more consistent with the approach taken to the area north of Cape Hatteras to the border with Virginia and then the northern stock, that is in the jurisdiction of the Mid-Atlantic Council. Both of them are currently being assessed, or have been assessed, using DLM, and the presentations are coming very soon, and so it makes it consistent if we request a DLM, and, you know, to complete a DLM, if that is possible, if the time allows.

DR. REICHERT: So you're suggesting an alternative to --

DR. SHAROV: Well, it's Number 2, right, the DLM?

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

DR. SCHMIDTKE: I think what I interpreted, from what Alexei was saying, is the fact that the DLM toolkit is run for the northern portion of the stock, and not because it's a distinct population, but because of data availability, because the ASPIC model -- The index that was used in the ASPIC model only extended up to Cape Hatteras, and so, if we're going to run a DLM tool model, then would it make sense to put the entire stock together, since it is a single unit stock?

That does have some reverberating effects to the process. I do want to point that out, because, right now, from a management perspective, like we're going to be going into the Mid-Atlantic and doing the process of divvying up that portion of the ABC between the councils, but, yes, and I guess I was wondering, and is that what you're indicating, or two separate DLM tool models for two different portions of the same stock?

DR. SHAROV: Separate. I mean, we just -- We're doing the same approach, in terms of methodology, but each apply to a separate stock unit.

DR. REICHERT: So I'm asking the committee, and we have two options here on the table. One, are we requesting both, and see what is available? I think, also, we have to realize that, the more we request -- I don't know. I'm not sure what the chances are of actually getting this done, and that goes back to Chip's request. Jim, I saw you had your hand up.

MR. GARTLAND: Yes, and that kind of goes back to what I was -- The question I posed earlier. I mean, I think we need two for sure, right? That's almost like at least we know we've got something. I mean, ideally, both one and two, because you want one to see what it does, and potentially hopefully be able to use it, but, if one doesn't work out, you need two. I guess a better way to say it is you can do two without one, but I don't think you can do one without two. Does that make sense?

DR. REICHERT: Yes. Jie, and then Jeff.

DR. CAO: I agree with that, because I think I'm a little bit hesitant to come to the conclusion that, in this case, the surplus production model is not appropriate, because I feel like we -- At least I don't have a full understanding of the model behavior at this moment.

The question, to me, is not as much about how many years data are available. It's how much contrast is in the data. Do the data have enough, or sufficient, contrast to produce reliable estimates, right, and so I'm not seeing, for example, like sort of a standard output, where you have -- You know, so, basically the surplus production phase plot, where you have surplus production product against biomass level, and that gives you some evidence of data contrast, right, and, also, I think that needs to be checked before we come to a conclusion that, in this case, you know, the surplus production model doesn't work.

I really think, with additional data for the most recent years, they'll anchor the biomass trend towards the tare, and so I think they'll be helpful, and so I think having both approaches tried is ideal because one, or potentially the other, could be considered as the confirmatory analysis to the other.

DR. REICHERT: Thank you, Jie. Jeff.

DR. BUCKEL: So my comment has to do with the DLM model. Since we're moving away from -- If it goes to the DLM approach, then I don't think Hatteras needs to be -- Right? Hatteras was being used because that's where the index was developed, was south of Hatteras, but, if we go to DLM, then I think we can use the Mid-Atlantic and South Atlantic boundary, and so there doesn't have to be the divvying up that Mike talked about, right, and so, if the DLM modeling hasn't been done for north of Cape Hatteras, then --

DR. REICHERT: It has been.

DR. BUCKEL: All right. Or if it could be redone, just the Virginia-North Carolina boundary north, and then you would do the DLM model, and, instead of south of Hatteras, it would be south of the North Carolina-Virginia border, because we don't have to use Hatteras. That boundary is no longer appropriate.

DR. REICHERT: Thanks, Jeff. I know where you're coming from. That may be a little too much to ask, because that means rerunning everything, but I don't know. Nikolai, go ahead, and before -- We have five more minutes left, and so we need to come up with a recommendation, at least what’s on the screen, before we end this meeting. Nikolai.

DR. KLIBANSKY: Just to note, you know, we ran the DLM with the approaches used last time for north of Cape Hatteras, and some of the approaches that worked last time didn't work this time, for reasons that I get into a bit in the report and, you know, could provide more information about, but, basically, the approaches that worked were average catch-based methods, and so just keep that in mind, and it might be worth, if you're going to suggest running DLM approaches to, you know, suggest how far you want to go with that, if you want to consider new data sources, you know, new approaches, because, you know, it's simple to run, but, you know, determining how wide you want to -- How many approaches you want to run, which ones you want to be considered, is not trivial. That's all.

DR. REICHERT: Thank you, Nikolai. Steve.

DR. TURNER: Yes, and so, of these two things here, I would prioritize DLM, and I would recommend to, or suggest to, the SEFSC that prioritization, and so if they have a limit on manpower.

DR. REICHERT: Thank you. That's very helpful. Should that be the recommendation? I'm looking around the group, looking around the room. Recommend -- Then switch them, one and two, and prioritize DLM, based on what Steve just recommended, and rerun ASPIC. Steve, go ahead.

DR. TURNER: Yes, and we could learn something between now and whenever we get the second -- The model with the new index, and we may learn something about that index that we don't like, that supports the rejection, and so I would put emphasis on DLM, and, as Nikolai said, maybe we emphasize average weight approaches, to simplify their tasks.

DR. REICHERT: Thank you. Unfortunately, I really wanted to go through what we had on our notes to help us write the report. It looks like, and I'm looking at Judd, that we will have to come back to this in May, at our webinar. This is the recommendation on the screen that will go to council, council staff and council, and see where that goes.

Unfortunately, you know, I really wanted to address Chip's comments, in terms of what would the committee need in order, in May, to come up with a recommendation, and so I want -- I'm not sure how to approach this, because, on one hand, one thing I wanted to say is, okay, let's use it as homework, and come back to that in May, but that means then that that's --

That information that will help us make that fishing level recommendation cannot be made in May, if we get that information there, and so I'm open to any and all suggestions, in terms of how we move forward in the next two minutes. I mean, it's unfortunate that we are here, and, you know -- But anything that can help to formulate a recommendation in May would be useful. Anyone? Fred.

DR. SCHARF: So I don't -- I wonder if Erik can speak to, if the council makes a formal request to do DLM, and do this rerun of the ASPIC model, how quickly will the council know, get a response from the center to know, that they'll -- Whether they'll be able to do it or not, and then I wonder if, based on that response, if it's -- If we're not going to have that information from the center by our late May webinar, then Judd could send out some information to us about here are some options for setting ABCs, given that we're not going to have this new information, and then we can provide some feedback on which of those options we think that we would like you to prepare for that meeting.

DR. REICHERT: Erik, if you're willing to address that, that would be great, and then I'll address a concern I have on the suggestion that Fred just made.

DR. WILLIAMS: Thanks, Fred. I appreciate you wanting to get some more information. The unfortunate thing is I don't know, and that is the response that we are generally getting across the board for what's been going on with the federal government for the last few months. It's literally chaos, is the best way to explain it, and so we're -- I don't want to try to even answer that, because I don't know what is in our future, and we're going to have a tough time managing the chaos, and even a much tougher time trying to predict what the future might look like for us.

DR. REICHERT: Thanks for that answer, Erik, and I guess we all sympathize. So, realistically, it looks like we may end up with an alternative method to provide fishing level recommendations in May. I like your approach. My concern there is -- My concern there is that I want to avoid a back-and-forth between Judd and myself and Wally and others about what we need to do in May and that's not part of the record. So, on the other hand, if we can come up with something that we can just discuss in May, I'm all for it, and so that's my -- A little bit of my dilemma there. Steve, you had your hand up.

DR. TURNER: A second webinar in May.

DR. REICHERT: Yes, and we can take a look at that. We had a hard time scheduling this one, because of everything else that's going on. We have a data workshop that requires some work, and we have some other things going on, and so we can certainly, or I can certainly, or Wally and I can certainly, discuss this with staff and see where we're going.

What I may do is then send out an email, or Judd will send out an email, in terms of what we are requesting from you guys that may help us at the May webinar, because, obviously it's past twelve, and we don't have time to discuss this any further. I hate to do that, to cut this discussion short. It's, unfortunately, the situation we are in.

Our next meeting -- Judd, I'll hand it over to you, to see if there's anything else that we definitely need to address. Unfortunately, I really had hoped for some discussion also relative to our working groups, but I guess we need to punt that to the next meeting, also. That soon seems like to become the stepchild of our meetings.

DR. CURTIS: So, Marcel, just to jump in, clear schedules then, and Wednesday, May 28th is the day that ExCom decided that we'll do the review, and that was already set up, for the blueline tilefish northern area model that's coming to the South Atlantic. This would be after the subgroup does their review, and after it's gone to the Mid-Atlantic SSC.

We will now probably extend this webinar slightly to address the blueline tilefish assessment for the southern region that was just discussed at this meeting, and so far inconclusive, and so we may go for a full day, in addition to adding some of the business that we were unable to get to during this meeting, this week's meeting.

DR. REICHERT: So a couple of questions. The webinar, is that going to be an addendum to our SSC report, or is that going to be an entirely separate report?

DR. CURTIS: That will be an entirely separate report. It's an entirely new meeting.

DR. REICHERT: Okay.

DR. CURTIS: I think we can include, you know, some recommendations on the blueline tilefish that was discussed at this meeting, because it will also be discussed in May as well, but, yes, we'll treat this as an entirely separate meeting, and not an addendum to this meeting.

DR. REICHERT: Okay, and so, for this meeting report, what's the timeline? When do we need to -- When is the briefing book, because I would like to give the members some guidance, in terms of -- Or let's do this. Judd and I will discuss this, and then the three of us will provide -- We'll send an email to you with the different deadlines for the report, and then you guys can provide some feedback, rather than trying to figure it out right now. Alexei.

DR. SHAROV: I'm still confused about the chances of any work being done about these two recommendations. Are they going to be tried or not between now and end of May?

DR. REICHERT: We do not know. That request will go out, and then we just have to wait, and I think we -- Listening to Erik, I think that may give us some indication of the chances that that is actually doable.

DR. SHAROV: So we should be preparing for the alternative.

DR. REICHERT: Yes.

DR. SHAROV: Okay.

DR. REICHERT: Yes, absolutely. Dewey, sorry. I see Nikolai, and then Dewey, and I forgot about public comment, and so we have to do that. Nikolai, real quick.

DR. KLIBANSKY: Very quick. Just, somewhere in here, if someone wants me to run another, you know, model, with another index, I should be provided with the index somehow, and so, you know, just pointing that out, to put that in the process somewhere.

DR. REICHERT: Thank you. That's a good point, and we'll make sure that, if that request is -- If we hear that that can be done, then we will make sure that you will be provided with that index. I saw public comment. Dewey. I saw your hand up. Sorry that I forgot the public comment at the end of the meeting. Please go ahead.

PUBLIC COMMENT

MR. HEMILRIGHT: I've been listening here this morning, and, as many of -- I have an interest, and my industry does, in blueline tilefish. Since 2016, the annual catch limit for blueline tilefish commercially has been 117,000 pounds, with 75 percent of that being caught north of Cape Hatteras, south of the Virginia-North Carolina line. You also have 116,000 pounds of catch coming from the recreational industry, that only has about a three to four-month season, and they've been catching their ACL, and they're based on MRIP.

We've been catching the fish from Key West, Florida to the Virginia-North Carolina line in the same places. Our quotas are -- You know, why can't the population be increasing, given the restriction of crumbs that we've been allowed to catch commercially.

We also have, with the new stock assessment, the northern region, particularly to the north of Virginia, has now switched over to MRIP, that has inflated the numbers, from what they were allowed to catch, of 73,000 pounds to over 200,000 pounds, and so, if we use them numbers in the

Northeast, then the stock has to have grown exponentially to produce them numbers, and so, as I sit here giving comments, my livelihood, and others, depend on what's out there in the ocean and somewhere getting closer to reality.

I don't see it, listening here to the SSC, with the comments that are provided, because the data -- It seems like we're not looking at the reality of what's being done. It's all these what the model is doing, or not doing, but I'm going to continue to follow, but there's some real problems with this MRIP in the Mid-Atlantic, with these landings, and, also, what happens with the allocation part, that's, all of a sudden like 90/10 in the Mid-Atlantic area, instead of, you know, 73/27. I appreciate you all's time. I thank you, and it's good listening to the conversation. I do wish that you all had the opportunity to listen to the AP discussion, but I know everybody's time is very limited, and so thank you, and thanks for allowing me to comment.

DR. REICHERT: Thanks, Dewey. As always, we really appreciate your expertise, and your comments, and so thank you for that, and thanks for joining us online. All right. It's 12:09. I thank everyone for your contributions. This was a somewhat -- These were some tough discussions. We knew that we had to make some tough decisions. I think at least I'm really glad that we went -- That we got through black sea bass, and we'll come back to blueline tilefish in May, and so thank you everyone. Safe travels, and we'll see you online in May, if not earlier at the red snapper data workshop a week from now, I think, or two weeks. Thank you.

(Whereupon, the meeting adjourned on April 17, 2025.)

- - -

Certified By: _____ Date: _____

Transcribed By
Amanda Thomas
April 30, 2025

SSC Tue 4/15

Scientific and Statistical Committee

Prefix	First	Last	Su	Position	Affiliation
Dr.	Marcel	Reichert		Chair	N/A
Dr.	Walter	Bubley		Vice-Chair	SC DNR Marine Resources Division
Dr.	Jeff	Buckel			NC State University
Dr.	Jennifer	Sweeney-Tookes		SEP Chair	Georgia Southern University
	Dustin	Addis			Florida Fish and Wildlife Conservation Commissio
Dr.	Jie	Cao			North Carolina State University
Dr.	Chris	Dumas			University of North Carolina Wilmington
Dr.	Jared	Flowers			GA Deptartment of Natural Resources
Dr.	James	Gartland			Virginia Institute of Marine Science
Dr.	Kai	Lorenzen			University of Florida
	Anne	Markwith online			North Carolina Division of Marine Fisheries
Dr.	Genevieve	Nesslage			University of Maryland, Center for Environmental S
Dr.	Christina	Package-Ward online			NOAA Fisheries, Southeast Regional Office
Dr.	Fred	Scharf			University of North Carolina Wilmington
Dr.	Amy	Schueller online			NOAA Fisheries, Southeast Fishery Science Cente
Dr.	Fred	Serchuk online			N/A
Dr.	Alexei	Sharov			Maryland Dept. of Natural Resources
Dr.	Steve	Turner			N/A
Dr.	Jason	Walsh			North Carolina Division Marine Fisheries

Dr. Erik Williams
Shep Grimes
Nikolai Kilbansky

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
John Carmichael
john.carmichael@safmc.net
843-302-8435

Deputy Director – Science
Dr. Chip Collier
chip.collier@safmc.net
843-302-8444

Deputy Director - Management
Myra Brouwer
myra.brouwer@safmc.net
843-302-8436

Citizen Science Program Manager
Julia Byrd
julia.byrd@safmc.net
843-302-8439

Admin. Secretary/Travel Coordinator
Rachael Silvas
Rachael.silvas@safmc.net
843-571-4370

Quantitative Fishery Scientist
Dr. Judd Curtis
Judd.curtis@safmc.net
843-302-8441

Fishery Economist & FMP Coordinator
John Hadley
john.hadley@safmc.net
843-302-8432

Habitat and Ecosystem Scientist
Kathleen Howington
kathleen.howington@safmc.net
843-725-7580

Fishery Scientist I
Allie Iberle
Allie.iberle@safmc.net
843-225-8135

Public Information Officer
Kim Iverson kim.iverson@safmc.net
843-224-7258

Administrative Officer
Kelly Klasnick kelly.klasnick@safmc.net
843-763-1050

BFP Outreach Specialist
Ashley Oliver Ashley.Oliver@safmc.net
843-225-8135

Fishery Scientist II
Dr. Mike Schmidtke
mike.schmidtke@safmc.net
843-302-8433

Communication and Digital Media Specialist
Nicholas Smillie
Nick.Smillie@safmc.net
843-302- 8443

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net
843-571-4368

Fishery Social Scientist
Christina Wiegand christina.wiegand@safmc.net
843-302-8437

Citizen Science Project Manager
Meg Withers
Meg.withers@safmc.net
843-725-7577

SEDAR

SEDAR Program Manager
Dr. Julie Neer
Julie.neer@safmc.net
843-302-8438

SEDAR Coordinator
Emily Ott Emily.Ott@safmc.net
937-479-6171

SSC
TUE 4/15

First	Last	Suffix	Position	Affiliation	Seat
Trish	Murphey		Chair	NC Division of Marine Fisheries	State Agency
Jessica	McCawley		Vice-Chair	Florida Fish and Wildlife Conservation Commission	State Agency
Robert	Beal			Atlantic States Marine Fisheries Commission	ASMFC
Carolyn	Belcher			GA DNR Coastal Resources Division	State Agency
Gary	Borland				Obligatory
Amy	Dukes			SC DNR Marine Resources Division	State Agency
Tim	Griner				Obligatory
Judy	Helmey				Obligatory
James	Hull	Jr.			Obligatory
Kerry	Marhefka				At-Large
Tom	Pease			Seventh Coast Guard District	USCG
Charlie	Phillips				At-Large
Tom	Roller				At-Large
Robert	Spottswood	Jr.			At-Large
Andy	Strelcheck			NOAA Fisheries Southeast Region	NOAA Fisheries
Deirdre	Warner-Kramer			Office of Marine Conservation OES / OMC	U.S. State Department
TBD	TBD			U.S. Fish and Wildlife Service Representative	USFWS

4/14

Scientific and Statistical Committee

Prefix	First	Last	Su Position	Affiliation
Dr.	Marcel	Reichert	Chair	N/A
Dr.	Walter	Bubley	Vice-Chair	SC DNR Marine Resources Division
Dr.	Jeff	Buckel		NC State University
Dr.	Jennifer	Sweeney-Tookes	SEP Chair	Georgia Southern University
	Dustin	Addis		Florida Fish and Wildlife Conservation Commissio
Dr.	Jie	Cao		North Carolina State University
Dr.	Chris	Dumas		University of North Carolina Wilmington
Dr.	Jared	Flowers		GA Deptartment of Natural Resources
Dr.	James	Gartland		Virginia Institute of Marine Science
Dr.	Kai	Lorenzen		University of Florida
	Anne	Markwith		North Carolina Division of Marine Fisheries
Dr.	Genevieve	Nesslage		University of Maryland, Center for Environmental S
Dr.	Christina	Package-Ward	web	NOAA Fisheries, Southeast Regional Office
Dr.	Fred	Scharf		University of North Carolina Wilmington
Dr.	Amy	Schueller	web	NOAA Fisheries, Southeast Fishery Science Cente
Dr.	Fred	Serchuk	web	N/A
Dr.	Alexei	Sharov		Maryland Dept. of Natural Resources
Dr.	Steve	Turner		N/A
Dr.	Jason	Walsh		North Carolina Division Marine Fisheries

Shepherd Grimes

SEC Wrq
4/16

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
John Carmichael
john.carmichael@safmc.net
843-302-8435

Deputy Director – Science
Dr. Chip Collier
chip.collier@safmc.net
843-302-8444

Deputy Director - Management
Myra Brouwer
myra.brouwer@safmc.net
843-302-8436

Citizen Science Program Manager
Julia Byrd
julia.byrd@safmc.net
843-302-8439

Admin. Secretary/Travel Coordinator
Rachael Silvas
Rachael.silvas@safmc.net
843-571-4370

Quantitative Fishery Scientist
Dr. Judd Curtis
Judd.curtis@safmc.net
843-302-8441

Fishery Economist & FMP Coordinator
John Hadley
john.hadley@safmc.net
843-302-8432

Habitat and Ecosystem Scientist
Kathleen Howington
kathleen.howington@safmc.net
843-725-7580

Fishery Scientist I
Allie Iberle
Allie.iberle@safmc.net
843-225-8135

Public Information Officer
Kim Iverson kim.iverson@safmc.net
843-224-7258

Administrative Officer
Kelly Klasnick kelly.klasnick@safmc.net
843-763-1050

BFP Outreach Specialist
Ashley Oliver Ashley.Oliver@safmc.net
843-225-8135

Fishery Scientist II
Dr. Mike Schmidtke
mike.schmidtke@safmc.net
843-302-8433

Communication and Digital Media Specialist
Nicholas Smillie
Nick.Smillie@safmc.net
843-302- 8443

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net
843-571-4368

Fishery Social Scientist
Christina Wiegand christina.wiegand@safmc.net
843-302-8437

Citizen Science Project Manager
Meg Withers
Meg.withers@safmc.net
843-725-7577

SEDAR

SEDAR Program Manager
Dr. Julie Neer
Julie.neer@safmc.net
843-302-8438

SEDAR Coordinator
Emily Ott Emily.Ott@safmc.net
937-479-6171

SSC Wed
4/16

Prefix	First	Last	Suffix	Position	Affiliation	Seat
	Trish	Murphey		Chair	NC Division of Marine Fisheries	State Agency
	Jessica	McCawley		Vice-Chair	Florida Fish and Wildlife Conservation Commission	State Agency
	Robert	Beal			Atlantic States Marine Fisheries Commission	ASMFC
Dr.	Carolyn	Belcher			GA DNR Coastal Resources Division	State Agency
	Gary	Borland				Obligatory
	Amy	Dukes			SC DNR Marine Resources Division	State Agency
	Tim	Griner				Obligatory
	Judy	Helmey				Obligatory
	James	Hull	Jr.			Obligatory
	Kerry	Marhefka				At-Large
Lt.	Tom	Pease			Seventh Coast Guard District	USCG
	Charlie	Phillips				At-Large
	Tom	Roller				At-Large
	Robert	Spottswood	Jr.			At-Large
	Andy	Strelcheck			NOAA Fisheries Southeast Region	NOAA Fisheries
	Deirdre	Warner-Kramer			Office of Marine Conservation OES / OMC	U.S. State Department
	TBD	TBD			U.S. Fish and Wildlife Service Representative	USFWS

Scientific and Statistical Committee

	Prefix	First	Last	Su Position	Affiliation
✓	Dr.	Marcel	Reichert	Chair	N/A
✓	Dr.	Walter	Bubley	Vice-Chair	SC DNR Marine Resources Division
✓	Dr.	Jeff	Buckel		NC State University
	Dr.	Jennifer	Sweeney-Tookes	SEP Chair	Georgia Southern University
		Dustin	Addis		Florida Fish and Wildlife Conservation Commissio
✓	Dr.	Jie	Cao		North Carolina State University
✓	Dr.	Chris	Dumas		University of North Carolina Wilmington
✓	Dr.	Jared	Flowers		GA Deptartment of Natural Resources
✓	Dr.	James	Gartland		Virginia Institute of Marine Science
✓	Dr.	Kai	Lorenzen		University of Florida
✓		Anne	Markwith		North Carolina Division of Marine Fisheries
✓	Dr.	Genevieve	Nesslage		University of Maryland, Center for Environmental S
	Dr.	Christina	Package-Ward	web	NOAA Fisheries, Southeast Regional Office
✓	Dr.	Fred	Scharf	~~web~~	University of North Carolina Wilmington
	Dr.	Amy	Schueller	web	NOAA Fisheries, Southeast Fishery Science Cente
	Dr.	Fred	Serchuk	web	N/A
✓	Dr.	Alexei	Sharov		Maryland Dept. of Natural Resources
✓	Dr.	Steve	Turner		N/A
✓	Dr.	Jason	Walsh		North Carolina Division Marine Fisheries

Shep Grimes
Erik Williams
Matthew Vincent

COUNCIL STAFF

Executive Director
John Carmichael
john.carmichael@safmc.net
843-302-8435

Deputy Director – Science
Dr. Chip Collier
chip.collier@safmc.net
843-302-8444

Deputy Director - Management
Myra Brouwer
myra.brouwer@safmc.net
843-302-8436

Citizen Science Program Manager
Julia Byrd
julia.byrd@safmc.net
843-302-8439

Admin. Secretary/Travel Coordinator
Rachael Silvas
Rachael.silvas@safmc.net
843-571-4370

Quantitative Fishery Scientist
Dr. Judd Curtis
Judd.curtis@safmc.net
843-302-8441

Fishery Economist & FMP Coordinator
John Hadley
john.hadley@safmc.net
843-302-8432

Habitat and Ecosystem Scientist
Kathleen Howington
kathleen.howington@safmc.net
843-725-7580

Fishery Scientist I
Allie Iberle
Allie.iberle@safmc.net
843-225-8135

Public Information Officer
Kim Iverson kim.iverson@safmc.net
843-224-7258

Administrative Officer
Kelly Klasnick kelly.klasnick@safmc.net
843-763-1050

BFP Outreach Specialist
Ashley Oliver Ashley.Oliver@safmc.net
843-225-8135

Fishery Scientist II
Dr. Mike Schmidtke
mike.schmidtke@safmc.net
843-302-8433

Communication and Digital Media Specialist
Nicholas Smillie
Nick.Smillie@safmc.net
843-302- 8443

Staff Accountant
Suzanna Thomas
suzanna.thomas@safmc.net
843-571-4368

Fishery Social Scientist
Christina Wiegand christina.wiegand@safmc.net
843-302-8437

Citizen Science Project Manager
Meg Withers
Meg.withers@safmc.net
843-725-7577

SEDAR

SEDAR Program Manager
Dr. Julie Neer
Julie.neer@safmc.net
843-302-8438

SEDAR Coordinator
Emily Ott Emily.Ott@safmc.net
937-479-6171

SSC Thurs 4/17

Prefix	First	Last	Suffix	Position	Affiliation	Seat
	Trish	Murphey		Chair	NC Division of Marine Fisheries	State Agency
	Jessica	McCawley		Vice-Chair	Florida Fish and Wildlife Conservation Commission	State Agency
	Robert	Beal			Atlantic States Marine Fisheries Commission	ASMFC
Dr.	Carolyn	Belcher			GA DNR Coastal Resources Division	State Agency
	Gary	Borland				Obligatory
	Amy	Dukes			SC DNR Marine Resources Division	State Agency
	Tim	Griner				Obligatory
	Judy	Helmey				Obligatory
	James	Hull	Jr.			Obligatory
	Kerry	Marhefka				At-Large
Lt.	Tom	Pease			Seventh Coast Guard District	USCG
	Charlie	Phillips				At-Large
	Tom	Roller				At-Large
	Robert	Spottswood	Jr.			At-Large
	Andy	Strelcheck			NOAA Fisheries Southeast Region	NOAA Fisheries
	Deirdre	Warner-Kramer			Office of Marine Conservation OES / OMC	U.S. State Department
	TBD	TBD			U.S. Fish and Wildlife Service Representative	USFWS

Attendee Report: April 2025 Scientific and Statistical Committee Meeting

Report Generated:

04/21/2025 07:30 AM EDT

Webinar ID	Actual Start Date/Time
373-010-435	04/15/2025 12:45 PM EDT

Staff Details

Attended	Interest Rating
Yes	Not applicable for staff

Attendee Details

Last Name	First Name
Allen	Shanae
Bianchi	Alan
Brouwer	Myra
Bunting	Matthew
Byrd	Julia
Candelmo	Alli
Cheshire	Rob
DeVictor	Rick
Degan	Jacqui
Dobbs	Jeffrey
Foor	Brandon
Gentry	Lauren
Grimes	Shepherd
Gustafson	Izzy
Hart	Hannah
Howington	Kathleen
Iberle	Allie
Klasnick	01Kelly
Klibansky	Nikolai
Lynch	Julia
MCCLAIR	GENINE
Markwith	Anne
Muffley	Brandon
Murdock	Claire
Murphey	Trish
Neer	Julie
Newman	Thomas
Ott	Emily
Package-Ward	Christina

Peterson	Cassidy
Santiago	Angelo
Schueller	Amy
Sedberry	George
Serchuk	Fred
Seward	McLean
Shertzer	Kyle
Silvas	Rachael
Smart	Tracey
Smillie	Nick
Sterling	Mary
Thomas	Suz
Vara	Mary
Vecchio	Julie
Webb	Greyson
Wiegand	Christina
Williams	Erik
Withers	Meg
Zapf	Daniel
collier	chip
evans	joe
vincent	matthew
Barrows	Katline
Batsavage	Chris
Bolser	Derek
Bristle	William
Coffill-Rivera	Manuel
Elliott	Gracie
Finch	Margaret
Grossman	Jenny
Helies	Frank
MIller	Cole
Mehta	Nikhil
Ragain	Riley
Waldo	Jennifer
Warren	Savannah
Woodstock	Matt

Attendee Report: April 2025 Scientific and Statistical Committee Meeting

Report Generated:

04/21/2025 07:30 AM EDT

Webinar ID	Actual Start Date/Time
373-010-435	04/16/2025 08:02 AM EDT

Staff Details

Attended	Interest Rating
Yes	Not applicable for staff

Attendee Details

Last Name	First Name
Allen	Shanae
Anderson	Kyra
Barile	Peter
Barrows	Katline
Batsavage	Chris
Bianchi	Alan
Bosley	Ella
Brouwer	Myra
Bunting	Matthew
Byrd	Julia
Calay	Shannon
Carmichael	john
Carruthers	Tom
Chagaris	David
Cheshire	Rob
Curtis	Judd
Darden	Tanya
DeVictor	Rick
Degan	Jacqui
Dobbs	Jeffrey
Elliott	Gracie
Foor	Brandon
Frank	Emma
Gartland	Jim
Gentry	Lauren
Gibson-Meehan	Caitlin
Grimes	Shepherd
Grossmann	Jenny
Hadley	John

Harrington	Richard
Hemilright	Dewey
Howington	Kathleen
Iberle	Allie
Iverson	Kim
Klasnick	01Kelly
Klibansky	Nikolai
Lynch	Julia
MCCLAIR	GENINE
Marhefka	00Kerry
Marhefka	Kerry
Marhefka	Kerry
Markwith	Anne
Matter	Vivian
Maxwell	Mathew
McEachron	Luke
Mehta	Nikhil
Mitchell	Luke
Mobley	Matthew
Murphey	Trish
Neer	Julie
Newman	Thomas
Ott	Emily
Package-Ward	Christina
Patel	Vale
Peterson	Cassidy
Ragain	Riley
Reding	Brandon
Rogers	Walt
Santiago	Angelo
Schueller	Amy
Serchuk	Fred
Seward	McLean
Shertzer	Kyle
Shervanick	Kara
Siegfried	Katie
Smart	Tracey
Smillie	Nick
Sterling	Mary
Thomas	Suz
Turley	Brendan
Vara	Mary
Vecchio	Julie
Waldo	Jennifer

Walter	John
Warren	Savannah
Wiegand	Christina
Williams	Travis
Williams	Erik
Withers	Meg
Zapf	Daniel
collier	chip
evans	joe
klibansky	Lara
mallik	logan
vincent	matthew
Bolser	Derek
Bristle	William
Candelmo	Alli
Coffill-Rivera	Manuel
Finch	Margaret
Grossman	Jenny
Gustafson	Izzy
Hart	Hannah
Helies	Frank
MIller	Cole
Muffley	Brandon
Murdock	Claire
Sedberry	George
Silvas	Rachael
Webb	Greyson
Woodstock	Matt

Attendee Report: April 2025 Scientific and Statistical Committee Meeting

Report Generated:

04/21/2025 07:32 AM EDT

Webinar ID	Actual Start Date/Time
373-010-435	04/17/2025 07:41 AM EDT

Staff Details

Attended	Interest Rating
Yes	Not applicable for staff

Attendee Details

Last Name	First Name
Allen	Shanae
Barbieri	Luiz
Barile	Peter
Barrows	Katline
Bianchi	Alan
Brouwer	Myra
Byrd	Julia
Calay	Shannon
Coffill-Rivera	Manuel
Darden	Tanya
DeVictor	Rick
Degan	Jacqui
Dobbs	Jeffrey
Dukes	Amy
Foor	Brandon
GREENE	Karen
Gentry	Lauren
Grimes	Shepherd
Hadley	John
Hart	Hannah
Hemilright	Dewey
Howington	Kathleen
Iberle	Allie
Iverson	Kim
Klasnick	01Kelly
Klibansky	Nikolai
MCCLAIR	GENINE
MIller	Cole
Marhefka	Kerry

Markwith	Anne
Mehta	Nikhil
Muffley	Brandon
Murphey	Trish
Neer	Julie
Newman	Thomas
Ott	Emily
Package-Ward	Christina
Reding	Brandon
Schmidtke	Michael
Schueller	Amy
Serchuk	Fred
Seward	McLean
Shertzer	Kyle
Smillie	Nick
Thomas	Suz
Vara	Mary
Vecchio	Julie
Waldo	Jennifer
Wiegand	Christina
Williams	Erik
Williams	Travis
Zapf	Daniel
collier	chip
evans	joe
klibansky	Lara
o	o
vincent	matthew
Anderson	Kyra
Batsavage	Chris
Beamer	Amelia
Blackwell	Colby
Bolser	Derek
Bosley	Ella
Bristle	William
Bunting	Matthew
Candelmo	Alli
Carmichael	john
Carruthers	Tom
Chagaris	David
Cheshire	Rob
Curtis	Judd
Elliott	Gracie
Finch	Margaret

Frank	Emma
Gartland	Jim
Gibson-Meehan	Caitlin
Grossman	Jenny
Grossmann	Jenny
Gustafson	Izzy
Harrington	Richard
Helies	Frank
Lynch	Julia
Marhefka	00Kerry
Marhefka	Kerry
Matter	Vivian
Maxwell	Mathew
McEachron	Luke
Mitchell	Luke
Mobley	Matthew
Murdock	Claire
Patel	Vale
Peterson	Cassidy
Ragain	Riley
Rogers	Walt
Santiago	Angelo
Sedberry	George
Shervanick	Kara
Siegfried	Katie
Silvas	Rachael
Smart	Tracey
Sterling	Mary
Turley	Brendan
Walter	John
Warren	Savannah
Webb	Greyson
Withers	Meg
Woodstock	Matt
mallik	logan