SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

Webinar

July 27, 2023

<u>Transcript</u>

<u>Scientific and Statistical Committee</u>
Dr. Jeffrey Buckel, Chair   Dr. Chris Dumas
Dr. Frederick Scharf, Vice Chair   Dr. Jared Flowers
Dustin Addis   Dr. Fred Serchuk
Dr. Walter Bubley   Dr. Alexei Sharov
Dr. Jie Cao   Dr. Jennifer Sweeney-Tookes
Dr. Kai Lorenzen   Dr. George Sedberry
Anne Markwith   Dr. Amy Schueller
Dr. Marcel Reichert

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Kathleen Howington   Christina Wiegand
Allie Iberle   Kim Iverson
Dr. Judd Curtis

<u>Attendees and Invited Participants</u>
Rick Devictor   Frank Helies
Shep Grimes   Nikhil Mehta

<u>Observers and Participants</u>

Other observers and participants attached.

The Scientific and Statistical Committee of the South Atlantic Fishery Management Council convened via webinar on July 27, 2023, and was called to order by Dr. Jeff Buckel.

INTRODUCTIONS

DR. BUCKEL: Good morning, everyone, and welcome to the July 2023 South Atlantic Fishery Management Council's Scientific and Statistical Committee webinar. My name is Jeff Buckel, and I will be chairing today's meeting. Along with Vice Chair Fred Scharf, we thank you all for attending and for your time today.

Before we do introductions, a quick update on membership of the SSC. We are excited to have three new members on the SSC, and our new members are Christina Package-Ward, Jason Walsh, and Steve Turner. We will do more formal face-to-face introductions at our meeting in October, and hear more about what those three are bringing to the SSC, but today's meeting is pretty jam-packed, and so we'll save that for October, at our face-to-face meeting.

The new members are replacing Scott Crosson, Anne Lange, and Eric Johnson, and we want to thank Scott, Anne, and Eric for their many years of service to the SSC, and we will send them a letter thanking them for that, and so, Judd, next up, if you want to do voice recognitions, introductions.

DR. CURTIS: Yes, and that will be good. I will pull up the roster that we just had there for audio check-ins.

DR. BUCKEL: Once Judd gets the roster check-in, we'll just start at the top.

DR. CURTIS: Okay. Jeff, go ahead.

DR. BUCKEL: I am not seeing it, Judd, but are others? There it is. Okay. I'm Jeff Buckel, North Carolina State University.

DR. SCHARF: Fred Scharf, UNC-W.

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

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

DR. CAO: Jie Cao, NC State University.

DR. DUMAS: Chris Dumas, UNC Wilmington.

DR. FLOWERS: Jared Flowers, Georgia DNR, Coastal Resources Division.

DR. LORENZEN: Kai Lorenzen, University of Florida.

MS. MARKWITH: Anne Markwith, North Carolina Division of Marine Fisheries, Fisheries Management.

DR. NESSLAGE: Genny Nesslage, University of Maryland Center for Environmental Science, Chesapeake Biological Lab.

MS. PACKAGE-WARD: Christina Package-Ward, NOAA, Southeast Regional Office.

DR. REICHERT: Marcel Reichert, SSC.

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

DR. SEDBERRY: George Sedberry, SSC.

DR. SERCHUK: Fred Serchuk, SSC.

DR. CURTIS: I don't see Alexei yet, and so let's move on to Jennifer.

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

DR. TURNER: Steve Turner, SSC.

MR. WALSH: Jason Walsh, North Carolina Division of Marine Fisheries, Fisheries Economics Program.

DR. BELCHER: Carolyn Belcher, council liaison to the SSC, and also the current council chair.

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

DR. BUCKEL: All right. Great. Thanks, everyone, SSC members and council members, and, Carolyn, you introduced yourself, but I see a few others, like Trish and Kerry, and thanks for attending, and thanks also to the Southeast Fisheries Science Center representatives that are here and that will be presenting today.

All right, and so we'll point everyone to the agenda item, Attachment 1a, and, if folks have any agenda changes, this is the time to make any, and so just hit the hand button if you have anything you want to say there, and, Judd, let me know if no one raises their hand, or let me know if someone does raise their hand.

DR. CURTIS: Will do, Jeff, and we've got myself and Kathleen that will be monitoring the hands raised, and so, just procedurally, for these webinars, for new members, if you've got a question, just raise your hand from the panel, and we'll populate your name on a list over here and then let the chair know that you wish to speak, and then, once you're called upon, you can take the microphone.

Just a couple of agenda items and a revised agenda and overview, and we added a couple of additional items to Other Business, namely the scamp and yellowmouth landings and discards topic, as well as a red grouper operational assessment spatial considerations topic, and so I will address those more when we get to the Other Business section.

DR. BUCKEL: Thanks for pointing those out, Judd. Any other concerns about the agenda? Okay. If there are none, we will consider the agenda approved, and, next, we move on to the Attachment 1b, which are the minutes from our April 2023 SSC meeting. Please raise your hand if you have any edits to the minutes from our last meeting. Judd, any hands?

DR. CURTIS: No hands raised.

DR. BUCKEL: All right, and so, if there are no hands raised, then we can consider our April 2023 SSC meeting minutes approved. All right. I think that brings us to public comment, and so this is a period that, if the public has any general comments, they can provide them now, and, when we get into the specific items on our agenda, there will also be time for the public to comment, and I often forget to do that, and so, if Judd and I forget, our collective brain, then others can remind us, but, the public, if you have something, just raise your hand, and we'll get your comment. Any hands, Judd?

DR. CURTIS: No hands raised from the public.

DR. BUCKEL: All right, and so that takes us into our first Item Number 3 on the agenda, which is the SEDAR 76, the black sea bass operational assessment, and we're going to receive a presentation from Dr. Matt Vincent, and, Matt, it sounds like you're going to drive that one from your computer.

SEDAR 76: BLACK SEA BASS OPERATIONAL ASSESSMENT REVIEW

DR. VINCENT: Yes. Okay, and so the projection request that I got from the SSC was to project using a fixed F for the interim years for the interim years for the average of the last three years of the time series, and then one of the informal requests was to include the landings and discards from 2022, and we've done this, and we'll talk a little bit about that later, and then they recommended using projections using the F 0.1, instead of what was being called Fmax, as had been termed FMSY within the stock assessment report, and we'll talk about some different possibilities for that.

Then the third model specification was to allow F from the discard fleets to remain constant, and we'll have some issues and things that will result if we try to do that, and we'll present some possibilities of what we can do going forward, and then the projection scenarios -- They provided two different projection scenarios, using different recruitment values and different F scenarios. I will note that some of these slides are out of order from what I presented. Just based on practicing it, this made more logical sense to me, when I was doing the practicing.

When I fit to the landings from 2022, I discovered that there were multiple ways in which you could fit to the landings or the discards. You could use the selectivity, the weighted selectivity, of the landings and the discards that we typically use in the projections, and you could try to fit to just the landings, and then the discards would follow along, based on that weighted selectivity, or you could fit to just the discards, and then the landings would be based on that weighted selectivity curve, or you could try to fit both of them at the same time, but it might fit one better than the other or just fit both of them not great.

Then the other possibility was you could try to separate the landings and the discards and have two fishing mortalities that you estimate, one for the pooled landings and one for the pooled discards, and then try to estimate separate fishing mortalities from that, but that would change your selectivity function. Then the third option, or the fifth option really, was to fit to -- Take the selectivity from the assessment for each gear and then estimate the fishing mortality for each fleet, and so we decided that it was probably best to do this option, which results in that red line, where we have a quite high fishing mortality, based on the high landings in the 2022, and so we estimated fishing mortality using selectivity from the stock assessment.

However, as you can see, this is a much higher F than the F current that was from the stock assessment, and F current is the average from the stock assessment of the last three years, using the average from 2019 to 2021, and so this brought about the question of what should be used in those interim last three years, or like what should the last three years that we average over, and so the first option was to use the estimates from the stock assessment, and this would be used in the fishing mortality for 2023 and 2024.

Then the other option was to take the F that's estimated from fitting to the landings in 2022 and then the estimates from the stock assessment in 2020 and 2021 and recalculate a new F current. However, this would then end up having implications on what our selectivity is, and we would have to reweight the selectivity across the gears, using this new F, and then this would have a cascading effect on all of the reference points that we would have calculated, and they wouldn't have been being estimated within the stock assessment, and so, based on this, our decision was that we should probably keep the F current from the stock assessment, using the average from 2019 through 2021, for the interim years of 2023 and 2024, because we didn't want to have changes to the stock status that weren't actually being estimated within the stock assessment.

Then so we would use the F combined across all the fleets from 2022, as our projections in that year, to get the abundance in 2023 and then project forward from there, and so we'll continue on to the next point, and, if you have any comments about that, I think we'll just do a discussion at the end.

The next point that was brought about was, in the assessment, the FMSY was flagged as not being actually an FMSY, which is correct, because, when we use the mean recruitment model, the equilibrium calculations are actually just the same as the yield per recruit, because the recruitment doesn't change with different spawning stock biomass. However, the Fmax is generally the fishing mortality where F yields the maximum total yield, and so this is generally calculated using the yield, the landed yield and the discarded yield, and so that is the curve that's up on the top-right up here, where we have total yield, which wasn't previously calculated within the stock assessment, and so this value of Fmax would actually be the maximum F that we tested in this scenario of three.

However, what we calculated and had termed as MSY was actually what I will start trying to refer to as the maximum landed yield, or we'll call it FMLY, and so this is a much lower value than the Fmax, and this curve is the yield per recruit using just the landed values, and so it does not include the discards, like the yield per recruit at the top does.

In a similar fashion, we had been asked to calculate the F 0.1, and so there are possibly two ways to calculate it, and so, as a refresher of what F 0.1 is, for those who haven't been in a stock

assessment class for quite a while, and so F 0.1 is the fishing mortality where the slope at that value is equal to 10 percent of the slope at the origin, and so we calculate the slope at the origin, which is this line, and then we find the value that has 10 percent, where the slope is 10 percent of the slope at the origin, and, generally, this has been calculated using total removals, and so I will term this the total F 0.1.

In this scenario for black sea bass, the total F 0.1 has a higher fishing mortality than the rate of fishing mortality with the maximum landed yield, and so you actually have higher discards and a lower yield at this fishing mortality, or lower landed yield, I should say, and so the alternative that you could do is calculate the F 0.1 using just the landings, and so we calculated this value from the yield per recruit of just the landings, and, throughout the presentation, I will either refer to it in the graphs as the yield at F 0.1 or just as plain F 0.1, and sorry for there being some difference between the terminology, but, if you just see F 0.1, I am referring to it as just the yield, whereas total F 0.1 will always be referred to as total F 0.1.

As a side note, I would like to note that, for all the previous assessments that have been done in BAM, the calculations for FMSY have been generally determined based on using the landed yield, and so they aren't including the discards in the calculations of the value of MSY, and so you just have the landings that are maximized for the FMSY values, and so, if we were to move to a total F 0.1, this would be a fairly large change from what has been done in previous stock assessments, and so there are three different proxies, since we do not have a stock assessment, or, sorry, and we do have a stock assessment, but we don't have a stock-recruitment relationship, and so we have to come up with an FMSY proxy.

What had been previously called FMSY was -- It seemed like it was being rejected because it was being called an Fmax, the F maximum landed yield, which we see down here on the bottom, and it was suggested that F zero should be used as an alternative proxy, because I think the thinking was that it would be less than the Fmax, or I'm not sure what the reasoning for using the F 0.1, but, depending on which F 0.1 you use, it will have very different distributions of what the fishing mortality is, reference point for that is, and so the question that I have for the SSC, that I will leave to discuss until later, was, if the fishing mortality at maximum landed yield is that of an appropriate proxy, can we use that for management, or should we use one of the F 0.1, and, if so, which F 0.1 should we use?

This has implications on the stock status, and I was sort of thinking that maybe we should discuss this before looking at what the implications of the stock status is, because I don't like making decisions knowing what the answers are, and you should just make your decision based on which is the appropriate value, but I think it's necessary that you see the results of the stock status from the stock assessment for the different reference points.

Moving on to the third specification of the projections, it was -- There was the request to allow F from your discards fleets to remain constant, and so this can be somewhat problematic, because, in the projections we use, we use a single fishing mortality level, using a single selectivity, which is combined across fleets, and then we separate it just into the landings and the discards, just so that we can present those results, but they still use a single F.

If we separate these Fs, this then actually changes the selectivity function that we're using in the projections, and, if you change the selectivity function, then you change the reference points, and

so, in order to show this, I created a Shiny app, which I hope you all were able to play with a little bit, and so I will just skip to the next slide, which shows an example from that Shiny app, where we set the discards, or the landings, at half the level of what the original value was, and the discards remain the same, and so you can see that the landings selectivity function doesn't look like it changes very much, but the discards do have a large change, and it has a large change on our total selectivity function.

Actually, I am going to switch to the actual Shiny app, because the plots are better labeled in this one, and so we can see this black line shows -- This is the original yield per recruit for the landings, and this blue line is what happens when we change the selectivity function, and so we actually have a reduction in our F at maximum landed yield, and I think the same thing occurs for the F of both the F 0.1.

This also has a change on the yield per recruit in our discards and the yield per recruit of the total mortality, and mostly it's a large change in this discards, where it increases much quicker than the original one, and this also has implications on our spawning potential ratio and the equilibrium spawning biomass, but it doesn't have any implications for equilibrium recruits, because we have the mean recruitment model. If we scroll down to this table down at the bottom, you can see that changing the selectivity also has changes on your fishing mortality at maximum landed yield, and the actual values of the landings and the discards, as well as the F 0.1 reference points, in terms of yield and total F 0.1.

Then this table shows a couple of different values, or a couple of different scenarios, for the different multipliers of the landings, and the one thing that I would like to note is that you only get the F at the maximum landed yield -- It only goes above the total F 0.1 when your landings are above a multiplier of I want to say 1.96, or, in other words, if you reduce your discards by half, that's the only time when your F, maximum landed yield, goes above your total F 0.1.

In the current projections, the scenarios, we set the fishing mortality in 2022 to be calculated based on the landings and discards that we have and the abundance from the stock assessment. Then, in 2023 and 2024, we used the average from 2021, or the average from 2019 to 2021, which were taken from the stock assessment. Then we used the weighted selectivity from the stock assessment and set the fishing mortality level, and so we don't actually try to account for that change in the -- Or setting the discards the same, because I'm not quite sure how to deal with that change in the reference points.

In the following slides, in the graphs for the fishing mortality, they vary depending on the title, and think, with F zero, the F is actually is the F maximum landed yield, but the values in the removals, the discards, and the spawning stock biomass levels -- These are all based on the maximum landed yield, whereas, if it's F 0.1, it will be based on that reference point, just for the F, but not for the other three. We can change this, depending on which reference point we end up choosing in the future, and so, without further ado, these are some of the results.

When we fit to the data from the landings and discards in 2022, we have a much higher fishing mortality level in that year than in the previous years, and this is largely due to an increase in the landings, but also a very large amount of discards, and you can see that there is quite a wide spread of that fishing mortality, and it depends on how depleted the stock was, and so, the more depleted the stock was, the higher the fishing mortality has to be in order to pull out these high landings and

high discards that were reported in 2022. Then you can see that we used these lower values from the F current from the stock assessment in 2023 and 2024, and then we assume that management starts in 2025 of zero fishing mortality.

This is the plot for the scenario where we used the yield F 0.1, and I guess -- Yes. These are just to show that we've done some more work on it, and we can do these projections for the F 0.1 and for the total F 0.1, but we will -- I still think it's up in the air which proxy we should use, and then so this will come to my last slide of the five questions that I have, and how to discuss them, or how we should discuss them, and so which methods are appropriate for fitting to the -- Are the methods that we proposed for fitting to the 2022 landings and discards and the choice of the F current from the stock assessment for 2023 appropriate?

Should the maximum landed yield -- Is that an acceptable proxy for FMSY, or which of the F 0.1 would be more suitable, and then it was proposed to use 75 percent of F 0.1. However, generally, we do projections using an ABC control rule, and so, even if we do an F 0.1, I think we can still do a P*, and so I'm not sure if a P* was calculated, and what should it be for black sea bass, and then what landings are -- If we set the F separate from the discards, how do we actually set what that F value is, because you can't really separate an F 0.1 from that.

The only possible thing that I would think that you would be able to do would be to set the landings Fs to zero and then keep the discards at the recent average level. However, this doesn't quite make sense, in my mind, because, if the discard selectivity is based on that minimum size limit, but if you're saying that you're going to have no landings, then you should pretty much set all your discards -- All your landings selectivity should then be set as the discards, and so pretty much you're just using the F from your total -- Well, it should just be the F from both the landings and the discards, and doing that scenario -- After I proposed it, it might not really make sense.

Then, finally, if we are proposing that we can't actually do anything with discards, which I assume that's what the justification for doing a -- For keeping the discards the same as in our projections, and how do we deal with this change in the reference points, if we're trying to separate these landings and discards, and so I will open it up to comments about each of these, and I don't know what the best way to do this is, but I will stop talking.

DR. BUCKEL: All right. Thanks so much, Matt, for the deep dive on this, and I really appreciate all your work that gets into the details on what we were asking for and the potential pitfalls. I think the first thing I want to do is ask the SSC if they have any questions on the presentation, before we get to these questions, and so do folks have any questions on the previous slides?

DR. CURTIS: We've got Kai Lorenzen and then Marcel Reichert.

DR. BUCKEL: Go ahead, Kai.

DR. LORENZEN: Thank you, and thanks, Matt. This is really interesting, and, you know, it's so interesting that it sort of raises almost more questions than it provides answers, but so one thing I wanted to just clarify, and I think you said that, and so, basically, the discards F and selectivity is constant, and so you're varying just the landed F, and so is that correct?

DR. VINCENT: It's a single selectivity function that uses a single F, and, so, if we vary F -- If we decrease F for the landings, the discards also will decrease.

DR. LORENZEN: Okay, and so that is linked, so that you're assuming that if you're landing --

DR. VINCENT: Yes.

DR. LORENZEN: Okay, because, I mean -- That makes sense, though, of course, you could make different assumptions at that stage, and that would influence your results, right, and you could treat the discards as -- If you have people going -- Talking recreational, and, if you have people going fishing and discarding a lot, relatively independent from whether they can keep something, but what they're keeping then -- You know, that relationship would be different, right?

DR. VINCENT: I think so. I guess, if you -- But if you change -- I guess the point I was trying to make is that, if you change your relative amount of your discards to the landings, then you end up having a change in what your reference points will be.

DR. LORENZEN: Yes. Right. Okay. Thank you.

DR. BUCKEL: Thanks, Kai. Marcel.

DR. REICHERT: Thank you, and I just had a clarifying question, and I think maybe what you just said partially answers that, and that's relative to Number 4 on the slide that is currently up, and maybe you can clarify that a little more, because, for some reason, I thought that what you said meant that, for the -- For the landings, your discard mortality would be 100 percent, if you combined them with the discards, and so I'm not sure if my question is clear, but maybe you can clarify what you said under Point 4 here, please.

DR. VINCENT: I think I bungled up my words on that, and I guess what I was trying to say is that, if you set the landings to zero -- Well, so the selectivity is kind of based on the minimum size limit, right, and so discards are anything less than I think it's the sixteen-inch size limit, or whatever it is, but, if we're setting the landings to zero, then I would think that anything that was a landing would now become a discard, in the future, and so you would then -- I would think that your landings selectivity function would then become your discard selectivity function, and so I guess that's what I was trying to say, and so you should pretty much be -- I haven't quite thought it through, but it doesn't -- After proposing this possible scenario, I have kind of thought that it might not make sense, in the projection sense.

DR. REICHERT: Thanks for that clarification. That helps a lot. Thanks.

DR. CURTIS: We've got Steve Turner next with his hand up.

DR. BUCKEL: Go ahead, Steve.

DR. TURNER: Thank you. Does anybody have a feel for how well, or not well, recreational fishers can target black sea bass? If they cannot target black sea bass, and they're mixed with the other species they're catching, then, if you drive landed F to zero, your discard selectivity function will -- Your discards could remain high, unless the selectivity function would differ from the

landings, and so does anybody have a feel for the ability of recreational fishers to target black sea bass, versus the other species they might be targeting?

DR. BUCKEL: Does anyone have an answer to Steve's question, and, if there's some council members that want to chime-in, feel free to do so here.

DR. CURTIS: Jeff, I'm going to call on Mike Schmidtke, who has got, hopefully, a response for us.

DR. BUCKEL: All right. Thanks, Mike.

DR. SCHMIDTKE: Thanks, and I'm trying to pull up the fishery performance report as we speak, but I know it's kind of a general principle within the snapper grouper fishery, and black sea bass is no exception to this, that fishermen generally will, you know, target an area where they may have caught these fish before, and may have, you know, caught a lot of them, but, you know, within a given drop site, there is not any way to distinguish between whether they're going to catch black sea bass on that drop or whether they're going to catch a variety of other bottom species, and so they can target by area, but, in the actual effectiveness of this, often black sea bass are one of a variety of species that are caught on a given site, and, if the other species continue to be open on that site, say vermilion snapper or something of that sort, then fishermen would continue to go to that site, fish that site, and they would be catching, and, you know, in the case where they couldn't keep black sea bass, they would be catching and discarding black sea bass, in that scenario.

DR. BUCKEL: I would agree with that, Mike, that assessment. I guess, Steve, to your point, and to Matt's question, you know, an F of zero -- Where there was an F of zero for landings, where landings equal zero, that discard selectivity would be a combination of the landings selectivity and the discard selectivity, right, because your landings selectivity in the assessment has the minimum size, but, when it's landings equals zero, you're not only going to have those larger fish getting discarded, but you're still going to have the small fish that were being discarded before, and so it's kind of a combination and not just moving all discards to the landings selectivity.

DR. CURTIS: Erik Williams has his hand up.

DR. WILLIAMS: Thank you, Chair, and so, just to add more to the sort of black sea bass fishing sort of characteristics, the other thing to recognize about black sea bass is it's probably our most widely-distributed species, in terms of depth and area. It covers everything from the inshore, where the young-of-the-year occur, all the way out to some of the deepest depths, and they certainly peter off as you get into the deeper waters, but they're still out there, and so recognize that, in terms of targeting, or the opposite, avoidance, they're everywhere, and they're probably one of the most common recreationally-caught species in the snapper grouper complex.

DR. BUCKEL: Thanks, Erik, and so other questions, clarifying questions, about the presentation, before we jump into the questions on the slide? All right. Not hearing any, the first question that Matt has posed to us --

DR. CURTIS: Jeff, if I could interrupt, we've got John Carmichael with his hand raised.

DR. BUCKEL: Go ahead, John. We can't hear you, John, if you're muted. We still can't hear you, or at least I can't.

MS. HOWINGTON: He's adjusting his audio settings. Give him one sec.

DR. BUCKEL: Thank you.

MR. CARMICHAEL: Sorry for that little technical snafu. One way to think about this, maybe, is how does fishing for black sea bass drive overall effort on a trip, if it potentially reduces the length of the trip, or how people fish in general, because, while they can't target very well, you know, between say black sea bass versus vermilion, we have felt that a lot of trips do try to catch a limit of black sea bass and contributes to the high discards of the undersized fish, and we have the disparate commercial and recreational size limits.

The rec guys are cycling through a lot of fish, and it seems to get a bag of keepers, and, if that number of keepers were to change or something, then you may find people potentially shortening their trips, because they've got a limit of the other stuff that they can keep, and so, you know, I think maybe it's more of a question of what's the overall effort and how is that impacted by the regulations the council may choose, which probably is a lot more than the SSC can get into, but it's probably something the council will have to consider.

DR. BUCKEL: Thanks, John, and I was thinking the same thing, that these are bigger issues that we're not going to be able to tackle here, and so thanks for that point. It's hard to know how the behavior is going to change. All right. Judd, any other hands on the clarifying questions or points?

DR. CURTIS: You've got Fred Serchuk.

DR. BUCKEL: Go ahead, Fred.

DR. SERCHUK: I have a procedural question for the committee, and, if we make decisions here with respect to black sea bass, in terms of these alternative reference points, will that have a bearing on any other stocks, or could it have a bearing on any other stocks? My concern is that, you know, we're trying to untangle a number of issues here, which I don't think are black-sea-bass specific, but I don't think this is the right forum, because there are a lot of technical intricacies that go on here that I would hesitate this to be a precedent-setting exercise without having a more rigorous technical review with other stocks of what this means.

I mean, I appreciate all the work that's been done, but my feeling is, when we start talking about maximum landed yield, and we talk about other ways of looking at reference points, it raises a much larger issue, particularly if these issues are not just black-sea-bass specific, and so I'm wondering whether -- If that is the case, whether we need a recommendation for a more thorough technical evaluation of these proposed reference points. Thank you.

DR. BUCKEL: Fred, excellent point, and I agree, and that was kind of what I was getting at before, and there are a lot of issues here that are too big for this webinar, and so that -- Judd and John, that's, I guess, another workgroup that we could consider, and I'm not sure if that is something that council staff is already in discussions about, and I know that council members have

brought up the issue of landings and discards combined, and so if I could just get your comments on that, but I agree that these are issues that will need to be dealt with with a technical workgroup.

DR. CURTIS: Just to address that, we've got a workgroup that will be looking at potentially, you know, total removals, like we saw for scamp and yellowmouth, and that was a request from the council meeting, and certainly we could formulate another workgroup, or make that an objective of this upcoming workgroup, to look at how to change these proxies that Fred alluded to, and so that's -- You know, that's something that, if the SSC wants to make a recommendation to form a technical workgroup to take a more in-depth look at this, they're able to do so. We've got a list of people here too, and I've got Kai, Marcel, and then Erik.

DR. BUCKEL: Go ahead, Kai.

DR. LORENZEN: I agree with everything that has been said, and I think we need to take a closer look, because there are obviously are very, you know, different sensible assumptions that can be made about, you know, how the discard mortality is -- Discarding and discard mortality are sort of impacted by changes in targeting and in regulations, but I am finding it difficult yet to fully grasp the consequences of those for the reference points, and that's why -- So I am very much in favor of having a workgroup, and I think we'll need some additional simulations to explore these things further, but this is a really interesting start, and I think we just should run with it and have a workgroup and look at it carefully. Thanks.

DR. BUCKEL: Thank you, Kai. Was it Marcel that was next or Erik or someone else, Judd, but, whoever was next, go ahead.

DR. CURTIS: Marcel, go ahead.

DR. REICHERT: Thanks. Yes, and I too completely agree, and I just want to clarify what we are discussing are implications for choices for other stock assessments. An additional issue is what the implications are for choices we make to other species, in terms of the ecosystem, which then brings in a whole new slew of issues, but I just want to make sure that what we are talking about here is the implications for other stock assessments, that are more the technical decisions that we are making, or recommending, but I completely agree with Fred and others on this.

DR. BUCKEL: Thanks, Marcel. Then Erik was next, I believe.

DR. WILLIAMS: Thank you, Chair. I understand the desire to sort of step back, because this is potentially a precedent-setting situation, in terms of decisions that need to be made, because these same decisions are likely going to come for other species, and so, just to sort of put this in context of, you know, looking at the history of our assessments in this region and what got us to this point, it's recognize that a lot of our projections were set up with this idea that total effort would be controlled, such that, you know, landings and discards would be reduced in a similar fashion.

We broke that model, you know, probably or four or five years ago, or even longer, and red snapper was the first that we realized that we -- You know, that discards were not going to be an easy thing to manage, and so we were then disconnecting discards and landings.

Add on top of that, you know, the problem we're facing with reduced recruitment in some of these species, and we are now at the point where black sea bass is the poster child for all of the problems that we're now facing with trying to understand how to go forward with projections, in terms of whether discards are going to be reduced at all by management, how that changes the benchmark calculations, how we deal with low recruitment, et cetera, et cetera.

I fully understand the SSC's desire to sort of, you know, address this in a more comprehensive and separate manner, but I do just want to make sure that we put black sea bass into its proper understanding, and that is we're coming to you here because we need answers to these questions in order to provide you with ABCs in October. That is our goal, from the Southeast Science Center, is to get as many of these questions answered so that we can give you a set of projections that, in theory, can be used to set ABC. I am fine with pausing on that for the bigger conversation, but I just want to make sure that you understand that then, by doing so, you might not get the ABC information in October from us.

DR. BUCKEL: Thanks, Erik, for the context, and it was going through the presentation earlier this week and going, well, why is this coming up now, you know, and these are things -- So I appreciate the history and why it's coming up now and it didn't come up earlier, and so that's helpful. I think, unless the council staff or members feel differently, I feel like we want to move forward and answer the questions and get an ABC, and maybe we'll stay with --

Well, we'll see, and maybe we'll be staying with how we've done things in the past, as we move through this, for consistency, and then that workgroup can get together to address some of these issues for the future, or, if the SSC is comfortable with making some changes for black sea bass now, we can do that today, and I don't want to get bogged down in too much of that discussion, because we've got other agenda items to move on to, and so let's do our best to work through the questions, so Matt can produce an ABC, unless I hear differently from SSC member or the council.

DR. CURTIS: I've got Marcel and then Fred Serchuk.

DR. BUCKEL: Go ahead, Marcel.

DR. REICHERT: Sorry, and I just left my hand up.

DR. CURTIS: Fred Serchuk, go ahead, and then we have Carolyn Belcher and John Carmichael.

DR. SERCHUK: I wonder whether there is any utility in trying to apply the proposed either reference points or the proposed terminology to this stock, but at some time back in time, and see what difference it would have made if you started applying these maybe ten years ago, and what implications would have changed regarding the stock productivity or the removals, discards or landings, to those events that we now know happened, based on our evaluation of the resource and the years subsequent to applying this procedure, and would that be a useful way to get some idea of the utility of this approach? Instead of starting with 2022, go back to ten years before that and then apply these approaches and see what difference it would have made. Thank you.

DR. BUCKEL: Fred, are you talking about within like some kind of MSE, right, because we don't know -- If certain things were changed, we don't know how the fishermen would have responded, and so you almost have to have some simulation, and there are -- I guess there was an MSE

presented for black sea bass, if I recall correctly, and so maybe that's a process that could address that question that you have raised, or that approach that you've raised.

DR. SERCHUK: I am just proposing the issue. If we think about maximum landed yield, and we did that approach for MSY, starting ten years ago, what effect would that have had, in terms of differences, in what we have observed?

DR. BUCKEL: Okay.

DR. SERCHUK: Thank you.

DR. BUCKEL: Thanks, Fred. I believe that Carolyn was next. Go ahead, Carolyn.

DR. BELCHER: Hi, Jeff. I do like your idea of kind of moving forward with status quo. I get a little bit concerned when we start talking about -- When the SSC is being asked about an acceptable proxy, especially knowing that you guys are going to be talking about technical guidance relative to proxies and reference points here later in the meeting, and I kind of feel like this might be a little bit ahead of what's coming out with the NS 1 adaptations, and so, I mean, my comfort level says that we should kind of hold back from new approaches until we can talk more about what that guidance document means and where it helps us go in the future.

DR. BUCKEL: Thanks, Carolyn. I appreciate the council's perspective. Erik, I believe you're next.

DR. WILLIAMS: I didn't, unless I still have my hand up. Sorry.

DR. BUCKEL: Okay. All right.

DR. CURTIS: We've got John Carmichael and then Kai Lorenzen.

DR. BUCKEL: John, go ahead.

MR. CARMICHAEL: All right. Thanks, and so, yes, I mean, I think this has been good discussion, and clearly this is a really challenging issue, and there is some new things here for the SSC to think about. On the good side, as Erik mentioned, you know, we are thinking about landings and discards in a more appropriate way, which hopefully gets the council able to better recover some of these stocks that have been resistant, assuming that, you know, recruitment plays along at some point in the future.

You know, I guess, in thinking of an ABC, it seems that it may be hard for the SSC to give a single ABC, given how discards and landings ratios and then reference points are all interconnected, because, you know, as we sort of see, what your F maximum landed yield is and what your yield of the fishery is going to be, et cetera, are kind of tied to potential management actions, which may affect that landings-discard ratio, and we don't know what those are going to be, going forward into the future.

You know, we're going to need, within an FMP, actions and alternatives which are going to require, you know, different scenarios, based on what the council does, and so it could be a

situation where there's a lot of if-then's going on, and maybe requiring certainly more analysis than we're accustomed to when it comes to crafting projections and that sort of thing and getting the information into the record that the council is going to choose from. I mean, I think maybe we need to go into it with that understanding, and it's not going to be as straightforward as it has been in the past, and we may need some conditional ABCs, or something along those lines, because we don't know what the council may do for the future.

DR. BUCKEL: Thanks, John. Conditional ABC, what are you thinking there, the specifics on that, just to --

MR. CARMICHAEL: Maybe something that addresses the extent to which the council can effectively reduce discards, because I think that's going to be key in what the F levels are and what the ABCs are.

DR. BUCKEL: All right. Thanks for that clarification and the comment. Okay.

DR. CURTIS: We've got Kai Lorenzen.

DR. BUCKEL: Go ahead, Kai.

DR. LORENZEN: I am thinking it would be good to not kick the can too far down the road, but maybe, you know, not shoot for having those projections, you know, based on a few decisions that we make now, sort of off the cuff, and I would suggest maybe if we could get some additional analyses here under, you know, different assumptions about how the discard F and selectivity and the landed F are related, and that would give us a better idea of, I think, how to make these decisions for the October meeting, and then we could look at -- We can have a more -- A bit more of a discussion about this, and I feel very rushed right now, sort of digesting this information and understanding really what the implications are of decisions that we would make with respect to these questions, and so I would advocate for getting some additional simulations for the October meeting and then having the ABC -- Then asking for projections and dealing with the ABC at the spring meeting next year.

DR. BUCKEL: Thanks, Kai. How do others feel about that approach? I like that, and I think, even before the October meeting, that workgroup could meet and potentially help identify, and hopefully the Southeast Fisheries Science Center staff could be part of that workgroup, and then that could -- You know, there could be more projections than what we discuss here that might come up from that workgroup. Marcel.

DR. REICHERT: I support that, but can someone remind me of the timeline for black sea bass? Where are we, in terms of when do we need to provide -- When does the council need to make a decision, because this means that we move now certain decisions to October, which means -- I am just concerned that this will -- This will take us further than perhaps we have to, or need to. Anyone?

DR. BUCKEL: Go ahead, Mike Schmidtke.

DR. SCHMIDTKE: I will try to address that, and I may need some help from other council staff, but, I mean, at this point, the council hasn't gotten any notification of status or anything like that,

and there hasn't been a clock set on the council, in terms of a response time at this stage, and I think some of that is dependent on the decisions that the SSC makes regarding, you know, the stock assessment and regarding, you know -- I mean, we're talking about reference points still at this stage, and so there's going to be some discussion from the SSC, and that may affect the timing of when any letter would potentially come regarding, you know, an overfished status and a rebuilding plan and things of that nature, but the council has not received that, and so any two-year clock has not started ticking, to this point.

There is, you know, just kind of in the back of my mind at least, there is some concern, depending on how long this takes, of, you know, bumping into a yellowtail snapper scenario, where, depending on how long these discussions go on, and how long the council, you know, has with their process to put management in place, and do the results of the assessment become stale, and so there's a bit of a balancing act, but we're not on a direct clock at this point.

DR. BUCKEL: Marcel.

DR. REICHERT: Thank you for that. That's very helpful, and, you know, it does point to the implications of the length of the stock assessment process, and that includes our SSC review, and so, you know, there's no clock ticking, except for maybe the population, but thanks for that clarification, and I'm still in support of the recommendation, or the suggestions, that folks had earlier, and so thanks.

DR. BUCKEL: Marcel, that's a good point about the population, right, and we've got this low recruitment, and protecting some spawning stock biomass to get a good recruitment and having something get in on the management, sooner than later, is important for the population, irregardless of, you know, what letters the council will get. Go ahead, Chris.

DR. DUMAS: Circling back to John Carmichael's comment about black sea bass -- About fishermen behavior and how the fishermen respond to this and how are they choosing their fishing sites and how do black sea bass landings, versus discards, interact with that, it seems to me that it might be useful to look at the correlations between black sea bass landings and other snapper grouper species that are caught together with black sea bass, look at those correlations, because it seems to me, if something came up that we wanted to reduce black sea bass landings, we could say, okay, fishermen, you know, we've got to reduce black sea bass landings, but, if I'm a fisherman, I think, okay, if there's a spot where I normally fish where I catch a lot of sea bass, black sea bass, and nothing else, well, then I will avoid that spot, and so any discards that were associated with that spot we would assume would not happen, because fishermen would not go there.

Then, if there was another spot, where the fishermen were catching some black sea bass, but they were also catching a whole lot of another highly-valued snapper grouper species, as a fisherman, I would think to myself, well, yes, I'm trying to avoid black sea bass, but screw it, and I'm going to go fish there anyway, because there are these other fish there that I catch often, and the season is open for them, and so I'm going to go after them, and, yes, I might catch some black sea bass by accident, and I will just have to discard those, and so, if there's any place where black sea bass and the other species are highly correlated, and the highly-desirable species are highly correlated, then fishermen we might assume would continue to go there, and so discards associated with that would continue.

Actually, discards would be larger, because they would be discarding both the black sea bass that they would have discarded anyway previously, but, also, they would be discarding the black sea bass that they would have landed there previously, and then the third possibility is a location where, you know, black sea bass are highly correlated with catch of some other species, but the season for the other species is closed, and so the fishermen don't go there, or the other species that are caught are not highly valued to the fishermen, and so they think, okay, I won't go there, because, yes, I'm giving up on catching some stuff, but I really don't like that stuff anyway, and so I will avoid that, to help the black sea bass.

My point is looking at correlations between landings of black sea bass and landings of other species might help us figure out -- You know, assess what the fishermen would do and how that would affect discards on some level, and, if we also had that information by location, the correlations between black sea bass and catches of other species, if we had those correlations by location, or by area, that would help us maybe estimate even better, and that's all. Thanks.

DR. BUCKEL: Thank you, Chris. I was taking notes, and I forget to mention, to all SSC members, please take notes, so that, when -- Judd is taking notes, but we'll flesh those out for the report from this meeting. Okay, and so it sounds like there was support for having a workgroup meet to talk about some of the technical issues on these projections and dealing with landings and discards, and then further projections would be brought to the October meeting, and I guess there's a potential that we could -- At the October, that would be the ideal situation, so we don't delay things, is being able to have an ABC at that meeting, and, Kai, I know you mentioned maybe the spring, but if we could get that workgroup to meet, and the Center has the time to produce some other projections that come out of that workgroup, then potentially we would be able to deal with that in the October -- Not only examine them, but potentially set an ABC in October. Go ahead, Kai.

DR. LORENZEN: I think, you know, if we can accomplish that, and maybe, yes, if this needs some work, but I feel that we're not ready at this stage, but, if we have a workgroup, we may be able to, you know, get further down the line in September and have projections for October, and so I am not insisting on kicking the can down the road, but I just thought that maybe we would have -- But, if we can do it beforehand, I'm all for it.

DR. BUCKEL: Great, and I know the Spanish mackerel workgroup got together, including Center staff, and were able to get some things together quickly, and so hopefully this workgroup could as well, and so I guess that's a question to Erik, in terms of workload, and is this is a possibility, if there's some other projections, or approaches, to deal with the discards and landings in these projections, and is that something that Matt would have time to be in meetings with that workgroup before October?

DR. WILLIAMS: Yes, and thanks, Jeff. Yes, I think we can probably accommodate that. I think we're fortunate that we can accommodate that, and I just will say that, just given the way the SEDAR schedule is, but we'll roll with it. I do -- I am just trying to think if there's any decisions that would help us now, before we actually -- Before that workgroup meets, but I don't know, and it probably is best that the workgroup just dive into this and we try to chip away at some of the decision points that have to be made in order to whittle this down to an ABC projection, and probably not a single -- As John Carmichael was suggesting, and I think he's right, we're probably

going to be looking at a range of options that then will have to be considered, because I don't see how we're going to get to a single best projection analysis that's going to give us that one set of ABC numbers at this point.

DR. BUCKEL: All right. Thanks, Erik, and thanks for Matt's time on this, and so, unless I hear from other SSC members, this will -- These technical issues, dealing with the projections, to get an ABC for black sea bass, we'll have a workgroup get together and come up with a plan of attack, answering these questions, so Matt can move forward and then have potentially the same projections, if that's what the group agrees on, or maybe new projections, depending on what comes out of that workgroup, that we can then consider in October to hopefully set the ABC.

DR. WILLIAMS: Jeff, sorry to jump in, and, you know, another option, in case we can't decide the final ABC in October, is we might get enough feedback and additional decision points at that point that then it would require maybe minimal follow-up, and we could do something like a webinar after that, and I'm hoping not to impose on the SSC too much, but then a sort of final ABC could be stamped at a later meeting, hopefully in quick order.

DR. BUCKEL: Yes, and that's a great point, and I was thinking of April, but it could be to set an OFL or ABC either in an October or a January webinar, and, Judd, if you want to -- Thanks, Erik. Good suggestion. John Carmichael.

MR. CARMICHAEL: Thanks, Jeff, and, just to put this out there, and maybe hear back some from Erik, perhaps, but I'm just wondering if it might be useful, in October, to have kind of a baseline and say, you know, what is the FMSY, given the conditions of the last three to five years, you know, the landings and discards as they occurred, to give a starting point from which we start to consider how the future may look as landings and discards are potentially changed.

Then, at least, from that, you could say, you know, if nothing else were done, then this is sort of where you end up, which I think we have, to some extent, within the model, but it might be helpful to just say, okay, here's what FMSY looks like, just in the terminal years of the assessment, and we know we've got to do something different going forward, but I feel like, as we get into what that something different looks like, we'll probably need a baseline like that for comparison in the FMP.

DR. WILLIAMS: Yes, and good suggestion, John.

DR. BUCKEL: Judd, did you catch that recommendation from John Carmichael about the baseline?

MR. CARMICHAEL: I am guessing the stock probably doesn't rebuild, given recent recruitment and what's been going on in the fishery under such scenarios, which then gives us more support for the fact that we're going to have to look into this deeper and make some pretty significant changes.

DR. BUCKEL: All right. Thanks, John. Okay. Any other -- Judd, anything else to address on this agenda item today? I know there's plenty to address by this workgroup and in October.

DR. CURTIS: No, I think we're set then, if the guidance is to form this technical workgroup to, you know, evaluate the approach and answer some of these questions that Matt has provided. I will get that going, and I guess we would need to get membership for that workgroup, and so why don't we tackle that in Other Business, to give people a chance to kind of think about if they want to volunteer for this workgroup, and then also a chance to hear some of the other presentations, like the NS 1 tech memo discussion that might help frame some of these questions and the workgroup load, and so start thinking about your time and other commitments and if you would be able to volunteer for this workgroup, and we'll solicit membership in extra business, Other Business.

DR. BUCKEL: All right. Thanks, Judd, and so the next item is the Atlantic scamp operational assessment, and, Judd, remind me of the time, and I know we've got the greater amberjack, and is that on a -- Is that at 11:00?

MR. CURTIS: Yes, and I was just discussing with Mark Albins, and I told him to deliver at 11:00, and so if we could have a hard stop there for him to deliver his presentation.

DR. BUCKEL: Okay. Let's go ahead and -- I was just debating whether we do a biological break now or after scamp, and so let's -- Marcel.

DR. REICHERT: I was going to ask for a quick break, but you just addressed that, and the other thing is, as a reminder, do we need public comment on the black sea bass, before we move on?

DR. BUCKEL: Thanks for the reminder on the public comment. Judd, do we have any public comment? It's on the agenda, and so, members of the public that are on the webinar, please raise your hand if you have any comments on the black sea bass discussion.

DR. CURTIS: No hands raised from the public.

DR. BUCKEL: Okay. Well, Marcel, you brought up the biological break, and I brought it up, and so let's just go ahead and do a quick five-minute break right now, and then we'll rejoin and do scamp. That way, we will be ready at 11:00, and we can go to amberjack, and so come back on 10:25. Thank you.

(Whereupon, a recess was taken.)

DR. BUCKEL: Okay. Judd, let's go ahead and get started. I've got 10:25, and I believe that Erick is giving this presentation, and is that right, Erik?

DR. WILLIAMS: Yes. That will be me.

DR. BUCKEL: Thank you.

SCAMP/YELLOWMOUTH GROUPER OPERATIONAL ASSESSMENT

DR. WILLIAMS: I will just dive in, because I know you guys are short for time, and so let's whip through this, and so this is a follow-up to a request for some additional analyses for scamp and yellowmouth. The specific request was that we do an additional projection with F at F 40 percent

SPR, using the long-term average recruitment, but this does hit on a broader topic, much like we just had with black sea bass, where, in some ways, scamp is also precedent-setting in some decisions, and so, you know, we're in a new realm, where now projection analyses have gotten more complicated than I've seen in my whole career.

The first topic is just this quick projection analysis, and this -- What we did here is we ran a projection analysis with the same methods that were documented in the assessment report, and the exception is we put in a new fishing rate, using F 40 percent, and it starts in 2025 instead of 2024, and it uses the long-term average recruitment, which would resume in 2023, and just a reminder that, in these scenarios for scamp, which is unique, that landings and dead discards are combined, and that was because the dead discards are pretty small for scamp.

Here is the information, and there's also report in your briefing book that has these numbers as well, and so I'm not going to go into detail on that, and I think this is mostly provided to fill in a box, but this does bring up a broader topic that I did want to just touch on, and I think it's an important one, and I think it's issues related to sort of non-stationarity in recruitment, which is also a topic for black sea bass and some other species.

Rebuilding depends critically on our assumptions about future recruitment, and long-term forecasts of recruitment are unreliable, because we can't know the future. Additional uncertainty, for species showing this low recruitment in recent years, such as scamp, the science can't really tell us when, how, or even if that recruitment will return to what was the long-term average that we've seen over the history for the stock. However, we do have a legal obligation to specify sort of a Tmin and a Tmax. Right now, the IPT for scamp is using a Tmin of five years and a Tmax of ten years, based on NS 1 Guidelines and projections with F equals zero and long-term average recruitment. This would be consistent with the idea that we are not declaring a regime shift at this point.

In terms of ABC, the SSC recommended that ABC be based on the forecast with 75 percent of F 40 percent SPR, and using the recent average recruitment, which is lower than the long-term average, and this follows the SSC protocol for short-term catch advice, the projection methods working group, et cetera, and this makes scientifically-sound sense, given what we know about autocorrelation and recruitment. Recent recruitment is believed to be a better predictor of short-term future recruitment.

The question then is what should OFL be, and should OFL be based on the long-term average recruitment? This would be consistent with not declaring a regime shift, and it results in a large buffer between OFL and ABC, if ABC is based on recent recruitment, as it should be, as we just discussed, or should OFL be based on recent average recruitment, and this is different from declaring a regime shift, or is it, is the question, and does a large buffer between OFL and ABC even matter in this case? In other words, if ABC is set correctly, and ABC is the more important metric for management, then OFL is just sort of a fill-in-the-box sort of thing that we're asked to do.

Another topic that has been coming up, at least in the literature and in discussions outside of this SSC, and so we're interested in the SSC's feedback potentially on this topic, is whether we should we move to something like a dynamic B zero, or a moving window, or some other non-equilibrium approach to setting the biomass benchmarks, or the other option is we just altogether avoid any

declaration of stock status in cases on non-stationarity, and so, basically, we would say stock status is unknown, because there is too much uncertainty, or too much non-stationarity.

This would avoid the declaration of rebuilding plans, and we wouldn't have to worry about Tmin and Tmax, but we can still estimate F benchmarks and fishing status, and, as I mentioned earlier, fishery management more or less focuses on controlling F anyways, and so that's sort of an idea here.

You know, we might not know what stock biomass is at F 40 percent, but, if we -- No matter which one we go with, we would achieve rebuilding, under whatever declaration of, you know, sort of the long-term recruitment level is, and this is just an example of, if we made various assumptions about what the long-term recruitment is going to look like, the stock would still rebuild.

Our proposal, at this point, is to compute Tmin and Tmax based on the long-term average recruitment or evidence-supported regime shift R, and ABC based on short-term projections, not to exceed five years, and using the most plausible recruitment, in this case recent recruitment, and use F adjusted for buffer, based on scientific uncertainty.

The question is what do we do for OFL, and, as I mentioned, there's two options here potentially, which is use the same recruitment assumption that was used in the ABCs or use the same recruitment assumption that was used in the rebuilding timeframe projections, and this is where we're sort of caught, and I don't know which one is either legally correct, or which one is appropriate, but, as we said, functionally, it almost doesn't really matter, in terms of management and what the course of action is for the stock.

This is just sort of a couple -- Some things to think about. I mean, rebuilding is ultimately governed by two primary processes, recruitment and fishing mortality, and one way to think of this is recruitment is largely up to nature, and fishing mortality is largely up to management.

When we say there's no regime shift, we're assuming, essentially, that R will eventually recover that long-term average, and we don't know how quickly, and we don't know when, or if, but, by assuming no regime shift, we are assuming that it will eventually. Absent any regime-shift evidence, this is sort of our best default assumption.

If R does not rebound, F, and the ABC associated with it, is still our primary process for recovery, and then I have another note here about risk, and this is mostly, if we start to think about sort of dynamic B zero, or sort of declaring regime shifts, one thing we need to be careful of is there is a potential risk that, if you're declaring one of these situations, you're sort of locking -- You're potentially locking the population into this low biomass level, and, if recruitment does -- If it is closely related to spawning stock biomass, particularly at low levels, which is when we tend to think that these stock-recruit relationships are the strongest, is when you're at really low spawning stock sizes, there's a slight risk that you may be locking that population into that low level and it will never get out of there, despite the environment possibly being favorable for it to get out of that sort of low level, but that's -- You know, it's an unquantifiable risk, but I don't think that it can be ignored. I think that was all I had, and so hopefully that was quick enough.

DR. BUCKEL: Thanks, Erik. Judd, do you want to deal with -- I think there's another presentation, and do we want to deal with this agenda item now? If you could pull up the --

DR. CURTIS: Both of these two topics, Jeff, are all wrapped into this one presentation, and so our task, the last of action items, is then to determine the OFL and then any discussion on the non-stationarity topics, and the discussion that Erik just presented as well.

DR. BUCKEL: Okay. I was looking at the old PowerPoints, where there were two. Okay. Got it, and so if you could pull up the overview and the action items. The first question -- Well, they're related, but Erik had the two options for OFL, right, and we filled in the ABC, based on the recent recruitment, at our last meeting, and we requested these new projections for the OFL, and we requested the long-term average recruitment for those, and so Erik gave those as two different options, either the OFL with the recent recruitment or the OFL with the long-term, and the reason we went with the long-term is that's the workgroup's recommendation, projections workgroup, and so do any SSC members have comments?

Do you want to stay with what our recommendation was from prior meetings in the workgroup or discuss doing something different for OFL?

DR. CURTIS: Just to orient the SSC to the table, the scamp catch level recommendations, the ABC recommendations, down below are based on that recent recruitment regime, and then the OFL recommendations there -- That would be the long-term average OFL recommendations, and those numbers have not been decided yet, but, preliminarily, I have filled them in in red.

DR. BUCKEL: How about a workgroup member, our chair, and, Amy, I think you were the chair of that one, but, Marcel, going ahead.

DR. REICHERT: I wasn't a workgroup member, but I just wanted to kind of start this off, and I understand the -- I remember the conversation we had about the working group recommendations, on the other hand, this is a species -- If anyone can, please remind me of kind of the generation time or the maximum age, but this is a species where we've seen, if I remember correctly, the relatively long-term very low relative population size, and that makes me a little worried about doing anything but looking at recent recruitment, just to start the conversation.

DR. BUCKEL: Thanks, Marcel. Fred Serchuk.

DR. SERCHUK: I tend to agree with Marcel, and the only way you can build, really, on a sustained basis, is to improve recruitment, and, if recruitment remains low, your chances of not rebuilding are increased, and, if you don't rebuild, it's no problem either, in a sense, and I've seen a number of management plans where the expected rebuilding time was not met, and so they extended another ten years, and typically that happens not because the council is lazy, or not because the council, or the scientists, are wrong, but nature didn't help out.

When nature doesn't provide sufficient recruitment to get stock rebuilding, there is nothing you can do, other than to try to, to the extent possible, hope that recruitment improves, but my feeling is we're in a period now, particularly with climate change, that what we might have seen in the long-term is no longer going to be applicable in the future, and, to that extent, I would focus more on using recent recruitments, if they have differed very much from the long-term, as the starting block for any stock recovery or for any actions that would relate to catches. To do otherwise I think is to not have a full appreciation that there are dynamic changes going on in the environment,

and that, if recruitment stays low, there is very little you can do, in terms of rebuilding to some long-term stock size. Thank you.

DR. BUCKEL: Thanks, Fred. Genny.

DR. NESSLAGE: Thanks, Jeff. I would agree with Fred if I thought that there was adequate evidence for a regime shift in this stock. As of yet, I have -- Well, I wasn't at the spring meeting, but I haven't seen evidence that this has actually occurred enough to convince me, and I think that -- I understand that that may be coming, but, at this point, I haven't seen it, and, therefore, our group's recommendation was that, if you don't think that it can rebuild to its previous recruitment, then you're declaring a regime shift.

If we're not declaring a regime shift, we need to stick with the traditional methods for calculating the OFL. If we think a regime shift has occurred, then, yes, we would use a different recruitment, and a different possibly, you know, generation time, et cetera, but we haven't made that declaration, to the best of my knowledge, unless I missed it, because I missed the spring meeting, and so I think it would be -- I think we're justified in sticking with our traditional method for calculating the OFL. That doesn't mean that, should we determine, based on stronger evidence, that a regime shift has occurred, that we wouldn't change that recommendation in the future, how we would calculate the OFL in the future.

I would also suggest that, yes, we've seen recruitment failure in a number of our stocks, and the evidence seems to be building, but we've also seen unprecedented increase in effort, coastal population increase, and, if MRIP is to be believed, an increase in coastal fishing effort. If that is all true, then this could also be contributed to fishing, and so I'm not quite ready to make that jump yet, and, therefore, I suggest that we stick with the workgroup's recommendations. Thank you.

DR. BUCKEL: Thanks, Genny. Wally.

DR. BUBLEY: I would agree. I mean, based on what the workgroup was saying, if there's no definitive evidence of regime shift, taking that action would be going against the recommendations that we've had already, but, as Erik pointed out as well, any of the catch level recommendations are coming from the short-term average anyways, and so the overfishing limit is -- Yes, it could technically change, but they're managing to the ABCs instead, and so it might not make a difference, in terms of the actual management strategies taken to rebuild the stock.

DR. BUCKEL: Thanks, Wally. Amy.

DR. SCHUELLER: I agree with Genny and Wally's comments here. You know, we've set up a rubric for scoring whether or not we believe a regime shift could be occurring, and this was scored, and it didn't score high enough to merit that a regime shift may be occurring, and I agree with Genny, and I don't think there is sufficient evidence to make that statement yet, and so I think that we should maintain with what we've been doing and what the workgroup has recommended. I mean, if there is a regime shift, the only control we really have is on fishing mortality rate, and so we have to do something, and so that's what we're doing. Anyway, I agree with Genny and Wally on this.

DR. CURTIS: Jeff, if I may, at the council's request -- There's a lot of interest in this, the concept of this regime shift, and so they requested that a workgroup would be formed to look more in-depth at this concept and take into account other literature, other than that Klaer et al. paper that has been used to quantify whether, or qualify whether, a regime shift is occurring, but, as of now, that's the only piece of evidence that we have that a regime shift has not occurred, and that was reviewed as part of this assessment, and so that will -- The population of that workgroup is something that I will bring up later, under Other Business as well.

DR. BUCKEL: Thanks, Judd. Yes, and I agree with Genny and Amy and Wally, and that's the record that we've -- The last several meetings, that's the record that we've had on this, that we're sticking with the workgroup, and so I agree with continuing on that path, and, Wally, thanks for the point about the ABC. That's what is going to be used for management, and that issue is in the recent low recruitment, to Marcel and Fred's points. Marcel, did you have another point, or is your hand raised from before?

DR. REICHERT: You just mentioned, and maybe I missed that, or maybe I misinterpreted what you just said, but, for the ABC Control Rule -- I thought you said, for the ABC Control Rule, we are using recent recruitment.

DR. BUCKEL: For the ABC level, yes, we're using recent recruitment.

DR. REICHERT: Okay. I'm sorry, and it may be me, and I'm a little confused, because we just concluded that we should use long-term recruitment, or am I confusing different things?

DR. BUCKEL: The ABC is being calculated with recent scamp recruitment, and the OFL is being calculated with the long-term average recruitment.

DR. REICHERT: Okay. Thanks for clarifying that. Okay. That was just me, and maybe I need my next cup of coffee first, but I do want to mention that, if you look at the population size, or the fishery-independent information from the stock assessment, the population size has been under the long-term average since 2006 to 2008, and so that's for the last fifteen to seventeen years, but, anyway, I just wanted to mention that, but thanks for that clarification, Jeff, and I will have my sip of coffee now.

DR. BUCKEL: Thanks, Marcel. Erik Williams.

DR. WILLIAMS: Thanks, Jeff. Just to add to this conversation, I mean, I think, right now, the choice of, you know, regime shift or no regime shift, in some sense, doesn't affect our ABC yet, and that's partly because we don't have a management system in place where the P*, or some mechanism, kicks in as the stock gets to really low levels that you start being more precautionary with your management, and so recognize that, in some sense, we're missing that from our region, and other regions have some of those rules in place, and, because we don't have that, sort of declaring whether a regime shift occurred or not doesn't, in the end, have any functional effect on the management, but, if we did have such a rule, then it would have a tremendous bearing, probably, depending on if we had one of those sort of ramping-down control rules that, you know, caused ABC to decrease as you get to really low stock sizes.

DR. BUCKEL: Thanks, Erik. Yes, and I think it's an important point, right, that we're still allowing harvest in a situation where recruitment is low, and that -- For this species, it's one that there is not a lot of targeting, right, and it's on that gets caught when folks are targeting other snapper grouper species, and so that's, I guess, just another point to the council, when we're talking about this reduction in effort, that that would go along for the ride, to reduce -- If we get that effort reduced, then that would -- These would -- You know, as they're getting caught, when folks are targeting other things, that would be reduced. Okay, and so it sounds like we've got a plan for moving forward. Alexei, I see you have your hand raised.

DR. SHAROV: I joined the conversation a bit late, because I had a competing meeting, but I am a little bit confused here, and so I understand that, okay, ABCs will be calculated using short-term projections, where we're using the logic that the recruitment in the projected years should be close to, similar to, the recent level of recruitment, however we define it in terms of length. Okay, and so these projections essentially, you know, generate a trend of the population biomass, or spawning biomass, into the future, given the, you know, fishing mortality rates that we put in there, against a target fishing mortality rate.

Then there is a discussion that OFL actually would have to be calculated using long-term recruitment, and, therefore, we're essentially saying, all right, for the short-term, we think that the population dynamics will look like this, but then, actually, to calculate the maximum limit that could be taken, we ignore this, and we assume that, actually, the recruitment could have been equal to the long-term, and, therefore, we could have taken that much, and so we essentially are generating an additional buffer between the ABC and OFL, which is just simply based on the different assumptions on the size of recruitment, but it has nothing to do with the P*.

Certainly -- I mean, the result of this generates sort of an additional buffer, which is, I guess, precautionary, but is this how you wanted it to be, or at least do we understand what we're doing here? I am just thinking out loud, and is that how we, you know, picture this process? Thank you, and if somebody could clarify.

DR. BUCKEL: Thanks, Alexei, and I think we've had this discussion before, and I will let one of the workgroup members answer that one, on the thinking about the buffer in this scenario. Amy, I believe you were the chair, if you don't mind taking this one, or if another member wants to.

DR. SCHUELLER: I mean, I'm not sure exactly what to say to that. I mean, yes, this does create a little bit of difference there, but the workgroup recognized that that was true, and, when we presented it to the SSC, I think that everybody was onboard with that, knowing that basically this does create an additional buffer, and I think people are okay with that, given that, if we do expect recruitment to be less, than we probably should be protecting the spawning stock biomass even more. Anyone else on the workgroup can go ahead and speak as well.

DR. BUCKEL: Thanks, Amy. Go ahead, Genny.

DR. NESSLAGE: Thanks. I think the answer is, yes, the SSC -- The whole reason that that workgroup was formed was because the SSC kept requesting ABCs with short-term R-based projections, and everyone wanted more of a buffer than our regular P* approach would have created, and so I think the answer to Alexei's question is wholeheartedly yes.

DR. BUCKEL: All right. Thanks, Amy and Genny, and so Judd has got some text up there, and I will give everyone a chance to read that, and we've got about five minutes before we get our amberjack presentation, and so we can add to this language, and so take a minute to read what Judd has there, and then raise your hand if you have any edits. Amy.

DR. SCHUELLER: In that statement, it says "and ignores the P* approach", and I don't know that I understand what that means.

DR. BUCKEL: I noticed that too, and "and adds additional buffer than the P*", maybe, or "creates additional buffer that is larger", maybe. How is that, Amy?

DR. SCHUELLER: Yes, that's better. I mean, I think the point is it gives a larger buffer than the P* approach alone, and it doesn't ignore the approach, and it just supplements it, I guess.

DR. BUCKEL: Yes.

DR. SCHUELLER: Thank you.

DR. BUCKEL: Thanks, Amy. Erik Williams and then Mike Schmidtke.

DR. WILLIAMS: Actually, Amy just covered it, and that's exactly what I was going to raise too, and so thanks, Amy.

DR. BUCKEL: Mike.

DR. SCHMIDTKE: Just a brief point, and I wanted to kind of frame in the context of where OFL comes into, or can come into management. The place where that would come in is kind of in between assessments. If a fishery is going over its overfishing limit, then the National Marine Fisheries Service can declare overfishing in between stock assessments. It can declare it as a result of a stock assessment, but also in between assessments, if there is regular exceedance of the OFL, and so that's a place where there is some interplay between management and OFL, but, yes, in terms of setting catch limits, catch limits are based on the ABC.

DR. BUCKEL: Thanks, Mike, and, if those ABCs are exceeded, there is accountability measures that come into play, right, and so it doesn't have to wait until it goes over the OFL for some accountability.

DR. SCHMIDTKE: John may be able to answer that better than I can, but, yes, accountability measures within a plan can vary between species and, you know, between plans, but there also is, you know, the overfishing declaration that we would get from the service that would require a response by the council to end overfishing immediately.

DR. BUCKEL: Thanks, Mike. Go ahead, John, and then Shep.

MR. CARMICHAEL: I was going to bring that up on the ACLs. I mean, it looks like, in most cases, our ACLs are tied to -- Or our accountability measures are tied to the ACL, and so there can be closures, and, certainly in the deepwater complex, as it is now, there can be closures if commercial or recreational exceeds the ACLs, and then there's the potential for payback, in some

cases, and so, in dealing with a new amendment, the council has to think about all of this, but I think the important thing is, you know, if there are seasons, and they can be closed, that's tied to the ACL and not the OFL, and so there could be consequences to future harvest for exceeding the ACLs, which, to me, is pretty important, in terms of, you know, keeping the stock on a rebuilding timeframe, and then, of course, the OFL, as mentioned, does come into the overfishing determination, and exceeding that a lot could bring some other consequences.

DR. BUCKEL: Thanks, John. Shep.

MR. GRIMES: Thank you. I was looking at the accountability measures, and I was going to mention that I could change. Being in an overfished status can change the accountability measures, what's done under the accountability measures, but not overfishing, and so I guess the OFL then really doesn't translate to different accountability measures. Thank you.

DR. BUCKEL: Thanks, Shep. Okay. We are at 11:00, and I don't see any hands raised, and so we'll move on from this agenda item to the next agenda item, and do we have Mark and the amberjack team? Mark, if you're talking, we don't hear you.

DR. CURTIS: Jeff, I don't see him online right now, but he was made aware to start presenting at 11:00.

DR. BUCKEL: He's Central Time, and I wonder if he is -- Is there anybody else from the team?

DR. CURTIS: You're part of the team, aren't you, Jeff? Why I don't recommend that we take another five-minute break, and let me give him a call and try to get him on the line.

DR. BUCKEL: All right. Thanks, Judd. If everyone could be back here at 11:06. Thank you.

(Whereupon, a recess was taken)

DR. BUCKEL: All right. I have 11:06. Judd, were you able to get with Mark?

DR. CURTIS: Yes, we've got Mark online. Mark, I'm going to ahead and make you the presenter, and you can go ahead and drive the presentation from your end.

DR. ALGINS: Can everybody hear me?

DR. CURTIS: Yes, we've got you, Mark. Thanks for joining us. Thanks for giving the presentation, and so take it away whenever you're ready.

GREATER AMBERJACK PROJECT UPDATE

DR. ALBINS: First of all, thanks for inviting me to give this presentation today, and I'm looking forward to giving you guys an update. In the interest of time, I've cut out some of the intro material, and so hopefully most of the people that are on the webinar at least have some idea of what this project is all about and what some of the driving rationales are behind it, and I won't go into too much of that.

I'm going to jump straight into the specific objectives of the project, which are, first of all, to synthesize existing bottom habitat observations across the Gulf of Mexico and South Atlantic region, to synthesize existing abundance data for greater amberjack, including catch data. As well as local ecological or stakeholder knowledge about amberjack abundances.

Also, to conduct, and this is kind of the core of the project, a comprehensive study to estimate the regional habitat-specific absolute abundance of greater amberjack using video and active acoustics, and we also have some secondary objectives, including determining movement and connectivity, using acoustic telemetry, conventional tagging, and genetic, population, genetic, markers. We were also tasked with assessing the efficacy of eDNA, to determine both presence and absence for greater amberjack at specific sites and specific times, and also to try and at least explore the opportunity of using this tool to measure relative abundance of amberjack and related species, and this is some kind of new areas that we're trying to push the technology into, so that we can utilize these new tools for assessing marine fish abundance.

Updating biological information, just in general, across the study region, and that's very useful for stock assessment models, and, also, we have a dedicated team within our team that's tasked with engaging in outreach to facilitate stakeholder input and communicate the results of the project, and so I'm going to go through each of these objectives, with a special focus on the South Atlantic. In the interest of time, instead of presenting all the detail about the Gulf of Mexico parts of the project, I am going to focus mostly on the specifics of South Atlantic stuff for you guys today.

Objective 1, synthesizing habitat data, there are, as I'm sure most of you know, no existing comprehensive maps of habitats across the entire Gulf of Mexico and South Atlantic, and so we basically, you know, dug through the literature, and contacted lots of colleagues, et cetera, to look for existing sources of habitat data, and what we found is that there's some areas that are really well covered, but with a lot of variability resolution, and some areas that are very poorly covered by any kind of habitat mapping data, existing data, and so we compiled the existing habitat data into a comprehensive GIS product across the entire region, and, basically, the idea was we need this habitat data both to inform our sampling design and ultimately to inform our final estimates.

It's all well and good to go out and decide how many amberjack, on average, are on a particular type of artificial reef, but, if you don't know how many of those artificial reefs are out there, it's really hard to scale that up for an overall abundance estimate, and so this is pretty critical information, and I will discuss some of the issues and problems that we're having with this, especially in the South Atlantic.

As far as this first goal, synthesizing habitat data, it's very different in each of the primary regions across the study area, and so, today, I'm going to focus, again, on this North and South Carolina and Georgia and east Florida regions and some of the challenges that we face there.

Habitat synthesis task in the South Atlantic, we do have lists of artificial reef locations, types, and sizes, right, and we've compiled these from various sources, including NOAA's ENC database, the FWRI database, and we also have a pretty comprehensive, or large, I should say, list of known natural reef point locations. Those of you that are familiar with the NOAA SERFS survey, this is basically their sample universe, right, and they have 5,000 or so points across the region that they know are on natural hard habitat.

The problem is that those are points, and they don't know -- For each of those points, there is no information about the extent of the reef that that point lands on, how big is it, what shape is it, et cetera, and so we do have these lists of artificial and natural reef point locations, and we also have a location -- The only location and extent info for natural reefs comes from, or the best that we could find, comes from a probability model that was developed, the NCCOS model, and, you know, reviewing the papers and the literature on this model, how it was formulated, it looks like -- You know, folks did absolutely the best job that they could with it, and it's extremely useful, but didn't feel like it was quite what we needed for either designing where to take samples or scaling up the results of the samples to the greater area, and so we didn't feel like this was a scalable habitat map product that we could put to use without some extra work, and so I'll talk about that in a second.

For the South Atlantic in particular, and this is different for other regions, but, for the South Atlantic, we don't have what we're considering scalable habitat map products, right, and we don't have a random survey of habitats that we can then scale up and estimate how much natural reef, how many artificial reefs, are in the region, especially for natural reefs.

Moving on to Objective 2, which is to synthesize greater amberjack abundance data across the region, we have, again, a number of different sources that we have utilized, including existing fishery-dependent and fishery-independent catch data, and these include the SERFS survey, the GFISHER survey, data that were, you know, collected by the various project PIs, as well as data that are available through observer programs, and mostly that's for Florida, and so we basically compiled all of those together, and we've also gone out and done some pretty extensive surveying of fishermen and compiled the results of those surveys into some heat maps that show essentially where the general fishing public believes that amberjack are in highest abundance.

All of these products can be used to inform our expectations, in terms of the presence and absence of the species, its relative abundance, and, maybe most importantly, the variance that we might expect to find at different locations within the study region. These are basically going to serve as priors for a Bayesian abundance model that I will -- I can give you a little bit more detail on, but probably at a different date, but, essentially, part of our goal is to reach estimates of abundance in two different ways, kind of a model-free stratified random sampling method and then also this hierarchical Bayesian modeling method.

That hierarchical Bayesian model requires informative priors, and so these will serve to --These will be compiled together to serve as priors for the modeling effort, and it also allows us to be a little bit more efficient in our sample design, because we can focus in on those areas where we believe the highest variance will be, thereby reducing our variance with the minimum replication.

Objective 3 is the big one, right, and this is the core of the project, to estimate the absolutely abundance of greater amberjack across this entire region, and this is a huge job, and, you know, I think we're going to accomplish it pretty well, given the limitations that we're facing, but I'm going to go ahead and go into some detail here about our abundance sampling methods, our sample design and framework, and then I will talk a little bit about the calibration work that we have done, and plan to do, to calibrate the different various gears that we're using to each other.

Abundance sampling methods, primarily the core approach of this project is to, first of all, leverage existing projects, but, for the project efforts themselves, to combine video, both stationary ROV

and towed video, and active acoustics to measure the density of greater amberjack at any given point in space. The specific type of videos are habitat and region-specific, due to advantages of those gear types. For example, towed cameras are more effective for sampling large swaths of low-relief habitat, whereas ROVs are more effective -- ROV video is more effective for sampling structures like high-relief artificial habitats, platforms, et cetera.

We also are trying to assess the efficacy of using emerging eDNA technologies to augment, or help, with abundance sampling methods, and, primarily, these are -- We believe that these will primarily be useful for discerning between sampling zeros and structural zeroes, and so, in other words, if our camera gears don't see the fish, but our eDNA does, it means the fish was there, but we didn't capture it with our camera gears.

Gears are all calibrated to each other and to a groundtruthed abundance metric using a Lincoln-Peterson estimated from a VPS array for our calibration studies, and I will go into more detail about this later, but, essentially, those are the abundance sampling methods, and so video types, again, for different habitats, and we're using baited drop cameras on artificial and natural reefs across all regions, and we're using ROV-mounted cameras on artificial and natural reefs in the Gulf of Mexico, and we're using towed cameras to cover uncharacterized bottom across most of the regions.

The project also includes some dedicated efforts to understand potential biases of each of these gears and how they influence the probability of detection. These can, you know, come in the form of attraction to the gears, avoidance of the gears, the influence of bait, in the case of baited cameras, how the camera videos are actually enumerated, and are we using max N or sum counts, et cetera, and also dealing with identification difficulties. As you all know, amberjack are one of several seriola species in the region that can, in certain situations, be difficult to distinguish on video, and so we're trying to kind of wrestle with each of these issues and come up with, you know, the best solutions for each of them, and I will talk a little bit more about each of those in a minute.

Also, the calibration studies that I will explain shortly, and coupling these video tools, these video gears, with active acoustics can help to address some of these issues. This is just some footage from USA's remotely-operated vehicle-mounted video, and, in this video, you can see a few -- There is actually three species of seriola, and there is almaco, greater amberjack, and you will see a group of banded rudderfish swimming through here at the end, and so the point I'm trying to make here is that, when you deploy a video on the bottom, you're getting essentially a tunnel view. Even if you have a 360-degree camera, you're getting one slice of what's out there, and you're not seeing past the visibly limitations of the camera gear, and you're not seeing what's above and what's below you, and so, by coupling our camera gears with active acoustics, we can help alleviate some of that issue.

This is a towed active acoustic array with multiple frequencies, and, basically, it's a real fancy, real expensive fish finder, right, and so you get -- The data on the right basically show the acoustic reflection off of fish in the water column around, I think in this case, an artificial reef, and, if you drag this acoustic array across the habitat that you're interested in, either in some kind of a flower pattern or in kind of a back-and-forth mow-the-lawn pattern, you can then take the counts of fish that you get from that echosounder and translate them into a surface, right, a density surface around that reef area, and so this is the basic idea of active acoustics.

The problem with using active acoustics is each of these little targets -- Basically we know it's a fish, but we don't necessarily know what species of fish that is, and, typically, that issue is solved, by surveys like this, by using the ratio of different species observed on the camera gear to then correct the biomass, or areal abundance estimates, that you get from your active echosounder, right, and that's our backup plan for this project.

Our hope is that we can get better at identifying amberjack in these kinds of echosounder data, and I will explain that a little bit to you, and so identifying amberjack from active acoustics data requires a process, right, and we have to go out and collect live fish, and we have to keep them alive for an extended period of time and transport them to a place with a CT scan machine, and, in this case, I'm showing you a picture of the USA, University of South Alabama, Children's and Women's Hospital pediatric CT scan machine, which they were gracious enough to allow us to use, and we basically ran live fish through this CT scan machine, and that allows us to build models of the parts of the fish body that are a different density than seawater, right, and, primarily, you're talking about the swim bladder, in this case.

Then create an acoustic backscatter model of that swim bladder, right, and then, from the backscatter models, and, first, I will show you a little video that just shows -- This is kind of fun, and this is a CT scan of a live seriola dumerili from that pediatric CT scanner, and so you can see the bone structure is visible, and we see a big pocket of air, where the swim bladder is, and then those data are then translated into this three-dimensional model of the fish, skeletal model and swim bladder model, and then, from that swim bladder model, that three-dimensional model of the swim bladder, what we actually can create are kind of the acoustic fingerprint of that particular fish.

What I'm showing you here is from a study by Boswell et al. in 2020, where they looked at nine different species of reef fish, and they looked at both the normalized backscatter, which is on the left, and the target strength of these modeled swim bladders for these different species, and what you can see is that, even if you have, you know, only three frequencies that you're looking at, by looking at those three frequencies, and looking at the responses from these different species-specific backscatter and target strength models, you can essentially identify specific species out of this group of species.

Now we are working on developing this for the group of seriola in the area, and, currently, it looks like seriola have a pretty good signature, and we're still kind of refining the models and running them through some super computers, essentially, to try and differentiate among the seriola species in this way, and we still hope that will be possible, but, again, our fallback plan is to use the species-specific ratios from the video gears to then correct the active acoustic density estimates.

Moving on to sample design and framework, and, again, here is where I'm going to skip a lot of the stuff for all of the regions except for the South Atlantic, and so our initial default sampling design is based on either stratified random sampling or cluster sampling by region and by habitat type, and habitat type is just three categories of artificial structures, natural structures, and uncharacterized bottom.

For the South Atlantic artificial and natural reefs, the sample design is basically built around leveraging the existing SERFS project, right, and so SERFS has all of these known point locations on natural reef across the region, where they drop trap-mounted cameras, and, you know, looking

at their historical data, amberjack don't get caught in the traps, but they're often seen on the cameras, and so that existing dataset -- We didn't want to leave that information, you know, on the table, and that's really useful information, and we wanted to incorporate that into our study.

What we wanted to do was build our efforts around these efforts, to try and augment and supplement them, right, and so the SERFS dataset is, again, about 5,000 known natural reef point locations that I think they randomly select about half of those each year to survey, and it's a simple random sample from their list of known locations. It does not cover any artificial habitat, and their cameras are depth limited. It also doesn't cover southeast Florida, and so those are kind of the holes in SERFS that we wanted to try and fill.

Essentially, what we did was FWRI is going to be using their S-BRUV cameras, coupled with echosounders, to survey a bunch of known natural and artificial reefs in the region, and they will be using, for artificial reefs, a random sampling of point locations, stratified by region and depth. For natural reefs, they will be using a random sampling of those SERFS point locations, stratified by region and depth, and we'll be covering all of the depths, but extra effort will be put into deeper waters and in southeast Florida, where SERFS coverage is lacking.

Essentially, the maps that I'm showing you -- All the green dots on these maps are sites that were selected as priority sites, and the red sites are, I believe, kind of secondary sites that, if we have time, we can go to, but the green sites, at minimum, will be covered by S-BRUV and echosounders in the South Atlantic.

I mentioned, earlier, that, in the South Atlantic, we have this habitat issue, right, and we don't have a source of scalable habitat mapping data, and so, in order to try and solve that problem, we're doing two different things, and one of those is that FWRI, when they're out dropping their S-BRUV and doing echosounder surveys, during the nighttime, what they're going to be doing is standardized mapping surveys at a subset of the natural reef sampling sites.

I'm not going to go into too much detail here, but the idea is that we're trying to map somewhere between 30 and 40 percent of the total number of sampling sites across the region, and the mapping looks like this. It's about four nautical miles long by three-tenths of a nautical mile wide, and they will basically put whatever their selected habitat, or survey point is, and it will be centered in this space. The idea is that, by mapping this the night before, and then dropping their cameras, they will, number one, verify where the camera drop is -- What they should expect from where the camera drop is, what the reef looks like and where the camera drop is happening, but, also, because those camera drop sites were randomly selected, these then randomly-selected areas that we'll be mapping can be used to extrapolate the amount of hard natural habitat across the region, and so this will provide estimates of reef area and number of reef features in the area.

The uncharacterized bottom in the South Atlantic -- So far, I've just talked about reefs, right, artificial reefs and natural reefs, and what about all that uncharacterized bottom, or all that area where we, you know, don't have these known point locations? Well, essentially, the other stratum in our South Atlantic sampling design is uncharacterized bottom, and it's going to be taken care of by a towed-camera array called the C-BASS, with associated echosounder data.

Essentially, we've got random sampling stratified by region, and there's only two regions, the northern region and the southern region, and I've got four regions here, but that's from kind of an

earlier iteration of our design, and so two regions and two depth levels, and we just used this middle line and divided it into shallow and deep, and, basically, we picked random points to start these transects and random directions for those transects.

In addition to the C-BASS and echosounder, again, during the nighttime, before the survey actually happens, the ship will pass across the transect area and run multibeam mapping to provide an estimate of unknown natural and artificial reefs, and this is potentially, you know, going to help validate the NCCOS model, and, also, it's going to tell us how many unknown natural and artificial reefs are in this uncharacterized bottom stratum.

That is basically the sample design for the South Atlantic, and now I'm going to move on to preliminary results from our calibration studies that we have carried out so far. So far, we have calibrated -- We have compared our camera gears, baited and unbaited cameras, stationary versus ROV cameras, stationary versus towed, and ROV versus towed cameras, by deploying them essentially in the same place at the same time, or nearly the same time.

We've also calibrated active acoustics to all the camera gears, and we've compared all the gears, both cameras and active acoustics, to a groundtruthed -- A Lincoln-Peterson estimate of abundance within a VPS array, and I'll talk more about that and give you some more details on that in a second. We have also compared the results of preliminary eDNA sampling versus all the other gears, to try and kind of get those methods dialed in.

Okay, and so our first calibration effort occurred in Florida in May of 2022, and the objectives for this were to test our gears, to deploy multiple gears at the same time in the same place, and compare the results. The ultimate goal here is to estimate calibration factors, but, as you'll see, we're not quite at that point yet for this dataset, and so Florida's calibration occurred at three different sites, the Pinellas II Reef, the Gulfstream Gas Pipeline, and a natural reef ledge called The Elbow. Each of these -- At each of these larger sites, we did two separate sub-sites for the gears.

Each gear was sampled every day, and the orders were randomized. We had an echosounder on the ship that essentially was running continuously, and so we didn't run any echosounder survey patterns, like a flower pattern or parallel lines or anything for this effort, and that was actually a problem, as you'll see in a minute, and the C-BASS was not deployed on the artificial reef site, because the relief of that reef was too high, and they didn't want to get the C-BASS hung up on anything, and so that's the only kind of hole in the design there, and so, essentially, this just shows you all the different gears, when they were deployed, first, second, and third, at the three sites and the six sub-sites, two sub-sites within each site.

This is a map of The Elbow, and this is the only map that I will show you, because the other ones basically show the same thing, and, essentially, what we did is, if you see the little red and green flags, those are the beginning and ending points of the C-BASS transect, and then the red dots and the orange dots are where we dropped ROVs and S-BRUV cameras, and so, essentially, we have a C-BASS transect and then these point counts from the cameras for each of these areas.

Preliminary results are the seriola species that were observed included greater amberjack, almaco jack, and banded rudderfish, and they were seen at all three of the main locations. All of the gear systems more or less functioned as designed and expected, and water visibility was generally good to excellent during this time period, and, so far, the ROV and C-BASS video reads are done, except

for some of the habitat reads for the C-BASS are not quite complete yet. The S-BRUV reads are in progress, and the EK analysis is done, although it was less fruitful than we had hoped, as I will explain in a second.

Essentially, for the ROV, we saw ninety-nine greater amberjack and three seriola spp., and, essentially, these were seriola that were unable to identify to the species level, and there were a lot of mixed schools of seriola, and the highest counts were on artificial reefs, and much lower counts on the Pipeline and Elbow, and the Elbow is kind of a flat hardbottom with some small ledges, if that gives you some idea.

On the C-BASS transects, we only saw four S. dumerili, but seven seriola that were not able to identify to the species level, and we're currently working on linking the fish counts from C-BASS to the actual locations where the ROVs were dropped, and that's proved to be a little more complicated than we thought at first, but we're working on that, and we do see light at the end of the tunnel, and so we should be able to link those two and look at calibration factors between those two very soon.

The echosounder did not give us what we needed for this calibration, and, essentially, we saw lots of fish, but we were not able to categorize them to species level, and we were still at the early stages of working out seriola acoustic signatures, and we are getting better at that, but we don't have it completely dialed in quite yet, but we are working hard at it and making lots of progress.

We also realized that -- You know, hindsight is 2020, and application of the kinds of abundance models that we need to get density estimates out of the hydroacoustics are really hard to apply to always on-track data, right, and you basically need to run some kind of pattern, either a parallel lines pattern, or some kind of flower or star pattern, around the area that you're interested in applying one of these abundance models to to get it to fit. Otherwise, you just end up with this kind of squiggly line of data that's really hard to make heads or tails of, and so that was a major lesson learned that we kind of closed the loop on for the second calibration study.

The S-BRUV video reads are still not finished. We're waiting on that, and, as soon as we get that, then we will, you know, look at the specific comparison values of each of the camera gears to each other and hopefully learn something from that, and so the next steps, to follow-up for this first calibration study, is to finish the S-BRUV video reads, to compare the S-BRUV to the ROV counts, to parse the C-BASS, or towed, camera data for overlap with the other camera gears and compare those, and then to test alternative echosounder survey patterns, and that's something that we did do at the next calibration, which I will talk about in a second.

The main takeaways here are the water clarity was good. Once the video reads are completed, we expect to have some data to inform our calibration factor estimates among the different camera gears. Again, always-on echosounder is of very limited value for calculating areal abundance, and we need to use some kind of pattern, parallel lines or a flower-shaped survey, for spatial models of abundance for the echosounder data.

Our second major calibration effort occurred in Alabama, off of Alabama, in August and September of 2022, and, essentially, our objectives were to -- Instead of just going out to sites, we wanted to have some way of having an alternate groundtruthed idea of how many amberjack were on a site, and so we established two VPS arrays with acoustically-tagged amberjack, and we

deployed multiple camera gears near concurrently within those VPS arrays, and we deployed active acoustics using two different survey patterns, a parallel lines pattern and a flower or star pattern, and we also used multiple frequencies for those echosounder surveys, to try and dial-in the methods there.

We used VPS triangulated positions from the VPS array, the tagged fish and the VPS array, in combinations with observations of tagged and untagged amberjack from our camera gears, to calculate a Lincoln-Peterson abundance estimate as a groundtruthed amberjack abundance, to then compare all of the other various gears to.

We also used those VPS triangulated positions to -- We're still in the early stages of this, and so I don't have much to present for you, but we're going to -- We are using those to quantify behavioral changes in response to gear deployments, right, and so we have tracked fish within an array. When we deploy the gear, we can actually measure how much the fish are either attracted to or repelled by that particular gear, using their triangulated positions and the vectors between them. We also made some serious efforts to run trial eDNA sample collections and assay efficacy at sites with known amberjack, in this case.

Okay, and so a little bit more about our methods. Again, VPS arrays were deployed at two different sites, and both of these sites were super-pyramid sites, and these are really large, twenty-five-foot tall --

DR. CURTIS: Mark, we've lost your audio. Mark, are you there? We have lost your audio.

MS. HOWINGTON: I am texting him, real fast.

DR. CURTIS: Okay. Thanks, Kathleen.

MS. HOWINGTON: Apparently he's not getting my text. One sec, and I will try and get his attention. Mark, we can't hear you.

DR. CURTIS: Let me take back control, and maybe that will get him back in.

DR. BUCKEL: Thanks, Judd.

MS. HOWINGTON: Pull up a Word document. He can't hear us, and he's not getting a text, and so we need to somehow get his attention.

DR. NEED: Judd or Kathleen, you can maybe turn on your webcams, so you can wave at him, and he might see that too, as another option, because he may not be aware that he doesn't have control.

MS. HOWINGTON: I got rid of my webcam option, because I didn't want to accidentally hit it, but I can try to bring it back up.

UNIDENTIFIED: Judd, you can do, on the screen, to just say that we can't hear you.

MS. HOWINGTON: Yes.

DR. ALBINS: Hello. Check one, two.

DR. CURTIS: Hi, Mark. We've got you back now.

DR. ALBINS: Oh no. How long has that been going on?

DR. CURTIS: About three slides or so.

DR. ALBINS: Okay. Do I need to go back? Probably.

DR. CURTIS: Yes, and let me give you back presentation capabilities, and then I will scroll back a couple of slides, and you should have the ability to bring up your presentation again.

DR. ALBINS: Okay. Let's try this. How is that?

DR. CURTIS: We can hear you now, and I think about halfway through this slide is where we lost your audio.

DR. ALBINS: Okay. Sorry about that. Okay, and so let's just go back the beginning here, so we make sure that we catch everything. I am talking about the methods for the second calibration. We had VPS arrays at two of the sites, and both of these sites were artificial reefs, super pyramids, and these are twenty-five-foot tall, fifteen-foot base concrete pyramid reefs with a steel super structure, and they're really good amberjack habitat, and that's why we picked them, and there were -- We deployed eight acoustic receivers per site, in this pattern that you see down here at the bottom, and the minimum range we estimated to be about 250 meters, or probably a lot more than that, but that was our minimum estimate, and so we have a minimum coverage area for triangulating the position of fish of about twenty hectares, centered on the reef.

On each of the two reefs, we deployed eighteen and twenty acoustically-tagged fish, and about half of those had pressure tags, or depth tags, and they all had external dart tags, so that we could both get data from the receiver array, but, also, when we deployed the camera gears, we could get a relative count of tagged to untagged fish on the camera gears themselves, and so we tagged both sides of the fish, and so it didn't matter which way the fish was facing, and you should be able to see the tag, assuming it was close enough to the camera, and then there were some additional dart tags put out without acoustic tags, but that doesn't cause too much of an issue.

All of the gears were deployed from these two vessels, and, essentially, we used two vessels, so we could get all of the people and gear out there, but also so that we could kind of hopscotch each other on the sites and randomize the order of vessels and the order or gears, and so The Escape carried the ROV, the drop cams, and active acoustics, whereas The Wilson, this vessel here at the bottom, carried trap cameras, which are essentially exactly the same setup that they use for the SERFS survey, and so we've got that as part of our calibration, the S-BRUV cameras, that are used by the GFISHER survey and FWRI, and then eDNA sampling also occurred aboard The Wilson.

This is just one day, basically showing one iteration of the order of gears and vessels and stuff like that, but it was a pretty complicated puzzle to fit together, to make sure that we were getting all of the gears on each of the days without any overlap or conflict, and it was pretty fun to watch that

all work out, but, essentially, we had to designate one site as the primary site each day and then deploy all gears at the primary site with some opportunistic deployments of the Wilson gears at a secondary site, because the Wilson gears didn't take quite as long to deploy. The vessel order, the gear order, were both randomized each day, except for eDNA sampling. eDNA sampling occurred before, after, and between deployments of other gears aboard The Wilson.

Preliminary results from the camera gears, essentially, half of the S-BRUV drops, the stationary camera drops, were baited, and other half were unbaited, and there were no obvious differences in max N counts between baited and unbaited drops, and we also dropped half of the S-BRUV drops and half of the trap cam drops close to the reef, and other half kind of far from the reef, because we wanted to basically see how much, you know, a good drop, versus a little bit off the habitat, how much that would affect the max N counts, and the drops -- The counts for drops that were within twenty meters of the reef were substantially higher than the drops that were about a hundred meters away, and, in fact, the hundred-meter drops essentially turned out mostly zeros, which is more support for the idea that, when these fish are on artificial reefs, they are pretty tight around those reefs. If you drop your camera a hundred meters away from the reef, you're usually not going to see a single fish, whereas the counts within twenty meters of the reef were picking up fish pretty readily.

We also looked at time periods, and so the question that we had, in our mind, was, because of amberjack behavior, the time period -- The part of the drop during which you actually analyze the data can be very important, right, and different camera -- Historically, different camera deployments have different standard operating procedures, as far as when they start counting and when they end counting, and so, essentially, what we did was, for the drop cams, the trap cams, and the S-BRUV cams, we looked at separate max N counts for different periods over the deployment, and we looked at them for the descent, kind of an acclimation period at the bottom, a post-acclimation period at the bottom, and then an ascent period, because we wanted to see where the highest max N counts, and where the most variable max N counts, occurred.

Essentially, what we found was that the dissent period, and so the time from the camera dropping from the surface to the bottom, actually had the highest max N counts, but those were the most variable counts, and those were higher than bottom and ascent periods, and the ascent period actually had the lowest counts, which was a little bit surprising, and I thought we would see fish following the cameras back up to the surface, but the ascent periods had mostly zero max N counts.

Location, all of the gears agreed that there were more fish on Pyramid 28 than Pyramid 26, and that was pretty good, and, unfortunately, they didn't agree on much of anything else, and so the camera gear comparisons are a little bit all over the place. The ROV counts were generally higher than counts from other camera gears, and, other than a general trend of higher counts on 28, there were no strong correlations among the different camera gears, and this is --

You know, we were hoping that we would get a lot stronger relationships among the camera gears, but we think that part of the problem is that we were only using two sites, with essentially two levels of natural abundance on them, and we think that it's really important, for the calibration part of this project, to go to a site with a wide range of natural abundances, and so we'll have sites with no fish on them, some sites with one or two, some sites with twenty, and some sites with sixty or eighty, and then, you know, spreading it out like that may help us with these calibration estimators,

because, right now, it's really hard to fit a line to any of these plots that could convince anybody that they make much sense at all.

We do have plans to do additional calibration efforts in April of next year, and this will be after the bulk of the surveys are conducted, but it will still provide important information for analyzing the data that we've collected, and so that's in the works right now, and the idea to run the calibrations across a wider range of natural abundances of the fish.

Okay, and preliminary results from the VPS array part of the calibration, and, essentially, I'm not going to go into too much detail here, but I will focus on Pyramid 28, and this is just a GIF animation of a single fish over twenty-four hours on Pyramid 28, and you can see that there's some interesting stuff going on here that we haven't fully been able to look at, but it looks like, at nighttime, the fish are really tight around the artificial reef, and then, during the daytime, they roam around quite a bit, but they stay within about a hundred meters of the reef.

Now, remember that we should be able to get good triangulations outside of that area, and so the fish just isn't moving outside of that, you know, hundred meters around the reef, essentially, and one of the things that we want to do is compare the deployment times of the different gears to kind of the subset of vectors just before deployment, during deployment, and just after deployment, the vectors of fish movement, to see if we can detect any signals that would suggest that fish are either attracted to or repulsed from the various gears that we're deploying, and so that's some stuff that we're working on currently, and I just wanted to show you that.

These are eight different fish around Pyramid 28, and these are all of the good and bad VPS signals from those fish, and so you see, again, this fairly tight clustering for all eight of these fish that I pulled out around the reef, and not venturing very far from the reef itself, at least during this time period, and so how does this Lincoln-Peterson groundtruthed density estimate work?

Essentially, there is a standard Lincoln-Peterson mark-recapture density estimator that many of you may be familiar with, and it looks like this. The number of fish -- The little n is the number of fish tagged, and the big K is the number of fish recaptured, and the little k is the number of recaptures that were tagged, and that fraction gives you a good estimate of the total number of fish, or capital N, and this assumes though that the system is closed, and so no tagged fish die or leave the system between the tagging event and the recapture event, and that is a hard assumption to buy for these kinds of open-ocean habitats.

What we did was combine our VPS data with this idea of Lincoln-Peterson density estimator, and, now, we're not the first people to do this, and Shertzer et al. in 2020 did a really good job of doing this with gray triggerfish, but, essentially, you use the acoustically-tagged fish to estimate the loss factor, the combined effect of emigration, mortality, et cetera, during the course of the time between when they're tagged and when they're observed for all of your tagged fish.

You then apply this factor to the number of fish that were initially tagged to get an estimate of the number of tagged fish that were present at the time of the recapture event, and so, essentially, n_a is the initial number of acoustically-tagged fish, and n_d is the initial number of dart-tagged fish, and that gives you n, and n^1 is then n^1_a plus n_d times n^1_a over n_a, where n^1a is the number of acoustically-tagged fish present, based on the VPS position data, and n^1 is the new estimate of the total number of tagged fish present during the recapture event.

The short of this is that you can then use this estimate of tagged fish present during the recap event in the Lincoln-Peterson density estimator, and so N^1 is equal to this new n^1 times K over k, and that gives you an estimate of the number of fish present during the recapture event, and so we essentially did this for each of the reefs on each of the days.

Unfortunately, there were very few samples where externally-tagged fish were observed on our camera gears. The highest number of externally-tagged fish observed during any single deployment of a camera gear was one. Five out of thirteen ROV deployments saw a single fish, and zero out of fourteen LSU camera deployments saw a single fish, and two out of twenty-nine trap cam deployments, and two out of thirty-one S-BRUV deployments saw a single tagged fish, and so this complicated things a little bit, but we were able to get Lincoln-Peterson estimates for Pyramid 26 on four of the days and for Pyramid 28 on two of the days.

If we plot our different camera gears, we have trap cameras, S-BRUV cameras, the LSU camera, and the ROV camera, and, if we plot each of those against our Lincoln-Peterson abundance estimator, we see, again, the only plot down here that, you know, engenders any kind of confidence is the ROV camera versus the Lincoln-Peterson abundance estimator, where it looks like the ROV cam is seeing, at least for this small sample size, approximately 10 percent of the fish that are there, which is encouraging, but the fact that these other three camera gears aren't showing high numbers at the same time that the Lincoln-Peterson estimate is high is a little bit troubling.

Again, we think that a lot of this is due to the fact that we didn't look -- We didn't calibrate across a range of natural abundances, and we're hoping that doing so will help to alleviate some of this problem and that some of this noise might be getting in the way of the signal here, because of the sample size and the low variance in natural abundance.

Again, I talked already about this, but looking at behavioral responses to the gear, and it's a really interesting application of this VPS data that we plan to do, looking at changes in step length and direction before, during, and after deployment of the different gears, and thereby estimating gear-induced change in density, and this will, obviously, be much more relevant for continuous versus discrete habitat patches, because we think the camera gears may have more of an effect on continuous habitats than discrete ones.

Okay, and moving on to the active acoustics part of the calibration study, here is one of those active acoustics, Tow Fish, being pulled back into a vessel, and, essentially, the objectives here were to test the abundance estimation methods for active acoustics, to look at the wideband response, and so the response across multiple frequencies, and to optimize the survey design, and, essentially, to decide between a flower or star pattern and a parallel lines pattern for the active acoustic surveys, and we essentially completed one of each of those two survey types, flower and parallel lines, each of the days, and we had three completed on -- Three days on Pyramid 28 and two days on the other pyramid, 26, and we tested four different frequencies.

This is just an image showing the same kind of slice of the water over an artificial reef on those four different frequencies, and you can see, just from the image itself, that the different frequencies basically have different levels of target acquisition and different levels of interference of the reef itself, and so frequency is also directly tied, at least in this case, to beam angle, and we know that the beam angle has an interaction with depth, to determine the beam width, and so, essentially, the

frequencies are each looking at a different sized patch of ground, or a different volume of water, and so that's important to take into account, but this can also affect interference related to structures.

If your beam is narrow, it's less likely to also include part of the structure at any given time, and so, the wider the beam, the more likely you are to have structures essentially getting in the way of seeing the fish, and so beam angle seems to be very important, and it's something that we need to tackle, but also frequency, depending on the acoustic signatures, determines your ability to observe targets at all, and so higher frequencies have higher bandwidth and detect a wider range of target types.

The cost is that higher frequencies have a reduced operational depth, and so we need to find kind of the sweet spot between getting as high of a frequency as we can and still being able to cover operational depths across the whole project, and then also the fact that frequency is tied to beam angle becomes important, and so there is some optimization stuff that we're working on here still, try to and figure out, you know, what the best combination is for the study.

Results of the CT scans have been combined with the calibration results, and that's going to help us to optimize both of these variables, but, essentially, we ran the active acoustics, and here is the different survey patterns that we ran on the various days of the calibration study. The fish counts were variable, but within a reasonable range, and we counted between eighteen and sixty-four fish per survey, and then we had to -- You know, this is just the kind of first step, and then you need a spatial model to interpolate what's going on between all these lines for the density estimators, and so we've considered -- We've tried a couple of different methods, and we considered creating exponential decay and GAMs.

The GAMs were shown to perform really well on at least isolated structures, but also on continuous reefs, and we evaluated each of these types of spatial models across all four of the different frequency transducers independently, and so estimates that came out of this of density are in fish per cubic meter, and so volumetric density, and they are then scaled to the survey volume, so that you can get the total number of fish in the area, right, and so evaluate the density in these cells, and then you basically create a surface, and the surface gives you an abundance estimate as the sum of the cell abundances, and then you can also estimate a coefficient of variation from your model predictions.

These are the results of the active acoustics, and there was high variability in predicted density among the frequencies. Here, we have estimated abundance on the Y-axis, and frequency on the X-axis, and the two on the left are for the flower pattern surveys, and the two on the right are for the parallel line surveys, and the top is Reef 26, and the bottom is Reef 28.

What we see is this high variability in predicted densities, and we think this has to do with the interplay between detectability and beam angle, and, therefore, the volume that's actually sampled. There were fairly weak correlations between the predicted density and ROY counts, except for when you look at the 120-kilohertz frequency. Preliminary results for the seventy-kilohertz echosounder are actually similar to those from the VPS Lincoln-Peterson abundance estimates, and the seventy and the 120 are actually the frequencies that we're kind of zoning in on as being probably the best to use for all of our surveys.

The parallel lines seem to give similar results to the flower line survey, but with substantially lower variances, but the total area covered is higher, and so the parallel line surveys actually take quite a bit longer, and it's not super surprising that the variances are smaller, because there is actually more area covered and more data going into those estimates, and so these are just some of the issues that we're working with and working through on the active acoustics.

The next steps are to standardize beam angles across frequencies, to isolate the beam-volume-dependent detectability observed in the analysis, to evaluate alternative spatial models, and looking at different types of GAMs I think is probably where we're going to land, and then calibrating against camera gears across a wider range, again, of fish densities, and I think that's going to be important and something that we can tackle in our April 2024 calibration.

Moving on to eDNA, we deployed eDNA, or we collected eDNA samples during the calibration, and the eDNA folks have developed a four-species assay, and so they have an assay for water samples that can basically differentiate between the four species of seriola that we have in the area and also between non-seriola targets, and these are -- The bottom graph is actually the results from the calibration study, and what you see is a bunch of dots here that represent S. dumerili, the greater amberjack, and then some dots over here that represent rivoliana, or the almaco jack.

Of six process samples, from one day at each site, we had four positive for dumerili and three positive for rivoliana, and we know that dumerili was present during all of these samples, and so those two where we didn't get presence -- Basically, that means the eDNA missed the fish. They were there, but the eDNA didn't catch them, and so this, you know, brings up some problems that we need to increase our detectability, essentially, and so some efforts in that direction are reducing filter pore size, sampling only down-current of the site, and so being very cognizant of which way the wind is blowing, so to speak, increasing replicate samples, and trying to improve the cost efficiency of sample collection. Those are all some different -- I will talk a little bit more about the details of eDNA stuff here in a bit.

Essentially, that's the end of the calibration study part, and we're going to move on to -- And the end of Objective 3 of my presentation today, and so I'm moving on to Objective 4, which is extremely interesting, looking at the movement, connectivity, and mortality of greater amberjack.

The Gulf of Mexico and South Atlantic are currently managed as separate, non-mixing stocks, but we know very little about their migratory behavior and population connectivity, and so we have a combined strategy to help answer some of those questions, including internal acoustic tags, coupled with an extensive receiver array, high-reward external traditional tags, and a population genetics study.

This is also one of the main opportunities within our project for angler engagement, right, and so we're dependent on anglers to return those high-reward external tags to us, and so that's a good touchpoint with the general fishing public, and this is kind of an example of what we've got going on, and we have a $250 reward for returning the tags from any tagged fish. There is a phone number there, and a website there, if you're interested, and you should have a copy of that, but, essentially, we're posting signs all around, and stuff on social media, that is advertising this high-dollar conventional tagging portion of the project.

The objectives here are to estimate the regional and sector-specific fishing mortality rates of amberjack in the Atlantic Ocean and the Gulf of Mexico, to assess length-based vulnerability to capture, harvest, and discard, and to evaluate rates of movements of amberjack among regions.

This map at the top -- All the little blue pins are where we have tagged amberjack, and we have about 950 of our planned 1,200 conventional tags already out, and the rest of them are actually going out kind of as we speak, in a rush to get out before the August 1 Gulf of Mexico opening of the season. We have more acoustic tags out than we actually planned to put out in this project, because we found some synergies with other projects, and we piggybacked onto some other projects. We've got almost 400 acoustic tags out there, at some of the same sites, and the conventional tag reward, as I said, is $250, and this hopefully encourages close to a 100 percent return rate. So far, we have seventy-two total tag returns, twenty-one in the Atlantic, thirty in the eastern Gulf, and twenty-one in the western Gulf.

This is kind of the bad news, and we have double-tagged about a third of our fish, and, of thirty-three double-tagged fish, or what should have been double-tagged fish, seven of them show evidence of having lost one of their two tags, and so this is something we hoped would be a lot lower, and, unfortunately, it's something that we're going to have to try and deal with in the mathematics, the modeling, and the remaining tags will be out before the beginning of the season, August 1, 2023, and, in fact, these numbers are from a couple of weeks ago, and so we may have most of those out already.

The plan here is to build a Bayesian multistate mark-recapture model, using both the conventional tagging data and data from recaptures in the acoustic array, and it could be used in the same way to build this model and then to incorporate the acoustic tag data in that, and so the plots at the bottom that you're seeing -- I just wanted to show you, because I think it's kind of interesting, but it looks like there is, at least in the fish that we have caught to tag, a pretty good discrepancy in the size distribution.

This is the Atlantic size distribution, and this is the eastern Gulf of Mexico size distribution and the western Gulf of Mexico size distribution, and so, I think, arguably, the western Gulf of Mexico is where we know the least about these fish, and it seems to be where a lot of the big ones, at least across our tagged fish, that a lot of the biggest fish are being captured.

Acoustic tagging objectives here are to look at residency period, site fidelity by region, structure type, and fish size, to estimate movement and exchange within and between regions, the South Atlantic and the eastern and west Gulf, and to estimate mortality, both fishing and natural mortality, to look at post-release mortality estimates, and look at depth use across different habitat types and regions. As I said before, we've incorporated a bunch of depth and pressure tags into our acoustic tagging program, and so that should make that possible.

So far, acoustically-tagged fish, we have, as I said, almost 400 tags out, and we're coordinating with both iTAG and FACT to get returns, not just from PI receivers but from an entire network of receivers that are out there.

Receiver downloads have started, but we don't have enough of them in hand to really make any conclusions, or present any of the data, but, by the fall of 2023, we expect to have a pretty good dataset to look at for the acoustic tagging part of the project.

Population genetics, the objectives here are to develop genomic resources to interpret the genome scans of greater amberjack, and this requires some different steps, right, and we had to draft a genome assembly and create a linkage map, in order to interpret the population samples, and then we had to survey the population genetic structure in both the Gulf of Mexico and South Atlantic.

Now, there have been some efforts to do this, but I think our effort is going to have way more spatial representation than any previous genetic study of amberjack. We have basically -- And better coverage, in terms of genomic coverage, and so we're sampling across the geographic populations and assaying those samples at 2,000 to 10,000 single nucleotide polymorphisms. We're then going to be able to analyze the genetic stock structure and connectivity, identify reproductive units, infer migrants and migration patterns, and analyze variation under selection, because we're doing the linkage map.

This is basically the number of samples that we have collected so far, and we've progressed on our reference genome, and we have sampled the population, through both our tagging project and partners that are collecting fishery-independent creel surveys, essentially, and what we still have to do is complete the reference genome, complete the linkage map, assay the population sample, using dd-RAD sequencing, and we're waiting until we have all of the samples in hand, so that we can essentially control for runs, so we can put fish from all the different regions, and all different years, in a single run together and run them all together, so that we don't end up with possible problems there, and then analyzing the genetic structure, stock structure and connectivity, from the data produced.

Samples are archived, and so we're not using the entire sample to do what we're doing, and we're keeping samples from all of these fish for future analysis, and this, you know, has been suggested that folks may be interested in doing a parentage analysis, and, if that ends up being the case, we'll have a really good library of tissue samples for whoever ends up doing that. We also have access to samples from several non-U.S. locations in Mexico, Cuba, and some other countries that we can use as kind of outgroups for the population genetics part of the project.

A little bit more about eDNA, and I just wanted to brush on this a little bit, and, of course, we're investigating its efficacy and its use in assessing presence and relative abundance of amberjack and closely-related species, and we have developed these novel eDNA tools, including a specific ddPCR assay that can differentiate between all of the seriola species, and between seriola and other non-target species, and it's specifically designed for greater amberjack, but it does all of that as well, and we can compare the performance of this assay to other gears during our calibrations and regular surveys.

We're hoping that this will be useful in confirming identification of species, but also to estimate sampling versus structural zeros. When our camera doesn't see a fish, does the eDNA see it or not, and there was some hope that eDNA might provide relative abundance estimates, but we're a little bit skeptical about that. Essentially, what it does is it measures the quantity of DNA in the water column, but there is, I think, too much uncertainty in this. Right now, we're struggling to have our -- To get positive samples, eDNA samples, everywhere that we also see the fish on camera, and so I think that we still have some work to do before we can start talking about relative abundance estimators, but we are making some pretty big strides in this particular -- With using these tools.

This is actually a proving ground for the use of eDNA tools to study distribution and abundance of marine fishes, and we've learned a lot, and we're going to continue to learn more as we progress through the rest of the project.

One of the things that we've learned, with eDNA so far, is that it seems to depend on -- How you're taking your water samples is very important. We started by using triplicate parallel Niskin samples, where this kind of array would drop down, and they would all close at the same time, and the problem is that it kind of makes more sense to do serial samples, because then you're actually sampling potentially different parcels of water, instead of taking all the three samples from the same parcel, and so that could increase detectability.

We've also had quite a bit of success using, surprisingly, passive samplers, and so there's been a few groups that have done this, but we tried it, and we mounted some clamps to our ROV frame and put both sponges and filter paper, just clamped to the ROV, or zip-tied to the ROV, and then, as the ROV swims around, those collect particulates from the water column, and you can then do an extraction on either the filter or the sponge, and we've actually found that the sponges are better at detecting amberjack than the Niskin samples, and so pretty interesting. Niskin samples appear to miss fish when they're present, but we need to really do a lot more work in this area, and we need to run a lot more samples from places where fish have not been observed on camera gears, to see how that's going as well.

Objective 6, I don't have much to say here, except that we are actively updating biological information for these species, right, and so recent stock assessments recommended expanding demographic sampling of amberjack, and we have an opportunity to do that here, and so we're taking age and growth information from all the different regions, in particular focusing on the western Gulf of Mexico, where that information is extremely limited, but, also, we're using fishery-dependent and fishery-independent collections to update, in general, biological information and refine age-length keys for the species. We're archiving samples that can be used, with additional funding, to update reproductive indices in the future, including fecundity, spawning season, et cetera.

We have a dedicated effort to engage stakeholders in this project, and we worked closely with established groups, including the Greater Amberjack Visioning Team, the Sea Grant Reef Fish Extension Collaborative, et cetera, to facilitate communication and cooperation with stakeholders. It's a start-to-finish process, and the visioning team collected input which was used to formulate the goals of the RFP, and then we believe that our funded research is very responsive to the priorities of that RFP, and therefore responsive to that stakeholder input.

We have incorporated local ecological knowledge in our study, and we've made attempts to incorporate it into the study design. That's been a little less successful, but we still have hopes that the local ecological knowledge will perform the role of at least part of the prior for a Bayesian, hierarchical Bayesian, abundance modeling estimation.

We have also participated in active engagement with the for-hire fishing sector, to provide platforms for our scientific sampling, and we are thoroughly dependent on commercial and recreational anglers for returns of those high-reward conventional tags, and we also have a very detailed plan for a dedicated effort to communicate the results broadly at the conclusion of this

study, and, obviously, we are also sensitive to the fact that this information needs to go through certain channels before it goes out to the public, and so we're going to be careful and contentious when it comes to that as well.

Impacted impacts and application of results, this is a large-scale survey, and it used novel integrated sampling approaches and we're leveraging existing datasets and ongoing research to augment our data collection and cost-effectiveness. We believe that the benefits of this project will be, first of all, a robust estimate of the absolute abundance of age-one-plus greater amberjack in the Gulf and the South Atlantic, a vastly improved understanding of the spatial and habitat-related distribution of the species, an improved understanding of their population and movement dynamics in the region and across the sub-region, and we also believe that what we're doing here is developing an approach and analysis framework that can hopefully be applied, you know, maybe with some lessons learned, but applied to future both amberjack abundance estimates and estimates for other reef fish species.

The secondary benefits, of course, include, as you know, the typical estimates of those data that are really important to our stock assessments, like growth, mortality, site fidelity, population connectivity, stuff like that, and we're also -- When we collect these data, we're collecting data not just on greater amberjack, and so, though we may not analyze the data fully for this purpose, the data are forming an archival dataset that can improve our understanding of reef fish community structure in general across the study region. That's all I have for you guys today, and I am more than happy to stay as long as you like and answer any questions that anybody has.

DR. BUCKEL: Thanks very much, Mark. We'll open the floor to questions. Go ahead, Kai.

DR. LORENZEN: Thanks, Mark, for that update, and it's interesting to see the mushrooming complexity of this survey over the years, but I was sort of wondering, and there were sort of three questions, I think, that were asked at the beginning, about, you know, getting reliable and precise estimates, and those were issues of species identification, responses to sampling gear, and then, of course, calibrations, and we presented preliminary results on two of those, one with the species identifications and calibrations, and I guess you're still working on the responses to sampling gear, but I was wondering if you can give us a sense of, when you put all of this together, how -- I guess how well are you on track to be able to, you know, identify the species with, you know, the needed precision, and to what extent do you think that -- You know, what level of calibration sampling will be required to actually integrate these different sort of estimates into a, you know, precise and reliable whole? I know that's multiple questions in there, but I was wondering if you can give us an idea of the sort of big-picture here of how well these things are likely to come together. Thank you.

DR. ALBINS: I mean, Kai, that's a great question, and, obviously, you've struck to the heart of this whole thing, is this is a big -- You know, this is a huge, ambitious project, with many, many moving parts, and a lot of questions, and, you know, we're doing our best to answer all of them, and we have pretty good confidence that, at the end of the day, we're going to be able to provide a robust estimate of abundance.

Now, we're not 100 percent sure on that, and there's so many things that it depends on, right, and it depends a lot on all of these different sources of uncertainty that we're trying to be -- We're trying to be very diligent in taking into account all of the sources of uncertainty, unlike, you know,

other projects that have happened, and, you know, I'm not pointing fingers anywhere at all, but what I'm saying is that our tendency is to ignore sources of uncertainty, and our -- In this project in particular, our staff team has been, you know, on point about, hey, you know, we need to incorporate all of this stuff, and it all needs to be folded into the final estimate.

At the end of the day, I can't tell you what that uncertainty in that final estimate is going to be, but I can tell you that we are being very diligent about taking all the sources of uncertainty into account, and, you know, whether that uncertainty is narrow enough for this to be an extremely useful estimate, or whether it's a little bit wider than we would all like, I don't know the answer to that question, and I don't think we will until we get there, unfortunately, but I can assure you, and everyone else, that we are being very diligent about taking all those sources of uncertainty into account, and, at the end of the day, that's going to be part of our -- You know, part of our estimate is going to -- It's going to be incorporated into that estimate.

I don't know if that answers your question in a way that is satisfactory, but I don't know that anybody has an answer to that question yet, and we do know that there is -- Like I said, there's a lot of moving parts, but we're being very diligent about each of the regions having a solid and robust sampling design that can feed into two different ways of estimating abundance, right, and so part of our staff team is working really hard on taking our sample designs that we've arrived at and translating them into estimator functions.

They are doing that now, before all the data comes in, so that, when the data comes in, they will be able to, to some degree, plug-and-play into those estimator functions, and so they're building those very carefully, based on each of the different specific regional sampling designs, and we also have a completely separate approach, where we have a hierarchical Bayesian modeler who is going to take basically as much information as she possibly can on gear type, region, all the different abiotic parameters, habitat type, depth, everything, into this big hierarchical model.

You know, we have hopes that both of these methods will arrive at a similar answer, and, when they do, that's going to give us a lot more confidence in that answer. If they don't, and if they arrive at very different answers, then we'll have, you know, more questions that we'll have to iron out, but the hope is that, by taking into account all of the different sources of uncertainty, by taking two different, you know, very different, independent modeling, or non-modeling, however you want to call it, approaches to estimating the final abundance estimates, we're hoping that that will provide, you know, something that we can all at least, you know, know that we did our best job at getting the information.

I mean, this is a species we know very little about, and it's a very short amount of time to find out a lot about them, and I think, at the end of the day, through this project, we are going to have learned more about amberjack, in the last year, than we have in the last ten or twenty, and so I think that that's one of the, you know, points that we have to remind ourselves as well with this project.

DR. LORENZEN: Thanks, Mark, and I think that answers my question, to the extent that it can be answered at this stage. I was just wondering, and the other thing is can you update us briefly on the timeline, and I think you mentioned -- So there's going to be a lot of sampling going on, and then you're going back to do some calibrations, I think you said next year, and so can you just update us on the overall timeline?

DR. ALBINS: Yes, absolutely, and so all of the abundance sampling efforts are happening right now, as we speak, over the course of this summer, in all the different regions. Some of the portions are already finished, and some of them are just starting, but, you know, within the last two months, and the next two months, I would say all of the abundance sampling efforts are going to be finished.

None of us were satisfied with the outcome of our first or second calibration study, and so we were able to, you know, figure out how to, you know, scrape together the funds to do an additional calibration study, and we have high hopes for that, but none of us have time to do it this year, and so that's going to happen early next year, and we're hoping that that will help, you know, with some of these inter-gear calibrations, and getting those nailed down, and we have, you know, some pretty good idea for how to do that, and I think that we'll be successful.

That's the timeline for the abundance surveys, and the timelines for all the other parts of the project are basically this year. This year, most of the data are going to be rolling in, and the analyses are going to be initialized, or started. In terms of the genetics, the acoustic tagging, the conventional tagging, you know, all of that stuff has -- Basically, at the end of the amberjack season in the Gulf of Mexico, we will have probably the bulk of the returns that we're going to get from conventional tags, and we'll have one full round of downloaded receivers, with a whole bunch of acoustically-tagged fish out there, and so, you know, a lot is happening this year, and I think early next year will be, you know, the time where we really wrap up the analyses, but also get this additional calibration data to help with those analyses.

DR. BUCKEL: Thanks for the question, Kai, and thanks for the detailed response, Mark. We have got a 1:00 speaker, Rick Methot, and so I want to give folks a half-an-hour for lunch, and so we've got just a couple more minutes to ask Mark questions, and then we'll come back to our action items later in the meeting, and so hopefully, as Kai just pointed out, these questions, or comments you have, but feedback on the methods and potential uncertainties, and Kai just hit on three of those that have been brought up before.

DR. LORENZEN: Right.

DR. BUCKEL: Mark has got, as he mentioned, the feedback on the methods made, and, you know, the methods for calibration next year would be beneficial, and then certainly the calculation aspect is in the future as well, and a lot of the field work methods are happening now or over the next couple of months.

DR. ALBINS: Yes, and, for our abundance sampling stuff, we pretty much -- The sample designs at least are nailed down, and the data are being collected, but we definitely, you know, would be open to any input about the calibration study and anything that has to do with, you know, the backend analysis part.

DR. BUCKEL: Go ahead, Christina.

MS. PACKAGE-WARD: I guess I was just wondering if you could speak a little bit more to what was gathered through the local ecological knowledge portion of the project.

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DR. ALBINS: Yes, and so the main part of that were these spatial surveys, and so we basically showed people maps and had them click on maps based on, you know, different sets of questions, and I don't have the details of that in front of me right now, and it's not my corner of the project, and so I hesitate to give you the wrong details, but, essentially, there were a series of questions that were designed to help us decide which of the respondents were experienced with greater amberjack and then questions designed to extract information from them about where they would expect to or go to to catch amberjack.

The idea there is that we wanted to, you know, have some information to potentially use in our sample design, but, also, maybe even more importantly, have -- Be able to incorporate local ecological knowledge into the priors for our Bayesian estimation effort. I'm sorry, and I know that's a little short on detail, but I can put you in touch with Dr. Steven Scyphers, who is in charge of those surveys in particular, if you have specific questions.

DR. BUCKEL: Thanks, Christina and Mark, and so it's 12:30, and so I'm sorry, but it's just going to be a half-an-hour lunch, but hopefully folks are somewhere where they can grab a quick bite to eat, and we'll be back at 1:00 for Dr. Methot's presentation, and, Mark, we will -- As I mentioned, we have an action item to comment and provide feedback, and we'll revisit this later in our webinar today and then get that feedback back to you, but thank you very much, again, for the detailed presentation, and, everyone, we'll see you at 1:00.

DR. ALBINS: Thank you, everybody, and I really appreciate the opportunity to come and share with you guys today, and so thank you, and I look forward to seeing your comments.

DR. BUCKEL: Thanks again, Mark.

(Whereupon, a recess was taken.)

DR. BUCKEL: Judd, I've got 1:00 here. It looks like -- Is that updated, the raised hand on return?

DR. CURTIS: Yes, and people are trickling back in, and it looks like we're just about full-up now, and so I think we can go ahead and proceed with Rick Methot's presentation, and we have him online, and I will him to presenter mode, and you are ready, Chair.

DR. BUCKEL: Yes, let's do it. All right, and so we're on to Agenda Item Number 6, the NS 1 Technical Guidance Document Review, and Dr. Rick Methot, from NOAA Fisheries, is here to give a presentation on that document, and our actions are to review and comment on the NS 1 technical memo and discuss application of guidance and recommend approaches for the South Atlantic. Rick, when you are ready, please take it away. Thank you for your time today.

NS 1 TECHNICAL GUIDANCE DOCUMENT REVIEW

DR. METHOT: Very good, and thanks for the opportunity to talk to you about this. This is a document that's been a long time in the making. We have not updated this aspect of our technical guidance for National Standard 1 since the Restrepo et al. document from 1998, and I think I'm the last one still active in the agency from that period of 1998, and so it was overdue, and, with the

most recent update to the National Standard 1 Guidelines themselves, it was definitely a good prompt for us to go forward with updating this technical guidance.

We've been working on it for the last several years, and a number of people have been engaged in this, and there was a period of time where we actually had some representatives from some of the councils engaging with us in our discussions on how to go about approaching some of these issues, and we've arrived at a point where we now believe that we need to wrap this up and get your comments on it, so that we can proceed to finish this as technical guidance for implementation of reference points and their proxies.

As an overview of the document, we structured this according to three tiers of assessment approaches, with Tier 1 being the age and length-structured assessment model, with direct estimation and sometimes proxies, and Tier 2 being biomass dynamics models, and I will spend a bit less time on that topic, and then Tier 3 being the data-limited approaches, where we've not had guidance before, and we felt that it was good to put a special effort into proving guidance for these data-limited approaches. We addressed some special considerations, and it also covers a number of additional points here that I will get to in this presentation.

You know, you're the SSC, and so you're probably quite familiar with the various bits of the alphabet soup associated with our status determination criteria. We have our fishing mortality rate, that is basically the slope of the line relating catch to biomass, and so, the steeper the line, the more catch, the higher percentage of the stock is caught each year, and this causes a lower average stock biomass, and there is some intermediate level of fishing mortality rate that strikes a balance between reducing biomass and catching a large fraction of that biomass and gives us a maximum sustainable yield. Overfishing occurs when the fishing mortality rate exceeds that level of FMSY, which is, for status determination purposes, labeled as the maximum fishing mortality threshold.

In a number of cases, this maximum fishing mortality threshold is completed with the level of biomass projected for the next fishing year, and that is turned into an overfishing limit as an amount of catch, and that is used as a basis for overfishing determinations, whether or not the catch exceeds the overfishing limit. A stock is considered overfished, hence depleted, when the biomass is below a minimum stock size threshold. This level is typically set at half of the BMSY, and it ranges between that level and something above that.

We note in this document, and it's not something that has previously been highlighted, that there is an F that corresponds to that minimum stock size threshold, just as there is an FMSY that corresponds with the BMSY quantities, and there's also an F MSST that corresponds to the level of F that, would, on average, move the stock biomass down to the MSST level, and that is something that we will utilize in the data-limited approaches.

For the Tier 1 assessments, those that are essentially age-structured, and sometimes life-structured, the direct estimation -- It comes down to a number of issues with regard to how we end up parameterizing the degree of density dependence in the population or using a proxy for that. This involves choosing a spawner-recruit relationship functional form and the parameterization of that, estimating those parameters, which, in some cases, in some regions, involved priors on one or more of those parameters, and what we have seen, as we got together to work on these technical issues and describe our technical approaches, is that indeed regional differences have evolved in this regard, and trying to come to a common understanding on this is, you know, much of what

took us a while to produce this document, and discussion of which you will find in the document, such that -- It largely depends on the region and the methods that have evolved in that region in order to deal with these situations that they are doing assessments, the data they have, and the models they tend to use.

We note that the data-moderate MSY-based proxies -- These are proxies for FMSY, and, typically, we are using proxies that are characterized in terms of percent SPR, and percent SPR is the percentage of an unfished spawning biomass per recruit that is retained under fishing, and so it's the spawning biomass per recruit under fishing relative to the unfished spawning biomass per recruit, and we find that the range of this is typically 30 to 60 percent, and I believe there are a couple in the Southeast that are at 26 percent.

Most of the new science that has come out about this, MSEs that have been done on this topic, tend to recommend that a proxy for FMSY be in the range of 40 to 45 percent SPR, but we recognize that the rationales that have been developed for the range of proxies that are in use today are not something that we reinvestigated in the document, and so we acknowledge that they could be updated, but we do not recommend that they need to be updated, but we do provide some information about the type of MSE that could be useful in order to better understand the performance of the selected proxy as a proxy for FMSY.

We also discuss proxies for BMSY, which typically are using a mean recruitment multiplied by the spawning biomass per recruit at that F proxy, and, here, the main challenge is in developing a sense of what is a reasonable value for the mean recruitment to use in that calculation.

For the second tier, the biomass dynamics tier, the pros of using this approach are its simplicity. It has very minimal data requirements, and it's simple to implement and to communicate. It's a very straightforward connection to the MSY quantities, and even the language of the Act are well connected to a biomass dynamics view of the world, but the details of how our fisheries interact with our populations are not something that can be captured with biomass dynamics models.

We can account for great differences in age specificity of some fisheries relative to others, and it ignores a lag effect of recruitment contributing to the spawning biomass, and it really can't well serve as the basis for projections that take into account recent fluctuations in the processes, and so we continue to recommend striving for age-structured approaches wherever feasible.

For the data-limited approaches, we touch upon a few categories within this set, and, you know, the catch-only methods, those that use absolute abundance, abundance trends, and then we spend most of our time with biological composition, and that is a recent measure of the age structure, or the length composition of the population, or even just the mean length of fish, as a recent observation, and using that, leveraging that information, into a calculation that is relevant to the status of this population.

All of these data-limited approaches rely upon structural assumptions in order to infer some aspects of status determination, and none of these methods do it all very well, and all are dependent, again, on some structural assumptions, in order to substitute for the data that we strive to have, but, where we don't, you already have defined ways of making reasonable assumptions about how the population is operating and use that to infer the status of the stock from limited information.

A biological composition observation allows you to calculate the recent average F, which allows you to calculate the recent average spawning stock biomass per recruit, and that then can be compared to the unfished level of SSB per R, in order to gauge what has been the recent level of fishing impact on the population, and so the observation itself of measuring the recent length composition is a product of the recent history of fishing, and so it's reflective of the impact of that fishing on the population.

Now, typically, this has been turned into a measure of, well, what has been that level of fishing, to make a calculation of the F, and essentially the associated percent SPR as a measure of the fishing mortality rate that has occurred, but, simultaneously, that same observation, under a quasi-stable stock and fishing condition assumption, is potentially a measure of the status of the stock relative to the MSST as well, and it's at a different level.

The F at MSST is a higher level of F, and the SPR is lower, but it is along the same axis of information, and so we can -- We believe it is logical to be able to utilize the percent SPR approach, under suitable conditions, which, you know, bodies like yours are the ones that will need to judge whether or not these conditions are met well enough in order to make an additional determination of whether or not the stock is overfished, but we believe that it is logical that this could proceed.

The document also has a section where we touch upon a number of additional factors, and some just are laying out the details of -- Or acknowledging the details of fleet dynamics and spatial complexity and how they confound the calculation of a F as a single number, and the interplay of the fisheries with the population, and as it gets calculated inside of our assessment models, don't produce one number for F that is a universal F, and it is age-structured, and potentially be area, and it is by fleet, and it's by season, and all of that needs to be boiled down to one measure of F, and all regions have developed -- We don't have particular guidance on how to do this, but we do acknowledge that that is part of the process in developing our fishing mortality rate thresholds that needs to be attended to carefully.

A topic that we touch upon is the impact of size-selective fishing, and, you know, it's a well-known phenomenon that fishing tends to be size-selective, and larger fish, faster-growing fish, will enter a fishery at a younger age, and they will experience a more cumulative fishing mortality rate, and so the end result is that the average size of older fish is lower under fished conditions than under unfished conditions, and this is something that, again, has been known as a phenomenon, but it has not been built into our assessment approaches.

It is feasible to do so, but we tend not to have done this, and is an added layer of complexity, but, nevertheless, it does help us document what has been the impact of fishing on the fish stocks, and it's something that would provide additional information to help guide what is the optimal level of fishing.

Another issue that has been, I think, underserved in our assessment approaches has been a look for density dependence and other life history factors beyond stock recruitment, findings of changes in age at maturity, changes in growth, changes in natural mortality rate, all of which are potentially going to change over time in response to the density of a stock and its interplay with other stocks in the region. Again, we feel as though this is an underserved topic and one that would be better if we were able to provide more information on this.

Our approach to looking at status has focused very much on the total spawning biomass. Other characteristics of the spawning biomass, like the average age of fish that are now spawning, and how it declines under fished conditions, is not something that we tend to document and move towards, you know, potentially utilizing it as an additional consideration in the status, and, again, it's not part of status, but it's closely associated with our efforts to make status determination criteria, and starting by better documentation of what is happening with the mean age of fish in the reproductive stock would be a good start.

Finally, we talk about the units of reproductive potential, and the Act itself refers to protection of the reproductive potential of the stock, and nearly all of our quantification of this has been in terms of the total biomass of the mature fish, or the mature female fish, in many cases, as our measure of the reproductive potential of the stock, but there have been a number of studies, a number of efforts, to move in the direction of utilizing information on fecundity in this calculation, to try to move in the direction of measuring reproductive potential in terms of total eggs produced, rather than just the biomass of the females that produce the eggs.

It's a right-minded approach to move in that direction, but we've not played it through to how that relates to our current proxies for FMSY, and they're all calibrated in terms of mature female biomass and not in terms of total egg production. It's not a large difference. It's a few percentage points, but it is something that is potentially a tune-up of the reference points that could be done, so that reference points -- We could have equivalent reference points though, in terms of mature female biomass relative to the total egg production by the stock, and so, again, it's a technical issue that is potentially cleaned up, but, because we slowly drifted towards measuring things in terms of eggs, yet still use the old proxies, we have a small bias in the application of those proxies.

A bigger issue though is the issue of updating reference points for changes in prevailing conditions, whether they are regime changes, as shown on this diagram, or just the slow drift in a long-term direction, you know, much of which is projected with some of the climate models, as impacts on the total ecosystems in which these fish are -- The impacts on the fish themselves are also going to be seeing this unidirectional, you know, push in one direction, and so it's warmer waters changing distributions and the like.

As we think about this issue of updating reference points for prevailing conditions, we realize that, for some characteristics, we're doing this routinely, and we're routinely updating the technical characteristics of the fishery, and we are always updating for changes in selectivity, changes in fleet allocations. These things which affect the reference points calculations are routinely updated.

Similarly, for the biology of the stock, we tend to routinely update for recent body size, maturity, and the like, and, you know, that is cooked into much of our approach, but not so much the factors that tend to be constant in the models, things like natural mortality rate, things like the spawner-recruit relationship itself, and we are -- We have a very conservative approach to changing those things and putting a high bar on making a change in these things that are fundamentally driving big aspects of the productivity of the stock.

We face a conundrum in this regard, and so, on one hand, we are remaining conservative in wanting a high bar in making a change in the reference point for factors like a change in recruitment. You know, there's something that we think is density-dependent, and we expect changes in recruitment because of density dependence, and we don't -- We too easily want to invoke a change in

recruitment that is essentially linked only to changing ocean conditions, and so we advocate for a trailing average approach, but we also want to have a reasonably high bar for invoking a big shift in using say the mean recruitment for a reference point. Again, we don't have an extensive analysis, and we've not done technical work inside of the document, but we do call out this fundamental issue that we need to be thinking about addressing.

In particular, we highlight a caution for declining stocks, and it is possible, and we have seen it happening in various parts of the country, where a stock is showing evidence of a decline, and, as we look at the changing biology of the animal, we may end up finding that, under the changed conditions, we would be maintaining a high F on a declining stock, or maybe even increasing the F. For example, if the natural mortality rate has gone up, that has caused, or contributed to, a stock decline, and that increase in M is also going to cause our F 40 percent to be a higher F level, and so a stock would be declining, but we would be recommending a higher fishing mortality rate on it.

Another example is where we have control rules with a kink in the control rule such that we would be reducing fishing mortality rate if the stock was declining below some level, and that kind of approach is pretty universal today, and, you know, it's certainly highly recommended in everything that we've done, but the point at which that inflection occurs in the control rule is the subject now, because, if we see changing biology, changing mean recruitment, you know, essentially, to include them, we would be changing the level at which that inflection occurs, and so, again, we could have a declining stock, that would have declined below the inflection point, but, with the updating of the biology, we would be moving the inflection point to a lower level, and now the stock is no longer below the inflection point, and so, rather than decreasing the fishing mortality rate on a declining stock, we would be maintaining the fishing mortality rate on a stock that had declined.

Again, we do not have answers on these and our best advice, at this point, is that we need to study it under more circumstances, but we float the idea, float the concept, that we should be updating the things that affect the current rates of fishing on full -- On healthy populations, the FMSY, the MSY, and OY reflect the recent prevailing conditions, but, for the MSST, for the inflection control rule, that we try to maintain a long-term perspective on those, so that, while the stock is above the inflection, we can use the most recent prevailing conditions on the stock and the fish conditions to, you know, provide optimum yield from those populations, but we maintain a long-term perspective on the minimum stock size threshold and the control rule, such that we still have the tool in hand to be reducing fishing mortality rate on the stock that's declining.

Moving to another topic that we bring into the document, the single species approach that we so commonly use is -- It's not mandated, and it's convenient, and we've gotten quite good at doing it, but we should not use sight of the fact that, in some circumstances, taking into account the direct interactions between species can provide us a more accurate and more holistic answer for the situations we're dealing with, and this involves, you know, how we deal with our stock complexes, how we deal with especially predator-prey situations, so that, you know, we can provide more holistic advice. In your region, the recent work with striped bass and menhaden is an example of the kind of work that can lead to more complete advice, when we are able to take in a multispecies approach.

In conclusion, and we've tried to update our technical guidance for implementation on the reference points and status determinations, and we've worked at it for several years, and we have

addressed some old and some new issues, and we generally find that, you know, there's no huge hole in our approach, and there's things that we need to update, and, you know, the impact of climate on reference points is the biggest deal that's out there, but it's a little bit beyond approaching with the technical guidance for our current National Standard 1 Guidelines. It's something that needs to be addressed at a higher level, so that we then can work on technical guidance once we get that overall approach defined better. I will leave it at that, and I'm certainly open for whatever questions you have.

DR. BUCKEL: Thank you very much, Rick, for that informative presentation, and so I will open it up to the SSC for questions on the presentation. Alexei.

DR. SHAROV: Thank you. Rick, thank you very much for the detailed overview, and there is a lot, of course, to discuss, and we're not going to have time for that, but I just wanted to ask if there are any advances, essentially, in recommending the percent SPR approach, because it's so widely used as the proxy, and that's the question.

A comment would be, on the biomass dynamics biomass model and their applicability, the team appears to mention that the negative sort of side of the biomass dynamic models is the inability to address the incoming pulses of recruitment, et cetera, and other elements associated with the biomass dynamics model, and I think it's unfortunate that you guys missed the publication by Genny Nesslage, who is present here as an SSC member, and Mike Wilberg, who published a paper on the surplus production models with time-varying intrinsic growth in those models, and so they are much more flexible, and they are able to account for changes in the product and the stock related to recruitment or changes in growth, and essentially fitting to the data much better, and so that certainly should be reflected in the comments back to you guys from the council, and so that's the comment, but the first question was about any additional recommendations on the SPR-based approach. Thank you.

DR. METHOT: Okay. Thanks for that, Alexei. I appreciate that, and certainly our community of model developers and researchers has been very active in this continued evolution of our methods, and so I would be glad to take a look at that recent work, and it sounds a bit more like the work seen from the Pacific Islands, and with Henning Winker as well, developing a model that has more flexibility, and certainly the whole approach with Bayesian biomass dynamic models has certainly made them more flexible. Nevertheless, I think we've maintained that, you know, we can do the same thing with the age-structured models, and with more control over the individual dynamics, but we'll take a look.

In terms of additional advice with regard to the percent SPR, I'm not quite certain what kind of things you're looking for, and are you looking for within the range that's been used, and are we more specific about what should be used?

DR. SHAROV: Yes, and I think, by the history of the development of this approach -- It's very much based on the sort of regional papers by Sissenwine and Mason, and really hinged on the available plots of stock-recruitment relationships, but, obviously, due to uncertainty of the data, and the differences among the stocks, the range of the sort of replacement levels was, you know, quite different, and so there were some general recommendations on the range, which then the assessment leads in different regions interpreted towards their own data, and the decisions were being made often done in a presumable objective, but effectively subjectively, you know, based

on the, well, either individual analyst decision, or maybe even a decision by the group, but I don't feel that there is much of the sort of more justified objective approach to it, and it's still sort of bits and pieces taken together, depending on the localities, and so I don't know if I described the sort of reason why I'm asking that.

DR. METHOT: Sure, and I understand, and, without doing the analyses ourselves, we recommend that more complete indices be done, and some have been. There was some recent work in the Gulf that was quite extensive in trying to look at, you know, their -- The basis for their proxies, and that was all a good approach to doing that.

I think that, in doing MSEs on this topic, there is two things that need to be tended to, and one is that the old work tended to treat the limit as the target, and there was not the concept of a buffer, such that we had a limit that we didn't want to be beyond, but we were setting a target below it, and I think that difference needs to be built into future MSEs that are trying to investigate what would be the performance of a given proxy, and the other is that, when we do MSEs, we tend to bring in additional factors, and I think that's a slippery slope between are we trying to get MSY as a limit or are we trying to find the optimum yield that takes additional factors into consideration, and so that is something that I think also would need to be done carefully, so that we don't end up with a hybrid that doesn't work perfectly as a basis for a limit, because it is now taken into account, ecosystem impacts, economic impacts and the like, which really are optimum yield considerations that are conditioned on being below the maximum sustainable yield. Other questions?

DR. BUCKEL: Fred Serchuk.

DR. SERCHUK: Thank you. Again, let me compliment you on a really wonderful presentation, and I have a question from a top-level point of view, because you can see things nationwide, and perhaps have a different perspective than just at a regional basis, and one of the things that I have observed, over time, is there have been many cases where standard models have not worked out, or the data have changed, or the data have been insufficient, and they have gone to different types of models, because they don't have the complete data.

Sometimes this gets manifested in rebuilding schedules that are not met, okay, and I know, from a council point of view, it must be very frustrating to have a ten-year time horizon, or any time horizon, with expected changes to the stock to meet the requirements and then find out, after ten years, that it wasn't rebuilt, and even though management measures were put into place to attain that. I wonder, from your vantage point, looking at all the councils, whether there are any observations that you can share when those sort of things happen, and are they happening more frequently? Is it because the councils didn't get a clear picture when they were setting their management plans?

You know, we've now had a number of years in which we have tried to rebuild stocks, and, in some cases, it's been successful, but, in many other cases, it hasn't, and I feel that the councils sometimes are under -- Nobody wants to fail, and my feeling is, if you set a time horizon for ten years, or longer, if the dynamics permit a longer time horizon, like the one-generation-plus, and you don't get there, is that a failure of the science?

DR. METHOT: Thanks for that, Fred, and certainly the performance of rebuilding plans is an important issue, and it's outside of what we approached from this particular document, but it's

certainly something that has been an important topic. When rebuilding plans are set with, you know, barely over a 50 percent chance of succeeding, you know, nearly 50 percent of them will not achieve their goal by the end of that time, and so, in a sense, it's not a surprise if you see some that have not achieved that rebuilt status at the end of it.

Whether it's a failure in the science, I mean, things are changing in other ways. I mean, there is certainly the impact of climate of stocks is causing a complication in trying to have a rebuilding approach, and, you know, these are wild stocks in the ecosystem, and our approach to rebuilding them is not engineering, and so, you know, we can set in place policies that have some probabilities of success, but, you know, there is plenty of ways in which things can not follow that plan.

DR. SERCHUK: Thanks for your observations. I appreciate it.

DR. BUCKEL: Kai, go ahead, please.

DR. LORENZEN: Thank you, and thanks, Rick. That was a great overview, and I am very excited about some of the proposals, and, in particular, you know, I like the idea of actually allowing the use of sort of composition-based SPR estimates for things like MSST, because I think we've been a little too constrained by the requirement to explicitly consider biomass, and so I am really excited about that.

I think the other thing that I'm excited about is some attention to density-dependence outside of the stock-recruitment relationship, and that's partly because those of us who have been working on this for a while mostly have operated outside of the stock assessment and management realm, or more on the ecological side, but this is being taken up, and, actually, in Europe in particular, and you're probably be aware of that, and that has become quite a major topic in the context of stock assessment and, in particular, setting reference points.

I was thinking -- So, for one thing, I think it would be actually great to reflect a bit more of that work, because it's gone quite far, I think, over the last few years in the technical guidance document, but I was also wondering whether -- You know, if NOAA is sort of ready to go that way and pay more attention to the sort of density dependence outside the stock-recruitment relationship, and can we start asking for that to be considered in stock assessments, perhaps at the research track level, and so because, in the past, we really haven't done that, but I think a logical consequence of considering that would be to actually start looking for those effects in more fisheries and considering them. Thank you.

DR. METHOT: Thanks for that, Kai. I appreciate it, and, yes, I was engaged with some of those conversations in the ICES environment, and so their updates, or their guidance, and I did hear, you know, a number of conversations about density dependence in biology. I think one of the factors that has impeded it here is we have tended not to have collected information, as a time series, on maturity and fecundity, and, you know, without having that history to look at and see how the stocks have performed, it's a lot harder to build it in.

I do understand that there was some investigation of this with the red snapper in the Gulf, and it didn't come to completion, but, nevertheless, they were, you know, starting to investigate, you know, whether or not they could feasibly have age-at-maturity be something that showed a density-dependent response. I mean, it's challenging to build density dependence into our stock

assessment models. It is available in the Stock Synthesis approach that is used for a number of stocks in the Southeast, but it is not, you know, straightforward to expect it to perform well, and so it's a tall ask, and it's going to be very case-specific on whether or not you'll have enough information to help calibrate it.

It's not something that NOAA is in a position to suddenly be able to do a whole lot more along those lines. Where feasible, it should be discussed, so that no one feels as though it's out of bounds, and that's all we're trying to do here, is to say that, you know, this is certainly a topic that is in bounds, and deserving of attention, where we can, but we have a wide range of information that comes forward in our assessments, and some are very data-rich, and those are the places where we could start exploring some of these factors, where we have the information to calibrate it, but it will be far from universal for a long time.

DR. LORENZEN: Thank you, and I was thinking particularly about growth, by the way, but I think, yes, that makes perfect sense. Thank you.

DR. METHOT: I mean, with all of them, the challenge is that they also -- Those same factors are also responsive to environmental conditions, and the time constant over which things change is similar for the decadal scale changes, and average abundance of the population that occur because of fishing is the time scale that we see, you know, essentially regime changes in the environment, and so there's a high confounding, and so ask me again in a hundred years, after we've seen a few more cycles, and then I will have an answer for you, is my glib response in that regard, because we just don't have enough contrast in the time series to do this confidently.

DR. LORENZEN: Thank you.

DR. BUCKEL: Thanks, Kai, for those questions. Next up, we have Genny.

DR. NESSLAGE: Thank you, and thank you to Rick for your presentation. I agree wholeheartedly that this issue of changing ecosystems and their impact on our stock assessments is really important, and it's kind of -- I think you said it was beyond technical guidance at this point, but an area of needed research, and I guess, given the recent literature on alternatives like dynamic B zero, that have either used MSEs or have recommended MSEs for exploring, and this is an alternative option to our traditional reference point framework, and do you know if any of the regional MSE gurus have been tasked with this, or have this as a priority on their to-do list?

DR. METHOT: Our technical group met with our MSE group to, you know, have that crossover conversation, and so, yes, it's certainly on our radar screen, but the doing of the MSEs -- You know, our MSE group is more coordinating work, and it takes a village to do an MSE, and, you know, I am hoping that we can see more work along those lines come out, and there certainly are a number of MSEs underway, and I know mostly about those on the west coast, and hopefully they will continue to work towards providing advice. In terms of -- You know, certainly there is a high level of top-down interest in seeing more MSEs done, but the same people doing the MSEs are doing the stock assessments, and so there's limited energy to go around.

DR. BUCKEL: Thanks, Genny. Fred Scharf.

DR. SCHARF: Thanks, Rick, for the overview. I wanted to ask you some questions, or a question, about the idea of the environmental regime shifts, and I appreciated, in the presentation, you know, creating a relatively high bar for making a determination that a regime shift was responsible for a change in productivity, and so that those changes that might be due to the fishing effects on stock biomass weren't being dismissed as just environmental effects, but it's a challenge that we're dealing with a lot here in the South Atlantic, where we're seeing consistently low recruitment for a large number of species, with only, you know, minimal evidence of stock size responses to changes in fishing pressure during that same time period.

I wondered, and, in the document, you had cited some other recent ICES workshops, and I wondered if you could comment more on some of the conversation about those environmental regime shifts in other regions in the U.S., or globally, and the evidence that's being used to make decisions about those, mainly because the last point, the last bullet point, in the document talks about strong justification to believe that conditions are not going to return to previous conditions, and, to me, that implies that we have a mechanistic understanding of the drivers of recruitment variability, which, you know, we haven't been able to do that for a century, and so I wonder if -- You know, how high the bar needs to be to determine whether we have moved into a new environmental regime that either lowers or raises productivity of a stock.

DR. METHOT: We certainly recognize, and I'm glad you're bringing this up, that, you know, our fundamental understanding, first principle-based understanding, of the linkages is incomplete, and so we can't have an expectation that you're going to have that mechanistic linkage, and it's a question of, you know, what is the body of evidence that this indeed is a pervasive change that is not logically associated with stock dynamics internally.

In doing that, you know, recognizing that a number of different stocks in the same region are all showing a similar pattern, and, well, that's certainly a supporting evidence that this indeed is something pervasive that is going on, but it might be that all of those stocks also have all been fished down to a low level and that we've not been paying close attention to their spawner-recruit relationship, and maybe this is a spawner-recruit relationship that we are finally seeing manifested that was masked before by the variability in recruitment.

I think the first thing to do is, you know, can you logically explain the change through some density-dependent response that has been caused by fishing changing the average abundance of the population, and that needs to be part of the analysis, and, beyond that, you know, we really can't be prescriptive, and we urge you to look, you know, widely for other things that are changing in the region that may give some at least circumstantial evidence that, you know, similar changes might be happening with the stocks, and, again, seeing several stocks showing the same pattern, seeing 101-degree temperatures that have never been seen before in the region, things like that are going to help build the case that there is impacts that are happening that are beyond the internal dynamics of the density-dependent response, but you need to look first for is this logically explainable by internal dynamics of the stock that would be responsive to fishing.

DR. SCHARF: Thanks, Rick, for that perspective.

DR. BUCKEL: Other questions for Rick?

DR. METHOT: In terms of your response to this document, we're looking for your feedback on whether we've missed something that we really need to address, whether we've got something in here that's going to cause a particular problem, or if we've missed something that you region is doing that you think is a good idea that ought to be in our national technical guidance, and, you know, please bring those kind of things to our attention.

We're not looking for, you know, wordsmithing of the document, we do hope to proceed, you know, fairly promptly after we get this set of comments from all the councils, and we hope to receive them fairly promptly for producing the final version of this and getting it out, so that we all can be using it.

DR. BUCKEL: Thanks, Rick. I will give it one more chance. Do any SSC members have questions for Rick? I've got one that we're going to create a workgroup to try to address, but it would be good to find out if others have had to deal with this situation, and I will probably explain it wrong, but some others can chime-in that are on the call to correct, if I misstate things, but we have, for several stocks, but the one specific one we were talking about today was black sea bass, and we have a situation where the assessment will have both landings and discards forming F, and those have different selectivity, and then, as you move forward with projections, and you're in a situation where you have to reduce landings, those projections then will have how to deal with discards in those, because, in the past, we've expected -- The way the projections were done is it was thought that the effort was going to drop, for both landings and discards, but we've learned that that doesn't happen, that the landings will drop, but then the discards will often increase.

Those have different selectivities, and it changes these reference points, as you move forward, and so have other regions dealt with that issue, and I guess the changing in the status, as you change from landings to more discards and those different selectivities influencing those reference points?

DR. METHOT: Yes, and it's certainly a technical issue inside of our approaches, and your region, the Gulf, and the Pacific Coast probably have the most experience in trying to deal with that, because you have these situations that -- You know, where the management tends to end up with an approach that has some structural discards that are occurring, and the degree to which discards are just small fish that are being discarded, because they're below a size limit, is the whole paradigm, but, indeed, you know, fully retainable fish also get discarded because of regulations, bycatch and other fisheries, and so configuring your assessment approach so that you have flexibility in dealing with that is the first step and not, you know, getting trapped into a situation where things are more linked than truly is happening in the real world is what you need to be attentive to.

You know, your region has as much experience, or more, than others in this regard, and I would be glad to, you know, confer with you on a specific at any time, but, you know, there's no one that I think has a lot more experience than you do in this regard.

DR. BUCKEL: Thank you, Rick. Last chance for questions for Rick from SSC or others. All right. I am not seeing any hands, Rick, and so thank you very much, again, for the informative presentation, and, Judd, we have some action items on this, if you could bring those up.

DR. CURTIS: Let me bring that around, but it was really just to discuss and comment on the NS 1 tech memo, and, procedurally, as Rick alluded to, the SSC comments -- We'll be sending a memo

to the Council Chair, Carolyn Belcher, for her review, and then eventually forward that on to the council and to NMFS, to provide the feedback from the South Atlantic region, but let me bring -- I tried to capture some of the questions and responses from Rick as well in the overview, and the only action item that really we have on our agenda is just to discuss any comments or recommendations from the SSC, based on the presentation that we just received.

DR. BUCKEL: Thanks, Judd, and thanks for taking notes on that, and so I will let folks -- I will give everyone a few minutes to read through Judd's notes and make sure it captures the discussion and any comments that members brought up, and so take a few minutes to read that, and then we'll do some editing, while we're all here.

DR. METHOT: I realized that, in my responses earlier, I was incomplete in my response to Genny with regard to dynamic B zero, and dynamic B zero is certainly being looked at in some regions, and I think being used in a couple, but it also is something that is susceptible to, you know, the kind of -- You're simply following the drift, and, if the drift is downward, you are building in a response to help mitigate that decline, and so that would be the caution about too closely following a dynamic B zero approach without stepping back and looking at the big picture of the stock over time. Do you anticipate any further dialogue with me, or should I sign-off now?

DR. BUCKEL: Rick, I think we -- No other SSC members, or others, raised their hands for questions directly related to your presentation, and so I think you're free to go. Thanks again for the presentation, and, if there are follow-ups, we know where to find you.

DR. METHOT: Very good. I will be here. Take care.

DR. BUCKEL: Thanks again. Go ahead, Kai.

DR. LORENZEN: Kind of a question, and so are we meant to give comments or recommendations, or what exactly are we meant to provide?

DR. BUCKEL: Kai, I think, if Judd scrolls up, the action item is to comment, discuss and comment on the NS 1 tech memo, and, as Judd mentioned, that's going to -- Our report will then go to the council, and I guess the council is going to comment, and then Carolyn and the council will send a response.

DR. LORENZEN: Okay, and so then, I mean, my -- I am coming back to the density dependence outside of the stock-recruitment relationship, and I would really like to see, you know, that to be expanded a little in the light of the literature on that topic, because there is -- This is sort of half a page with three references, but there is quite a bit of literature now on, you know, the sort of magnitude -- Of course, the processes, but also the magnitude of impacts on reference points that are typically found, which ranges from not very much to quite substantial, and I just think that needs to get a little bit more -- It needs to be fleshed out a little bit more to really be useful for, you know, considering, you know, when to try and take that into account, and so I'm not making a lot of sense, but, I guess, what I would like to see is a little bit more developed sort of guidance on that point.

DR. BUCKEL: That makes perfect sense, Kai, and I agree, and, you know, I was excited about both of the things that you were excited about, the density dependence outside of the SRR, and also that SPR proxy, the biological composition approach.

DR. LORENZEN: Yes.

DR. BUCKEL: That is also -- It's in the document, in the draft, and I don't think there's any -- Maybe there are no references, but it should be -- If there are no -- If folks haven't done that approach, and it's just something that's being described here, then the details on how to do that would be helpful.

DR. LORENZEN: I agree, and I think there's certainly big literature on using those approaches in a data-limited context, and so I think it's Magnuson-Stevens that makes us think that it has to involve biomass explicitly, and I think most of those things don't do that, but I think, also, that, yes, there is probably more literature there that could, you know, usefully be summarized and referenced.

DR. BUCKEL: I would recommend that the figure that Rick had in his presentation -- Several of those figures were helpful, that I didn't get from reading the document, but that I got it when I saw the figures, and so incorporating those figures into the document, and I don't think they're -- Several were in the PowerPoint, but not in the NS 1 document. Genny.

DR. NESSLAGE: Thanks, Jeff. Regarding dynamic B zero comments, I am both excited by and terrified by its potential use, and I -- I guess a little bit of background, I guess, and my understanding, and it may be wrong, of the literature to-date on this, like Aaron Berger's work on this, and then the most recent work, Bessell-Browne work, and I think it indicates that it seems like a really attractive option at the outset, but some of the previous work that had been done indicated that it didn't really provide much in the way of improvements, and the model can get -- If it's mis-specified, that can get caught up in confusing your estimates of that change in B zero.

The more recent paper seemed to indicate that you could get greater catch out of the stock, but you had to be able to be more flexible than the previous versions of it, and you had to be able to estimate time-varying growth in your parameters, parameters for time-varying growth, and so I'm a little dubious about our ability to do that, but it would be really cool if the Center tried, for some of our more data-rich stocks, and so I guess my -- Where I'm getting to is my recommendation is that, if the council is interested in NOAA providing a -- Well, they should -- I would encourage them to ask NOAA to provide more guidance, more research, on this this could be applied to stocks like ours.

As Rick mentioned, many of our stocks where we might want to consider using this, where we're worried about regime shift, these are stocks that have a one-way trip, if you will, with recruitment, and so, before we get too excited about that recommendation, or before they even, I guess, encourage its use, and I don't think that they encouraged its use in the paper, but the fact that it's out there, and it's being used in some regions, indicates that it's at least somewhat approved by NOAA, and do you know what I'm saying, and so I would encourage though that, in our case, in our region, the type of situations we're confronted with, that it be specifically tested for that before we start considering it as an option, but it could be an interesting approach, and so I don't know, and those are just my thoughts, and I'm not sure what the rest of the group thinks.

DR. BUCKEL: Thanks, Genny. We have Fred Serchuk next, but, folks, if you want to comment to Genny's point on the dynamic B zero, we will take those first. Fred Serchuk, was yours to the dynamic B zero?

DR. SERCHUK: Just one small point, and I want to bring it up now, and, when we use a term like dynamic B zero, because there are going to be people that are not familiar with the intricacies of it, it might be worthwhile just to spell out what we mean there, or just to try to define the term a little bit better, so that people don't think that we speak in a cryptic language. Thank you.

DR. BUCKEL: Great point, Fred. Thank you. Marcel.

DR. REICHERT: I had a different -- Basically, an observation, and I do agree with this, but I am happy to wait until we have completed talking about this particular topic.

DR. BUCKEL: Do others have any comments on dynamic B zero? Matt Vincent, is it to the dynamic B zero?

DR. VINCENT: Yes, and I was just going to ask Genny if she -- Like all the work that I'm familiar with with dynamic B zero are assuming a stock-recruitment relationship, and I'm curious if there's been any work that's been done using a mean recruit model, because I have a feeling that, once you try to use a dynamic B zero for the mean recruit model, it will start just following it down the drain, essentially.

DR. BUCKEL: Genny, please go ahead, if you have anything.

DR. NESSLAGE: I agree completely, and I think that's what Rick was insinuating, or not insinuating, and that makes it sound devious, but I think that's what he was hinting at with the idea that it could just be tracking drift, and so I agree completely, and it would require -- You know, like I said, I don't know that it would work for our stocks, and so that would need to be -- Before we get too far down that rabbit hole, we might want to be very clear to the council, or have the center advise the council, on that. I agree completely.

DR. BUCKEL: Thanks, Matt and Genny. All right. I don't see any other hands for dynamic B zero, and so, Marcel, please move us to the next topic.

DR. REICHERT: Thank you. I basically have two observations, and I'm not even sure whether they are questions, but just a couple of things that I wrote down. The first one is, you know, the stock-recruitment relationship, and we talked about that, and Rick talked about that, and, you know, no matter how we are looking at it, it seems like it remains critical for how we approach stock status, et cetera, but, as we all know, in our SSC, and I reckon others too, we have struggled with the fact that, more often than not, the stock-recruitment relationship is often very poorly defined, and so I am not entirely sure how that works through some of the things that were presented, and, as I said earlier, it's, right now, more or less an observation, because I am still trying to full wrap my head around it.

That brings me to the second observation, and I kind of understand the issues for the assessment approaches, but what I am, again, struggling a little bit is that, to me, it's a little unclear what the

implications of all of this are for our ability to develop recommendations, and potentially our ABC Control Rule, and, again, I don't have any specific questions relative to that, or solutions, and that's just something that I'm struggling with a little bit, is how does that affect or ability -- Or what are the implications for developing our recommendations to the council, and, with that, I will -- That's it, basically. Thanks.

DR. BUCKEL: Thanks, Marcel. Others? Anybody want to address Marcel's question?

DR. REICHERT: This may be something that we can pick up at some future discussions about the implications of this guidance.

DR. BUCKEL: Erik Williams.

DR. WILLIAMS: Thank you, Jeff. I will follow-up on Marcel's comment and what has been said, and that is that a stock-recruit relationship, or any assumptions about it, are absolutely critical to what we do, and, over the course of the history, the way we've approached that in this region has shifted quite a bit. We used to go down the road of even, you know, saying it was Beverton-Holt and fixing the steepness and ignoring the fit, and then we realized that we weren't getting good fits, as Marcel correctly identified, that we rarely get a good definition of what the stock-recruit relationship looks like in our data, but it doesn't mean that it doesn't actually exist, but it just means that the data is not informing that exact shape.

Now we're dealing with all these benchmarks, and I would say that this is such a critical issue that it almost is worthy -- You know, again, I don't want to suggest work for the SSC, but there might be value in establishing a workgroup that sort of focuses on our region and what would be a sort of, you know, rubric of sorts, or default steps to take, in sort of modeling the stock-recruit relationship and benchmarks, which are both closely tied together, and that's all I was going to say.

DR. BUCKEL: Thanks, Erik. Marcel.

DR. REICHERT: I just wanted to say thanks, Erik, for that. I appreciate that, and I am hesitant to agree with you about a workgroup, because, you know, I don't necessarily want to give us, collectively, more work than we already have on our plate, but, as you said, this is a critical issue, and that's why I brought it up, and so thanks for your comment.

DR. BUCKEL: Thanks, Marcel. Erik, I guess I'm wondering where the data would come from, or is that what the workgroup would examine, is there other fishery-independent data, or other data out there, that could be explored to try to get an empirical estimate of a stock-recruit relationship outside of an assessment, and is that what you were thinking, or are you thinking about trying to come up with -- Using the assessment and trying to figure out how to improve that approach?

DR. WILLIAMS: A combination of all, and including, you know, recent literature from other regions, and other MSE analyses and things like that, that might weigh-in this, because, for instance, I think we get stuck sometimes in a rut, and this was brought up actually in the black sea bass, the idea that, when we make a decision for one assessment, it sort of sets the precedent for others, and maybe that just -- I think that has hamstrung us and tied us in a knot sometimes, and, like I said, we used to estimate --

Well, we used to assume a Beverton-Holt stock-recruit relationship, and then we had a prior on steepness, and even in some cases we would fix steepness, and we seemed to be okay with that for a while, and then, suddenly, we ran across a few stocks, and we kicked it to the curb, and I don't know that that needed to be kicked to the curb for all species, and so I guess, yes, I'm just thinking we need a more holistic sort of step back and think about this issue and not get caught up in the specifics of any one stock, and, again, I don't know exactly what data would come to bear to help us out with that, because it is such a critical issue, and it is such a tough one, because, if there was a clear answer, I think we would jump on it immediately, but I think there's room for at least further discussion about options, and, you know, maybe we should have sort of a suite of options always available for any given assessment too, I mean, instead of locking ourselves into one decision that fits all assessments.

DR. BUCKEL: Thanks, Erik. Marcel.

DR. REICHERT: In that respect, I think it would shine a light on that process if we can figure out why, or how, we made the decisions we made, because that may also vary by species and the situation we found ourselves in, and so I think it would be good to look back at some of the key assessments and see how we came to the recommendation, or the conclusion, of using a certain stock-recruit relationship or how and why we used, or chose, a certain proxy. Thanks.

DR. BUCKEL: Thanks, Marcel and Erik. Do others have guidance to Rick and the other authors on the draft document? All right. I don't see any hands raised, and so I think that -- Is it public comment next on this one, Judd?

DR. CURTIS: Yes. If there is any members of the public that wish to comment on this topic, you can go ahead and raise your hand on the webinar, and we'll call your name. I am not seeing any hands, Jeff.

DR. BUCKEL: Okay. This isn't a question to the document, but I'm just curious -- Or a question for Erik, and is the biological composition approach, under the data-limited tier, where the SPRs were plotted to get status, and is that something that you guys have explored, or Kai mentioned that he was excited about it, and is that something that can be used for some of the species that we can't do age-structured assessments, or maybe even for the age-structured, the species that we do age-structured, just as a different look at those?

DR. WILLIAMS: My understanding is, to use those per-recruit methods, you have to make some assumptions, of course, and some of them are going to be selectivity, because you won't have a selectivity, and you also need a current mortality estimate, as Rick was saying, and the question is where do you get that from? We typically get that sort of from -- If we don't have a full-blown assessment, we get that from an age structure, and, if we don't have age structure, then you're looking to length compositions, and that -- Length compositions are always very tough to sort of use for that kind of estimation, particularly for our region.

In our region, we suffer from -- The reason we don't use a lot of length data in our models is because that length data has very low information content, is probably the best way to put it, in terms of what's going on with the stock, and we almost never see sort of year classes passing through the length data, because it's just a big smear, and we have such variability in size-at-age,

and we have protracted spawning seasons, and all of these things add to just really stripping out a lot of the classic pop-dy information that we would like to get from say a length composition, and we just can't get it from our region, because of some of those confounding issues.

I am not sure of what value it would be, and, you know, maybe it would be valuable for some of these stocks where we have really low age sample sizes, but we can still get enough say over a five, or even ten, year period, and you can collapse and then maybe get a rough mortality estimate from a collapsed age composition from multiple years, but, again, to get that SPR benchmark, you then have to make assumptions, and you have to know the growth, and you have to know selectivity, and those sort of things, to get that curve, but, again, you know, you can cast some stochasticity around all of that and then come up with a probabilistic model, of sorts, and so I don't know if that helps. I mean, I think it's possible for us to do it for some of our stocks.

DR. BUCKEL: Okay. Thanks, Erik. I think that just reiterates that point, that first bullet under recommendations, for this document to provide some more guidance on the methods, or citations for the methods, so it's clear that some of these are a bigger lift than others. Kai.

DR. LORENZEN: I think -- You know, I'm excited about it, and I don't think that it will be a game-changer for most of our stocks, and it's just, you know, sometimes we're in a situation where actually we have decent say age-structure information, but we can't get a good estimate of biomass, and so I'm thinking of things like, you know, in the Gulf, goliath grouper, and so there is some situations I think where this can help us out that we don't have to actually have an explicit biomass, but that would be a relatively small number of situations, I would imagine.

DR. BUCKEL: Thanks, Kai. All right. There was no public comment, and so we'll move on to the next agenda item, which I believe is Spanish mackerel, and is that right? Yes. Thanks, Judd, and Erik Williams has a presentation for us. Erik, are you going to --

SPANISH MACKEREL CATCH LEVEL RECOMMENDATIONS

DR. WILLIAMS: Actually, I don't have a presentation, and it's a one-page document, and so you should have it.

DR. BUCKEL: Right. We do have that one-page document.

DR. WILLIAMS: It should be hopefully very self-explanatory and very straightforward, but, if anybody has any questions, just let me know.

DR. BUCKEL: Yes, and so this is Attachment 7a, everyone, and so, at the April meeting, we came up with a way to move forward to get an ABC from SEDAR 78, and we requested equilibrium values corresponding to 75 percent FMSY, and Erik has provided those in the document for both FMSY and 75 percent FMSY, and those will be put in the table, or Judd has actually got them in there, and so you can check out -- Within the overview document, you can see the table with the values for the ABC and the OFL.

DR. CURTIS: Jeff, the SSC adopted the OFL and the ABC at our last meeting, and the values from the assessment -- We only had the landings in whole weight, and so we had just made a

request to the Science Center to provide the landings in numbers, the discards in whole weight, and the discards in numbers, and those are the last four columns you see in the table in Erik's one-pager, and those are then relayed onto the table for the SSC's recommendations in the overview.

DR. BUCKEL: Those are on Table 3 on PDF page 11 on the overview. Our action item to review the values from that run, and so does anyone have any questions or concern about those? Seeing no hands, this will move forward to the council. Thanks, Erik, for getting those new numbers for our table, and we have a public comment on that, and so does anyone in the public have any comments? Before we go to the public, Fred Serchuk.

DR. SERCHUK: A small procedural thing, Chairman. The top of the page talks about SSB and the other parameters in metric tons and thousands of pounds, and it would be good to -- If you're going to put those things on one part of the page, it would also be good to keep the same units on the bottom of the page, and do you see what I'm talking about? Go back to Table 3, and we have pounds under OFL recommendations and pounds under ABC recommendations, but, on the top, where we compare these things to things like SSB MSY and MSY, they're given in thousands of units, and can we keep the units the same on the top of the page as we do on the bottom of the page, or vice versa? Do I make myself clear what I'm suggesting, to try to simplify things?

DR. BUCKEL: Yes, and so, for example, under the Criteria, MSY, it says MSY, and then it says, in the parenthetic, it says thousand pounds, and, instead of having 8,210 -- We would take out the thousand pounds and, instead of having 8,210, it would be 8,210,000?

DR. SERCHUK: Yes, or the other way around, but just have be expressed in the same denomination on the top of the page as in the bottom, whether they're in thousands or just metric tons or pounds, and it's just a little simpler to interpret the page. Thank you.

DR. BUCKEL: Thanks, Fred. Judd, that's -- Maybe that's a question for the council, since I think it's been shown this way to them for a while, and so I guess it's up to -- I will leave that up to you guys, to decide which way to change it, but I take Fred's point that it would be easier to have the MSY and then the OFL and the ABC treated the same way. Any other comments from the SSC or the public? All right. I don't see any hands raised, and so we'll move on to Agenda Item Number 8, which is the SEDAR items, and it's scopes of work for the 2026 assessments. Marcel.

DR. REICHERT: Break, please.

DR. BUCKEL: Excellent idea. Thanks, Marcel, and so I have 2:37.

DR. REICHERT: Even five minutes would be nice.

DR. BUCKEL: Okay. We'll give you a few extra, and we'll meet back at 2:45. How does that sound?

DR. REICHERT: Thank you, Chair.

DR. BUCKEL: Thank you, Marcel.

(Whereupon, a recess was taken.)

SEDAR: SCOPES OF WORK FOR 2026 ASSESSMENTS

DR. BUCKEL: Okay. Welcome back, everyone. We are moving on to Agenda Item Number 8, the scopes of work for the 2026 assessments, and that's Attachment 8a. This has been developed by council staff and will be used by the Southeast Fisheries Science Center to evaluate workload associated with the assessments, and so hopefully folks have reviewed that document, and I think, Judd and Chip, are you going to just walk us through it now?

DR. CURTIS: Yes, we've got three scopes of work, draft scopes of work, that we're providing to the SSC, and the three species are snowy grouper, Spanish mackerel, and dolphin. Spanish mackerel has been added to the document, because the SEDAR Steering Committee stated that benchmark assessments would be a valuable addition to the assessment portfolio, and, previously, the staff could not fit another research track assessment into the SEDAR planning grid.

The dolphin MSE has been on the SEDAR planning grid, but we do have to have a discussion on the type of review that the SSC would like to have for the analysis to set any catch level recommendations, and so, based on previous feedback from the SSC, you know, we developed these scopes of work a little bit differently than in the past and brought together all the research recommendations from the past stock assessments, as well as the SSC reviews and any other uncertainties that were present during the review.

We ask the SSC to discuss and modify these draft scopes of work for the potential 2026 assessments and to comment on the type of review they feel is appropriate for the Spanish mackerel benchmark assessment and the dolphin MSE, and so we'll just walk through them one at a time, and you will see this list here, starting with the snowy grouper operational assessment. Included in the document, you have all the research recommendations from the SEDAR 36 update, and then, below, you have the SSC research recommendations provided during the review of the SEDAR 36 update, and then, below that, we've got just the draft scopes of work, proposed scopes of work, a template that then the SSC needs to review and make any additional modifications to, and so we'll start with snowy grouper.

DR. BUCKEL: The one thing I noticed on snowy was that the assessment type is not listed here, and is that on purpose? You know, on dolphinfish and Spanish mackerel -- For example, for Spanish mackerel, it says the assessment type is benchmark. Thanks. I see it there in the third bullet there now. Marcel.

DR. REICHERT: I saw that one of the -- I am trying to scroll down, but one of the adjustments to the model was to look at average recruitment, and we discussed some of that earlier, and I assume that the timing will be not enough to include any potential recommendations of that possible working group that Erik mentioned earlier, and is that something that we should mention here, or we can leave it open for later, but --

DR. CURTIS: Marcel, is that the MSY proxies and benchmarks workgroup that we were forming or the latter?

DR. REICHERT: I think what I am specifically asking about is the stock-recruitment, for the stock-recruitment curve, and that was something we talked earlier, and I was just wondering that anything that comes out of conversations relative to that topic can be included here or whether the timing is insufficient to do that.

DR. CURTIS: I think we can include that in here, you know, depending on the timeline and when that workgroup convenes and then they can generate that report, and that may be available in time for the assessment.

DR. REICHERT: Okay. Thanks.

DR. BUCKEL: Julie Neer.

DR. NEER: Good afternoon. I just wanted to clarify something quickly. Currently, under the structure, you need statements of work for operational assessments, and you do not need statements of work for research tracks, and those are developed through a planning team, and then they come to the SSC to review the actual terms of reference, and I don't know yet what's going to happen with benchmarks, whether statements of work will be required in advance of them, because we're still fleshing out how we're putting them back into the process, and so I think it's valid for the SSC to take some time to work through what Chip and Judd has prepared with regard for Spanish, and whether it will go back through a planning team and come back to you again or not, I am not sure, but I am just letting you guys know.

Then, with regard to the dolphin MSE, it is SEDAR's understanding that it's going to be a review workshop only, and so I am not sure if in fact statements of work will be required or just terms of reference with regard to how you want to review the -- How the dolphin project is going to be reviewed, but it would be good for the SSC to weigh-in certainly on whether they feel it needs to be a CIE, in-person, web, just the SSC can do it, whatever you guys want, what sort of review you would be interested in having, and we can provide that information to the steering committee and the council moving on, and, obviously, when we get whatever the terms of reference are for dolphin, you guys will get a chance to look at that as well, but I just wanted to let you know that, you know, we have three things in here, and each one of them is sort of a different point on the SEDAR process, and it's going to be a bit confusing, but I just wanted to try and head off some of the questions that might come up as you work through this document. Thank you.

DR. BUCKEL: Thanks, Julie. We were on snowy, and is that right?

DR. CURTIS: Yes, that's correct, snowy grouper.

DR. BUCKEL: Any other modifications to what Chip and Judd have here for the requested modifications for the next snowy grouper assessment? Chip or Judd, how many years will the SADL survey have when this is -- Just out of curiosity, and I see it has the develop the index, and that's been designed, and it has been ongoing now for a couple of years.

DR. CURTIS: Yes, and, actually, our chair of the SADL workgroup just raised his hand, and so I will let him address that.

DR. BUCKEL: All right. Marcel.

DR. REICHERT: I was actually asking for a clarification for something else, but, real quick, what is the terminal year for this operational assessment? Could you remind me?

DR. BUCKEL: 2024.

DR. REICHERT: I don't want to speak out of turn, but I think that survey may have been going on -- Let's see. If we use the -- Remember, the 2021 data, like three years or something like that, and so, again, I don't want to speak out of turn, but I personally would be surprised if the committee considers -- If it will recommend to use that for index development in 2024, and, Wally, to that point?

DR. BUBLEY: Yes, and so, if the terminal year is 2024, that would be four years' worth of data, most likely. 2020 was the first year, but there's been some adjustments made after that first year that probably eliminates that from index development, and so, at the best case circumstance, it would be four years.

DR. REICHERT: Anyway, as I said, I don't want to speak out of turn, but -- I have completely forgot what my -- Oh. Yes. Julie mentioned that this was a little different than what we normally see, and so I assume that the next step would be to develop the terms of reference from this scope of work, and I believe that's what she said.

DR. BUCKEL: Go ahead, Kathleen.

MS. HOWINGTON: Yes, Marcel, and this statement of work -- This statement of work for snowy grouper is per the usual process. It will go to the Science Center for feedback, and they will then provide their feedback, and there will be negotiations between the council, the council staff, and the Science Center. This will then go to the Steering Committee next May, to be approved by the Steering Committee, and then, after that, it will be developed into terms of reference, and those will come back to you all, and you'll be able to see it again.

DR. REICHERT: Thanks for that clarification, Kathleen. That's all I had.

DR. BUCKEL: Thanks, Marcel, and thanks, Kathleen. Others on snowy grouper? Julie Neer.

DR. NEER: I am not on the SSC, but I just want to be clear with everyone that this is your chance. If you want topical working groups, you need to state it now, because that heavily impacts the Science Center's discussions with regard to timing, and so you have a lot of things that you want looked at for snowy grouper, and does the SSC feel you're going to need to provide input during that development for those specific topics, or are you good without it? I just wanted to refresh everyone's memory that now is your chance to ask for topical working groups.

DR. BUCKEL: Marcel.

DR. REICHERT: That's why I brought that stock recruitment issue up earlier, because, if there's going to be a working group that addresses that issue, then I don't think a topic working group would be necessary otherwise, and that would be -- I think that would be a good topic for a topical working group. Does that make sense?

DR. BUCKEL: Yes, it does, Marcel, and so, Judd, maybe an SSR working group, if there isn't a larger -- If a larger SSC workgroup doesn't, for multiple species, doesn't take place. Marcel, did you have another --

DR. REICHERT: No, and I was just interested in other members had any thoughts on this.

DR. BUCKEL: Fred Scharf.

DR. SCHARF: Just a clarifying question for Julie, and so, because this is going to be an operational assessment, there won't be data, assessment, and review workshops, as part of SEDAR, that the SSC would have representation on?

DR. NEER: That's correct, and so the SSC may be a part of topical working groups, essentially, and then you get a completed report for your review.

DR. SCHARF: Okay. Then I would agree with Marcel that, if a working group for stock-recruitment relationships isn't able to provide recommendations, then this group could make sure that that's incorporated, or we have a topical working group on that for snowy.

DR. BUCKEL: All right. Any other topical working groups? I don't see any hands, Judd, and so do you want to get feedback on the timing, or that's already -- That's already done, it looks like, and so

DR. CURTIS: All right. No hands raised.

DR. BUCKEL: Then we'll move on to Spanish.

DR. CURTIS: So, again, you know, you see the research and sampling recommendations from SEDAR 78, and then also from the SSC's review, and this should all be fresh in your minds, as we just finished the review of this over the last eight or nine months, and, below, we have a proposed scope of work for the benchmark-type assessments, which is now available as well.

DR. BUCKEL: Marcel, do you have your hand raised? Please go ahead.

DR. REICHERT: Yes, and thank you, Jeff. This is a clarification, and I may have missed part of that conversation earlier, and so the benchmark is now an assessment that is being added to the assessment types, and is this kind of a one-time for Spanish mackerel, or is that a consideration for all future assessments, just to add an option for the assessment types?

DR. BUCKEL: Kathleen is going to answer that for you.

MS. HOWINGTON: This is not an option from now on. At the previous Steering Committee meeting, they had a discussion about research tracks and operationals and how there was a need for something in between that gave management advice, that had deadlines, and so the Steering Committee voted to add benchmarks back in as an option. We have not finalized how we're going to integrate that, because, back in the day, when benchmarks were happening, there weren't

planning teams, and we didn't do SOWs, and so we're trying to figure out how it's going to work in, and so please look at this, and act as if it is a normal SOW.

Once we figure out that process, either this is going to inform the terms of reference that the planning team will create or it will inform the terms of reference that the coordinator in charge of the assessment will create, and so this is still extremely helpful for you to have, but, to answer your question, yes, benchmarks are now an option for you guys at the SSC, if you're making species recommendations for the future, and you can suggest a benchmark.

DR. REICHERT: Okay. Thank you for that clarification, and I am really glad to see that as a third option. Jeff, if you will allow me, I had a similar question for dolphin, and do you want me to wait for that until we get to that, but since we are talking about assessment types right now?

DR. BUCKEL: Go for it, so we don't forget.

DR. REICHERT: Dolphin is an MSE, but it is -- I assume, from reading the scope of work, it is meant for us to provide management advice, or catch level recommendations, to the council, and so is MSE now another assessment type, or does it fall in one of the other assessment types, and, again, this is kind of more of a procedural question, but I was just wondering about that, and, again, not that I am against an MSE, because I know how complicated dolphin can be, but just as a formal procedural question.

DR. BUCKEL: Kathleen.

MS. HOWINGTON: So it is definitely a complicated conversation, and, technically, the MSE is not an assessment type that is going to go through SEDAR. We are a science-based process. However, SEDAR can logistically provide a review workshop, if you guys need it. Additionally, the scope of work is going to help inform the Science Center of what you all are envisioning and what you think needs to come out of this, and so, no, it is not an assessment type that -- SEDAR is not going to lead the entire MSE. However, we can provide administrative and logistical support for the review workshop, if it is needed. Then this SOW is more about you all being able to communicate what you need to come out of this MSE and start working with the Science Center on that, and, Julie, please feel free to jump in if I am misinterpreting all these conversations, and, like I said, this is a complicated new thing.

DR. REICHERT: Thanks, Kathleen, and, yes, that all makes sense, and I was just wondering about that in terms of where this would fit in the overall scheme of assessment types, et cetera, and so thanks for that clarification.

DR. BUCKEL: All right. Thanks, Marcel, for getting that clarified, and so back to Spanish mackerel, and you can see the other -- Well, I guess, first, are folks comfortable with the assessment type being a benchmark? That's something that I know, in prior meetings, when we were talking about Spanish mackerel, right, the choices were operational or research, and so there was discussion about going to a research track assessment type, and so now the benchmark is back in play, and are folks okay with the benchmark here? I will take no hands as -- Marcel.

DR. REICHERT: Sorry, Jeff, and I saw, under the suggested process, the review, and there were three options, and are we asked to comment on that, or is that basically an indication that that is what is being considered? Sorry, and I'm on the wrong page. This is dolphin. Sorry. I apologize.

DR. BUCKEL: No problem. All right. Go ahead, Steve.

DR. TURNER: I saw, under Spanish Mackerel OA, a terminal year of 2024, and so it would be a benchmark, or is an OA occurring before the benchmark?

DR. BUCKEL: I think that was a mistake. Good catch.

DR. CURTIS: Thanks, Steve, and that was just a typo, and it's just the terminal year, and so we'll strike out "OA" from that.

DR. BUCKEL: Good catch. Thank you. Go ahead, Julie.

DR. NEER: I just have one comment up there, at that first section. If you guys are in fact recommending a benchmark, that would also imply that you could make changes to the BAM configuration, the assessment configuration itself, and not just the data, and so, under that last bullet up here, you could either -- Basically, recall that a benchmark would be more like a research track, except with defined deadlines, and so it would have a data process, an assessment process, and a review process, the three chunks like we had previously when we did benchmarks, and so it does allow you guys to do stuff.

If you're perfectly happy with the current configuration, then that's not needed, and I just want to, as we're having these conversations about what's a benchmark versus an OA -- An OA, you were more constrained on making changes to the model configuration itself, but, in a benchmark, you have a little bit more flexibility. Now, you're not going to have two years to look at stuff, like a research track, and it's going to be, you know, we have this much time to look at it, and, if you can get it done in that timeframe, great, but I just want to make sure that you understand that you do have potentially an option, if required, and it might be fine, because you guys just did this, but I just wanted to make sure that you recognize that change. Thanks.

DR. BUCKEL: Thanks, Julie. Good catch. Go ahead, Marcel.

DR. REICHERT: Perhaps it would be good to add some flexibility there to -- You know, I think the language that we have used in other assessment updates, like, if needed, update the BAM configuration. That gives the assessment team some flexibility, and I have to correct myself from earlier, because I do see here, under the suggested process, review CIE in-person, CIE desk, or SSC only, and my question then still becomes is that just a suggested process, or are we asked to provide feedback of either of these three options? Thank you.

DR. NEER: Jeff, to Marcel's question?

DR. BUCKEL: Sure, Julie. Go ahead.

DR. NEER: When the committee, the Steering Committee, talked about benchmarks, we wanted to allow some flexibility for each cooperator, to determine whether they felt they needed an actual

in-person review workshop, if they felt they could do it via a web-based, you know, a desk review for CIE, or if they felt the changes would really just be okay to be handled within the SSC, and so we are asking for your feedback on what you think -- What type of review you would like to see for this Spanish benchmark, and so, yes, we are asking for your feedback on that, and it's a little tweak that we added, hopefully to give the cooperators flexibility to do whatever level they think they needed for any specific species. Thanks.

DR. BUCKEL: Fred Serchuk.

DR. SERCHUK: I wanted to get back to this "if needed update", and I understand why it's there, but, because it's a benchmark, as I understand benchmarks, the group is -- The group has the liberty to look at any available models that they feel are appropriate, and so I don't know if the "if needed" is really the right direction that we want to give. A benchmark says, look, we're going to take a fresh look at everything, and I'm just concerned about the words "if needed". Aren't there terms of reference for a benchmark that say consider appropriate models that would best describe the dynamics of the stock, or something like that? I don't think -- You know, from what I'm seeing, I don't think there's anything wrong with the BAM, but I think it's a little bit restrictive.

DR. BUCKEL: I agree, and so we'll make that change. Thank you. Marcel.

DR. REICHERT: Since I was the one that made that comment, I completely agree, and if it was more -- Because, in the original scope of work, it said to apply the current BAM configuration, and that would be more restrictive, and so I completely agree with you, Fred. Thanks.

DR. BUCKEL: Underneath "investigate changes in distribution", Judd, there's a lot of this discussion related to what appears to be a northward -- Increased northward catches, and so I guess it's a -- I don't know if we want to say something that's more changes in distribution related to climate, or that's just a little more -- I know the commercial -- Some of the concern there was the commercial catch in northern or southern. Thank you. Other comments on the Spanish mackerel scope of work?

There's the workgroup, the Spanish mackerel workgroup, that had recommendations, and you have the catch level projections workgroup, but maybe the TORs are that -- Address recommendations from the Spanish mackerel workgroup. All right. If there are no other hands, I guess the comment on the process, and is that the next one, Judd, that you needed feedback on?

DR. CURTIS: Yes, that's correct, and just, again, as Julie mentioned, what type of review would be the most appropriate in the eyes of the SSC?

DR. BUCKEL: Go ahead, Marcel.

DR. REICHERT: Since I was the one that brought it up, I would be comfortable with any of these choices, but I would also be comfortable with an SSC review only, but I could go with any of the three.

DR. BUCKEL: Julie.

DR. NEER: I just want to clarify, because I'm not sure if everyone knows what we mean by a CIE desk review, but a CIE in-person review would be what you guys normally see, where you would have CIE reviewers as well as SSC members on the review panel, and a CIE desk review is simply that we employ however many CIEs you want, and usually it's three, who will do a review, at their home, at their desk, and provide that to you, and so there would be no SSC representation during that review, but you would certainly get -- Those independent CIE reviewers then would come to you guys, when you have to do your management specifications, or you could just do SSC only, but I just wanted to clarify what a CIE desk review meant, as opposed to the CIE in-person and the role that SSCs would have at that review stage. Thanks.

DR. BUCKEL: Thank you, Julie, for the clarification. Do others have thoughts for the data workshop, as well as the review? You know, we had a lot of discussion on Spanish mackerel, with the recreational MRIP and natural mortality shift due to climate, and so is that something that those -- Does all of that lead to, you know, an in-person data workshop, or, well, I guess that's a definite, but the -- Focus on the review, I think, here, and that's the main question, the CIE in-person, CIE desk, or SSC only. Marcel is okay with all, any and all.

DR. REICHERT: But that also means that I would be comfortable with an SSC-only review, and I am happy to post that as a recommendation.

DR. BUCKEL: Okay. Fred Scharf.

DR. SCHARF: I think -- I mean, given what you said about all the concerns we had, and some of the changes, I think 1 or 3, and I'm not sure I would be comfortable with just a desk review, but I am comfortable with just an SSC-only review as well, since we're going to have direct involvement in the in-person data workshop as well as the assessment workshop webinars.

DR. BUCKEL: All right. That's two for SSC only, and does anyone feel strongly against SSC-only? Amy Schueller.

DR. SCHUELLER: I am fine with the SSC-only, and I would kind of like to see the CIE desk review stricken from the list of possibilities. I just -- I know it's like a potential, probably, to save money, time, or resources of some sort, but I think that the getting feedback on an assessment that then you cannot respond to really isn't super helpful in that format, and I feel like the in-person reviews are better, because there can be a give-and-take and questions, et cetera, where the desk review is -- I don't know, and I'm not for a desk review, and I would personally like to see it off the list, and I don't think it's helpful.

DR. BUCKEL: Thank you, Amy. Julie.

DR. NEER: I just wanted to give you a little hint on timing, is that we're looking at this assessment for 2026, which means it would start sometime in 2026, and you guys might get it in 2026 or 2027, just the thought process of how far away you're getting from -- I know it's fresh in everyone's mind right now, but I just wanted to give you timing for that, so that you can put that in your brains as you think of times for this section. Thanks.

DR. BUCKEL: Thanks, Julie. Is that something that -- Given that, maybe we can just keep both options open and see how things proceed, since there's timing on when the final SOWs are due,

and that's May 1 of 2024, and so maybe, between now and then, there will be some -- We may have some reason for the CIE in-person, but maybe put an asterisk on the CIE only, that right now that's the one that the SSC seems to prefer. Great. Thank you. Kai.

DR. LORENZEN: I was on that workgroup, but, you know, we've had an awful lot of discussions about this assessment, and I'm wondering whether maybe having a CIE review is not a bad thing.

DR. BUCKEL: I definitely -- With all the potential changes, I think having an independent person -- There's an argument for that, and so we'll keep that option on the table, Kai, and, for the sake of time, we'll move on to dolphin, unless anyone else has -- Last call for Spanish mackerel. All right. We'll move on to dolphin, please. Marcel.

DR. REICHERT: Given that this is kind of new for us, this was the one that I thought a CIE in-person review would be most appropriate, but, again, I am interested to hear what others have to say about that.

DR. BUCKEL: Do folks feel strongly for CIE in-person? Marcel's vote is for that, given that this is an MSE approach, and it's a new one for us. We will strike CIE desk, for the reasons that Amy mentioned. Judd, I think you can copy that either 1 or 3, just given we have a little bit of time before the final SOWs, and that, if we learn that the MSE -- Maybe we'll learn more about it, and it's going to be more complicated, and we want to go with 1, or maybe it's going to be -- We get initial looks, and we see that it's more appropriate for SSC only. Other comments on the dolphin SOWs? All right. I don't see any hands. Judd, is there anything else that you or Chip need from the SSC on this document?

DR. CURTIS: No, and I think that's all we need for the scopes of work, and Kathleen gave you kind of the timeline, and this will be submitted to the council and the Science Center, and negotiations will ensue, and then, out of that, a terms of reference will be generated, which the SSC will get to review as well.

DR. BUCKEL: All right. Thanks, Judd, and thanks, SEDAR staff, for all the good information that you provided. That was very helpful. Okay, and so the next agenda item is Other Business, but, before we go there, we need to revisit amberjack, because we had to break for lunch after Mark Albin's presentation, and we didn't get a chance to finish that up, and so Judd is scrolling back to amberjack, and so we had the presentation on the greater amberjack abundance project, and there were some questions for Mark. Our action item is to comment and provide feedback on the methods and potential uncertainties for the greater amberjack research project.

GREATER AMBERJACK PROJECT UPDATE (CONTINUED)

DR. CURTIS: One question that I had, as well as to the SSC, is, you know, are you all willing, or would you like to see an additional update of the work that they've done, including any of this additional calibration event, sometime next year, once they've concluded that?

DR. BUCKEL: I think it's appropriate. You hate for these things to go to where there's a report-out, or a presentation on the final product, and folks have concerns, and so I think seeing not only the calibration, but maybe some initial approaches that they're using for the estimation, and Mark

didn't get into the details on that, and so maybe that's something that our SSC members could give them feedback on. Kai summed it up, that there were initial concerns with the calibrations between gears, using different regions, species IDs, given the similarity of the different seriola, and then the response of greater amberjack to sampling gears, and so those are all areas, continued areas, of uncertainty that, in addition to the calibration, maybe species ID and how they're dealing with -- Great. All right. Wally and then Kai.

DR. BUBLEY: I mean, I just want to concur with kind of what you were talking about with this, is there was a lot of topics that he had discussed being -- Making progress and getting to the point where they feel comfortable with it, but a lot of those weren't resolved, and so I think it would make sense, as you said, to look at things at a stage prior to the final product, just to get some input in at that stage, so that it can be addressed potentially before the finished product comes out, like just some of the acoustic work, where they're looking at identifying the signature for greater amberjack, and that's another thing that he said they started to make some progress on. All the topics that have been touched on, I agree with, and it would make sense to get an update on them.

DR. BUCKEL: Go ahead, Kai.

DR. LORENZEN: Actually, I'm not sure that I have that much to add, and I think it's a little disconcerting that -- From the data we've seen, it seems it's going to be hard to address some of those issues, but there's really not a lot else we can do right now, other than wait for the next update, and, yes, we should look at that next year.

DR. BUCKEL: Thanks, Kai. Judd, just to be a little more explicit, that last "and preliminary modeling", add "and preliminary abundance estimation modeling". Other comments for the greater amberjack team? Chris Dumas.

DR. DUMAS: Thanks, Jeff. Yes, I thought this was a great presentation, and, obviously, the project is extremely ambitious, and they're going after so many things at one time, but the part of the project that was most interesting to me was the potential for improving our estimates of the natural reef habitat and the -- What did they call it? The uncharacterized bottom, and understanding that better, and understanding sort of the habitat distribution, and I think that part of their work, hearing back from them on progress on that, would be very interesting, not only for greater amberjack, but for potentially some of other bottom-dwelling species that we work with.

You know, looking at what their estimates are of the natural and artificial and uncharacterized bottom habitats out there, what their estimates are and what their uncertainty is in those estimates, after they finish their sampling program, their stratified sampling program. That, to me, is very interesting, and it could have potential uses for a lot of different species that we manage here in the region. Thank you.

DR. BUCKEL: Thank you, Chris. Good point. Judd, when you're done with that, I think the first bullet, having something that's complementary, and I agree with Chris, and a lot has been done, and Mark did a good job of conveying the multiple layers of that project to us. Other SSC members or others on the call with feedback to Mark and his team? All right. Well, if things are -- Fred Scharf, go ahead.

DR. SCHARF: Jeff, is it your understanding that the additional calibration event, scheduled for spring of 2024, that we have listed here, and is that referring to additional VPS tracking events, trying to incorporate a broader range of densities, and then trying to calibrate that with the cameras?

DR. BUCKEL: Fred, I think that's the hope, if there's enough money for telemetry tags, and so that would be the hope, and, as far as I know, that hasn't been finalized. The exact details of that haven't been finalized.

DR. SCHARF: Okay. I just remember that one of the issues was that the two sites that they used in the northern Gulf both had, you know, relatively high densities, and so they just didn't have a lot of contrast in the VPS sort of abundance estimates, and so they were looking to do this with some more contrast, to see if they could get the relationships with the ROVs.

DR. BUCKEL: Right.

DR. SCHARF: Okay.

DR. BUCKEL: I think -- Yes, that's still to be determined, and the details are yet to be finalized, but that's the hope, is to have multiple sites, but you saw how -- I wasn't involved with that, but, you know, it was -- Trying to get all the different gear types that are being used throughout all the regions was a herculean effort, and I'm not sure if they're going to be able to do that. You know, four different amberjack density --

DR. SCHARF: Yes, and I agree with the statement that you guys added to the beginning about just commending the work on the project, and it probably wouldn't hurt that the SSC also acknowledges how difficult and challenging it is, you know, what they're trying to actually do, in terms of counting -- You know, this pelagic species is challenging. It's probably a lot harder than the red snapper counts.

DR. BUCKEL: All right. I don't see any other hands, and so I think we will go back to our Agenda Item Number 9, and, if folks do have others that come to mind, you know, we can add them to the report, the draft report. All right, and so Item Number 9, and we have several items under Other Business. The first is the SSC workgroup membership and SEDAR appointees. Is that Chip or Judd?

DR. CURTIS: That's me, and I will discuss all of these Other Business items.

DR. BUCKEL: Okay. Great.

OTHER BUSINESS

DR. CURTIS: So thank you to all that put their names down and volunteered for the SSC workgroups and other various SEDAR appointees. We did a little bit differently, where I have a Google sheet, and you're able to sign up, sign your names down, if you had interest in it, and I will bring that up right now. We'll start with SEDAR appointments.

We've got several people that volunteered to fill those squared cells, where we needed additional membership, and so there's a still a few -- Well, there's one square still available for the mutton snapper benchmark assessment, for the data workshop. If anyone is still interested, that is coming up very soon, August 21 to 25, and that will be in-person in St. Petersburg, Florida, and so, if you are interested in participating in that, there is a mechanism to get you approved, an expedited method to get you approved, through the council process, to be able to participate in that data workshop.

Then, for assessments coming down the way, we've got multiple memberships, and the council will reviews the membership of these SEDAR panels and come to a consensus, or a decision, on who will be appointed to those assessments in September.

Then, moving on for the workgroup membership, we've got several ongoing workgroups, and we're still needing some membership to fill in some of these, the Ecopath, Ecosim, Ecospace, and the regime shifts workgroup, which I will touch upon in just a minute, and we had discussed the idea of having a standing scope of work workgroup that would assist in kind of expediting the scope of work reviews, instead of the entire SSC, and then bringing them to the full SSC body, and then a couple of the new ones that we've just added are the -- That MSY proxies and reference points workgroup, and then potentially this spawning stock recruitment relationship workgroup as well that we've been talking about at different agenda topics throughout the meeting.

Those will be there, and you've got the -- I can send out the link again, at the end of the meeting, if you're interested in volunteering for any of those workgroups, and please place your name in each of those boxes there.

DR. BUCKEL: Thanks, Judd. Julie, did you have a question or a comment?

DR. NEER: Just a quick question, and hogfish will be -- In the assessment for hogfish will be in 2024 as well, which will be coming to the SSC to review terms of reference in October, and so, on that SEDAR page, Judd, don't forget to give people a heads-up. Under upcoming assessments, we have a benchmark for hogfish in 2024, just so people can plan accordingly. Thanks.

DR. CURTIS: Thanks, Julie.

DR. BUCKEL: Judd, do you want other non-SSC members that -- I know Kyle Shertzer volunteered to be on the regime shift --

DR. CURTIS: Yes, and so those members will be included in the overall workgroup, and this is just for the SSC members to express their interest in joining these workgroups.

DR. BUCKEL: The MSY proxy -- That's the one that we were just talking about for black sea bass?

DR. CURTIS: Correct.

DR. BUCKEL: That's landings and discards and dealing with -- That's one that Matt would be involved with, and so just a -- As long as you had that in your notes.

DR. CURTIS: Yes.

DR. BUCKEL: Folks can either -- If you know you want to be on one of these, go ahead and let Judd know now, and then you don't have to go to the link, and he can type it in right now. Marcel.

DR. REICHERT: That was my question, and I looked at my calendar, and I am available for the mutton snapper that's coming up this August, correct, and so, unless someone else has an urgent desire to be part of that, I can join that workshop, the mutton snapper one.

DR. BUCKEL: Great. Thanks, Marcel. Kai.

DR. LORENZEN: I was going to volunteer for the black sea bass -- What is it called, the reference points workshop, assuming that the workgroup will be mostly in September, and I think August is a non-starter for me.

DR. BUCKEL: Thanks, Kai. All right. As Judd mentioned, he will send that link, and you can look at calendars and fill in for workgroups that you're able and you have time for.

DR. CURTIS: Right, and so, of course, I don't exactly have definitive timelines on most of these currently. You know, this MSY proxies one, we want to get off the ground running pretty quickly, and the other one here that we're going to be convening pretty shortly will be this regime shifts workgroup, and the council, as I mentioned earlier, is very interested in this topic and wants to see some more -- A technical group dig into some of the specifics of when they declare regime shifts and its implications, and so kind of an overall workgroup task and timing for that particular workgroup would be meeting this fall, and probably the first meeting in either late August or September. The goal is to have a workgroup report submitted to the full SSC for review in April of 2024, and then the recommendations from that review at the SSC would be provided to the council in June of 2024, and so please consider joining the regime shifts workgroup if that is of interest.

DR. BUCKEL: Thanks, Judd. Marcel.

DR. REICHERT: Sorry. I still had my hand up.

DR. BUCKEL: Okay. So we've taken care of the first two, and is that right?

DR. CURTIS: Yes, and so the third order of Other Business, and this is more directed towards the Science Center, but we just wanted to get some feedback from the SSC as well, and so, if you recall, from the scamp and yellowmouth, we had estimates for OFLs and ABCs in total removals, which included both landings and dead discards. For management, we need an ACL to track the landings, because we do not get any commercial discard data and sufficient time for in-season management, and this is used to prevent overfishing.

Additionally, these general rec discards were developed using --, as opposed to point estimates from MRIP, and that is used to track discards, and, therefore, they feel like the best approach for the in-season management is to track the landings. This would be done by removing those dead discards, and the landings would be used to track the catch compared to the ACL. The discards, we're not going to ignore discards, and staff will work with the Science Center to add an estimate

of dead discards during their next snapper grouper SAFE report, which is expected to be completed in 2025, and so this was directed to Erik, I guess, and if we can get a landings and discards stream separately for ACL tracking, and any discussion from the SSC, if they see any concerns with that approach.

DR. BUCKEL: Go ahead, Mike Schmidtke.

DR. SCHMIDTKE: I just wanted to bring up something that I think that the SSC just didn't get to in the timing with amberjack, but regarding scamp and the rebuilding timeline, but, if you want to come back to that and have Erik address the current scamp issue at-hand, then I can wait.

DR. BUCKEL: All right. Thanks, Mike. Yes, we'll deal with the scamp issue, and Erik has got his hand raised, and so please go ahead, Erik.

DR. WILLIAMS: Thanks, Jeff. Yes, I am actually shocked that we don't already have those separated, but, if not, that's just a data provision, and so there is nothing tricky with separating these in terms of the assessment output, because they were lumped together, and so the selectivity is assumed to be the same, et cetera, et cetera, and so it is literally just getting different data streams, and, yes, that should be pretty easy to provide.

DR. CURTIS: Thank you.

DR. BUCKEL: Thanks, Erik. I know, you know, the reason it was combined was because the discards were so low, and at some point, is it just this small percentage that you just take that ABC and ACL of landings, and I guess it's worth looking at, to see if that's the case, but I know that's why they were combined initially, and so thanks, Erik, for looking into that and separating it out for ACL tracking. All right, Mike, and we'll revisit your comment.

DR. SCHMIDTKE: Thanks, and I just wanted to make sure that I had clarification to be able to bring back to the IPT, as we develop the scamp amendment, and one of the things with scamp is that, as of the last assessment, it has an overfished status, and so we need to develop a rebuilding plan for that. I heard the SSC's conclusion for ABC to be based on projections using the recent recruitment and for OFL to be based on the long-term recruitment, but I wasn't totally clear on how that played into a rebuilding timeline for this stock.

You all looked at a few rebuilding timelines in your last meeting, but kind of concluded that there was no ability, at that time, to determine Tmin, or Tmax, based on not knowing what is going to happen with recruitment, given your recommendation in this meeting to use the short-term recruitment for the first five years of new management. I guess one of the questions is how does that transition into what we're legally required to support with a probability of at least 50 percent of the stock being rebuilt, given that the assumption that, when that recruitment is going on, that lower recruitment is going on, the stock is not making any progress towards rebuilding, and so there is no increase in the probability of rebuilding.

There was one projection that showed a transition from the low recruitment to high recruitment, and we automatically are like putting in a higher recruitment for year-six of the rebuilding plan, and just going straight from the short-term to the long-term, and I was curious what the SSC's

conclusion would be, and recommendation would be, on those issues, because we'll need that to develop the rebuilding plan for that stock.

DR. BUCKEL: Thanks, Mike, and that's something that we didn't -- You're absolutely right that we just focused on the OFL option. Judd, I don't know if you want to bring up Slide 12 of Erik's presentation, and there was that proposal from the Southeast Fisheries Science Center for how to deal with the rebuilding timeframe, which was based on the long-term average recruitment.

DR. CURTIS: Yes, and let me get that fired up right now, Jeff.

DR. BUCKEL: I think, based on what we decided on for the OFL, that that would be -- In terms of a rebuilding timeframe, that we would accept that -- Or I guess that's a strawman to put out there for the SSC to comment on, that we would accept the Southeast Fisheries Science Center's proposal to choose a Tmin and Tmax based on long-term average recruitment, because, in April, we just said there's not enough information to decide, but one of the previous slides in here said that we have to -- As Mike mentioned, we have to -- We're legally obligated to provide this, and so, to be consistent with the philosophy of using long-term for OFL, I think that would apply to the Tmin and Tmax, but, Mike, did you have a comment?

DR. SCHMIDTKE: Yes, and I guess it seems like there's a place of conflict in this, in terms of, at some point, you know, the projections for catch in the short-term would then be added to the projections for catch in the long-term, to form the entire rebuilding plan, and there seems to be some like -- There seems to be some conflict, in the sense that, for the first five years, the recommended -- Even, you know, within the Science Center, with the Science Center's presentation, the most likely scenario is that recruitment is going to remain low, like we've seen it in recent years, but, at the same time, we're going to have a rebuilding plan that is assuming a high recruitment, and trying to reconcile those two things, that are both going to be in the exact same amendment -- There is some difficulty there, saying that, you know, the best available science to rebuild the stock has a long-term recruitment, but the best available science for catch levels assumes the short-term recruitment, and that doesn't directly -- That doesn't correlate with the long-term recruitment projection. I hope I'm being clear on that.

DR. BUCKEL: Yes, and, Wally, I see you have your hand up.

DR. BUBLEY: Yes, and, I mean, it goes to that point. My understanding, with all of this, was, because, anything out after a few years, we don't have a good feel for, and we don't have for the long-term aspect -- While these values may be low now, for the near-term, there is also the potential that those values are higher than average in the long-term, and so I think the reasoning for using that average approach is because there could potentially be those large fluctuations, and we don't have any evidence of a change, and so, looking at in the total time block, that's why we're using that average, because there's going to be low years and there's going to be high years, as opposed to the projections, where we're more comfortable with it being low initially, if that makes sense. I mean, I'm just trying to go by what I've kind of had in my head with this, as to why we're using the long-term average for any of the rebuilding plans, versus the short-term recruitment for the projections.

DR. BUCKEL: Thanks, Wally. Marcel.

DR. REICHERT: Why don't we let Shep go, because he may address some of this.

DR. BUCKEL: Sounds good. Shep, please go ahead.

MR. GRIMES: Thank you, Mr. Chairman. I don't intend to speak for anyone here with this, but I have talked to the others, and not to Erik specifically, but to the Science Center about this whole situation, and just to -- You know, my attempt, maybe, to make more sense of it, but rebuilding -- You know, everything -- There is no regime shift, right, and, without a regime shift, how do you do anything other than expect recruitment to return to average, long-term average, and so you're going to use that for the purposes of rebuilding.

Tmin and Tmax, and then setting, you know, whatever our T rebuild ends up being, and I presume it will be also assumed to this return to long-term average recruitment, but, because you haven't seen that in recent times, and we wanted to take -- The SSC, and apparently the Science Center as well, think a more precautionary approach is appropriate, in terms of ABC setting, right, and you assumed lower recruitment, and so the levels would be lower, but, as I understand it, right, still consistent with rebuilding, if what we realize is higher than that low recruitment and more like the long-term average. Hopefully that made sense and is accurate. Thank you.

DR. BUCKEL: Yes, it made sense, Shep, and I think that's what Mike needs, is just a way to capture that. We'll go with Marcel and then Mike.

DR. REICHERT: Yes, and this may just complicate the projections, but I just want to throw that out there, and, you know, I agree, because the five years, current recruitment, or low recruitment, and then, you know, the projections would go up to the long-term recruitment, and correct me if I'm mistaken there, and perhaps it would make more sense looking at the generation time, or the longevity, to let that recruitment gradually increase over X number of years to that long-term recruitment. I think, biologically, that would make a little more sense than, all of a sudden, have it increase to the long-term recruitment from one year to another, but I realize that that may complicate things quite a bit, but just to throw some thought out there.

DR. BUCKEL: Thanks, Marcel. I had Mike next and then Wally.

DR. BUBLEY: My hand should have been down. Sorry.

DR. BUCKEL: Okay. Go ahead, Mike.

DR. SCHMIDTKE: In regard to what Marcel just discussed, of, you know, actually projecting the change in recruitment, that was something that was brought up at the last meeting, and that's something that I have a little bit more ability to like make sense out of that, out of wrapping my head around, you know, this is what the SSC recommends as, you know, what you all think is the most likely path forward, or what the stock is going to do, going from a low level, and, as we put in these different catch levels, then you all would predict that the recruitment would increase gradually over time.

I guess, in the current scenario, the difficulty is that we're going to be basing ABC on a recruitment that does not progress the stock toward rebuilding in that projection, but we're also saying, you

know, overall -- We're overall projecting the stock to rebuild within a timeframe and to have a completely different recruitment pattern than what is being used to set the short-term catch levels.

DR. BUCKEL: I think, to me, it's spinning the other way, whereas ABC is going to be more precautionary, as Shep mentioned, and so I will let Fred comment, and then we can come back to that. Fred Serchuk.

DR. SERCHUK: It seems to me that there's a number of scenarios here, and clearly, if you're going to use the low recruitment for the next five years -- I don't know the specifics now, but I don't know what the -- What would be the jump after five years, and would it be five-times as high, six-times as high, four-times as high, as what we've seen? I think the analyses are going to be predicated on how large of a jump there is, and, if we think it's a jump of maybe threefold, and I don't know, to me, that seems unrealistic.

I don't know whether that would be the most plausible, after you use the current recruitment for the next five years, and what would be the justification for that? I don't know, and my feeling is, you know, if you're using the recent recruitment for five years, that's half of the rebuilding period, if the rebuilding started tomorrow, and I don't know when the rebuilding plan started, but I think that we need to pass the red-face test here.

You know, if we think recruitment has been low, and it's been low for a while, and it's half, or a quarter, and I don't recall the assessment, of what the long-term is, to assume that it's going to go to the long-term recruitment in the next year I think is silly, and I think we'll lose credibility by that, and I think we need to put some thought to really what we might expect from short-term rebuilding, with the current low recruitment, and then, for the next five years, do we really expect a step increase, or do we expect to be where we are, or a gradual increase, and no one knows at this point in time, but it's important for the rebuilding, and maybe we have to put that in the text, to caveat any approach that we take, but to -- You know, to go from a current low recruitment to some higher level, whether that's the long-term or half the long-term, you know, we have to have some support for that. Thank you.

DR. BUCKEL: Thanks, Fred. Other SSC members want to comment on this? Mike Schmidtke.

DR. SCHMIDTKE: Just responding to Fred's question, because I have like the report from the last meeting up, but the long-term recruitment is between three and four-times the short-term recruitment.

DR. SERCHUK: So clearly, if you accept that, you might give the impression that we can rebuild the stock in ten years, and I think that's a credibility issue. It may happen, and, if it doesn't, we haven't passed the red-face test. Thank you.

DR. BUCKEL: I think that's why we didn't want to provide Tmin and Tmax at the April meeting, because we just didn't know, but it seems like we are legally obligated to do so, and so I guess the way I look at it is we have -- To stay consistent, we are -- For the OFL, we're saying there isn't a regime shift, and so then the OFL, based on long-term average recruitment, that we would also take that philosophy for Tmin and Tmax, but with the caveat that we have no idea, and we don't have any information for either of those OFL or Tmin or Tmax scenarios, the long-term average recruitment.

The preference, you know, of the SSC in April was we didn't have any information to be able to say anything about the rebuilding timeframe, but we're obligated to do so, apparently. I would like to hear from others on this, maybe members of the projection workgroup. Fred Scharf.

DR. SCHARF: I think a couple of things that we talked about, but I also think it's important to remember too that the long-term average recruitment -- You know, while it's higher, obviously, it includes the recent period of low recruitment, and so it's not -- It's not that we're assuming that we're going to bounce back to high recruitment that had occurred before, but it's just that we're using long-term average recruitment over the entire time series in the distant part of the projections, beyond five-years, mainly because most of the literature that the working group examined felt that there was -- It indicated that we could use short-term recruitment for the short-term projections, but not beyond three to five years.

It incorporates both the high and low-recruitment periods, and, basically, it's assuming that we're coming back to a long-term average. As Fred mentioned though, the rate at which we approach that long-term average -- You know, we talked last time too about potentially some -- I think Kyle had showed us some sine wave models, where you showed this rate of decline to the low recruitment, and then you could use that to inform a similar rate of return to a long-term average, and so you use the rate of decline to this current low-recruitment period to inform the rate of return to the long-term average. That's just some suggestions.

DR. BUCKEL: Thanks, Fred. I've got Marcel and then John.

DR. REICHERT: Real quick, and then I'll hand it over to John, and I will keep the second question, or comment, for potentially later, and I agree with Fred about that long-term recruitment. I am still struggling a little bit, looking at the current biomass, and the biomass trajectory, but, yes, I'm -- One of the questions I have is, well, if we -- I think we discussed that earlier, but what if we just have to conclude that, realistically, it may not rebuild? What are the consequences for our recommendations to the council, but maybe we can pick that conversation up later, and so John may have something to say about this. Thanks.

DR. BUCKEL: Thanks, Marcel. John.

MR. CARMICHAEL: I had to go listen to the congressional hearing, talking about red snapper and stuff, and so sorry, but, yes, I don't know if I can shed too much light, and I guess a couple of questions that I had was, you know, it seems that, by determining that there is no regime shift, as Shep pointed out, it sort of says -- Well, it doesn't give you much basis to then say we can't give a Tmin and Tmax. Maybe if a regime shift was unknown, and would that impact that conclusion? Then my other question was, and I don't know, Erik, if you guys have looked at this, but is F rebuild, under Tmax with the long-term recruitment, less than the F 75 percent of F 40, because I was just sort of wondering where your ABC recommendation could fall, based on 75 percent of F 40, relative to whatever F rebuild may look like at Tmax, because that could create a bit of a problem, potentially.

DR. BUCKEL: Thanks, John. Erik, I don't know if you wanted to -- To John's point on that?

DR. WILLIAMS: Yes, and I will quickly answer. I don't know the answer to that at this point. I don't know, and I feel like we're trying to thread a needle that there isn't even really a needle to be threaded, but --

DR. BUCKEL: Amy Schueller.

DR. SCHUELLER: I was just going to say that I think that Erik is right, that we're trying to thread some needle that I'm not sure we need to thread, and I agree with Shep's statement about the rebuilding plan being sort of the long-term, and, you know, base it on the long-term average of recruitment, and, I mean, I think everybody is sitting around thinking that, if we give a rebuilding timeframe, that means we will be rebuilt, but you have to keep in mind that this isn't a 100 percent probability of being rebuilt, and it can be a 50/50, or a 70/30, and, I mean, it depends on the P* and the uncertainty, and there is a lot of times where there is a rebuilding timeframe, but that doesn't actually result in a rebuilt stock, and so I guess I am --

I don't know, and I challenge everybody to look at this with a little bit less certainty in their minds, and we're not giving any sort of guarantee that something is going to be rebuilt by a certain amount of time, and I just wanted to reiterate that, you know, we've decoupled this sort of long-term rebuilding and OFL process from the short-term risk related to ABC, and we've acknowledged that multiple times. I will stop there, I guess.

DR. BUCKEL: Thanks, Amy. Other SSC members?

MR. CARMICHAEL: Jeff, if I could again?

DR. BUCKEL: Yes, John. Please go ahead.

MR. CARMICHAEL: I think I totally agree with Amy and Erik, and we're just really trying to craft something here that is extremely difficult, and, you know, the thought of what do you do in five years, and where are you relative to your ABCs and a rebuilding timeframe, which, you know, everything looking at it now thinks that it could be kind of optimistic, because we don't know. As Erik's presentation said earlier, we don't know when recruitment will turn around, or what it's going to do, and that's always so key to all of our rebuilding times.

I guess I would think, in a practical sense, you know, in five years, we look at the next assessment, when we get to the end of the rebuilding time, and, if the stock is still not performing, and recruitment hasn't begun to turn the corner, then the SSC may very well reconsider the idea of regime shift, and I think, at this point, and I feel like Erik kind of said this in his presentation, that, you know, you've got to end the overfishing, to see if the stock can turn around, and while also being careful about just presuming a regime shift and putting you in a place where you kind of make it happen and you don't give the stock a chance, and so I think that's the needle that we're balancing in.

You know, I just think that -- Maybe we just need to get something on there for a rebuilding plan, and hopefully it doesn't conflict with your desired ABC, and perhaps put you into another ABC level, but I think, if the rebuilding schedule is built on the long-term recruitment, and the short-term recommendations are based on the short-term recruitment, then clearly the ABCs are going

to be very conservative relative to what you think the rebuilding can do, which I guess is a plus, in one sense.

DR. BUCKEL: Yes, and I think that's what has to be captured, that being conservative, as Shep said it well. Okay. I've got Genny, Marcel, Anne, and Steve. All right. Genny first.

DR. NESSLAGE: I was going to say the same thing, but John Carmichael said it so much more eloquently than I could have, and so kudos to John. Thank you.

DR. BUCKEL: Thanks, Genny.

MR. CARMICHAEL: You're too kind.

DR. BUCKEL: Marcel.

DR. REICHERT: I will let Anne and Steve go first, and then, if there's anything still on the table, I will comment.

DR. BUCKEL: Anne.

MS. MARKWITH: Kind of like Genny said, and John said what I was going to, but I do agree, and I think that using the rebuild that the Science Center has provided. It makes sense, and I'm kind of like Marcel, where, when you look at the landings trends, I don't know if it really will do anything, but that's why we redo stock assessments, but I think it does need to be captured that we're being more risk-averse by using that low recruitment for the ABC, and so hopefully the savings, quote, unquote, savings you get between the difference between the OFL and the ABC -- It will make a difference, and maybe the rebuild, based on the long-term average recruitment, is going -- It may do better than we think, and we don't know. There is so much that goes into play with the recruitment aspect of these species.

DR. BUCKEL: Thanks, Anne. Steve.

DR. TURNER: So this might be a question for Shep. Let's say we develop Tmin and Tmax based on long-term average recruitment, and then we develop the ABC rule based on recent recruitment, and will that open the ABC up to question from fishers, as to being too conservative? You know, essentially my question is --

MR. GRIMES: Do you want me to jump in and answer that, or respond to that?

DR. BUCKEL: Go ahead, Shep.

MR. GRIMES: Well, I mean, I think we've already heard some criticism about the buffer, the huge buffer, between OFL and ABC on this, or what would be expected, and we didn't have the OFL yet, and it's based on this -- The same thing with the rebuilding timeline, and it's a recruitment assumption. Somebody could always come in and challenge that, or, well, not always, but, you know, people will come in and will complain about it one way or the other, will comment upon it, likely.

You know, in terms of the litigation risk, there's a long way to go before we have a rebuilding plan, and I think you could meaningfully gauge any sort of litigation risk associated with it, and I think, to give you -- Maybe this will give you some comfort, but, in thinking about it, the risk here -- The greater risk is obviously in the rebuilding time, right, and are we really going to achieve that rebuilding, and, as you've all discussed, do you realistically expect recruitment to jump three or four times over, you know, the next few years, which is what it would take? Given that Tmin is five years, that would have to change very quickly, and would you achieve the rebuilding target, and so the risk is really in achieving rebuilding, because you make more conservative assumptions in ABC setting.

The risk, therefore, is that you don't achieve the rebuilding targets in the time that you allotted, right, and you planned, and you can revisit that. Well, you have new information, and you didn't have the recruitment that you expected at the time that you initially set your rebuilding plan, and so you could in and revisit T rebuild at some point in the future, right, and we do this -- Not necessarily explicitly, but we have a number of stocks where we've gotten to the end of the rebuilding plan, and we just fish at 75 percent of FMSY and monitor it without setting any hard rebuilding timeline, and, frankly, that's one of the options specified in the guidelines, and it seems to be where we default. Thanks.

DR. BUCKEL: Thank you, Shep. All right. Any other comments? I think there was a consensus there. Genny, did you have another comment? Go ahead, Mike.

DR. SCHMIDTKE: I just wanted to make sure -- I think I've got the guidance that we need from the SSC, and I just want to make sure and confirm, using one of the attachments from the last meeting, and, Judd, I sent you a link in the question box, if you are able to pull it up, but, if people have access to, you know, the April Attachment 5a, Table 2 and Table 3, and those would be the two projections, and like one is the 50 percent probability, and that's the council's legal bare minimum requirement, and the other one is 70 percent, and that's the recommendation from the SSC, as far as the probability of rebuilding level, but those would be the two tables that we would be including in rebuilding options for the council's consideration. It's on page 7, PDF 7.

Those would be -- We would, obviously, have to work with the Center to get whatever percentage of the removals would be allocated as landings, but we would set our landings based on that projection in one alternative, and the next table as another alternative, for the rebuilding timeline, and then ABC options -- The ABC recommendation from the SSC would be a lower level, in one of the later tables there, based on the short-term recent recruitment.

DR. BUCKEL: Yes, that's my understanding.

DR. SCHMIDTKE: Okay.

DR. BUCKEL: Any other comments to this? Alexei.

DR. SHAROV: I don't know how helpful this would be, but I've been listening, and I have a feeling that we're at an impasse, because -- Well, you can make different assumptions here, but until we develop a better ability, essentially, of predicting future recruitments, which, of course, is a gigantic challenge, or at least until we review sort of the performance of the projections for different stocks and make maybe more sensible rules as to when we can assume the long-term

recruitment to be used for the long-term projections, like for the rebuilding scenarios, versus the short-term, which is a recent development, which is sort of we arrived at that because of the experience of underperforming projections that were based on sort of the standard use of the long-term average or sampling for the full time series of recruitment.

Until we do that, and until we make a firmer rule, where we make real progress in defining future recruitment, any option is subject to the criticism, but, with the current approach, as just said earlier, we are just creating a very significant buffer between the ABC and the OFL, and that certainly, of course, will prevent this from possibly getting into the overfished status, but at the expense of the miscalculating the OFL and essentially creating an OFL situation, overfishing situation, and so I don't know. It becomes really very subjective here, the choice.

DR. BUCKEL: Thanks, Alexei. I think we have to capture the caveats in our language, and those are helpful, the way you just described it. Any others? Marcel.

DR. REICHERT: Yes, and it may be a function of the long day, but can you, or Mike, summarize the bottom line of our recommendations, because I am not entirely sure that I know where we are right now, and, again, that may be entirely on my end, but I think it would be helpful, for me, to kind of tell us, or tell me, where we are, the bottom line.

DR. BUCKEL: I will give it a shot, and others can correct me, but the ABC will be based on using the recent recruitment, which is low, but the OFL is based on the long-term average recruitment, and then, similarly, the Tmin and Tmax, since those are long-term rebuilding, those would also be based on the long-term average recruitment.

DR. REICHERT: Okay. That's what I thought, and I have no problem with that, but I think, to address Fred Serchuk's, and others, I think we need to really be very careful to acknowledge the potential conflict in that, and the uncertainty, and also stress the fact that it is extremely important to have an update, or an operational assessment, in five years, no more than five years, to see where we are, because I think that will give us an indication whether or not our rebuilding schedule is realistic or not, or it may provide an indication of whether or not our rebuilding schedule is realistic or not, and so, in other words, recognize that there could be some perception of conflict in our recommendations, and that we realize that, but that's kind of a function of how we approach that, and I hope that makes sense.

DR. BUCKEL: It does, Marcel, and I hope that Judd was taking notes on that, and that will be good to -- As Mike mentioned, he wanted to capture it in our report and as well in the amendment, that this is something that we're putting on the books, with a huge caveat, and that we will revisit it before, you know, that rebuilding timeline is over, and we're going to have a check-in on things, as John Carmichael mentioned as well. All right. Any other comments on scamp and yellowmouth? Mike, do you have what you need now?

DR. SCHMIDTKE: Yes, I think so, and my only additional request, in Erik's direction, and I think Kyle is the Science Center person that sits on scamp, but I'm not sure who sits on that IPT, but if whoever the Science Center rep is can make sure that they have a close eye on how we write the assumptions that went into the rebuilding and the ABC recommendation, and that will be much appreciated.

DR. BUCKEL: Thanks, Mike, and thank you very much for bringing the Tmin and Tmax to our attention. We had forgotten to deal with that on scamp, and so I'm glad we've got that captured, and we don't have to revisit that in another webinar, and that's a good segue to the fourth Other Business item. Judd, I will let you take it away.

DR. CURTIS: Okay. Let me bring our overview back over here. The last topic in our Other Business was this red grouper operational assessment spatial considerations, and so the Science Center requested providing a presentation to the SSC, to gather some feedback and guidance on changing the base red grouper operational assessment model, to incorporate some spatial considerations.

The Center developed a document that describes this reasoning for development of a spatial, or a two-stock, model, and, currently, they use -- They are currently using a single South Atlantic stock model. Because the topic was not listed in the Federal Register notice for this meeting, and likely will require some substantial discussions, council and staff determined that it was probably not appropriate to extensively cover this presentation under Other Business, and so we recommended that an option to set up another webinar in late August, or early September, just a half-day webinar to cover this red grouper topic and the spatial considerations provided by the Science Center.

This would allow us time for an expedited SSC review and then guidance to be ready for the September council meeting. Procedurally, if these requested changes to the red grouper operational assessment model are approved by the SSC, then that would require modification of the terms of reference, and potentially a topical working group formed to address this, which would then potentially delay the SEDAR schedule for this assessment, and so that's a lot to tackle under Other Business today, and so if we could set up another half-day webinar to tackle this at the end of August, either the week of August 28 or the week of September 5, and September 4 is Labor Day, and please see down under our next meetings section those two options for potential dates for a half-day webinar.

If you have your calendars handy, and I don't know, Jeff, if you just want to throw one out there, and, if it's not agreeable for the majority, then we can choose the other one, and I'm not sure how you want to handle the scheduling.

DR. BUCKEL: Yes, and let's try the week of the 28th, and we'll avoid Mondays and Fridays, and so the 29th or 30th, that Tuesday or Wednesday, and we can talk mornings or afternoons, but does anyone have a -- Go ahead, Wally.

DR. BUBLEY: I am potentially at-sea that week.

DR. REICHERT: Same here.

DR. BUBLEY: That's right, and Marcel is coming out on that one too.

DR. BUCKEL: So the week of the 5th would be better for both of you. Amy.

DR. SCHUELLER: I was just going to say the week of the 28th is fine, except Wednesday is my bad day, where I cannot participate.

DR. BUCKEL: Okay. To get Wally and Marcel, let's try this. The September 5th week, and so Wednesday is a bad day for Amy, and is that true every week, Amy?

DR. SCHUELLER: If we're looking at the week of the 5th, I have stuff on the Tuesday and Wednesday right now, and so Thursday or Friday I'm available.

DR. BUCKEL: Let's see. Fred and I teach on Thursday.

DR. SERCHUK: Friday doesn't work for me, Chairman. There is a New England Council SSC meeting on the 8th.

DR. BUCKEL: Okay. Thanks, Fred.

DR. NESSLAGE: That doesn't work for me either, if it helps.

DR. BUCKEL: How about the afternoon of the 7th?

DR. SCHARF: We could work that if we start at 1:00.

DR. BUCKEL: Right.

DR. SCHARF: So like 1:00 to 5:00 p.m. on the 7th, Thursday the 7th?

DR. BUCKEL: Raise your hand now if it's not good. Christina.

MS. PACKAGE-WARD: I am on travel actually both of those weeks that you're suggesting, and so I don't know if it's important if I am even on there, but if I'm able to be on, and I'm not sure yet exactly like when we'll be flying on the various days.

DR. BUCKEL: Okay. Thanks, Christina. I would say join us if you're able. I knew we weren't going to get everyone, but it sounds like this will work for the bulk.

DR. SERCHUK: What about the 1st of September, Chair?

DR. BUCKEL: I think that week -- That Wally and Marcel were out to sea that week, Fred.

DR. SERCHUK: Okay.

DR. REICHERT: Yes, that's correct.

DR. BUCKEL: Okay. Judd, take it away.

DR. CURTIS: Thursday September 7 would be good with council staff as well, and there's nothing happening that day, miraculously.

DR. BUCKEL: Great. Okay. Anything else?

DR. CURTIS: The only concern there, Jeff, is, with the council meeting looming the next week, we'll have to have a quick turnaround for the report review, and so just keep that in mind, and just to bring that to everyone's attention.

DR. BUCKEL: Thanks for the reminder on that.

DR. CURTIS: I think, with one topic, we can tackle that.

DR. BUCKEL: Yes.

DR. CURTIS: Okay, and so thank you for that. Stay tuned for, and look out for, an email scheduling that webinar, and then, you know, it will go through the same process, and we'll have a briefing book posted two weeks prior, or the materials may be available before that for you to review for that discussion on September 7. That covers all of the other business, Jeff.

CONSENSUS STATEMENT AND RECOMMENDATIONS

DR. BUCKEL: All right. Thanks, Judd. Okay, and so the next item, Number 10, is Public Comment, and so, any members of the public that have a comment on our recommendations and agenda items from today, please raise your hand. All right. Seeing no hands, we will move on to Item Number 11, the Consensus Statement and Recommendations.

We have been going through the -- Judd has been taking notes today, and so I think we've kind of reviewed those as we've gone along. Does anybody have -- Is there any area that you would like to revisit? I think we took some time to look at what Judd had done on the consensus statements. I will give everybody a few minutes on each of them.   This is straightforward, with the workgroup, and so can you scroll down to the next one, and just raise your hand if you have any edits that you would like to be made, or additions.

DR. CURTIS: Just a couple of things to highlight here that I added from our discussion in Other Business, and it's a statement that Tmin and Tmax will be based on the long-term recruitment scenario, and then some language in here, and maybe you want to elaborate a little bit further though, and, because of the uncertainty in R and its influence on rebuilding, you would have an updated estimate within the five-year period of the termination of the ABC recommendations.

DR. BUCKEL: Thanks for capturing that, Judd. All right. No hands, and so please scroll to the next item. All right. Thanks, Judd. No hands there, and we can scroll on. Judd, we will probably have to -- Maybe we will break this into the -- There were questions from the SSC to Rick, and his answers, and then later -- The latter part of this response is the comments on the tech memo.

DR. CURTIS: Right, and so this first part is just the questions from the SSC and Rick's responses, and I don't see any hands, and so we can move down to the recommendations.

DR. REICHERT: You can remove my name from the last bullet point.

DR. BUCKEL: All right. Everybody likes the text, I guess, Judd. Good job. All right. It's almost 5:00. That's a quick one. Okay. I think that's a good review of that, and so the final SSC report

will be provided to the council by noon on Friday, August 18, and so we'll shoot to have this -- I will shoot to have this to you early next week, and, Judd, does that work for you?

DR. CURTIS: Yes, and that all sounds good.

DR. BUCKEL: It's Thursday the 27th, and then, by early next week, I will get it to the SSC, and then we will shoot to have it back around Friday the 11th, or maybe a couple of days before, so I can get everybody's edits incorporated and then get that report to Judd by August 18th, or prior to that, so he can get it to the council, and so expect an email from me in the early to middle of next week with the draft SSC report, and please -- Hopefully folks took notes today, and please flesh out to get more specifics, and that's one of the issues. You know, the general comments are fine right now, but then, when you go back to it a year or two later, you're wanting more detail, and so if folks can help in fleshing out the details on Judd's notes, over the next week or so, that would be great, for the final report. Judd, did you want to go over the next meetings?

NEXT MEETINGS

DR. CURTIS: Yes, just briefly, and so we've got the half-day webinar to tackle the red grouper spatial considerations on Thursday, September 7, 1:00 to 5:00, and we will have an in-person meeting in Charleston on October 24 to 26, and we're currently working on getting hotel contracts finalized for that, and, typically, you know, we've been having a one-day webinar also in January or February, and it sounds like, to tackle some of the black sea bass final OFL and ABC recommendations, we may need to have that, and as well as some other business that will likely pop up, and so keep those free, and I will work with the ExCom to schedule kind of a one-day webinar in January and February, and we'll get a date to you as soon as we confirm that.

DR. REICHERT: Jeff, a quick question, and Judd, and sorry to butt in here, but do you already know what our start time is going to be on October 24?

DR. CURTIS: I am looking at the agenda, the preliminary agenda, for October, and it's likely that we are going to need to start probably October 24th, in the morning, and so that might be a travel day on October 23, but stay tuned, and we are going to try to make that determination hopefully very soon.

DR. REICHERT: Thank you. I appreciate it.

DR. BUCKEL: Okay. Thanks, Judd. Any other comments on meetings or other agenda items? Now is your last chance before we meet again. All right. Well, thanks, everyone, for a productive day. SSC members, thanks, and also thanks to the Southeast Fisheries Science Center for their presentations and helping us in our conversations, and as well as thanks to council staff and council members for joining us today, and your help, along with a big thanks to SEDAR staff for helping out, particularly on the scopes of work, and that was really helpful, and I'm sure that I missed others, and so thanks, everyone, and we'll adjourn this July webinar.

(Whereupon, the meeting adjourned on July 27, 2023.)

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Amanda Thomas
August 21, 2023

Attendee Report: Scientific & Statistical Committee Meeting (July 27, 2023)

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Webinar ID	Actual Start Date/Time	Duration	# Registered	# Attended
893-351-507	**07/27/2023 08:22 AM EDT**	8 hours 27 minutes	63	58

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