

TABLE OF CONTENT

TABLE OF MOTIONS	2
CALL TO ORDER AND ROLL CALL	4
ADOPTION OF AGENDA	7
APPROVAL OF THE APRIL 9-11, 2024, AND SEPTEMBER 23-25, 2025 MINUTES	8
SEDAR 91 U.S. CARIBBEAN SPINY LOBSTER PUERTO RICO ASSESSMENT: FINAL REVIEW-KEVIN MCCARTHY	10
QUESTIONS/COMMENTS.....	18
SEDAR 91 U. S. CARIBBEAN SPINY LOBSTER PUERTO RICO ASSESSMENT: FINAL REVIEW-ADYAN RÍOS	26
QUESTIONS/COMMENTS.....	40
SEDAR 84 CARIBBEAN YELLOWTAIL SNAPPER PUERTO RICO: FINAL REVIEW-ADYAN RÍOS, CARIBBEAN BRANCH SEFSC, NOAA FISHERIES	97
SEDAR 84 CARIBBEAN YELLOWTAIL SNAPPER ST. THOMAS/ST. JOHN: FINAL REVIEW-ADYAN RÍOS, CARIBBEAN BRANCH SEFSC, NOAA FISHERIES	158
SEDAR 84 CARIBBEAN STOPLIGHT PARROTFISH ST. CROIX: FINAL REVIEW-ADYAN RÍOS, CARIBBEAN BRANCH SOUTHEAST FISHERIES SCIENCE CENTER (SEFSC), NOAA FISHERIES	174
QUESTION/COMMENTS.....	182
SSC FINAL RECOMMENDATIONS FOR SEDAR 84 YELLOWTAIL SNAPPER PR	192
SSC RECOMMENDATIONS FOR SEDAR 84 YELLOWTAIL SNAPPER STT/STJ	196
SSC RECOMMENDATIONS FOR SEDAR 84 STOPLIGHT PARROTFISH STX	197
SEDAR 103 UPDATE-LIAJAY RIVERA GARCÍA, CFMC	200
NEXT MEETING	202

TABLE OF MOTIONS

~~PAGE 53:~~ The SSC recommends that the assessment for SEDAR 91, U.S. Caribbean Spiny Lobster for Puerto Rico, is based on the best scientific information available. Motion carried on page 58.

PAGE 74: The SSC considers the assessment for SEDAR 91, U.S. Caribbean Spiny Lobster for Puerto Rico, to represent the best available science. Motion carried on page 75.

Page 85: The SSC finds that the results presented in the SEDAR 91 U.S. Caribbean Spiny Lobster Puerto Rico are useful for providing management advice and developing fishing level recommendations for the Council. Motion carried on page 88.

PAGE 88: The current assessment indicates that the stock is currently above target and, therefore, experiencing a fishing down to the MSY proxy. In addition, the new stock assessment shows an increase in the overall size of the population (i.e., a higher unfinished population size), which leads to an increase in catches with all other things being equal. This increase in stock scale is greatly influenced by the final point in the new abundance indices, which adds further uncertainty in the model (as shown in the retrospective analysis). These conditions lead to a 3-year average ABC that will exceed the proxy-MSY OFL in 2029. Instead, the SSC recommends using the ABC that is derived from the OFL based on the proxy-MSY (F at SPR=30%) as a constant catch value for management. Further, the SSC recommends using the 2022-2024 landings average for each fleet as the provisional landings' values for 2025 and 2026. Motion carried on page 91.

PAGE 142: The SSC considered the assessment of SEDAR 84 U.S. yellowtail snapper for Puerto Rico to represent the best available science. Motion carried on page 143.

PAGE 54: The SSC finds that the results presented in the SEDAR 84 U.S. Yellowtail Snapper for Puerto Rico are not, at present, useful for providing management advice and developing fishing level recommendations for the Council. Motion carried on page 157.

PAGE 169: The SSC considers the assessment of SEDAR 84 U.S. Caribbean Yellowtail Snapper for Saint Thomas and Saint John to represent the best available science. Motion carried on page 171.

PAGE 172: Given the uncertainties noted during the review

workshop, the SSC finds that the results presented in the SEDAR 84 U.S. Yellowtail Snapper for Saint Thomas/Saint John are not, at present, useful for providing management advice and developing fishing level recommendations for the Council. [Motion carried on page 174.](#)

[PAGE 189:](#) The SSC considers the assessment for SEDAR 84 U.S. Stoplight Parrotfish for Saint Croix to represent the best available sciences. [Motion carried on page 190.](#)

[PAGE 190:](#) The SSC finds that the results presented in the SEDAR 84 U.S. Stoplight Parrotfish for Saint Croix are not at present useful for providing management advice and developing fishing levels recommendations for the Council. [Motion carried on page 191.](#)

[PAGE 199:](#) The SSC endorses the recommendations made by the data and review panels and also makes the following recommendations related to SEDAR 91 and 84: SSC final recommendations for SEDAR 84 YELLOWTAIL SNAPPER PR, SSC recommendations for SEDAR 84 YELLOWTAIL SNAPPER STT/STJ, SSC recommendations for SEDAR 84 STOPLIGHT PARROTFISH STX. [Motion carried on page 200.](#)

**CARIBBEAN FISHERY MANAGEMENT COUNCIL
SCIENTIFIC AND STATISTICAL COMMITTEE
PUBLIC VIRTUAL MEETING**

APRIL 8-10, 2026

The Scientific and Statistical Committees of the Caribbean Fishery Management Council convened via Zoom on Wednesday afternoon, April 8, 2026, and was called to order at 1:00 P.M. by the Council Chair, Vance Vicente.

CALL TO ORDER AND ROLL CALL

GERSON N. MARTÍNEZ: Buenas tardes. Parecen niños preparados para la escuela.

CRISTINA D. OLÁN-MARTÍNEZ: Buenas tardes, Gerson.

GERSON N. MARTÍNEZ: Saludos a todos ahí.

JULIAN MAGRAS: Good afternoon, everyone. Julian here.

VANCE P. VICENTE CERNUDA: Good afternoon, Julian.

CRISTINA D. OLÁN-MARTÍNEZ: Hi, Julian.

VANCE P. VICENTE CERNUDA: Good afternoon, all of you. Thanks for participating in this. The Fishery Management Council Scientific and Statistical Committee, which is a public virtual meeting being held today, April 8th, 2026, and will continue through April 10th, 2026. As usual, I first have to read the rules for the SSC meetings. And thanks, Kiara, for preparing it.

One, keep all microphones off. If virtual, make sure you have the microphone set to mute. If in person, please set your computer's microphone to mute and ensure you have the face-to-face microphone on the red light. The green light is only for when you have the turn to speak. Third, please raise your hand to be granted a turn. You will be notified when it is your turn.

And then please, speak loudly and clearly, so that we can hear your testimony better. Five, any document that is presented at the meeting by the speakers needs to be sent to Kiara or Liajay. Sixth, the meeting is being recorded, please do not chew gum or sweets during the process.

And seven, it is very important to identify yourself with your

name and last name each time you speak. There will be verbatim transcriptions of the meeting, and the transcriber needs to determine the speakers. So, thank you for your attention and cooperation.

For the roll call, I will first name each SSC member present at the moment. Please confirm your attendance after hearing your name.

Then we will have the roll call for all other participants. So, Vice Vicente, present. Richard Appeldoorn. Richard Appeldoorn? No answer.

Jason Cope?

JASON COPE: Present, and good morning.

VANCE P. VICENTE CERNUDA: Morning, Jason. ¿Juan Cruz-Motta, J.J.? ¿Juan Cruz-Motta? ¿Está entrando? Ok.

Tarsila Seara?

TARSILA SEARA: Hi. Can you hear me?

VANCE P. VICENTE CERNUDA: Hi, Tarsila.

TARSILA SEARA: I'm here.

VANCE P. VICENTE CERNUDA: Reni? Jorge García-Sais? Reinaldo? Reni? ¿Todd Gedamke?

TODD GEDAMKE: Hola a todos. I'm present.

VANCE P. VICENTE CERNUDA: How are you, Todd?

TODD GEDAMKE: Very good. And you?

VANCE P. VICENTE CERNUDA: Good. Walter Keithly?

WALTER KEITHLY: Walter Keithly, present.

VANCE P. VICENTE CERNUDA: Wow. Thank you. Michelle T. Schärer-Umpierre? Michelle? No answer.

Elizabeth Kadison? Elizabeth Kadison? No answer.

Skyler Sagarese?

SKYLER ROSE SAGARESE: Hi there. Can you hear me?

VANCE P. VICENTE CERNUDA: Skyler?

SKYLER ROSE SAGARESE: Yes.

VANCE P. VICENTE CERNUDA: Yes. Thank you.

VANCE P. VICENTE CERNUDA: J.J.? Juan Cruz-Motta, were you able to connect? Were you able to connect?

TARSILA SEARA: I think J.J.'s having a hard time with the link.

VANCE P. VICENTE CERNUDA: He is having problems with the link.

LIAJAY RIVERA GARCÍA: But he's there.

VANCE P. VICENTE CERNUDA: But he's present. Lo marcamos presente. Okay. So, 1, 2, 3, 4, 5, 6, 7. We have 7 SSC members. ¿Eso es un quorum, no?

So, we have a quorum. Now please, other Caribbean Fishery Management Council panel members, starting with the DAP Chairs. Julian Magras?

JULIAN MAGRAS: Julian Magras, present. Good afternoon, everyone.

VANCE P. VICENTE CERNUDA: Good afternoon. Nelson Crespo?

NELSON CRESPO: Good afternoon, everyone. Nelson Crespo, present.

VANCE P. VICENTE CERNUDA: Nelson, saludo. Gerson Martínez?

GERSON N. MARTÍNEZ: Good afternoon, all. Gerson Martínez, present.

VANCE P. VICENTE CERNUDA: Okay. Let me see if I'm missing anybody.

LIAJAY RIVERA GARCÍA: Y ahora EBFM TAP Chair.

VANCE P. VICENTE CERNUDA: Okay. And now, please, the EBFM TAP Chair.

SENNAI HABTES: Afternoon all. Sennai Habtes, present.

VANCE P. VICENTE CERNUDA: Hello. The OEAP Chair? ¿No esta? Okay. Any other Chair that I might have missed? No?

Okay. Conference room attendees, beginning with Liajay.

LIAJAY RIVERA GARCÍA: Good morning. Buenos días. Liajay Rivera, Council Staff.

VANCE P. VICENTE CERNUDA: Vance Vicente, Chair, SSC.

KIARA M. MATÍAS ROJAS: Buenas tardes. Kiara Matías, Council Staff.

GRACIELA GARCÍA-MOLINER: Graciela García-Moliner, Council Staff.

VANCE P. VICENTE CERNUDA: Okay. Thank you very much. Then we go to all the other participants.

LIAJAY RIVERA GARCÍA: Of course.

VANCE P. VICENTE CERNUDA: Liajay.

LIAJAY RIVERA GARCÍA: So, we have, in the Zoom platform, Cristina Olán, Adyan Ríos, David Behringer, Derek Soto, Kevin McCarthy, María López, Martha Prada, Mich Walsh, Nathan, Rachel Banton, Refik Orhun, Stephanie Martínez, and an unknown number ending with 507, if they can identify themselves. And Jannette, the OEAP Chair, has just entered the meeting.

VANCE P. VICENTE CERNUDA: Okay. Thank you.

SARAH P. STEPHENSON: Hi. This is Sarah. Can you hear me? I'm the phone number.

LIAJAY RIVERA GARCÍA: Yes. We can. Thank you, Sarah.

SARAH P. STEPHENSON: Okay. Thanks.

ADOPTION OF AGENDA

VANCE P. VICENTE CERNUDA: Okay. So, we have on the screen the agenda and the SSC expected input. Day 1, call to order and roll call that's been done. Also, for today, this afternoon, consideration of the SSC verbatim transcriptions, of April 2024 and of September 2025 minutes. And then we will need to adopt the agenda. And then, SEDAR. We will go through the SEDAR 84 Caribbean Stoplight Parrotfish Saint Croix: Final Review, which

is going to be presented by Adyan Ríos. Then SEDAR 84 Caribbean Yellowtail Snapper Saint Thomas/Saint John, will also be presented by Adyan Ríos.

SEDAR 84 Caribbean Yellowtail Snapper-- this is on day two --for Saint Thomas and Saint John, also will be presented by Adyan. SEDAR 84 Caribbean Yellowtail Snapper Puerto Rico. That will also be presented by Adyan Ríos. And then, Final Recommendations to the Caribbean Fishery Management Council SEDAR 84.

And then, day three I don't-- On day three, April 10th, 2026, we will go through the SEDAR 91 U.S. Caribbean Spiny Lobster Puerto Rico assessment. It will be presented by Adyan Ríos. We'll have a short break. And then the SSC final recommendations to the Caribbean Fishery Management Council on SEDAR 91 Spiny Lobster Puerto Rico. Then, Liajay will give us a brief summary of what is the update of SEDAR 103. Then, if there's any other business that we may want to add, and then also the planning for the next SSC meeting.

So, I have read to you the agenda. Are there any proposed modifications or any other business that you would like to consider on the last day?

Kevin. Yes.

KEVIN MCCARTHY: Thank you, Mr. Chair. Kevin McCarthy, Southeast Fishery Science Center. In speaking to a couple of the SSC members offline for other matters, I understand that fewer of the SSC will be available on Friday. And given the priority that the Caribbean Council has set for SEDAR 91 Puerto Rico Spiny Lobster, I'm going to request a change that we review SEDAR 91 Caribbean Spiny Lobster today. Tomorrow, Puerto Rico yellowtail, that's SEDAR 84. And then on Friday, U.S. Virgin Islands Yellowtail Snapper and Parrotfish. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Kevin. I don't see any problems with making those changes. So, if there aren't any other additions or changes suggested, I need somebody to move, to present a motion to accept the agenda for this meeting. Okay.

So, I need a motion. Yes. Jason?

JASON COPE: Yes. With those suggested changes, I'm happy to accept this agenda.

VANCE P. VICENTE CERNUDA: Thank you, Jason. And then, any second?

TODD GEDAMKE: This is Todd Gedamke. I'll accept. Second it.

**APPROVAL OF THE APRIL 9-11, 2024, AND SEPTEMBER 23-25, 2025
MINUTES**

VANCE P. VICENTE CERNUDA: Thank you. Thank you very much. So, I'm sure that all of you have read the minutes of the last 2 meetings. I did look over them. And my only comment is, I would like to point out, I mean, just to recall that in the first meeting, April 9th to April 11th of 2024, there was one motion that was adopted, which I will read just both just to recall.

"The SSC moves to accept the catch at F_SPR 40 as the ABC for the queen triggerfish in both island platforms. Saint Thomas/Saint John 97,809 pounds and Saint Croix, 18,808 pounds." It was a motion proposed by Juan Motta and was seconded by Jason Cope. Regarding the meeting, the September 23-25 meeting, there were also several motions that were adopted.

One was that "The SSC moves to recommend the assessment of SEDAR 91 U.S. Caribbean Spiny Lobster for Saint Thomas and Saint John as the best scientific information available." The other motion was "The results presented in the SEDAR 91 U.S. Caribbean spiny lobster for Saint Thomas and Saint John are useful for providing management advice and developing fishing level recommendations for the Council." The third motion adopted was that "The SSC recommends including years using the average of 2021-2023 as the provisional landing values for the 2024-2025 forecast for the SEDAR 91 U.S. Caribbean Spiny Lobster for Saint Thomas and Saint John." The fourth motion that was adopted was that "The SSC moves to recommend the assessment for SEDAR 91 U.S. Caribbean Spiny Lobster for Saint Croix as the best scientific information available." The fifth motion adopted was that "The results presented in the SEDAR 91 U.S. Caribbean Spiny Lobster for Saint Croix are useful for providing management advice and developing fishing level recommendations for the Council." Lastly, "The SSC recommends including years using the average of 2021-2023 as the provisional landings' values for the 2024-2025 forecast for the SEDAR 91 U.S. Caribbean Spiny Lobster for Saint Croix."

So, if any other members or from the public have any comments to make regarding the verbatim, or the minutes of these two meetings, please. No hay nadie.

Okay. J.J., please.

JUAN J. CRUZ-MOTTA: Motion to approve. Thank you.

VANCE P. VICENTE CERNUDA: I need a second.

TARSILA SEARA: This is Tarsila. I second.

VANCE P. VICENTE CERNUDA: Okay. So, the minutes and verbatims of the SSC, of the April 9th through the 11th, 2024 meeting as well as the September 23-25 of 2025 minutes, as well as the verbatims have been approved.

Happy we didn't vote, but are there any objections? I don't see any objections. So, the minutes have been approved.

So, SEDAR 91 U.S. Caribbean Spiny Lobster Puerto Rico Assessment: Last meeting highlights. The assessment was conducted by the Southeast Fisheries Science Center. The Southeast Fisheries Science Center would explore bringing additional data for the analysis needed to be looked at for SEDAR 91 assessment Puerto Rico. And three, the Southeast Fisheries Science Center will present SEDAR 91 Puerto Rico Assessment Results to the SSC for final review.

So, Kevin, you're up to present the Caribbean Spiny Lobster Puerto Rico Assessment of SEDAR 91. So, whenever you're ready.

**SEDAR 91 U.S. CARIBBEAN SPINY LOBSTER PUERTO RICO ASSESSMENT:
FINAL REVIEW—KEVIN MCCARTHY**

KEVIN MCCARTHY: Okay. Thank you, Mr. Chair. Kevin McCarthy. I think we're going to start with me presenting, and we're going to go through the index work. And then Adyan will take over and talk you through the assessment modeling that was done. So, I'll present it first.

Does green mean that I can share my screen?

KIARA M. MATÍAS ROJAS: Yes, Kevin. You can share it now.

KEVIN MCCARTHY: Okay. Perfect. And I will put this in presentation mode. That's the wrong thing. Okay.

Are you seeing presentation mode?

LIAJAY RIVERA GARCÍA: Yes.

KEVIN MCCARTHY: Okay. Terrific. Alright. Well, good afternoon, everyone, or good morning if you're our Westernmost SSC member. I'm going to talk to you through the work that Stephanie

Martínez Rivera and I did, which means Stephanie did 98% of the work. But I've done indices before, so I provided a little guidance.

We looked specifically at Puerto Rico. It says U.S. Caribbean, but this was specifically Puerto Rico. Let me get started with, I want to back up a little bit and sort of walk you through how we got here. This was an analysis that this Council requested back in August. We had planned on presenting this in December or November, whichever month we had scheduled for the SSC meeting. But given lapse in funding, that didn't happen.

Anyway, they requested this, and I'll talk to you through this. I don't know, it's certainly been a long time since the SSC has looked at a fishery dependent index of abundance. So, I apologize if many of you already know all this stuff, but I want to walk us through this fairly deliberately, but I don't want to take a terrible amount of time.

So, if we go back to when we had landings, we could see that the landings are going up in-- I don't know if-- can you see my cursor on the screen or not?

LIAJAY RIVERA GARCÍA: Yes. We can.

KEVIN MCCARTHY: Oh, terrific. So, in these last few years things have been bouncing around all over the place, but they're generally going higher and higher and higher until we're up around 500,000 to 600,000 pounds in landings. However, if you look at these are the number of commercial fishing trips that actually landed a spiny lobster. We're looking here at, you know, it bounces around a bit, but it's not shooting up like the landings did. So, as a result of that, and I want to give credit where credit was is due, Daniel Matos and colleagues at DRNA along with Ricardo López, they took a look at the data, they brought this very figure to the data workshop for spiny lobster. And what you could see is-- so this is catch per trip of lobster. We're starting around 20 pounds and going up to, let's call it 35. So, there's definitely an increase over time. This begins in 2014 and goes to 2023.

And so, they presented this, but the panel, the data workshop panel, because this is what we'd call a nominal index, didn't recommend its use for the assessment. What they've done here is this is across all gears, across all coasts. They've got this upward trend in CPUE. They brought this back to the Council at that August meeting and I'm glad they did. I'm glad they stuck with it. Ricardo talked to the Council through this work,

Ricardo and Daniel. So, the recommendation was, let's dive into these data a little more thoroughly. And so, that's what we did.

So, the first step was still, these are still nominal indices. This hadn't been standardized or anything. I split out the data by gear. So, these are all traps combined. At this point, we haven't split lobster traps from fish traps. But I've also plotted it by coast. And what you could see is there's certainly a general upward trend from, say, and this big heavy black line is all traps combined.

And so, you could definitely see this upward trend, particularly in the East. That's this sort of orange line here. But most of them are trending upwards, most of the coasts. And, again, this is lobster trap. Here again, these are number of trips that landed the-- these are trap trips that landed a spiny lobster, and the effort's flat, at least in terms of trips since the mid 2-thousands. There's not all there's not a lot more trips that are being reported.

You see a similar trend in the dive CPUE. Again, this is just nominal. We haven't standardized anything at this point. It's not as dramatic an upward tick, it's definitely an upward trend. Again, this is dive gear, by coast. And then, this is the number of trips if they landed a spiny lobster. Again, it's flat. In fact, it's been pretty much flat for the entire time series.

Recall that, well, maybe, Adyan, we'll get into this a little bit, but we truncated the time series. There was some concern at the data workshop that some of these landings may have in fact been coming from The Dominican Republic. So, the actual time series for the assessment begins in 1985. It also now runs through 2024. This is an old plot where we didn't add the additional year of data, but Adyan may talk about that a little bit more.

So, we had something that looked like it needed more investigation. So, what we wanted to develop was a fishery independent index of abundance. We're going to use this available data. We'll talk about that now. This is a standardized index of abundance. So, it's a little more involved than simply getting catch per unit effort without further examination.

So, we use the commercial catch logbook. Each of those logbook entries has information about the trip, the landing date, the kinds of gear used, the coast, or we can get to coast depending upon the landing site, gear specific fishing effort, the species

that were caught, way to the landings. I'll talk a bit about how we filter those data. I'll also talk about a data subsetting routine that we used. I'll get a little bit more into that later.

And ultimately, we wanted to end up with catch per unit effort, which is defined as the whole weight of landings by gear quantity. And in this case, gear quantity is the number of traps fished, or the number of scuba tanks used. Those are all reported in the CCL.

So, what we did for data exploration, first of all, we combined similar deer group groups of gears. You know, you have things reported as scuba gear or spear with scuba, those kinds of things. So, we took a look at all of that information and where it made sense to combine gears. We did that. We removed some outliers. So, you always get some strange reports that are coming in, whether it's a typo in data entry or it wasn't legible. So, you get things like, well, we used 50 tanks on a trip, and those are likely not true. So, we did some outlier removal.

We also did some data exclusions, which I'll show you in a minute what I mean by that. And basically, it had to do with are enough trips, say, for a gear on one of the coasts for those data to be included. I'll talk about the years that we included in this analysis. That was also based on sample size. If there weren't enough trips during the year, it didn't make sense to keep that. It would be problematic for the analysis.

And the data were restricted to include only trips that had gear effort information. Meaning, if they didn't report the number of traps fished, if they didn't report the number of scuba tanks used, then we couldn't use it in the analysis. When you do that, after you apply all of these restrictions and things, you end up with about 30% of the trips remaining that have sufficient data to run the analysis. Now that's not the end of the world, provided those trips are representative of the fishery as a whole.

You don't need to account for every single trip to do a CPUE index analysis, but you do want something that's representative. So, if there was some reason that the guys that reported all the data were better fishers. They had higher catch rates, then this isn't going to be representative of the fleet as a whole. I have no reason to suspect that. So, we moved ahead with those 30% of the data. And then, we'll talk about how we calculated the standardized CPUE, at the end of this.

So, here's how we got to the time series of data that we ended up using. So, as everybody who's done data analysis has experienced, 80% of your time goes into building the dataset and the actual analysis is about 20% of the time. So, here what you see on the left are the fish trap data. So, we split out the lobster traps from the fish traps. This is the full time series 1985 to 2024. So, I've added in that last year, which hadn't initially been in the analysis when we began SEDAR 91.

It's divided up by coast and also by dry season and rainy season. We define dry season as December, through April, and then May to November, we defined as the rainy season. So, you could see here, particularly in the West, there's very low, very low, number of trips that made the cut in terms of having sufficient data. So, it's really the early 2000s that we're starting to see enough trips to do something with the North. Not surprisingly, we already know this about the North. There's not a lot of-- we didn't end up with sufficient traps or fish trap trips to include the North. And here also in the South and in the East there's very few in the beginning.

So, on the right, this is the dataset we ended up with. We truncated the data to begin the time series in 2001 all the way to 2024, and we dropped the North Coast. That's specific to fish traps.

When we looked at lobster traps, we got a different picture. There are tons of data from the South, a little bit in the East, not much in the North, not surprising. Not much in the West, which was surprising. So, for the West, that doesn't mean there isn't fishing going on there using lobster traps. What it means is the reporting of the data was not sufficient, so it got dropped in the data filtering.

So, at the end of the day, what we elected to do was not include spiny lobster traps for another index. We also decided not to combine traps. We didn't combine the lobster traps with the fish traps because we think targeting by the lobster traps is different than the fish traps. So, you're mixing apples and oranges there. So, we didn't want to do that. And you don't have to account for every gear to have a good index. Again, what you want is data that you understand so you can understand the results that you get.

Looking at the dive, we've got a similar situation here. I won't belabor this, but when we looked at the data, we could still use the north. There's a there's enough data there. It doesn't look

like it, but there's enough there. But we had to truncate this time series to begin in 2012, and it goes through the end. The most recent year was 2024.

So, those were our datasets. So, the next step is, okay, since we've got fish traps and we've got divers and they don't just catch lobster, how do we know that they were even targeting lobster? How do we know that they were in lobster habitat? And we do this by a species association analysis, which gets at, based upon the species that were caught, can we presume that trip, even if they didn't catch lobster, were fishing in lobster habitat? And we do this through a method called Stephens-MacCall. It uses multiple logistic regression to estimate a probability for each trip that spine lobster was caught given the other species caught in the trap.

So, what that means is we can identify zero trips. Zeros are data in this case. And 0 is valid only if they were fishing in presumptive lobster habitat. If they were fishing somewhere else where lobsters don't occur, we didn't want to include that as a zero. So, this analysis is meant to get at that.

We did separate analysis for each gear and coast combination. So, we did dive gear in the North, and dive gear in the South as two separate analyses. So, we did a number of these analyses and here is what the results look like. So, this plot, let's take this one where it's a little bigger. So, bars that go to the right mean a positive association, bars that go to the left mean a negative association. And it makes some sense.

You know, if you catch coney or boxfish or queen triggerfish in a trap, you're fishing in lobster habitat. If you catch silk snapper, you're not. So, if there's a bunch of silk snapper, that's not going to be identified as a lobster trap. If you catch a bunch of conies and boxfish and triggerfish on the West Coast, that would be considered a lobs-- that would get classified as a lobster trip even if no lobster were caught.

And we've got similar results for the dive. And so, no matter which coast you're on, well, not so much the North, but if you're diving and you're on the East Coast, the South Coast, or the West Coast, and you catch queen conch, you probably weren't doing a lobster trip according to this analysis. But if you're getting red hind, queen triggerfish, or hogfish, you probably were in lobster habitat. Again, you may or may not have caught a lobster and brought it back, but you were in lobster habitat according to this analysis.

Okay, so now we've got our dataset, we've filtered it down so that it meets our data requirements and it's identified as fishing in lobster habitat. That's our dataset. And now the analysis for getting at CPUE, we modeled that using a pretty standard approach, Delta GLM. This combines two separate generalized linear models. One that describes, was there a lobster? Was there not a lobster?

So, it's a binomial model, in this case, Bernoulli submodel. So, it's all ones and zeros. Did you catch one or not? So that's one part of CPUE.

The other part is if you caught one, what was your catch rate? So that would be the second one, this positive CPUE model. If you caught a lobster, what was the catch rate? And what we're going to do is combine these two to get our standardized CPUE. But first, we want to go through, and we want to look at some variables that might help explain what we're seeing.

So, we looked at, year. Year is always one of your variables because you want a time series. We also looked at season. Again, December to April is the dry season made in November, the wet season. That's why you saw this earlier. We looked at coast. For the fish trap index, we dropped the North Coast, but that's okay. We're looking at South, East and West, and we had all the coasts for the dive index.

The other thing we included, but only for the binomial model, that presence/absence model, is this notion that how much gear was being used. So, you can imagine that if you fish for 10 minutes, you have a lower chance of catching a lobster than if you fish for an hour. And so, that's what that's getting at. We didn't use it in the catch rate side of things because it's not appropriate for that submodel, but we wanted to understand and account for the amount of time people were fishing that might play into whether or not they caught a lobster or they didn't. So, that was included in the binomial model or that Bernoulli model only.

So, here are the results from that first presence/absence Bernoulli model. Initially, the way we do this is you put all those explanatory variables in, all four that I just showed you. Then you do a stepwise AIC, which tells you which model performs better, but doesn't overparameterize. So, you get penalized if you got more variables in the model, but you also receive a better AIC score if there's if those variables are explaining the data a bit better.

So, we run this backwards so that you start with the full model

and you'd gradually take away the different explanatory variables. And what we ended up with is for the fish trap index, just the Bernoulli submodel, the presence/absence, year, coast, and year quantity were informative and were retained as the model. The dive index, we kept all four. Year, coast, season and year quantity, you do the same exact procedure for the CPUE submodel.

So, this is the positive, this is getting at the catch rates. And here we ended up for both the fish trap and the dive index with the same model, we kept year and coast. And so, now we've got our two submodels built. We run those to get our standardized index, and this is what we get for fish traps. So, you could see a couple things on this.

The blue, which is labeled as GLM CPUE, that's the standardized index. That's a result of these analyses. And the red is just the nominal. That's if you just went in and you divided catch by the amount of gear that was deployed, and you don't account for any of these other variables.

So anyway, and then we did 1000 bootstraps to get the variability around our standardized index. And what you're seeing is the index is pretty flat for the first, say, almost half of the series. We've got a big dip in 2013. Not quite sure what's driving that, but we do have very low proportion positives, meaning the number of trips that are reporting a lobster fell down to about 10% of the trips. But then it takes off. Then, since 2013, it's been a steady upward run, little bit of a bump here. You know, it may have dropped.

This is less affect-- things like COVID and things like, say, a hurricane may or may not affect the catch rates in the same way that they affect the landing. So, this isn't the same thing as landings. Right? This is a catch rate. So, as long as they're fishing and their fishing hasn't been impeded by something, if they can get out on the water, the catch rate can be independent of the same kind of forces that drives the landings.

Now it could be that you have a hurricane come through. There's no fishing for a while, you go back out in two or three months, and there are lobsters all over the place because nobody's been fishing for a few months. So, that can affect catch rates, to be sure. But we don't want to look at this the same way as we'd look at landings.

So, anyway, definitely an upward trend throughout the second half of this time series. When we look at our residual plots,

these all look great. They look shockingly great. In fact, I've done a lot of these in my former life as an analyst, and these look really good. You don't see any weird patterns in the residuals. So, things are looking really nice. These are all the ones in the Bernoulli submodel.

And then, some more diagnostics, the log transform CPUE. Again, this is shockingly good in how well it fits a normal distribution. We do test for a gamma distribution versus a normal distribution. It turns out that the normal distribution performed better. And I can see why. It certainly fits it well. The sort of QQ plots for the residuals look really good. There's a little bit of wonkiness here on the ends, but that's really minor compared to some I've seen. It's meant to fit that diagonal line.

And here's the index for the dive gear. Same sort of thing. You do coincidentally get that drop in 2013, but then it's just a steady up. I mean, it's a little bit flat here, but it's steadily increasing.

And, not surprisingly, this usually happens. The nominal CPUE trend kind of follows that really, really closely. That's pretty much what they always do unless something really strange has happened. And, again, the diagnostic plots look really nice. I have nothing here that concerns me. And this is for the positive submodel, the CPUE model. Again, the residuals are nothing to be concerned about. Here, this is a little skewed. I've seen worse, but it is a little skewed, but seems reasonable, and, also, the tails of the QQ plot are a little off. I've certainly seen worse. It doesn't give me great pause. And when you plot them both together on the same scale, you're seeing the same kind of trend.

The way you can interpret this is, it's flat here, but when you get up to here, if you're at 1.6 versus 0.8, this is relative abundance of animals in the water. So, going from 0.8 to 1.6 is double the numbers of animals in the water. That is a way to interpret this. Provided it's, in fact, tracking abundance.

There are a couple of things, a couple of caveats here. We're presuming that it's tracking abundance. That's why we go through all of this. Fishers are very good at catching lobsters. So, that's one of the dangers of a fishery dependent survey. You can have very high catch rates even when the population levels are going down.

I don't think that's what's happening here. This corroborates

what we're hearing from fisher testimony that there's a whole lot more lobster over the last, 5, 10 years than we had been saying. That's what this is showing. Couple of things, this could be because we've had lots of strong recruitment for a number of years. That's our operating hypothesis.

The other thing that could be happening, and I don't know that this is, we don't have any evidence of this, but if fishers are moving into new areas that are unexploited, you could also see an increase in catch rates through that. I don't know that we've got any information that suggests that. The model is not spatially explicit in that way, so we're not accounting for that. We can't detect that, but I haven't heard anything about somebody finding a whole new area where the lobsters are just everywhere and in an area that's never been fished before.

We're also seeing increased rates across most of the coasts. So, that too suggests that this is a general thing. This isn't something that is limited to the South Coast or the East Coast or something like that. So, we think what we're seeing is improved recruitment across these last, say, 10 years or so. And that's what this index is reflecting is increased abundance.

I think that's it. So, thanks very much.

QUESTIONS/COMMENTS

VANCE P. VICENTE CERNUDA: Thank you, Kevin. Jason, please.

JASON COPE: Yeah, Kevin, thank you and Stephanie for this. I found that really easy to follow, very logically laid out from the filtering through the model fitting. And I think I just had some clarification questions. I found it. And so, I'm looking at the slides.

What slide is this? I think it's-- if you go back one slide, if you don't mind?

KEVIN MCCARTHY: Yes, will do.

JASON COPE: Thank you. So, what's really interesting about this is that you have two separate fisheries measuring what we hope is the same sort of thing. I'm assuming their selectivities are probably fairly similar. And what's really interesting is that you did not z score standardize this so they're on the same scale. They just are basically on the same scale as far as their CPUE, which is, I think, really interesting. Just something for us to just to consider.

You didn't have to scale-- So, the cues on these are probably very similar, which is interesting and makes them kind of more straightforwardly comparable. So, I just wanted to note that.

It's also interesting that, obviously, that 2013 dip, it's seen in both of these things. The fish trap time series, much more dynamic than the dive survey. And you noted, I mean, that is a really big drop. I was curious, and I apologize if you did say something about this already. I'm wondering if anyone in the fishing community would be able to add something as an explanation on why there was such a dip in CPUE in that year.

The reason I'm saying that is I'm just wondering, I think the trends that you have here are probably right on. There's just a bit more dynamic here in this fish trap. I'm just curious if there's another variable for future consideration that might be worth pulling out of the fishing community's experience that might help understand why that's such a dip and might correct for it.

Because I guess my ultimate thing is I wonder, this is going into the model, and you showed that the CVs around this, the uncertainty around this was pretty, pretty small, probably underestimated. We always underestimate it when we do these things. But in the model, if that small CV is being used, the model is going to want to follow these dynamics closer than having more of an ability to kind of bypass some of these extreme values of up and down. And if they weren't so extreme, the model wouldn't care as much, again, with the tighter CV.

So, I think this is a combo question. Do you know of any reason why it would have dipped that much or had that much dynamic in that year? And then two, I don't know what CV-- or --what was used in the model. Was it the CV coming out of this analysis, did worse additional CV estimated, which we sometimes do in these assessments to kind of get at this?

Yeah. I just didn't know how much how much this sort of dipped down the model was kind of trying to track. So, maybe I'll hold my questions because that's kind of a lot of stuff squashed into, one question.

KEVIN MCCARTHY: Yeah. That's okay. Thanks, Jason. Kevin McCarthy. Yeah.

A couple of things. So, what I did do, actually, did scale these. I divided through by the mean of the common years. So, it

is scaled a little bit in that sense. As for the CVs coming out, I don't think Adyan uses those. That's just sort of the standard code for presentation purposes. She'll talk more about it in her presentation, but I don't think she used these. I think she used different uncertainty.

As for the 2013 dip, I think the way to get at that and to understand that, is to really have conversations with the fishers. Right? They're going to know. So, for the sake of everybody listening, so much of this can be driven because it's a fishery independent index.

So, much of this can be driven by the way the fishery operates. And what we want to do, as Jason is getting at, I think, is to account for things that don't have anything to do with the size of the population of lobsters in the water. Right?

So one of the things that sometimes you would do, we didn't do it for this one, you account for things like if you can catch more lobsters because you've got another person on the boat with you, that has nothing to do with how many lobsters are in the water. So, you want to account for things like that. If there are management regulations that go into effect that change the catch rates, you want to account for that.

So, what we really need to do is talk to the fishers, because it's really this 3-year period of 2012, '13 and '14 where we're really low. You can say 2011 something else was going on, but it's not unprecedented. But these are the 3 lowest years, 2013 by a lot. So, I think the way to get at that is to have conversations with the fishers in Puerto Rico and try and to get a handle on what may have gone on there.

I just know it was extremely low proportion positive, the lowest in the time series, and it wasn't a sample size problem. There were as many or more trips in '12, '13, and '14 as there were in in any other year. So, it's not a wonky sample size problem.

JASON COPE: Yeah. This is Jason Cope. Kevin, thank you. That's exactly what I was kind of getting out. For the next iteration of this, exactly what you said, maybe there's another factor or two in there that might help kind of smooth this out a bit.

But like I said, I think you got the general trend, which is the most useful thing for a relative index going into an assessment. So, thank you, both you and Stephanie, for this presentation.

VANCE P. VICENTE CERNUDA: Thank you, Jason and Kevin. We have,

J.J. Motta, and then Tarsila, and then me.

JUAN J. CRUZ-MOTTA: Thank you. Thank you, Kevin, for the presentation. Actually, quite nice. My question is regarding the Stephens-MacCall analysis. I haven't used that one in a long, long time. From the time I used it I remember that it was a pairwise comparison and in this case a lobster versus lionfish, lobster versus grouper and so on and so forth. So, the question is, has it changed since that general approach or is it still the same principle? Is it a pairwise comparison or does it take into consideration that these things come in groups? That's the first question.

And the second question is, related to that correlation structure among all those species. What we know from the EBFM work is that correlation structure changes through time, right? So, in this case, you're having only one coefficient like regardless of time. Yeah, how do you take into consideration that that correlation structure changes through time? Thank you, Kevin.

KEVIN MCCARTHY: Yes, I'll take the last question for this. Kevin McCarthy again. I'll take the last question first, J.J. Yes, it's a struggle that is not unique to the Caribbean. Back when I was doing this in The Gulf in the South Atlantic, there was always, do you have time blocks where you look at those associations?

Certainly, you want to do it by the different gears because there's every reason to believe that you'd have different suites of animals who are susceptible to the gear. Different areas, it certainly makes sense. So, we did it across all years, but I don't disagree with you. Yeah, we could have refined it and maybe that's an improvement for the future.

Again, that might be a useful conversation to have with the fishers. You know? What makes sense for time blocks when you're looking at these suites of species. Yeah, I don't disagree with you, but for this one, we did it across the whole time block.

And I'm not aware of any changes to Stephens-MacCall. This is another one we struggle with when trying to subset the data so that you're not including zeros that aren't true zeros, that they're out somewhere where there isn't any lobster anyway. Stephens-MacCall, at the Science Center, the use of it depends upon who you ask and when you ask them. So, we don't think--it's certainly not the only way to do this, but that's the way we went this time around.

There are other approaches where people will use sort of the species gilds, and I think that's a little less statistical. That seems to be more, at least the way that I've seen it done seems to be a little more open to interpretation. So, I'd love to talk to you more about this, J.J., in terms of what other approaches you found because I'm always happy to improve the process.

But, yes, I don't think Stephens-MacCall has changed.

I haven't talked to Andi Stephens in 20 years, so maybe she's made some improvements since then.

JUAN J. CRUZ-MOTTA: Yeah. I mean, the recommendation would be to use an index of association across all species instead of Stephens-MacCall. That will be the recommendation. But I'm not suggesting you change this, you do it if you see this again. So, if you use for future analysis where you want to see what groups of species are coming out together, I would use an index of association, sensu stricto, rather than these pairwise analysis. That's all.

KEVIN MCCARTHY: Okay. Thanks, J.J. Yeah. And I know that people have talked about taking that approach as well. But thanks for the insight.

JUAN J. CRUZ-MOTTA: And for the record. I'm not suggesting you do all this analysis again. I'm happy with what I saw today. Thank you, Kevin.

KEVIN MCCARTHY: Thanks, J.J. Were there other questions?

VANCE P. VICENTE CERNUDA: [inaudible] try to find out what happened in 2013 that could affect this catch per unit effort values, the drop in that value. The only thing that—

(Part of Dr. Vicente Cernuda's comments are inaudible on the audio recording.)

KEVIN MCCARTHY: Vance, you're cutting out.

VANCE P. VICENTE CERNUDA: Yes. Regarding the drop CPUE for 2013, I don't know how socioeconomic factors could affect the CPU [sic] value, but in 2013, there was a lot of upheaval in Puerto Rico. There was a political transition in the government. And, also, there were a lot of demonstrations and general unhappiness, from what I just checked, just looking on the

Internet for information on 2013. I don't know if you have anything to add to that.

KEVIN MCCARTHY: I don't. Certainly, socioeconomic factors can impact an index of abundance. In this case, what we're seeing is there aren't fewer trips. We identified just as many trips in 2013 that met all of our criteria for amount of data as well as were identified as fishing in lobster habitat. It's just the numbers of trips that brought back lobster to the dock.

So, maybe there was some change where people didn't want lobster. That's possible. Because remember, this isn't what was caught in the boat, which would be great if we had that, but we don't. We only have what they bring back to the dock. And so, if the fishers are selecting things to retain and take back to the dock and throw other things back that they caught, we don't know what that is. We only know what they came to the dock with.

And so, if there was some market demand that said, you know what? We don't need a lot of lobster, that could explain why we've got lower proportion positives. But I don't have that information. We really need to dig into that more.

VANCE P. VICENTE CERNUDA: Thank you, Kevin. Walter Keithly?

TARSILA SEARA: Excuse me, Mr. Chair. I've had my hand up for a few minutes. I want to ask a question?

VANCE P. VICENTE CERNUDA: Yeah. I'm sorry, Tarsila. Please.

TARSILA SEARA: Thank you. This is Tarsila. Thank you, Kevin, for a really great presentation. I have a comment and a question. My comment is I think-- I would like to emphasize this is a great example and an opportunity to make a case for the importance of collecting local ecological knowledge, information from the fishermen using the appropriate methods, right? So not just having casual conversations, which are of course great, but treating local ecological knowledge as data that needs to be collected and used for management advice. I think this conversation today is a great opportunity to make a case for that.

My question is, did you analyze the potential effects of management actions on changes in effort? And is that something that you could take into consideration, for instance, for time blocks as J.J. suggested or if you looked at that at all?

KEVIN MCCARTHY: So typically-- this is Kevin again. So,

typically what we do, Tarsila, and thanks for the question. But, yeah, I agree with you completely on your comment about local ecological knowledge and doing it properly. Yeah, just talking to a few fishers that happened to show up at a Council meeting or happened to show up at a SEDAR meeting is a good start but not adequate. So, I agree with you completely on that.

In terms of the management regulations, I'm going to put in a plug for some work we've been doing for years and years, which is a management history database. I've talked about it, and other people have talked about it at Council meetings in the past when we give our updates from the Science Center. That was specifically to account for those kinds of management actions in this kind of time series work when you've got fishery dependent data, whether it's size composition data or CPUE data.

What we would do is go in and if there's a closure, if there's a fishery closure, we would not use data from those times. So, the more-- what I think I'm hearing is the sort of more elaborate analysis where you'd come up with time blocks based upon management changes. We haven't done that for this. We've just removed data when there was a closure.

It gets a little bit tricky in a CPUE series if you change the minimum size, which hasn't happened during this time series. But if that happens you want to account for that somehow. So, that's generally how it gets used, but there's probably some more elaborate ways and more informed ways we could be incorporating it. So, that might be an interesting thing we could chat about sometime.

But in this, it's pretty straightforward if there was a closure, let's not include those data because they're not landing lobsters. Those aren't real zeros, that kind of thing.

TARSILA SEARA: Thank you, Kevin.

VANCE P. VICENTE CERNUDA: Skyler, please.

SKYLER ROSE SAGARESE: Yeah. Skyler Sagarese. I just wanted to point out too that from SEDAR 57, and I'll post it, Adyan has put together a really amazing timeline of different environmental, like hurricanes, for example, economic and regulatory changes that have come up. I'm going to post it right now. But this is the kind of information that when we're trying to look at our data inputs or our assessment results, having an idea of what's going on can be really important.

So, just looking at this figure, looking at the fish tract index, what concerns me here is if you were to treat that orange line as an index of what's going on with the spiny lobster population, that jumped from 2013 to 2018, that is a huge increase in biomass for that stock. That's going to say, like-- that's just a massive amount of addition of the population. Now I'm just trying to figure out, is that biologically plausible, or there other issues? And I think Jason hit on that. Are there other things that we need to be standardizing out of this assessment?

And I do recognize that in Adyan's document, she says there were a couple of hurricanes too as well in 2018. So, when we're looking at these kinds of inputs, I think it's really important to have that handle on what has been happening. And I am definitely a little concerned about 2013, that huge drop.

But I think this is great. And Kevin, I just wanted to confirm since I've been involved since SEDAR 46, my recollection, correct me if I'm wrong, but this is really the first time where you were able to thoroughly QA/QC the data and really work on getting standardized indices from this fishery dependent data source. Is that correct? Has that really just been the limitation in the past as we only were able to produce nominals?

KEVIN MCCARTHY: That's correct. Yeah. Yeah. This is Kevin again. Yeah.

This is the first standardized series from fishery dependent data. Right? Of course, the NCRMP has their fishery independent survey. I mean, they don't do lobsters, but they-- so we've had fishery independent surveys that are that are more standardized. But it's up to now for, coming out of logbook data, it's all been nominal series.

So, this is the first one. You're right.

SKYLER ROSE SAGARESE: Yeah. Thanks, Kevin. Skyler Sagarese again. Just following up. I just wanted to bring that up because when I was trying to look back at some of the past assessments and I just remember, from my past experience, a lot of times, this reappended data indices were not recommended for use, but it sounds like that was because it was more of a limitation of what we were able to produce.

And so, this is really the first full blown standardization with this data source. And I commend you, Kevin, and your team for doing this, and I'm hoping that this will become one of those

really important data sources that we discussed during SEDAR 103. How many of these species could we be using this information? So, thank you.

KEVIN MCCARTHY: Thanks, Skyler. Yeah. And to be clear, I would be remiss if I didn't confess that Stephanie did the vast majority of the work. I provided a little guidance, but she did all the heavy lifting.

We definitely want to look at this kind of approach for a number of species in SEDAR 103. Again, Stephanie and Refik, Adyan has also worked with this notion of this data triage approach where we can identify which species have various data sources that are adequate to help inform analysis. So, yeah, it's definitely in the works for 103.

VANCE P. VICENTE CERNUDA: If there are any more questions, then we would move forward and listen to Adyan. SEDAR 91, U.S. Caribbean Spiny Lobster Puerto Rico Assessment: The Final Review. So, Adyan, are you ready?

**SEDAR 91 U. S. CARIBBEAN SPINY LOBSTER PUERTO RICO ASSESSMENT:
FINAL REVIEW—ADYAN RÍOS**

ADYAN RÍOS: Yes. Thank you, Vance. Can you hear me okay?

VANCE P. VICENTE CERNUDA: Okay. We can hear you. Thank you.

ADYAN RÍOS: Awesome. And can you see my screen?

LIAJAY RIVERA GARCÍA: Yes. We can.

ADYAN RÍOS: Awesome. Okay. Let me just do a couple more things here on my end. That way I see you and my slides. Okay.

Do people online see my slides?

LIAJAY RIVERA GARCÍA: No. They are not advancing.

CRISTINA D. OLÁN-MARTÍNEZ: Yes. They're advancing. What I see is SEDAR 91, Puerto Rico with the lobster.

ADYAN RÍOS: Perfect. Okay. So, I don't oh, it doesn't show me what you're seeing. Okay. Perfect.

Okay. Hello, everyone. Today we'll be talking about SEDAR 91, and we'll cover just some background as to how we got to SEDAR 91, a little bit of information about SEDAR '57, and then some

of the additional details that went into '91, including covering some of those new sources of data. We'll also just provide a slightly more detailed summary of the data and life history and then tell you about the models that were in the report, as well as the model that was provided as an additional sensitivity, including the indices that Kevin just presented.

In SEDAR 91, we included a quantile analysis, which we'll talk about later, but it's looking at the different quantiles in the length data. So, looking at what's happening over time to the 95 percent of the largest lobster over time and what's happening to, like, the lowest, the smallest lobster over time. And then, we will cover some of the figures that are in the reports and then get to a discussion and conversation about decisions that take place before any finalization and next steps.

So, SEDAR 91 addressed the stock assessment for the U.S. Caribbean spiny lobster. It consisted of an in-person data workshop followed by webinars, before and after the workshop, and then followed by a series of webinars to develop the assessment with the assessment panel. The assessment report, the stock assessment report became available in September of last year. And now we're, at the time to determine whether the assessments represent best available science and whether those, the results of the assessments are useful for developing recommendations. So, that brings us to what we're aiming to accomplish today. And if we go back in time, we can cover a little bit of information about SEDAR 57.

So, this was the first application of stock synthesis in The U.S. Caribbean, back in 2019. The models were developed using just the catch time series length composition information for two fleets, dive and pots and traps. And so, this is considered a data limited/moderate implementation of stock synthesis. Importantly, these used average recruitment, and that's something that we will also talk about later. So, later, we'll also talk about predicting recruitment versus using average recruitment over the entire time series.

Following SEDAR 57, there was an update done in 2022 to provide updated OFLs and ABCs. So, the landings were updated through 2022 so that 2023, 2024, and 2025 OFLs could be provided. SEDAR 91, built on that same approach from SEDAR 57. And again, it's that length based statistical catch at age model, and it brought the data through 2023.

Stock synthesis was implemented. This is just, again, explaining how we're using this model. It's a statistical catch at age

model. So, it's forward projecting, and it's tracking these lobsters by age and applying the biology and the fishery dynamics to predict those removals. And then, it fits the removals of our catch data as well as our length composition data. And then now in the newest sensitivity run, the index of abundance as well, or indices of abundance.

This slide summarizes the sources of data. So, we have, just like SEDAR 57, the landings time series from the self-reported fisher logbooks. And then, for SEDAR '91, that was through 2023. And now for the index sensitivity through 2024. Those years are also the same for the length composition data from the port sampling. And then, we carried over the life history parameters from SEDAR 57. So, there hadn't been any publications that were reviewed during the data workshop that led to recommending alternative life history parameters.

And then, the next 3 points are new to SEDAR 91. So, the SEAMAP-C and HJR, so these are 2 surveys that are over a brief period of time, but they targeted a smaller lobster. So, it was great to try and incorporate these into the assessment and see how the fit was corresponding, like, was matching and predicting these data well. And so, those are now included in the base run.

And then lastly, the fishery independent indices of abundance that Kevin presented, those standardized indices of abundance that we can use to understand or relate to what's happening to the stock size in the water. So, that's why they're relative indices of abundance, but they're not tracking other things. They're tracking the number of lobsters in the water. And that's really exciting to be able to add that. And then, in doing so, really changed or improved the structure of the model to be dynamic and be reflecting this change in the underlying population. By using those data to predict recruitment deviations, we'll see the estimates of recruitment that were, again, in SEDAR 91, in the stock assessment report, as well as in SEDAR 57, just a single average recruitment over the entire time period.

The next couple slides continue just to remind us about how the information or what information went into the model. And so, again, we had the landings and the length composition. And so, the landings, these log normal area error and the composition data, the length data had multinormal area error. And, in the SEDAR 91 assessments that are in the stock assessment report, those do not have indices of abundance, but we do have indices of abundance for the sensitivity run that was provided.

And those, sensitivity run included the indices by scaling the CVs to 0.2 or standard errors. And so, that conversion is common in some of our assessments in the Gulf of Mexico because, as Kevin showed, the CVs on an index can be very tight. And so, increasing those, but by doing so with, by scaling the mean is a way to retain the information that you have and that some years are known better than others. So, that still gets carried in. But then the model isn't exclusively trying to fit these indices. It's trying to fit all of the data. And so, that 0.2 is the scale that was used for incorporating those indices.

The model has 2 sexes. So, it's a male and female information. So, the length data is provided. So, from the port sampling data, we do have all of those samples by sex. And so, we are able to build those sex ratios. And we do have life history information, and growth information and length weight/information, I believe, that are also sex specific.

Moving on, we've got the natural mortality, 0.34. And we've got the fecundity relationship coming from a study in Cuba and the maturity, also referenced here from VA. The models do not have any recreational fishing, and so just an underlying assumption is that the recreational fishing is considered constant or ignored. And so, this continues to be like another research recommendation to potentially also use LEK to understand recreational fishing. But this is still kind of a data limitation, but just a reminder that we're working with commercial data and understanding the relationship between the stock and the data that we have to model for the commercial fleets.

There is no discard mortality included in the model. We know spiny lobsters are discarded, but because of the, like, high survival and the selective nature of traps and dive, that was a decision that was also consistent from SEDAR 57 in that, we do have discards, but all of those discards are assumed to survive. The age structure of the model is from 0 to the 15 plus age group, and the size bins are from 51 millimeters to 248 millimeters, which translate to 2 to 9.8 inches.

There's only one area, so it's not a spatially explicit model. It's all of Puerto Rico. And, we're assumed to have a single spawning stock population with a Beverton and Holt recruitment function. And although the stock synthesis is using a Beverton and Holt recruitment function, so that's relating the spawning stock size to the expected annual recruitment, that's being kind of intentionally decoupled because we talked a lot about the potential and situation we're in of likely external recruitment.

And so, in SEDAR 57 and in the update, a high steepness was assumed. That was of 0.95. And then, upon review of that and the intended effect of decoupling this spawner/recruitment relationship, the SEDAR 91 models used a 0.99. So, just really, taking that assumption, like, fully to the-- I don't think you can put a steepness of one in SS. So, that's the way we're able to accomplish that assumption of external recruitment, which also allows the stock to have high recruitment even at very low levels. Like, even if the stock is small, it's saying that we're not relying on the local stock to replenish the recruitment, we can still have high recruitment when the when the local population is low. So, that's just how that spawner/recruitment relationship works when we have a high steepness.

We have length-based selectivity and retention, and we also have models that assumed, especially in the report, I explored this a little bit in the sensitivity with the indices, but we assume that the commercial catches have a high precision. And then, an important note, just to reiterate, is that catches have increased in recent years, but Daniel and others at the Department of Natural and Environmental Resources did provide that report of high abundance. And then Kevin and Stephanie were really able to dig into the data.

You know, it's a lot of work to explore and clean up that data. There's changes in the forms and changes, but getting to that time series of when the data are consistently in the effort units and removing of the years prior where things might have been either low sample sizes or the forms might have been different, it's really great to take that forward for all of our assessments, that methodology for trying to get at what is happening to the population from our fishery dependent data. So, thanks to everyone for bringing that information to the table now. And so, that's something we were able to explore and provide now the SSC with a comparison of the outcome and the fits and the sensitivity of the model to using that information.

This slide is in the stock assessment report, but with one edition, which is that last line in yellow. But I'll just kind of overall orient a little bit, which is on the far left, we've got the stages of model development, which were the initial model runs, what the assessment panel and what is described in the assessment report as the base model. And then, sensitivity runs. And then we've got the codes here. So, the model is a shorthand, and the codes are just for how we look at the models. That's also, commonly, how we see on some of the plots and tables. So, I just included that here as well.

But I also can bring your attention to the model description, which generally is kind of additive. There are some cases where it doesn't go, like, sequentially. But, if we look at this here, we see that the initial model for that initial stage of model development was the SEDAR 57 model with the parameters unchanged, but with an important recommendation to change the start year to 1985. And this had data through 2023.

Then, the next model looked at estimating the initial fishing mortality for each fleet, so, no longer fixing those parameters to what they were in SEDAR '57. Subsequently, new data sources were added. And then the initial, once all of those data sources are in the model, the initial equilibrium catches are estimated-- No, they were actually-- they were estimated, but they were initiated at locations that came from exploring their likelihood profiles.

So, we know we have a lot of uncertainty in our initial conditions. We don't have a model that goes all the way back to when fishing was expected to be negligible or when the stock was unfished. So, this helps us really guide the model to those assumptions and that starting place. It still gets to freely estimate these parameters, but this is where earlier analyses of those likelihood profiles guide where those parameters start.

Then we have a number of selectivities explored. And so, these first two were related to the selectivity pattern. And so, just verifying that even if we initiate the model at a logistics selectivity, it still estimates that dome. So, that explores our assumptions of the dome shaped selectivity.

We also have a run where we look at the lower steepness, so a steepness of 0.8. So really, instead of that assumption of external recruitment, considering the recruitment to be really tied to the local population size. And so, that's, again, that's a sensitivity just to provide the example of basically the opposite of our assumption. What if it is tied? 0.8 is still intermediate as far as a steepness value, intermediate to high. But, yeah, I think it's a useful sensitivity run included in the report, to be able to understand the alternative to the assumption of our 0.99 steepness.

We also have a combined sex sensitivity. So, instead of providing male and female specific length and growth information, it is just the information for male used for both of them. And so, that helps us approximate, "well, what if this was a simpler model of just a single sex model with a single growth for both sexes."

Next, the length weight relationship was updated to parameters for the entire region. And so, SEDAR 57 used parameters specifically from Puerto Rico, but when we incorporate the data from the larger U.S. Caribbean, there's more information, more samples, and it's not, unless there's like a strong reason that the length/weight relationship differs across areas, it's kind of good advice to use the regional information and to have your larger sample size and information going into your length/weight relationship.

We have two additional sensitivities related to how those initial equilibrium catches were parameterized. So, how those parameters were initialized, so where they started. And so, we have our high and our low. And so, I mentioned earlier that the base model was parameterized with the best initialization, and then they also explored the high and low. And then, we have a run where we have a higher CV on the catch data.

All of those that I've talked about, so far, are summarized in the stock assessment report. So, there's tables about how these sensitivity runs affect and how those initial steps of model development affect the parameters and the derived quantities. And then, now we also have the sensitivity run for indices.

So, that is the base model plus those fishery independent indices of abundance and that additional year through 2024, which I forgot to include here. So, there are a lot of tables that provide a comparison of the results and quantities coming out of all of these sensitivity runs. But for the sake of time, for today's presentation, we're going to focus on the SEDAR 91 base model, which the report kind of justifies as the best model of those presented in the stock assessment report. So, building up to it and also specifically exploring and evaluating the sensitivity of all the other models described here. And then, the other model of focus today will be the sensitivity with the indices.

Okay. Before I go forward with showing some of the data and the analyses and the results, are there any questions? Drink some water as well. Okay?

So, the first thing that I'm showing you here are the results of the quantile analysis.

Oh, I see here. I see movement.

GRACIELA GARCÍA-MOLINER: Okay. We're having a little bit of

technical difficulty. Hold on a second, Adyan. Thanks.

Okay. Thank you very much. So, you can continue.

ADYAN RÍOS: Okay. Thank you. So, the first thing we're showing here is the quantile analysis for the dive fleet. And so, this has quantiles of the size data for each year. So, the tenth percentile, the twenty-fifth, the fiftieth, the seventy-fifth, and the ninetieth. And so, if we had the hundredth in here, that would be, like, what was the largest lobster observed each year? Or if that's-- so this allows us to see whether, not just the average is changing over time, so the 0.5 quantile, but what's happening to lobsters at the smallest sizes and lobsters at the largest sizes relative to the ones we're seeing each year over time. And overall, what we see is not a lot of change in our quantile analysis. A little bit of change is associated with our retention of our smallest lobsters. But overall, we see that for many years now we have the ninetieth percentile, and the tenth percentile lobster have remained similar, as has the mean.

And so, on the left here, we have females, and on the right, we have males. And sometimes this plot gets a little wonky, and that's usually due to low sample size. So, there's low sample size years. I believe this is 2008 and earlier. But again, this is like a forest level view of the length composition data that an analysis like this could show us. Like, "hey, you're not seeing any small lobster anymore, or your smallest lobsters have-- like, if the smallest lobsters that we're seeing have been increasing in size, then that would tell us that we're not seeing any smaller lobster.

And the same would be true for the large lobster. If the largest lobster, the ninetieth percentile of our lobster is decreasing over time, that means that we're not seeing the same amount of large lobster that we used to. But that's not what we're seeing overall in this quantile analysis.

I believe this is also a nice kind of diagnostic and look at the length composition data that is also going to be incorporated into SEDAR 103, just being able to get a snapshot of just looking at the length data, what is happening over time to the mean as well as to the largest lobsters and as well as to the smallest lobsters.

So, next we will look at the trap fleet. And here we have a few more years of low sample size. But overall, again, this forest level view did not raise any concerns and just highlighted that consistent size that we're seeing over time in the length data

that we have for the two gears and the sexes.

Okay. Now we're going to get into some slides with more than one plot. So, I'll take my time to orient. Here on the left, we have the landings time series. On the right, we have the indices of abundance. And we have the colors representing the fleets. So, blue is diving, and green is the pots and traps. And then for landings, we have the total in black.

What we also see here is that inclusion of that 2024 data point. So, for pots and traps, we have a slightly higher value, and for diving, it is a slightly lower value. On the right, we have the standardized indices of abundance provided by Kevin and Stephanie with the corresponding colors.

Kevin also showed this. We don't have the uncertainty plotted here, but we do have that on our next slide where we show the fits to that. So, I want to do that first before we go further into seeing more of the comparison between the SEDAR 91 base model and this SEDAR 91 sensitivity model. That's just what we're going to look at next.

So, in the sensitivity model, here we have the fits and the standard error bars. These standard error bars are actually rescale-- I think they're rescaled by ISS, but I'll double check. But anyways, it's meant to represent 95% uncertainty around the coin estimates of those indices of abundance.

We're seeing pretty good fits for a data limited model. We do see that we're not capturing all years well. So, for example, there's, like, a conflict in 2012 between the two indices. So, dive is showing a decrease, and trap is showing an increase. So, the model's kind of confused there. Oh, wait. That's not 2012. Let's see. Yeah. That is 2012, 2010, '11, '12. They both show that they both have the corresponding decrease.

So, I guess the point here that I wanted to make before I got confused by my axes was that we're not capturing this deep drop, and we're also not capturing really detailed fits to these indices, but we are capturing this overall trend of increasing abundance from 2012 on-- or from 2013 on.

VANCE P. VICENTE CERNUDA: Excuse me, Adyan. Jason has a comment.

ADYAN RÍOS: Yes.

JASON COPE: Yeah. Jason Cope. Yeah. Adyan, I actually think

this is a good thing to see that your model is ignoring that major dip, because what's wild there also is that the highest confidence interval is around that tiny value just because the values, I think, are tiny and you put in constant CVs. But I think I'm happy to see that the model isn't forcing itself to do some really wild decrease and is kind of going through here.

It would be interesting as an additional, sort of, curiosity run to flip on the added variance option. I think you would probably show that you get the same results, but you'll just blow up the CVs on this in order to incorporate those funky low numbers there in 2012 through 2013 but still get probably very similar results. So, I am not discouraged by your lack of fitting that. I'm happy it's not fitting it.

ADYAN RÍOS: Thanks, Jason.

VANCE P. VICENTE CERNUDA: Okay, Adyan. Continue, please.

ADYAN RÍOS: So, now that we have the comparison now moving forward between SEDAR 91 base and the CPUE sensitivity run with the indices, and we just saw the fits to the indices for the model that produces the selectivities on the right. So, on the right here is the selectivities by gear for the-- sorry, by fleet for that sensitivity run. And on the left, we have the values resulting from the SEDAR 91 base model. And in the document that we provided for the sensitivity, we also have tables that show the changes in these sensitivities. And what you can see is they're very similar, and those changes in those tables are quite small.

So, overall, the dynamics of the fleets in these models are not changing by incorporating the additional indices. And that's good because what we're trying to understand is that the indices relate to the underlying population. And so, we still have similar fits to the length composition data as well, because that's related. The selectivity relates a lot to length composition data, predicting the length composition data that are estimated. Okay.

So, now we'll move on to what's not the same, and this comes out from the derived quantities. And we'll talk a little bit about why this happens and why we kind of expect this to happen. What we see here is the fraction of unfished spawning output. So, this is the total biomass divided by the unfished spawning biomass. And we have a reference line for 0.3.

What we see on the left is this relative spawning output before

we incorporate dynamic recruitment. So, this model uses a fixed, not fixed, but a single average recruitment throughout the entire time series. The model on the right does not, and we're going to talk more about those recruitment deviations that are the cause of the pattern change that we see here.

And so, on the left, we see that we have this M shape, and we still see that on the CPUE sensitivity, because keep in mind our indices don't start until 2001. But then during the period of time where we do have the indices incorporated along with those recruitment deviations, we do see quite a different interpretation of what's happening to the stock.

And so, when we account and when we use the indices and provide information for the model to understand that we have data telling us about the relative abundance of lobster over time, it incorporates that information and it tells us that, there was a decline, but over the last decade, there has been an increase in the spawning stock population. And so, this is saying that those higher catches aren't actually fishing down the stock. Those higher catches that we've seen in recent years aren't eating into our standing sustainable stock size. They're actually capturing additional individuals that have been added to the population because of recruitment.

That's only possible to do because we have the indices of abundance, and therefore we're estimating recruitment. Before we used a dynamic model like this to understand what's happening to recruitment, when you have the same recruitment every year, the same expected recruitment every year, and your catch increases, the model still expects your stock to only have received that same number of recruitments. So, that's why it interprets that the stock has been actually sharply declining while your catches have been sharply increasing because you're not allowing the model to understand that these catches are actually happening on a larger stock that is being fed by this increased recruitment.

Okay, so I've kind of explained what I wanted to there, and I hope that kind of-- we can come back to this slide too, but you now see how the underlying trend in the stock kind of reflects what we see in the indices.

This is another way of looking at that information, but now it's not a ratio. I will point out that in these comparison slides, maybe I should go back one for a second, our axes do change. And I apologize for that. I'm going to try and learn how to fix these to be a common axis. I just wanted to kind of bring your attention to that detail. So, the reference line is still here

but do pay attention to the axes as I move forward.

And so, that brings us to our next slide, where we see that the unfished spawning output was below. It increased a little bit. So, this is the incorporation of the index, and the recruitment deviations and it is actually saying that the bucket, the actual total size of this population, could have actually been a little bit higher when it was unfished.

And then we can keep going. We have a table later that gets us at the MSY proxy, which tells us about the comparison between the two models, about how the model is predicting the productivity of the stock. So, providing that estimate of maximum sustained productivity for each of these models' structures of the SEDAR 91 Puerto Rico spiny lobster.

Next, we have the fishing mortalities. And again, seeing the scale and going up to, close to 3 or a little bit above 3 in that terminal year and now being between 2 and 2.5. And so, the model previously was saying, in these years you've been capturing 20%, 25%, 30% of the available fish. And, again, that's because it only knew that it was only expecting a certain amount of fish to enter the fishery every year, grow to the size of capture, and then be available to the fishery. And the fishery was reporting those larger catches that we see. But that gets rescaled and understood to be different when the stock is actually increasing over time, based on that dynamic recruitment. So, that is what we see for the change in the fishing mortality.

Next, we have the estimates of recruitment. And again, our scales are changing. So, on the left here, it's a little bit over 1000, and here it's just a little bit more over 1000. And so, that's what our average recruitment is being predicted as. Here is our average recruitment during years that are considered to be less informed by available data. And I'm going to talk on this side a little bit about what we mean by that and what we can also look at.

And so, when you turn on recruitment deviations, you want to do that only for the years where you have data like an index of abundance, and when you have that understanding of length composition and catch to be able to help predict that recruitment. Recruitment happens because the model predicts that a certain number of fish must have come into the stock in order for these landings to have existed a few years later. So, that's how it kind of relates to recruitment gets predicted, kind of, forward projected to match what the size of the lobster that we

have, the amount of lobster that we have, and then the relative abundance of lobster that we have. And so, doing that, the run that we had prepared for the sensitivity only turned on our recruitment from 2001 to 2021. And so, it had these initial years that used the model's average recruitment and the final years that used the model's average recruitment too.

Now, this is an important decision, but it's quite common to turn off the recruitment deviations in your most recent years because that's when your model has the least amount of information to predict recruitment. But we also looked at, I think I did pull together an example of changing that to be all years or changing that to be one year fewer. But this is an important thing to talk about.

I'm glad that when I did my practice presentation, this question came up because it is a very good question to say. Because these do influence your projections. These final year estimates of your most recent recruitment do carry forward into your projections. But we do have a comparison, and we can look at that a little bit later.

What we do see here is the level of uncertainty in the model-predicted recruitment, as well as a drop in the last year predicted recruitment, but not far below average. So, it's kind of back at average recruitment. And then, with those three final years of average recruitment. I did use the adjusted bias ramp, and I do have additional slides that I was able to put together for that. But I did want to highlight that and make sure that we talk about that later when we come back to this. Okay. This is the next slide. Oh, yes.

Okay. So, now I just want to bring your attention to what we saw in the figures of that terminal year of each of these assessments and what it interpreted the fishing mortality to be relative to the F_{MSY} proxy of SPR_{30} . And so, in the previous model with that static dynamic of that constant average recruitment, it estimated the value to be at 1.26 or that the fishing was happening at 126% of what it should be for that sustainable fishing mortality of the $F_{SPR_{30}}$.

Now with the indices and that dynamic recruitment and that recruitment of 10 years of good recruitment, I forgot to point that out here. So, like 10 years of above average recruitment. The model says that the fishing mortality that we're seeing is actually pretty close to the expected fishing mortality that is sustainable. So, that ratio is 0.96.

And then, these are terminal years as well. So, I did want to highlight that. So, this was run through 2023. This is run through 2024.

And then we also have the values of the spawning stock biomass relative to the spawning stock biomass that produces the long-term sustainable yield. And the previous model said that the stock was slightly overfished at only 92% of that expected long-term value. And then the current model says that we've actually seen a really strong recruitment and growth in the stock, such that it's actually at 132%.

Now we can take a quick look at the MSY proxies. And so, these are first shown in what the model uses, which is metric tons. And so, the sustainable maximum yield of the stock, previously, including the recruitment deviations and the indices, was about 180 metric tons, and now it's about 200 metric tons. And when we translate that to pounds, it reflects 396,000 to 446,000. That's a 50,000-pound increase.

Okay, so I did compile some additional slides related to the topics that I brought up, but I do want to open the floor for questions and just kind of orient to where we want to be heading, which is discussion of these models and whether they can be used for management advice. Any other questions or models that we want to see. And then, in order to move forward, like always for all our assessments, we need to make assumptions about what to include for the landings between our terminal year and the year when we want to start our projections. And so, I think that would be 2025 and 2026.

In past assessments, we've used a 3-year average, but that's just something that we always want to revisit just in case there's more information about, like, right now more fishing is happening than we saw in the past 3-year average, or less fishing is happening than we saw. Or should we just leave it at that 3-year average and then just update it in a few years when those data are available?

And then, in order to get the ABC from the OFLs, we will also need to just, you know, use a P^* . In the past, we've used 0.45. And the sigma, which is recommended by the SSC to account for scientific uncertainty. In the past, we have used 0.5.

So, open the floor to questions, and then I think we can circle back to some of the additional questions that I prepared for.

VANCE P. VICENTE CERNUDA: So, the floor is open for questions.

Skyler, please.

QUESTIONS/COMMENTS

SKYLER ROSE SAGARESE: Skyler Sagarese. Thanks, Adyan. So, I just, first of all, want to say you've done a ton of work on this model. I think a lot of the improvements that you've made have made it a much better product.

I was just curious, because you're proposing this model for management advice, were you able to run the diagnostics for it to just make sure that everything was behaving as expected? I know it's a bit more work, but I would think that we would certainly want to make sure that this model is performing well enough to propose management advice from it.

ADYAN RÍOS: Absolutely. Thank you, Skyler. I do have that. I have the R naught likelihood profile, and the steepness likelihood profile. So, I'm just making notes to myself as to what to show, just to come back to. So, diagnostics.

I can show them right now, or I can, kind of, listen to everyone's questions and then go back in order. Okay. Let's go show them right now, and then I'll just keep going until we get to another question that pops up.

VANCE P. VICENTE CERNUDA: Yeah, Adyan. We would need a 15-minute break and then come back at 03:15.

ADYAN RÍOS: Sounds good. Thank you.

(Whereupon, a brief recess was taken.)

VANCE P. VICENTE CERNUDA: Hello. Can you hear me? Yes. Okay. So, it's 03:15.

So, we shall continue with Adyan. She's going to be responding to Skyler's request. So, Adyan, whenever you want to come back in, we're ready.

ADYAN RÍOS: I will in one moment. I have one more copy/paste.

VANCE P. VICENTE CERNUDA: Okay. Whenever you-- whenever you can.

ADYAN RÍOS: Okay. One more second. Sharing my screen now. Okay.

So, the first question was about diagnostics. I have all of

those that we can look at, except the initial F likelihood profile. In previous SEDAR 57 models, we started with estimating only the initial F for the, I believe, the trap fleet. The dive fleet started at a negligible amount. And so, all of the effort of that first year was estimated into one fleet, which facilitates the likelihood profile. But the likelihood profile is a bit trickier to do on the two fleets of just, kind of, increasing the initial fishing mortality by, like, a ratio, to kind of-- It can be done. It has been done, but I haven't been able to do it for the current assessment. Matt did it for SEDAR 91. But that brings us to saying what we do have, which are the jitters and the R naught likelihood profile, the steepness likelihood profile, and the retrospective.

So, CPUE sensitivity is really stable. It always hits the same likelihood, even when we run it with a 20% jitter on varying the initiated parameters where the model starts fitting and estimating those parameters. Previously, in SEDAR 91, it looks like there were a couple runs that landed at different likelihoods. So, one that went way off into a different combination of parameters at a different equilibrium catch, and one that looks like it went off as well, but just slightly different. Like, when we see pretty stable jitters, both for the SEDAR 91 base model and the CPUE sensitivity.

Next, we have the likelihood profiles. In the SEDAR 91 stock assessment report, we can't really see this curve, this likelihood profile, because there was one, it was-- wait, no. It's steepness that I want to come back to. So, this one's fine. This one is directly from this

This is matching from the SEDAR 91, base likelihood profile for R naught. And we do see that there's a minimum, but we have the same kind of really low, similar likelihoods across a pretty wide range of R naught. So, that just shows the model is predicting the R naught with the best likelihood, but there's also a space over which there's almost equally predicted R naught. So, when we get into changes in log likelihood, like less than one or less-- that means that the model's performing pretty equally at those different values of--

Over here. So, we also see that in the earlier model, the only element of the likelihood is the length data. So, that's equal to the total. That's because we were fitting catch exactly. And so, now in the CPUE sensitivity, we've got likelihood components from catch, from the length data, from the indices, from the estimated recruitment, and from the estimated equilibrium catch.

Next, we have the steepness profiles, and here's where I removed one that hadn't converged. When I removed that, we saw something that-- we couldn't really see the shape. It was pretty-- it looked like it was just completely flat because the value that had gone way higher really distorted and lost the perception of what we see here. But when I remove that, we do see that the SEDAR 91 base does have a lowest likelihood. But again, every steepness above 0.8 has, like, pretty similar likelihood. So, the difference between the log likelihood, whether it's one or 0.99 versus 0.8 is less than 0.5.

Now, with the CPUE sensitivity run, we see that the model and based on the length data and the index data and the recruitment estimates, really prefers a steepness of, like, the highest we can allow it to be. So, again, steepness is fixed at 0.99 in both models, but this sensitivity shows us the outcome and how well it's being estimated by showing us what likelihoods do we get when that value is changed. So, how unlikely does that lower our values? And then, we see that much lower values are becoming very unlikely.

So, that's it. So, those are the three that we have comparing between the 91 and the CPUE sensitivity that I was able to just bring these into the slides instead of, kind of, navigating in my browser. And then, I also have the retrospective. I'm just going to show the retrospective just for the CPUE sensitivity. The retrospective for the SEDAR 91 base is in the SEDAR 91 report. And so, we can also pull those up if we want to, but I just wanted to start showing the retrospective. We have like 3 different slides coming now with information about the retrospective.

I'm going to take just a quick second here. Escape. Make these a little bigger. And I apologize for the overlapping legend.

Okay. So, on the left here, we have our estimates of F , predicted by the model, when we peel off consecutively one year of information. And so, it's changing slightly, but this isn't a terrible retrospective pattern. We see the biggest shift going from when we remove that fifth year of data, and we also see a shift when we remove that first year of data. So, we go from blue to this cluster and then down to red.

So, that's the effect of the peeling off of data on F . And here it is on recruitment. And so, the final years of recruitment are the ones that were associated with the highest uncertainty. And we do see a bit of a retrospective pattern here, and we'll see that on the next slides as well, as the model is having a tough

time predicting that final year of recruitment and then the subsequent year of what happens in that next year.

So, here's the fix to the index with those peeling off of information. And so, we've got the dive on the left and the trap on the right. And, we do see a retrospective pattern, kind of showing that the model constantly wants to predict a lower index value in the terminal year. So, it wants to predict a lower value in 2024. And then, when we only have data through 2023, it wants to predict a lower value. And so, that is a bit of a concerning retrospective pattern that we might want to investigate if that continues to happen across, just because it's saying, like, when we add a new year of information, we might expect this fit to be a bit higher, reflecting what we're seeing in this trend that it constantly predicts lower than expected until we get data for that next year.

But again, the models have the least amount of information in that terminal year. So, that's not too unexpected, but it is a little bit of a concern for how we move forward with projections. And that might be something I might be able to check really quick if it happens when I use different recruitment settings.

VANCE P. VICENTE CERNUDA: Adyan, I have to interrupt you. Jason Cope needs to intervene.

ADYAN RÍOS: Thank you, Jason. Yeah. Help me out here.

JASON COPE: Sure. Hi. Yeah. Jason Cope. Question about those fits.

If I'm thinking about this right, because this is the model that includes the CPUE, and therefore, allow it to fit the CPUE. I thought that model was fitting it really well. I don't recall a dip at the end, and the data 0 years, wouldn't that one be the model that fits-- that has all the data in it and it's fitting for? But that one's also showing a dip, and I don't recall seeing that in the actual model. It seems like it fits really well.

ADYAN RÍOS: Yeah. Good point.

JASON COPE: So, I'm not sure what that's doing. I'm just curious if that retrospective was run on a model that truly isn't the real base model because this looks-- because we're looking at what, that left, the dive.

ADYAN RÍOS: Yeah.

JASON COPE: Yeah. And it's fitting it good. So, I don't-- yeah. That might just be an artifact of a different model that you ran the retro on. And--

ADYAN RÍOS: Yeah. So, I can double check that.

JASON COPE: Okay. Great.

ADYAN RÍOS: Yeah. Because that was weird to see it going all the way through 2024. Yep.

JASON COPE: Yeah. I'd say it should show really nice fits, and I expect, if you use that base model, that it will continue to show pretty nice fits. It might wiggle a little bit because of that, like you said, that recruitment uncertainty kind of gets a little higher. But this dip, there's something funky here.

ADYAN RÍOS: Yeah. And then, just the last of the retrospectives are these-- I forgot what these are called, but these are, like, predicting the next year. And I'll try and fix the axes on this, but we can't really tell what's going on. So, we'll come back to that.

And then here's one where we actually can see the axes. And we're seeing that dip again, that predicted dip in subsequent estimated year. And so, that's something that definitely want to double check and look into because that's not what we, kind of, saw when we fit the data through 2024, earlier, in the fits that we saw. Okay.

So, that covers the retrospectives. I'll also circle back to, like, this, that, kind of, like, instability that we saw in the recruitment deviations. I wonder if it also relates to what year I'm running the recruitment deviations through. And so, I did want to just show how I'm using the recruitment deviation and variance and how I am using the bias ramp, that SS, those recommended years. And that it does, we do see, like, that highest uncertainty in that last 2022 associated with that kind of decrease compared to the previous 10 years back to being similar to average recruitment. So, I know, Jason, you had kind of mentioned to me before-- Yeah. Go ahead.

JASON COPE: Yeah. No. Thank you for this. This is very informative. So, what it's telling me is that you have a fair bit of information on recruitment to be estimated, and so your decision to flip that switch and estimate recruitment is one

supported by data.

My guess is you mentioned the question on what you do with those last few years where you probably don't have much information because of the lag, and selectivity selecting for the lengths, which is where you're getting your recruitment information from, mostly. And in this version, I believe this is probably the base model version, you've already made the decision of cutting those off, which is why we see that last year kind of just stop.

My curiosity, you might be able to support your point for turning those off if you show a model that actually estimates through the end of the year. My guess is that information content, maybe just to orient everyone, I'm looking at that middle figure. And theoretically, if there wasn't much information, we would expect those dots to be closer to that red line or above it or something like that. When it drops below that red line, we interpret that, usually, as the model having some information. And my guess is those last, in this case, 3 years, if you turn them on an estimated recruitment through those, I'm guessing that they are going to dive closer to that 0.6 value, that red line, which does tell you could turn them effectively off, like you're doing.

So, I think what you've chosen to do is probably the right decision. You could show that with that model estimating all the way through the time series. And, yeah, yeah, there you go. Perfect. Thank you. And so, yeah, those last two are basically there showing you that you'd really—

Now, my guess is if you bias corrected using this exact model in those, you might get the exact same result as what you've already done, which is turn them off. But I think that plot that you just-- that little floating one that you just showed is supportive of your decision to turn off the last three.

So, great. Thanks.

Are these ones you're showing here that model that estimates it all the way to the end or doesn't? And I can't hear anyone now.

ADYAN RÍOS: Well, I've been speaking, and that's unfortunate.
[laughter]

JASON COPE: Okay. It's not just me.

ADYAN RÍOS: Yeah. So, thanks. Sorry about going silent on you there. But, yeah, I was showing these models as the comparison

of the F and the fraction unfished and the recruitment for when we have it on through 2024, and then also when we have it on just through 2021. So, peeling one year off as well.

So, it doesn't really have a big outcome on our interpretation of F and of our relative biomass. But I assume that this would be influential into projections.

JASON COPE: That's exactly right. That was what I was going to say is even though your terminal stock status and stuff doesn't care about this, you rightfully point out it is going to push that forward And then it's going to take, as you mentioned earlier, any projections are going to be based on an average recruitment going forward or pulling it off the stock recruit curve. And so, it's yeah. You don't want that red thing happening.

So, all of this supports your decision on turning off those last, at least couple of recruitment deviations.

ADYAN RÍOS: Thanks, Jason. I actually think that in the forecast file, we might be reverting to the average recruitments, but that's still only for the average recruitments going forward. So, again, those--

JASON COPE: Correct.

ADYAN RÍOS: --recruitments in those last couple of years. And these are poorly informed. Do you see, like, how high the rates are in those last years?

JASON COPE: Yeah, but It is going to push forward an age structure that, like you said, is not informed and saying something really severe, which is a complete failure in recruitment, which I don't-- not the type of precaution, I think, we're looking for when we want to do our projections. So, again, you're right in turning those off.

ADYAN RÍOS: Thanks. Make that a little bit bigger.

Okay. So, I do have just one slide here that I thought might come up as a question. Let me see if there are any questions in the chat. Okay. Not yet.

So, I did really focus on comparing the base to the, CPUE sensitivity run, but there were models that were explored in that model development process. And so, I did want to just kind of point out that these are also models that we were able to

kind of look at and think about and understand. So, that's how we got to 3g. In case you were wondering if-- about 3g, I kind of quell that curiosity here.

And so, initially, I wasn't directly exploring recruitment deviations in data limited models. Kind of, the framework, or the approach that I had, was that that would be something that I would do at the very end, once I understood the model dynamics. And so, that's why that follows this structure. But I was also trying to find a good fit between the data components without recruitment deviations. And so, that's what led to the two decisions of deviating from estimating the exact patch and using a more detailed F estimation approach, that estimates the parameter for each year. So, that went into those decisions of getting us to model three.

But I also have model 00g, which is essentially the base, plus rec devs, plus trap index, plus dive. And then we also have, model 3C, which I have a slide here on the next-- information on the next slide, which kind of gets at how was the model fitting the catch before we included the rec devs?

And so, before we included the rec devs, there was a period of time in the late 2000s where the model is-- I always get these confused. --solid line is the is the observed. So, the model is predicting lower landings.

No. Sorry. Observed solid line. Yeah. And expected. I always get those confused with the observed and expected versus predicted.

So, anyway. So, there's that discrepancy in the diving fleet during these periods of years and these periods of years. And I note that, like, I think all of these years are the ones where we are, like, carrying over that correction factor. So, the correction factors are not year specific in these years. I wasn't too surprised. It got me curious of saying like maybe there is some variability in that correction factor. But again, we go back to fitting our catches and treating them as strongly informing our model, when we use the recruitment deviations.

And then this slide shows that 00g compared to 3g. Let me make this big. And so, we get really similar trends, but we get a slightly different R naught, which isn't too surprising. So, essentially here, what I think-- the big difference between these two models is that the blue one is fitting the catch exactly, and the red one is not. They're fitting the index similarly, and the trends are similar. But what we see change is that R naught. And that's not too surprising because we did have

that low likelihood surface for R naught as well.

Jason?

JASON COPE: Yes. Jason Cope.

VANCE P. VICENTE CERNUDA: Yeah. Jason?

JASON COPE: Thank you. Thank you, Vance. And, yeah, Adyan, this is great. I will say I prefer the double 00g version, the one without the variance on the catches, because I think of these models, all these sensitivities, they're little, tiny experiments, and we like to control our experiments. And the addition of the variance on the catches, they're saying something. They're saying, "we don't know if these catches are right and we're going to let the model wiggle around and figure out what catches it wants." My worry is that it's got so many wiggles to do, with moderate data, that it becomes a place where variance just gets soaked up. And it, ultimately, as you show very well here, it creates an alternative reality for the catches.

And so, I think then the question becomes, is the catch series that went in the best catch series? Or do people believe that the catch series that was estimated or realized by this model, that was able to change it, a better realization of catches? And just in my mind, I prefer to kind of go in on these models saying, "this is our best estimate of catches."

You can show these sensitivities, but controlling catch in this experience, for me, I would rather propose alternative catch histories that might be realistic rather than let the model wiggle it and do something that, for me, becomes more of a black box. Like, why is it doing that? Why did it why did it choose it higher here and whatever? And like you say, it has a little bit of effect on scale, as it should, because the scale of this model is determined by the catches that are realized.

And so, again, I prefer to control that in these models. This is one of per person's opinions. And so, I definitely don't want to say, "that's the right way," but kind of arguing, I like the fact that you provide this 00g version. For me, I think it's a bit more preferable because I know what the catches are versus the model did something to realize new catches and then you have to back up and say, do I believe that? And I guess that would be a question for the rest of the group. Thanks.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Jason. Are there any

other questions or comments? I don't hear anything. So, Adyan, can you continue, please?

ADYAN RÍOS: Okay. Thank you. I think that's a great observation. And, like, I think it's part of the model development of going down the road of exploring these fits and the effect of these individual indices and things like that. But then, when it comes down to it's a-- I recall why I went down this road and others, but it does make sense to like, kind of bring it back to finishing our experiments and then coming back to like the 00g model.

And so, the diagnostics for the 00g would take me, probably, like, 10 to 15 minutes to run. And so, we could have those. I could probably plot the comparison between 00 and 00g, and that will kind of give us the material for justification of the potential for 00g being the model for which management advice would be based.

I could compare, maybe, the three ones that are in red on one plot similar to what we have shown here and just kind of see if that gets us to a final recommendation.

VANCE P. VICENTE CERNUDA: Okay. Richard Appeldoorn, please.

RICHARD APPELDOORN: Yes. I'm getting back to Jason's comments on catch. One of you, I think it was you mentioned something about not having a good handle on correction factors in the later years. Is that the case?

ADYAN RÍOS: Yeah.

RICHARD APPELDOORN: So what years are in question here?

ADYAN RÍOS: Is Refik gone? He knows it by heart, and I know Kevin knows it as well.

VANCE P. VICENTE CERNUDA: Kevin?

KEVIN MCCARTHY: Yeah. Thanks, Vance. Kevin McCarthy. So, the correction factors become less certain starting in 2020 with the beginning of the electronic reporting. So, we use an average of-- a coast specific average of correction factors for the preceding several years and those get applied to the landings by coast since starting in 2020 through current, right now, but through the end of this time series 2024.

RICHARD APPELDOORN: Yeah, certainly during the beginning of

that period, you've got COVID issues and things like that. So, fishing isn't going on like the way it has in the past. And who knows how that's affecting what the corrective factor ought to be. So, this goes back to Jason's comment about not really letting the model try to do something but there may have been something going on that we're not capturing.

VANCE P. VICENTE CERNUDA: Adyan?

ADYAN RÍOS: Yeah, and I think that's something that LEK could help with, when we kind of try and determine what alternative time series should be considered. And then, I think that 2017 was also interpolated. The hurricane year. So again, this is telling the model "do whatever you want," which is not some-- it's done as, like, experimental. But I do think that our best path forward might be to not treat that as an experiment and treat our landings as known. And if we do think that maybe the correction factors were, well, hopefully, maybe those will become available too as we move forward.

But for now, interpolation of correction factors has been the solution proposed at the data workshop for all of our species to account for these years where they haven't been year specific and it's like an average. And so, I think that has been, like, the approach that we've been using consistently in our assessments to use the catch that we have. And we're able to consider other catch time series, but they need to be based on, like, a hypothesis of what that time series should be with justification and development of that other time series.

RICHARD APPELDOORN: Yeah. I agree. Thank you.

VANCE P. VICENTE CERNUDA: Any other questions or comments for Adyan? I don't hear anybody. So, Adyan, you want to start making some conclusions? Or--

ADYAN RÍOS: I would like to provide the-- I would like half an hour, for us to come back in half an hour to just be able to see the remaining diagnostics for that 00g plot. And that way-- Because I don't want to push it into tomorrow. I could do it in this half hour and then we could look at it tomorrow. But then I also want to leave time for the presentations that we need to do tomorrow.

VANCE P. VICENTE CERNUDA: Okay. Jason?

JASON COPE: Yeah. Jason Cope, thank you. One thing we could discuss while Adyan's running those models. Adyan, you presented

to us the idea of how we're going to treat uncertainty and come up with a-- use the OFL and come up with an ABC. Maybe the SSC can have that discussion while you're running that model, because I don't think that that's going to change given this model diagnostics that you're going to show us. The two models are very similar.

There might be a little bit more catch coming out of this new one, but I don't think there's any change in what we need to talk about regarding this decision and how we treat the output of the model. So, I would propose that we have this discussion while you're doing that, and then you can present us with the results when you're ready.

ADYAN RÍOS: That sounds good. I'm wondering if, maybe, Cristina or Liajay, if you guys have my slides and you want to just pull it up and run the slides in case there needs to be moving around just so that I can go off screen and make use of my multiple screens.

LIAJAY RIVERA GARCÍA: Yes, Adyan. We can do that. Do you mean the one on the email or the one-- did you recently send another with these new slides?

ADYAN RÍOS: Let me-- file. Where do I do this? Download.

KEVIN MCCARTHY: So, Adyan, just so you know, you're sharing your screen still.

ADYAN RÍOS: I'm still sharing the presentation screen. Yeah. I can stop. Thank you. How do I stop?

VANCE P. VICENTE CERNUDA: Well, in addition, Jason, we have to, as the SSC, determine whether the information that has been presented to us is best-- the best available scientific data, and that if we feel that it is sufficient for the SSC to submit catch information for the Caribbean Fishery Management Council on this forthcoming meeting in September. I mean, later on in October.

So, I need somebody to make a motion saying, well, the SSC accepts the information provided in this final-- Well, my computer went out. --final recommendation on SEDAR 91 spiny lobster Puerto Rico is based on the best scientific information available.

I need somebody to put that in, and then we can take a take a vote on it. That's the SEDAR process.

LIAJAY RIVERA GARCÍA: Thank you, Adyan. We just received the PowerPoint.

RICHARD APPELDOORN: You've got Jason waiting.

VANCE P. VICENTE CERNUDA: Yes, Jason. Vance.

JASON COPE: Yes. This is Jason Cope. Vance, you're right. We have a couple of things we want to do. Obviously, we want to see this last model. I really don't anticipate-- everything that I've seen and all the reasoning we've seen the new data and how it was worked up. I feel like that was an appropriate way. I think we outlined some really good research recommendations for further improvement. I love the discussion on local ecological knowledge. It infuses so many of the discussions we're having here, so, that's great.

So, I think everything that I've personally seen seems to support the best available information. One thing I did want to say is that is that SEDAR 57 model presented itself as this platform from which additional information, when available, could get added. And this new model is kind of meeting that expectation, living up to that promise. And so, building off of that previous one that we accepted, I feel like we've added some very good information, fishery dependent relative abundance index, and I think it was done in an appropriate way.

And so, everything that I've seen thus far, I feel, again, I don't know if this is premature until we officially see the this 00g model and its diagnostics, but I just want to throw out there I have not seen anything that would go against my support of this being the best available information and model for management advice.

VANCE P. VICENTE CERNUDA: So, we have the alternative for waiting half an hour or so or concluding this SEDAR 91 Spiny Lobster Puerto Rico tomorrow morning. In the meantime, I don't know whether Adean wants to begin filling up the other parts of the agenda, such as the SEDAR 84 stoplight parrotfish-- ¿no? Sí, por eso. Entonces, ¿que hacemos? ¿Ah?

VANCE P. VICENTE CERNUDA: Ok, so, we'll wait for half an hour to conclude this. Jason, you wanted to discuss?

JASON COPE: Sorry, this is Jason Cope. On this topic right here, last time, this is how we moved forward. What I've seen is, I think that the CVs coming out of these new models are much

lower than the sigma of 0.5. So, using a sigma of 0.5 again seems very appropriate. It's what we did last time.

I don't think we have any arguments to say it should be higher. I don't think I would support for it to be lower and using what's coming out of the model. So, I would support this in in the P^* of 0.45. I mean, I don't have any problem with that either.

So, I don't know if we can have some discussion on this point because if we can if we can come to a conclusion about this, then all we're left to do is accept the model, and then it the OFL and the ABC are going to come-- well, the OFL will come from the model, the ABC will come from this control rule. And I think we're-- I think we're there, but I would love discussion or to hear what others on the SSC think.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Jason. Richard Appeldoorn.

RICHARD APPELDOORN: Yes. Jason, do you recall how much lower the models were coming up with CVs?

JASON COPE: So, on one of the slides and I think if we back up one from here, I think there was a slide that said, so the MSY proxy right there has a CV of, like, 10%. This new model having-- again, just extrapolating out or guessing the 00g model seemed to have a very similar uncertainty as this model, certainly didn't have something way, way higher. And so, I anticipate it to be something around here, which is well below 0.5. And so, using 0.5 seems appropriate.

RICHARD APPELDOORN: [inaudible] It could actually be lower.

JASON COPE: It could be lower than this.

RICHARD APPELDOORN: Well, lower than the 0.5?

JASON COPE: Oh, it's going to be. Yeah, it's going to be way, way lower. But the decision to use the 0.5 is based on recognizing that these models, this one model by themselves are inherently underestimating uncertainty, which is why we have all those other sensitivities and likelihood profiles and all those things. And if we actually did an ensemble model, truly representing uncertainty, it would definitely be at least 0.5.

So, bumping these reference models up to 0.5 for our control role, I think, is very appropriate. And it's what other places

do in the country.

RICHARD APPELDOORN: All right. Thank you. That makes it a lot clearer.

VANCE P. VICENTE CERNUDA: Any other comments or discussion until we get ready for Adyan to come back to us? I hear none. So, we'll be waiting for-- Richard. Pardon? Richard.

RICHARD APPELDOORN: Oh, as I understand it, we have two questions. One is, do we have the best available data? And the second question is, given that, is that level of data acceptable for providing management advice? And those are two different questions. Right now, I'm not seeing anything that doesn't say we have the best available data.

We can answer that one. But whether it's acceptable for management advice, that's what we're waiting for Adyan to give some last few graphs on. That's my understanding.

VANCE P. VICENTE CERNUDA: Okay. So, we can take the first one, whether the committee, Scientific and Statistical Committee believes that the final recommendations, the final review for The Caribbean stoplight-- I mean, for the-- Jesus Christ. Caribbean spiny lobster Puerto Rico is based on the best available information.

RICHARD APPELDOORN: Well, I would make a motion to that effect.

VANCE P. VICENTE CERNUDA: Yes, go ahead.

RICHARD APPELDOORN: Well, I'm making a motion that the SSC feels that the data used and the modeling approach used for SEDAR 91 Spiny Lobster Puerto Rico is the best available data. You can work on the English.

VANCE P. VICENTE CERNUDA: Sorry. *The SSC moves to recommend the assessment for SEDAR 91 U.S. Caribbean Spiny Lobster for Puerto Rico as the best scientific information available.* That is the motion by Richard Appeldoorn. Any discussion? Richard, do you accept the way it's written down?

If okay. If there's no-- then we're open for discussion--

RICHARD APPELDOORN: I'm still reading.

VANCE P. VICENTE CERNUDA: --before we go for voting.

RICHARD APPELDOORN: Vance, I'm thinking.

VANCE P. VICENTE CERNUDA: Okay.

ADYAN RÍOS: Hello, Richard. This is Liajay. Can you repeat that again? We can't hear you.

RICHARD APPELDOORN: I haven't said anything yet. Walter has his hand up, though.

VANCE P. VICENTE CERNUDA: Walter, please.

WALTER KEITHLY: Thanks, Mr. Chairman. Just a technical point. I wonder if anybody looked at the relative prices of lobster with other species. I was looking at the CPUE and large increases over time over the past decade. And Skyler had a little bit of concern with the large jump from 2013 through 2015 roughly saying, is it possible? Now, I realize that could be external recruitment, doesn't necessarily mean local recruitment to the stocks. I guess with external, you could have large increases from one year to the next.

But you could also have significant changes and increases in your CPUE if they're able to target lobster to some extent. And the price of lobster has increased relative to the other prices that are of the species that were given earlier as being in the same areas as lobster. Thank you, Mr. Chairman.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Walter. I think Kevin addressed that issue regarding what a lobster habitat or lobster place is, by knowledge of the fishermen and also by association with certain reef fish. So, I don't know if Kevin wants to jump in on this one again. Yes, Kevin.

KEVIN MCCARTHY: Thanks, Vance. Kevin McCarthy. Walter, we didn't directly answer your questions as we didn't look at prices. Yeah. There's certainly a role there or could be, but we didn't look at prices in this CPUE analysis.

VANCE P. VICENTE CERNUDA: Walter?

WALTER KEITHLY: If I could follow-up on that Mr. Chairman and Kevin, you maybe gave the answer, but I can't remember. You looked by different gears. Did you look at specifically the lobster trap versus fish trap? Because you said the lobster trap would be able to target more specifically for lobster. Was there a significant difference in your changes in CPUE for those 2 gears?

KEVIN MCCARTHY: So, this is Kevin again. So, we didn't do the full analysis for the lobster trap because there were so many-- there was a lot of missing data. So, it didn't meet the criteria we had set for having sufficient data. What we did see, though, in exploring the data is that the proportion positive, meaning the trips that came back with a lobster, for all of all of the trips that went out that fished lobster traps, that percentage of the trips that came back with lobster landings was really high. I mean, of course, they're targeting lobster. You know?

So, they would have 95, 99% proportion positives. There may have been one or two years where it dipped, but it dipped to, like, 90% or something like that if I'm recalling correctly. So, the proportion positives for the fish traps were around 80%. There may have been a couple of years when it dipped a little lower or went a little higher, but it was quite a bit less.

So, the main difference I saw was proportion positives, which is why I'd say they're specifically targeting lobster and the fish traps aren't necessarily doing that. Maybe some of them are. But we didn't put together an index for the lobster trap only, just because the data were insufficient for a couple of the coasts and for a lot of the years.

WALTER KEITHLY: Okay. Yeah. Okay. Thank you.

VANCE P. VICENTE CERNUDA: Kevin, I just remember, Julian, in our last meeting stating that they get targets specifically for trigger fish depending on the bait that they use in their traps. Was any type of attractive bait used for lobsters in this fish trap study?

KEVIN MCCARTHY: Well, it wasn't a study. This is Kevin again. It wasn't a study. We used the data coming out of the commercial logbook reporting forms. So, they baited them however the fishers normally fish.

And I'm sure that differs among differs among-- Sorry about that. I was getting an echo. I'm sure that it differs among the different fishers. You know, they're probably, if you got 100 guys fishing, you might have 100 different ways of doing things. So, we had no control over that.

VANCE P. VICENTE CERNUDA: Okay. Thank you. Richard Appeldoorn.

RICHARD APPELDOORN: Yes. So, my very unscientific input into this is based on two things. One, talking with Andy Maldonado,

who's a diver, who was informing me that the catch of lobsters have increased so much that the price has gone way down to the fishermen. There's nothing gone down in the price of lobster in a restaurant. That's just increased substantially and of course driven by inflation in the early 2020s. [crosstalk]

JULIAN MAGRAS: This is Julian. Can I make a comment?

VANCE P. VICENTE CERNUDA: Yes, Julian.

JULIAN MAGRAS: Yes, Julian Magras for the record. So, just to talk about the question. One of the questions was if we can target the size and stuff like that. It's what the market demand is. The market demand has a certain size of any species that we harvest, what it can use. As it pertains to the lobsters, there's a certain size of lobsters that are harvested in the lobster traps, especially the Florida plastic traps.

You don't normally catch a lobster that's bigger than 6 pounds in those traps. So, your average lobsters are, like, a pound and a half. It's, like, a pound and a half to, like, 4 pounds average, that you would catch, besides the ones that we released, the shorts.

So, the bigger lobsters now are more caught by diving or by the nets in Puerto Rico. So, but it all boils down to what the market demand is. And most of that is restaurants in Puerto Rico compared to the Virgin Islands where the local people that buy a lot of the lobsters also. I hope that helps.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Julian. We have Skyler next.

SKYLER ROSE SAGARESE: Yes, Skyler Sagarese. Walter, I can't answer your question directly, but I'm looking through the Caribbean ecosystem status report. And it does have a plot that shows the percentage of total revenue by grouping, by island platform. So, it's not giving us price per pound, but it's at least giving us an idea of over the time series how much of that total revenue has been lobster.

I don't know if that would help, but I'll post that link as well. You can download the ecosystem status report for Caribbean region. And I know the staff putting that together are always interested in input on what other metrics could be really helpful. So, that's something maybe for us to consider. Thank you.

VANCE P. VICENTE CERNUDA: Thank you, Skyler. Richard Appeldoorn.

RICHARD APPELDOORN: Yeah. Can I get back to the motion? Yes?

VANCE P. VICENTE CERNUDA: Yes. We'll go back to the motion.

RICHARD APPELDOORN: Okay. I'd like to revise the wording just a bit. So, delete "moves to." And then after "recommend" would be "recommends that". And then after "Puerto Rico," would be--

LIAJAY RIVERA GARCÍA Sorry. Could you repeat again?

RICHARD APPELDOORN: After "Puerto Rico," we're going to say, "is based on the best scientific." So, delete "as" and--yeah, delete the "as."

That sounds more like I think what we're supposed to be addressing, or I could refer the committee to every other assessment we have made where we've had to answer this question and use the wording from those.

VANCE P. VICENTE CERNUDA: Well, let me read it as it's written down. Okay? Motion number one. The SSC recommends the assessment for SEDAR 91 U.S. Caribbean Spiny Lobster for Puerto Rico is based on the best scientific information available. That's the way it reads right now. Any discussion or any comments?

RICHARD APPELDOORN: After "recommends" is the word "that."

VANCE P. VICENTE CERNUDA: "Recommends that the assessment of SEDAR 91 U.S. Caribbean Spiny Lobster for Puerto Rico is based on the best scientific information available." Does that read better?

RICHARD APPELDOORN: Yes, sir.

VANCE P. VICENTE CERNUDA: Okay. Okay. So, we need to have somebody to second the motion. J.J., please?

JUAN J. CRUZ-MOTTA: J.J. Cruz, I second the motion.

VANCE P. VICENTE CERNUDA: Thank you. ¿Quién fue la otra? Elizabeth? Elizabeth.

ELIZABETH KADISON: I'm sorry. I was just raising my hand to second the motion.

VANCE P. VICENTE CERNUDA: Okay. So, do we have a discussion on this motion before voting? J.J.?

JUAN J. CRUZ-MOTTA: Yes. I basically agree with what Richard proposed. That's all.

VANCE P. VICENTE CERNUDA: Okay. So, we need to vote. First, I have to read it. The motion reads as follows.

"The SSC recommends that the assessment for SEDAR 91, U.S. Caribbean Spiny Lobster for Puerto Rico, is based on the best scientific information available."

So, it's open for voting. So, SSC members say their name and say yes or no or abstain.

JASON COPE: Jason Cope, yes.

ELIZABETH KADISON: Elizabeth Kadison, yes.

TARSILA SEARA: Tarsila Seara, yes.

RICHARD APPELDOORN: Richard Appeldoorn, yes.

JUAN J. CRUZ-MOTTA: J.J. Cruz, yes.

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

WALTER KEITHLY: Walter Keithly, yes.

VANCE P. VICENTE CERNUDA: Vance Vicente, yes.

TODD GEDAMKE: Todd Gedamke, yes.

VANCE P. VICENTE CERNUDA: Okay. So, the results are the following. All 9 members in today's meeting have voted to approve motion number one. So, therefore, let me read it again. Motion number one moves to-- Dale un poquito arriba que no veo.

"The SSC recommends that the assessment for SEDAR 91 U.S. Caribbean Spiny Lobster for Puerto Rico is based on the best scientific information available." *So, the motion is approved.*

J.J., you want-- you have your hand raised do you want to add anything?

JUAN J. CRUZ-MOTTA: My apologies, Vance. I forgot to put it down. Thank you.

VANCE P. VICENTE CERNUDA: You're forgiven. Thank you.

Yes. We have some time before Adyan comes back to us. Would you like to discuss what research recommendations the SSC wants to, present to the Council in the forthcoming meeting regarding the spiny lobster, of course, Puerto Rico.

Yes. Jason?

JASON COPE: Yeah. Jason Cope. It sounds like there were lots of really good ideas regarding the next version of the standardized indices that are being used here and how other factors might help inform that standardization process. I'll let others speak to maybe what those things might be, but it seems like there was value in noting that speaking with fishing community and community members might identify some additional factors. It also sounded like there was still some desire, again, to talk to community members about recent catch and catch correction.

Those really stood out to me as some research recommendations to make sure we don't lose. Thanks.

VANCE P. VICENTE CERNUDA: Okay. Thank you, Jason. Can you write it down, please?

JASON COPE: I can write it down in a generic way. I would definitely like people who know more than me on those things to fill it out. But if the generic version of just saying, "Hey, go find some more factors for the standardization and figure out the catch correction." I can write that down.

VANCE P. VICENTE CERNUDA: Yes, make it generic. I mean, we can develop it later.

JASON COPE: Where do you want me to write that?

LIAJAY RIVERA GARCÍA: Hi, Jason. This is Liajay. We have developed a blank template document. It is in Google Drive shared as SEDAR 84 and SEDAR 91 SSC recommendations. So, we will be sending all the SSC members the link so they can provide their input in that document.

JASON COPE: Terrific. Thank you.

VANCE P. VICENTE CERNUDA: Tarsila, come in.

TARSILA SEARA: Yes. I just wanted to ask Jason if it's okay to

edit your recommendation here, to add sort of "local ecological knowledge data collection, rather than just saying "community members may be a rich source of information?"

JASON COPE: I love it. Please, Yes.

TARSILA SEARA: All right. Thank you.

JASON COPE: This is Jason. Let me offer an open invitation to anyone who would like to edit any of this stuff that, at least, I'm putting down in this document.

VANCE P. VICENTE CERNUDA: Yes, Jason. Regarding local ecological knowledge data, I would, specifically, emphasize the necessity to determine the way that the traps are prepared. For example, baited or not baited. If it's baited by locality. If there are differences of baiting by locality or by depth, because that can really make a big difference.

JASON COPE: I added just an example, parenthetical example there. I don't know if that's too remedial or if that at least captures the type of thing that you're thinking about. But please, please edit as you see fit.

VANCE P. VICENTE CERNUDA: Is there any of the SSC members working on these research recommendations, or can I just, read them now as complete? Let me know.

JASON COPE: This is Jason. I'm all done.

VANCE P. VICENTE CERNUDA: So, I'll just begin reading it. And if there are any changes in the meantime, you can add them or make them. ¿Puedes subirlo un poquito la letra?

Okay. I'm going to read the April 8th, 2026 SSC meeting, research recommendations for SEDAR 91 Spiny Lobster Puerto Rico.

One, investigate further potential factors for use in the catch per unit effort index standardization. The fish trap survey in particular showed large dynamics outside biological bounds that may be due to other factors currently not included in the standardization process. Collection of Local Ecological Knowledge data can be a good source to understand potential factors. Exempli gratia, how traps are baited.

Two. When developing fishery-dependent indices of relative abundance, consider alternative trip selection methods and/or improvements to the Stephens and MacCall 2004 trip selection

approach, such as exploring whether species correlation coefficient vary over time periods.

Three. Model sensitivity analysis showed that when catch is given a larger variance, the model will deviate from the inputted catch time series, especially towards the end of the time series. The period of catches is also recognized as more uncertain and currently derived from a catch correction process that can also improve. Local ecological knowledge may bear further insight into the best catch time series and how to calculate it, and it is preferred to model catches with low uncertainty rather than let the model estimate catches.

Four. Adding recreational or other removal fleets will help us estimate the overall scale of the lobster population and offer a more complete estimate of the overall fishing mortality.

Do you have room and time to make any additional changes?

Can somebody, Richard or Jason or whoever, write something up as part of the research recommendations to consider socioeconomic events in helping explain variations in catches and in catch per unit effort indexes, etcetera. Like, for example, in 2013 there was a lot about political upheavals. People were unemployed, especially government employees were more than 60 to 70% of them. They were cut down, and there were protests in the streets. People were worried about other things rather than eating lobster.

So, anyhow, can somebody write something up like that regarding to evaluate socioeconomic factors as a potential-- socioeconomic factor that can potentially explain variabilities in the catches of lobsters or other reef fish taxa. I don't know. Something like that.

JASON COPE: Would it be alright to add that to bullet point one as another source of information that could--

VANCE P. VICENTE CERNUDA: Yes, definitely. Yes, Jason. That's good.

TARSILA SEARA: Yes. I agree. I was going to suggest that. This is Tarsila. I think that's a good idea, Jason.

JASON COPE: Does someone with a little bit better handle over socioeconomic language want to take that, or do you want me to hack it away and then you can change it?

VANCE P. VICENTE CERNUDA: Well, let's see. Walter can contribute to that. Walter?

WALTER KEITHLY: Yes, sir. Thank you. Collection of local ecological knowledge data as well as other socioeconomic data or analyses can contribute.

VANCE P. VICENTE CERNUDA: Now it reads, regarding socioeconomic factors, "collection of local ecological knowledge data and other socioeconomic analysis can contribute to understanding potential factors. Example, how traps are baited." Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. One thing that I think we really need to stress in these recommendations is the collection of recreational data on lobster. You know, I've been sitting here, I voted in favor of the previous motion, but in 2011 or '12, right around that time, they changed the bag limit, a significant reduction of bag limit or potential significant reduction bag limit for recreational fishermen, which that in itself might explain the increase in the CPUE among the commercial sector. I doubt it did, but again, this type of information is pretty important to determine the validity of using the CPUE. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. I totally agree. We have to include to determine what is the recreational fishing pressure for not only the lobster, but for other fisheries resources, definitely.

WALTER KEITHLY: Well, this is Walter, again, Keithly. Again, we used to collect it for the finfish under the MRIP or MRFS program, whatever, but we've never collected it for lobster. And my point being that they passed a law right around the time that we started seeing that large increase in the CPUE for the commercial sector. They passed legislation reducing tax limits, bag limits for the recreational sector. And something like that could be affecting the CPUE for the commercial sector.

Again, I thought of it, but I'm just not sure if it's that big of an issue, but it could be. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you. That's a very valid point. We have Richard Appeldoorn, then Kevin, then Tarsila. Richard?

RICHARD APPELDOORN: Yeah. Just for the committee's information, against my better judgment, I got involved with a stock reconstruction for Puerto Rico that went up to 2022. As part of

that, I did some probably questionable calculations based on the MRAG report that attempted to come up with estimates for conch and lobster recreational fishing. It wasn't really successful, but if you make a whole bunch of assumptions, I came up with something where the recreational catch was probably about 6% of what the commercial catch is. So, it's not very high even allowing for a lot of variability in the rest of it.

VANCE P. VICENTE CERNUDA: Well, that's new to me. Thank you, Richard.

RICHARD APPELDOORN: Yes. It hasn't been published yet, but I was just checking the files while we were going through this.

VANCE P. VICENTE CERNUDA: That's good. No. I never thought it was going to be that low, 6% of the commercial catch. I was expecting a bigger percentage value. Anyhow, Kevin?

RICHARD APPELDOORN: It may be. Remember, the MRAG study was not successful. So, they gave data, and I was using that data. But they were trying to come up with a sampling plan to try to estimate these values. And they weren't getting enough data to do that, which tells you something about how good the data must have been, which is not too much.

So, this just emphasizes the point Walter made is that we really do need to know what the recreational catches are for some of these invertebrates.

VANCE P. VICENTE CERNUDA: Kevin?

KEVIN MCCARTHY: Yeah. Thank you, Mr. Chair. Kevin McCarthy. Just further information for the committee. Specifically in Puerto Rico, Grisel Rodríguez had, and has for the last two years, a recreational survey going, that unlike MERFs and MRIP is not limited to finfish. So, when they bring lobsters to shore, her port samplers are quantifying those. So, all the invertebrates, everything that comes in.

At the moment, that is limited to vessels. So, she's not yet doing the shoreline mode of recreational fishing. But if it's a vessel, I think she's covering the for-hire fishery as well. If they happen to be-- they'll try and talk to everybody and if it's a commercial vessel, they don't do a full interview, but they'd note the fact that a commercial vessel had landed. But if they're recreational fishers or for-hire, they do the complete interview and quantify the catch.

So, that has been ongoing for the last, about 2 years. And the intent on the Virgin Island is to have a similar kind of sampling.

So, we're not repeating the mistakes of MRIP and MERFs by not measuring lobster and not quantifying conch and that sort of thing. If they come to shore with it, it's being recorded in the dataset.

Thanks.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Kevin. Tarsila?

TARSILA SEARA: Yes. I just wanted to go back to some of the factors that we were mentioning as potentially impacting the CPUE index. And I think a lot of the things that we discussed during Kevin's presentation covered the potential socioeconomic factors, the management actions. And I think I just wanted to clarify if we're comfortable with this just being-- with all of these being covered under other factors, or if we would want to list these suggestions that were made during the discussion here.

Because I think we're encompassing a lot of these things here, but not explicitly. So, I just wanted to ask the committee if we want to be explicit or if we're comfortable with that being covered under other factors.

VANCE P. VICENTE CERNUDA: Thank you, Tarsila. Any additional comments?

LIAJAY RIVERA GARCÍA: Ella hizo una pregunta.

VANCE P. VICENTE CERNUDA: ¿Quién?

LIAJAY RIVERA GARCÍA: Tarsila.

VANCE P. VICENTE CERNUDA: Yeah. Any responses to Tarsila's question?

Adyan?

ADYAN RÍOS: We can come back to me when you guys are finished with this.

VANCE P. VICENTE CERNUDA: I didn't hear you.

ADYAN RÍOS: We can discuss what I ran when this section

concludes. I just wanted to let you know.

VANCE P. VICENTE CERNUDA: Yes. I don't know how much time we'll have. At 05:00, meeting will be adjourned. Although within 10 minutes or whatever it's going to be, whatever time it's going to take you, 10 minutes may not be enough. That's up to you.

You can wrap it up tomorrow morning, and that might give you some additional time to prepare for these last items that we need to discuss. So, it's up to you, Adyan.

ADYAN RÍOS: No. That sounds good. I'm still seeing the retrospective issue, so I'm going to have to ask for help on that. So, that's what I was just going to show. But I do have the metrics that don't come from diagnostics.

So, the F_SPR, SSB_SPR, and the MSY proxy. And so, those changed a little bit like we saw when we looked at the comparisons, but I'm happy to revisit those tomorrow or, yeah, I think tomorrow.

VANCE P. VICENTE CERNUDA: Well, show us what you have so far, and then let's see how long it takes. Okay? Thank you. Oh, Tarsila, you have a question?

TARSILA SEARA: No.

VANCE P. VICENTE CERNUDA: Okay.

ADYAN RÍOS: Okay. So, I added values to the slides that we showed earlier. And so, this is for this 00g run, and the F_SPR ratio says that the stock is doing a little bit better. Sorry, that fishing is even lower. So, it's at 80%, 81%.

And the SSB_SPR goes up to 1.5. And that's because we saw this earlier of the change in the R naught.

VANCE P. VICENTE CERNUDA: So, if I remember correctly, anything above one, one or above one is considered close to overfishing? Or what?

ADYAN RÍOS: It's-- so if it's over one for F, that would be overfishing. And if it's under one for SSB, that would be considered overfish. So, this further states that with this strong recruitment that's driven by these indices of abundance, the fishing is at 80% and the stock is at 150%.

VANCE P. VICENTE CERNUDA: Okay. Thank you.

ADYAN RÍOS: Okay. That also drives up the MSY proxy to 227. And again, this is that comparison of fitting our catch with high precision versus the experiment of how the model fits the catch. So, this also brings the MSY proxy to 500,000. And then we have the R naught plot, and then we also have the steepness likelihood profile, redoing this plot without these two points so that we can see it's probably going to be the same straight line down to one that we saw for model 3g.

And then just back to this retrospective, I double checked what model is in the retrospective folder when it generates the retrospective of model 0, and it matches what we have in our regular folder. So, I don't know why the retrospective plots, the index is like this. So, I think that's something that I'm going to have to ask for more time to investigate.

VANCE P. VICENTE CERNUDA: Yeah. Jason, come in, please.

JASON COPE: Yeah. This is Jason Cope. Adyan, I wonder if it's something in the way that the retrospective's treating the end year. I wonder if it's adding the projected catch or-- it must be doing something with the end year. Because this year-- so this thing says the model's end year is 2024. Is that correct in your final base model, or is it 2023?

I feel like it's adding, a forecast year. It's doing something funky.

ADYAN RÍOS: Yeah.

JASON COPE: But do you recall if--

ADYAN RÍOS: No. The terminal year is 2024, but it's not giving us a data point in 2024.

JASON COPE: Yeah. Something-- I feel like it's something in the forecast or the starter setup or something like that. And I don't know. If you want to send me along a base thing, base model file, I can do a quick look. But I think it's something in the treatment of the retrospective, code where it's the-- yeah.

Something's weird.

ADYAN RÍOS: Yeah. I'll share this 00g model, and hopefully we can understand that retrospective. And then I think that was the final piece of information that we wanted to convey.

JASON COPE: Yep.

ADYAN RÍOS: And then the other things like a table of the parameters that are estimated. I mean, we also already have the selectivities for this model. And let's see.

VANCE P. VICENTE CERNUDA: Skyler, you want to add something?

SKYLER ROSE SAGARESE: Yeah. Skyler Sagarese. No. I was just going to follow-up with Jason and Adyan. It is very weird.

It looks like it is one of those, you know, for example, it'll give you spawning soft biomass and then end year plus one. It seems like there's just something funky going on with those indices trends.

ADYAN RÍOS: Mhmm.

SKYLER ROSE SAGARESE: And, Adyan, is this model-- did you reupdate your 00g? Isn't that through 2023 only, or did you update it through 2024 data?

ADYAN RÍOS: So, I did 00g on the 2024, which is almost like that. So, you're right. So, this doesn't go here. It actually goes-- it's 8524 00g. It's not 8523.

I didn't pick up on this one because I already have one that has that additional year of data with this one. Thank you for catching that.

SKYLER ROSE SAGARESE: Yeah. Skyler Sagarese. Yeah. Thanks, Adyan. Because I just-- looking at those plots, it looks like the last black dot, the last observed data looked like it was 2023, not 2024.

ADYAN RÍOS: Mhmm. But I got

SKYLER ROSE SAGARESE: Which is really odd.

ADYAN RÍOS: We'll look into it because I just opened the data file too, and I still have data all the way through 2024 and indices through 2024 and everything. So, thank you, everyone. Back to you, Vance, unless there are more questions for me.

VANCE P. VICENTE CERNUDA: Okay, Adyan. Okay. Well, if you're done, I'm sorry. It's almost 05:00. Then tomorrow, first thing in the morning, before we enter into the other SEDAR, the yellowtail snapper and stoplight parrotfish.

Adyan, can you have the table showing us the OFL and the ABCs the numbers that we need to present to the Council later on this month?

ADYAN RÍOS: Depending on solving this, yes.

VANCE P. VICENTE CERNUDA: Yes.

ADYAN RÍOS: I believe you guys already made the decision on the sigma. And so, yeah, we'll either have that tomorrow morning or tomorrow. That's definitely going to happen before this SSC meeting concludes.

Yeah.

VANCE P. VICENTE CERNUDA: Yeah. Well, thank you. I appreciate that. You know, with the different scenarios that you think that we should look at before coming to a final decision. So, then I propose this meeting to adjourn until tomorrow morning.

Tomorrow at 01:00PM. 1:00 PM tomorrow morning.

LIAJAY RIVERA GARCÍA: No. Afternoon.

VANCE P. VICENTE CERNUDA: Me caso en na'. In the afternoon. I'm tired today, believe me. Anyhow, so really, thanks all of you for such a productive meeting and for all your participation. So, we adjourn now and see you tomorrow at 1:00PM.

Okay? Thank you.

JASON COPE: Thank you.

KEVIN MCCARTHY: Thanks, everyone.

ELIZABETH KADISON: Thanks.

GERSON N. MARTÍNEZ: Goodnight, all.

SKYLER ROSE SAGARESE: Thank you.

TARSILA SEARA: Thank you.

(Whereupon, the meeting recessed for the day on April 08, 2026.)

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APRIL 09, 2026

THURSDAY AFTERNOON SESSION

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CRISTINA D. OLÁN-MARTÍNEZ: Necesito que me hagan co-host.

KIARA M. MATÍAS ROJAS: Sorry, voy. Te pongo ahora.

VANCE P. VICENTE CERNUDA: Good afternoon, all SSC members and other participants. In this second day of the SSC meeting, April 9th, 2026, it is 01:00PM. We will begin. First, with roll call, please.

GERSON N. MARTÍNEZ: ¿Va a empezar por cualquier persona o van a empezar con los que están en el cuarto?

LIAJAY RIVERA GARCÍA: No, no. SSC.

VANCE P. VICENTE CERNUDA: Lo leo-- First the SSC members. Richard Appeldoorn? Jason Cope?

JASON COPE: Present. Good morning.

VANCE P. VICENTE CERNUDA: Good afternoon. Well, good morning. Juan Cruz Mota?

JUAN J. CRUZ-MOTTA: Present. Good morning. Good afternoon, everybody.

VANCE P. VICENTE CERNUDA: Good afternoon. Tarsila Seara?

TARSILA SEARA: I'm here. Hello.

VANCE P. VICENTE CERNUDA: Jorge García has excused himself, so he would not be present today. Todd Gedamke. Todd? Walter Keithly?

WALTER KEITHLY: Good morning. Walter Keithly, present.

VANCE P. VICENTE CERNUDA: Okay. Michelle Schärer sent me an email, she has been excused from this meeting for some health reasons. Elizabeth Kadison?

ELIZABETH KADISON: Present. Good afternoon.

VANCE P. VICENTE CERNUDA: Ms. Skyler Sagarese?

TARSILA SEARA: Skyler Sagarese, present.

VANCE P. VICENTE CERNUDA: Hi, Skyler. Me, Vice Vicente, present. Richard? Richard?

RICHARD APPELDOORN: Yeah, present.

VANCE P. VICENTE CERNUDA: Yeah. And Todd?

TODD GEDAMKE: Todd Gedamke, present. Good afternoon.

VANCE P. VICENTE CERNUDA: Okay.

Okay. So, 4, 5, 6, 7, 8, 9. We have 9 members, so we do have a quorum. Well, we have a plan for today-- pardon?

LIAJAY RIVERA GARCÍA: Tienes que presentar el resto de la gente.

VANCE P. VICENTE CERNUDA: Ah, I'm sorry. I'm sorry. I'm sorry.

The DAP Chairs. Julian Magras?

GERSON N. MARTÍNEZ: Julian Magras está de vacaciones, salió hoy.

JULIAN MAGRAS: Julian Magras, present. [laughter]

GERSON N. MARTÍNEZ: Oh, is that him?

VANCE P. VICENTE CERNUDA: Okay, Julian, we hear you.

GERSON N. MARTÍNEZ: No vacation yet?

JULIAN MAGRAS: I don't think that my phone [inaudible] but I'm going to be there.

VANCE P. VICENTE CERNUDA: Gerson Martínez?

GERSON N. MARTÍNEZ: Gerson Martínez, present.

VANCE P. VICENTE CERNUDA: Nelson Crespo?

NELSON CRESPO: Good afternoon, everyone. Nelson Crespo,

VANCE P. VICENTE CERNUDA: The TAP Chair, Sennai.

SENNAI HABTES: Good afternoon, all. Sennai Habtes EBFM TAP Chair.

VANCE P. VICENTE CERNUDA: And OEAP Chair, Jannette Ramos.

JANNETTE RAMOS-GARCÍA: Good afternoon, everyone. Jannette Ramos-García, OEAP Chair.

VANCE P. VICENTE CERNUDA: Thank you, Jannette. Okay. So, now we>Welcome to the Conference room here at Caribbean Fishery Management Council.

LIAJAY RIVERA GARCÍA: Buenos Días. Liajay Rivera García, Council Staff.

VANCE P. VICENTE CERNUDA: Vance Vicente, SSC ¿Graciela?

GRACIELA GARCÍA-MOLINER: Graciela García Moliner, Council staff.

KIARA M. MATÍAS ROJAS: Buenas tardes. Kiara Matías, Council staff.

LIAJAY RIVERA GARCÍA: And in the Zoom chat, we have Adyan Ríos, Cristina Olán, Kevin McCarthy, Jesús Rivera-Hernández, Kate Zamboni, Maggie Ríos, María López, Martha Prada, and Stephanie Martínez. And that is all, Chair.

VANCE P. VICENTE CERNUDA: Okay. So, first, we'll go-- we have as an agenda, unless any changes are suggested. Today, April 9th, 2026, from one to 01:30PM. We will conclude the SEDAR 91 U.S. Caribbean Spiny Lobster Puerto Rico assessment. This is the final review. This will be presented by Adyan Ríos.

From 01:30 to 3PM, we will cover SEDAR 84, Caribbean Yellowtail Snapper, Puerto Rico. The final review also, which will be presented by Adyan Ríos from the Caribbean Branch of the Southeast Fishery Science Center. We have a 15-minute break between 3:00PM and 03:15PM. And lastly, from 03:15PM to 5:00PM, we will cover SEDAR 84, Caribbean yellowtail Snapper, Saint Thomas/Saint John final review. This would also be presented by Adyan Ríos.

Are there any suggestions, changes in order? Any-- if I don't hear any, well, then the agenda for today, April 9th, 2026, has been adopted. Okay. Kevin, please.

KEVIN MCCARTHY: Thank you, Mr. Chair. Kevin McCarthy. So, maybe I'm misunderstanding. So, the proposal for the agenda today, obviously, we'll finish spiny lobster, and then it's yellowtail

snapper for Puerto Rico followed by final recommendations for yellowtail snapper for Puerto Rico. And then I thought tomorrow we would move on to the Virgin Islands. Is that correct?

VANCE P. VICENTE CERNUDA: Okay. Graciela?

GRACIELA GARCÍA-MOLINER: So, Kevin, that was something that we were going to ask you. But we would like to have the final recommendations from the SEDAR 91 Lobster, Puerto Rico, today.

KEVIN MCCARTHY: Yes.

GRACIELA GARCÍA-MOLINER: Okay. So, then that would follow-- then we will follow with SEDAR 84, Yellowtail, Puerto Rico. That's where you want to start, right?

KEVIN MCCARTHY: Correct.

GRACIELA GARCÍA-MOLINER: Okay. And then we'll, as long as we have time, finish the Yellowtail Puerto Rico and begin with the Yellowtail Saint Thomas. Hopefully, we'll have final recommendations for SEDAR 84 Yellowtail Puerto Rico and Saint Thomas/Saint John today.

Or, if we don't finish today, then begin Friday with final recommendations on the yellowtail for both Puerto Rico and Saint Thomas/Saint John and finalize the SEDAR 84 for stoplight parrotfish for Saint Croix tomorrow, Friday.

KEVIN MCCARTHY: Let me take two minutes and confirm with Adyan if that schedule works for her. So, give me two minutes. Thank you.

GRACIELA GARCÍA-MOLINER: Okay.

VANCE P. VICENTE CERNUDA: Well, in the meantime, I would like to state the following. I want to let the SSC members know that we have a very strong mandate to please try to think about these items that I'm going to mention so that we make sure that at the end of the meeting, we can agree whether or not we have complied with our duties, which are as follows. This is regarding the SEDAR process. The Council Scientific and Statistical Committee will review the stock assessment reports, and we, the SSC, are asked, number one, whether the assessment represents the best available science. Number two, whether the results presented in the stock assessment reports are useful for providing management advice and developing fishing level recommendations for the Council.

Three, an SSC may request additional analysis to be conducted or may use or may use the information already provided in the stock assessment report as the basis for their fishing level recommendations. For example, overfishing limit level, OFLs, and acceptable biological catch. Four, the Caribbean Council will review the assessments at the forthcoming April 21 through April 22, 2026, meeting. And just as a note, the documentation on SSC recommendations is not part of the SEDAR process and is handled through each Council.

Okay. That being read. Open for comments. Kevin?

KEVIN MCCARTHY: Yep. Thank you, Vance. Kevin McCarthy. I don't think we're-- I think it's going to take a bit longer to get through yellowtail, Puerto Rico than maybe it has been allotted here. There's a lot to cover, and I think we have yet to completely finalize the presentations for the Virgin Islands.

So, we were counting on that happening on Friday. And I know there's going to be some people that aren't available on Friday, but I think the Virgin Islands assessments are pretty straightforward. But the yellowtail, Puerto Rico, is going to take a bit longer than maybe the time allotted here. So, I don't think we're prepared for the Virgin Islands discussions until tomorrow.

VANCE P. VICENTE CERNUDA: This is, for both?

KEVIN MCCARTHY: Yes. I think we can get-- those won't take long individually. I think we can get through both Saint Thomas/Saint John and Saint Croix in a single meeting tomorrow afternoon and still have time for-- I know Liajay was going to present an update for SEDAR 103. I think we'll still have time for all of that. But I think that yellowtail Puerto Rico is going to take a little while to go through that information.

And, of course, we have to finish up spiny lobster as well.

GRACIELA GARCÍA-MOLINER: Okay. So, the agenda for today is amended to read Lobster, Puerto Rico now. And as soon as we're done with the final recommendations for that, SEDAR 84 Yellowtail Snapper, Puerto Rico will go on. Correct?

KEVIN MCCARTHY: Yes. Thank you. If that was directed to Kevin. Thank you.

GRACIELA GARCÍA-MOLINER: Thanks.

VANCE P. VICENTE CERNUDA: Okay. Now we're clear. Walter, come in.

WALTER KEITHLY: Hey, Mr. Chairman. Just to ask before we move on to SEDAR 84. Right?

VANCE P. VICENTE CERNUDA: What's your question? Walter?

WALTER KEITHLY: Can you hear me?

VANCE P. VICENTE CERNUDA: Yes. We didn't understand what specifically you want to say. You said something before--

WALTER KEITHLY: No. I'd like to wait till the end of the discussion on the U.S. Caribbean spiny lobster at Puerto Rico. But then, after we've done that discussion, I would like to ask make a few comments and ask one or two questions regarding the stock assessment and so on.

VANCE P. VICENTE CERNUDA: Okay. Okay. We can do that.

WALTER KEITHLY: Thank you, Mr. Chairman.

VANCE P. VICENTE CERNUDA: Sure. No problem. So, if Adyan is going-- I'm sorry. Richard, we have a comment from you.

RICHARD APPELDOORN: Yeah. In light of your listing of the SSC requirements, the motion that was passed yesterday talked about best available data and not representing the best available science. So, we need to amend that at some point. It doesn't have to be right away.

VANCE P. VICENTE CERNUDA: Regarding that, it is not enough information for management advice, is that what you're saying, Richard? Yeah. I understand that yesterday, the motion-- yes. I understand that the data is good.

It's based on the best available information, and we all agree, and that was a motion. But regarding whether there is enough information to provide catch advice to the Council that we haven't voted for, I don't know how to handle that one. You want to make a motion?

RICHARD APPELDOORN: No. I'm saying that when you were reading out what our responsibilities were, you said we had to make a ruling on whether the assessment represents the best available science. So, that's not just the data. That's the analysis of

that data. So, *that first motion should be amended to reflect that this was the best available science, but not the best available data.*

VANCE P. VICENTE CERNUDA: Well, you want to do it now, Richard?

RICHARD APPELDOORN: That would be fine with me.

VANCE P. VICENTE CERNUDA: Yeah. Write the motion and then read it out.

LIAJAY RIVERA GARCÍA: Just allow me a second till I can share this with--

VANCE P. VICENTE CERNUDA: Hold on. Richard, can you see what is on the screen? Yeah.

RICHARD APPELDOORN: You like me to refine the wording?

LIAJAY RIVERA GARCÍA: Sorry. I pulled up the wrong motion document.

RICHARD APPELDOORN: So, I would take out "moves to recommend."

LIAJAY RIVERA GARCÍA: Sorry, Richard. That was not the document referring to the motion of yesterday. So, allow me a second for me to find the right document. Sorry, that about that.

RICHARD APPELDOORN: It sure looked like the right document.

LIAJAY RIVERA GARCÍA: I believe this is the right one. Let me know, Richard.

RICHARD APPELDOORN: Yes, okay, that's fine. So, I would get rid of "recommend that" and say "considers" "the assessment for SEDAR 91 U.S. Caribbean Spiny Lobster for Puerto Rico" "represents" delete "is" delete "based on," "the best available--" "the best available science." Yes, "the best available signs."

LIAJAY RIVERA GARCÍA: ¿Borro eso?

RICHARD APPELDOORN: No. Yeah. Delete the rest. Yes. Mhmm.

Alright, "represents" should be "to represent." That's good.

VANCE P. VICENTE CERNUDA: Okay. So, I will read it, and then we have to vote since it has been modified.

JUAN J. CRUZ-MOTTA: Yes, I am. Thank you.

VANCE P. VICENTE CERNUDA: So, let's read the motion again first, and then we need to-- it has already been second. Okay. So, okay. So, okay. So, everybody in accordance with the amendment?

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Okay. So, any opposition? No? So, the motion moves.

And then it reads, the SSC considers the assessment for SEDAR 91.

LIAJAY RIVERA GARCÍA: You need the voting of the motion.

VANCE P. VICENTE CERNUDA: Si, si. If there was no objections, then that means that it was accepted. Well, we need to specifically vote. Those in accordance, those in favor.

RICHARD APPELDOORN: Rich Appeldoorn, yes.

VANCE P. VICENTE CERNUDA: Yeah. Next.

ELIZABETH KADISON: Elizabeth Kadison, yes.

VANCE P. VICENTE CERNUDA: Okay. Tarsila?

TARSILA SEARA: Yes.

VANCE P. VICENTE CERNUDA: Jason? Jason Cope? Skyler?

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

VANCE P. VICENTE CERNUDA: Todd Gedamke?

TODD GEDAMKE: Todd Gedamke, yes.

VANCE P. VICENTE CERNUDA: Okay. Vance Vicente, yes.

JUAN J. CRUZ-MOTTA: J.J. Cruz, yes.

VANCE P. VICENTE CERNUDA: Okay.

WALTER KEITHLY: Walter Keithly, yes.

VANCE P. VICENTE CERNUDA: Okay. So, all in accordance. Jason? We're still holding for you. Hello?

JASON COPE: Sorry. Sorry. Can you repeat?

VANCE P. VICENTE CERNUDA: Yes.

JASON COPE: Hello?

VANCE P. VICENTE CERNUDA: Okay.

RICHARD APPELDOORN: Jason, are you in favor of the motion?

JASON COPE: Oh, yes. Yeah. Sorry. I thought my thumb went up.

LIAJAY RIVERA GARCÍA: Okay.

VANCE P. VICENTE CERNUDA: *So, the motion carries.* So, Adyan, whenever you're ready, we're ready for you.

ADYAN RÍOS: Wonderful. Okay.

Okay. So, yesterday's conversation ended with the discussion of the 00g, which is the base model from SEDAR 91 with the updated terminal year, with the trap index, the dive index, and the recruitment deviations.

And, what we did during break, and then, just refined slightly for it today, was to run the diagnostics on this model and also report the derived quantities. So, we have the estimates of F over F_SPR30 and SSB over SSB_SPR30. And we showed these yesterday. And so, again, just showing the effect of this strong recruitment for a sustained period of time, how it changes the model outcome.

Next, we have the MSY proxy, which goes up to 227 metric tons, which equates to 500,000 pounds.

Okay. That's also something we looked at yesterday. Let me go to the next slide.

Yesterday I showed the steepness. However, it wasn't easy to see because there were two runs that just went off at a much higher likelihood. And so, now I've removed those two runs. And, again, we see the same steepness that we saw for model-- Steepness likelihood profile that we saw for model 3g, where we get lower likelihoods at higher steepness, especially for the length data.

On the right, we have the R naught profile. And, again, we see, like, this little area of very similar likelihood profiles across slightly different values of R naught. But we do have a minimum. And then we have-- well, I might-- we could zoom in on that. It's pretty flat across a few of these runs. I meant to just kind of reiterate that.

And then yesterday, we were seeing an issue with how my plots were being generated where it wasn't showing the last point, the final year of information. I was able to correct that. And now the code runs to show that point and not show us this like waterfall effect that we were seeing before. So, thank you to Jason for taking a quick look to help me diagnose this.

So, here we have our fits to our indices, and we're still seeing a bit of a decline. And so, that's still something that, each subsequent year, the model isn't kind of expecting that realized recruitment or that realized index of abundance to continue to increase and so it's kind of expecting that we're going to see a slight decrease or the population's going to stay the same. But what we've seen is that, even though it's kind of expecting the population to stay at a similar level to where it was in this retrospective, we really see a continued increase. That's what's driven by these subsequent years of information, particularly this increase that we see in this index on the right, which is the [trap?] index.

We also have our retrospective outputs for our spawning output and for our absolute F. And so, we do see the model slightly changing, in these retrospectives as those indices provide additional information and additional increase in that index of abundance, telling us that the population in the water has been continuing to increase. But when we take off each successive year, the model kind of recalibrates.

However, we also can see how that also changes the R naught value. So, it changes it from what we saw in the lowest likelihood profile, from around 7-- almost 7.2 to below 7. So, when we peel back those years of information. Of course, more years of information are always better, but we also know that there are uncertainties across the most recent year of data as well as in our datasets overall. And so, this type of retrospective comes back to highlighting the importance of other types of data that can help further improve the model. And that's related to understanding more things about selectivity, understanding really digging into what's happening with this abundance signal and how tied to the actual abundance do we think it is.

And so, that concludes the observations that we were expecting to see. And then the last thing that I did was based on the assumption of 3-year averages for the years 2025 and 2026.

So, I put in the forecast file that the 2025 and 2026 would have the same average catch by fleet as the fleets did for 2022, 2023, and 2024. And then, now that I've included that, I generate the OFLs for 2027, 2028, and 2029. I calculated the average of those 3 years. I would like to add-- I'm going to add one more number here just to have that average in pounds.

I also just re-referenced what the long-term sustainable yield was estimated to be. And so, again, like, when a when a stock is above the size that can produce your sustainable maximum yield, you're able to fish it down because the stock is, you know, we were seeing, I'd say, like, was it 150? Yeah. Percent of the size that would continue to produce that long-term equilibrium sustainable maximum yield.

Okay. So, I just wanted to, again, emphasize that as OFLs go forward, the projection intends to bring the stock to the size that produces that long term MSY. And so, that's why the OFLs go down, because the stock is above the size that can produce MSY. And so, in this first year, 2027, the model is telling, "yes, you can catch 317 metric tons, and that will continue to push the stock towards that long-term value of 227. And so, that's why we see, as the stock is being fished down to its size where it gets to the MSY, we see these values decline. We've also referred to that before as, like, the ramp down to MSY.

And this 3-year average-- let me open up my Excel where I have these guys. Let me drag this down. Oops.

And so, that average is 609 pounds. And so, this is quite a bit of an increase, but the index is also telling us that there's quite a bit of an increase in what we understand to be happening in the water with the abundance based on our indices.

So, that concludes what I have for you today for spiny lobster. The next, I guess, the last step would be just for me to calculate what the ABCs are based off of the sigma and the P*, which is really quickly. I can have that in just 2 minutes. But, yeah, I have this information available, which gets us to the OFL. Any questions?

VANCE P. VICENTE CERNUDA: [inaudible]

RICHARD APPELDOORN: I have a question.

VANCE P. VICENTE CERNUDA: Well, can you [inaudible] the number too small? Thank you. Richard?

(Part of Dr. Vicente Cernuda's comments are inaudible on the audio recording.)

RICHARD APPELDOORN: Yes. First a lead off question. The growth parameters that you're using in the model, date from when? Let me know when that study was done.

ADYAN RÍOS: Oh, this one, the Cuba study, SEDAR 8?

RICHARD APPELDOORN: Yeah, SEDAR 8. That's a while ago.

ADYAN RÍOS: Yeah. I think that was 2005 maybe.

RICHARD APPELDOORN: Okay. So, here's what I'm thinking. And this is based on work that was done decades ago in the state of Maine where they were able to show a very distinct correlation between lagged temperature and recruitment to the fishery, lobster fishery. And it was based on the idea that when water temperatures were warmer, they grew faster and therefore exposed to mortality less time before they recruited to the fishery. And it had a very strong effect, but this lag was like 5 or 6 years.

So, we're not talking about that kind of lag in spiny lobster. They're in the water 6 to 9 months as plankton, and within a year or year, I think, they can enter the fishery. So, that effect might not be as great because the times aren't so high. But I'm wondering whether this recruitment effect that we're seeing is a function of warmer temperatures. And we've certainly had significantly warmer temperatures going into this period since 2005.

I'm not asking for any kind of assessment to be redone based on this, but it might be something that we would want to look at in the future about whether there is a temperature effect that might be driving enhanced recruitment. So, that's my comment.

VANCE P. VICENTE CERNUDA: Jason Cope?

JASON COPE: Yeah. Jason Cope. For Rich's observation there, should we add that to the research recommendations? Because it sounds like a mechanistic possibility to explain, and I think, Adyan, you were saying that it's likely that the recruitment in the model is being informed. And we saw that there's well

informed recruits in the model by the index, you thought? Probably by the lengths too, but maybe by the index. So, this sounds like a mechanistic thing that might be looked at, might even be possible part of the standardization. Who knows? So, should we capture that in the research recommendations?

RICHARD APPELDOORN: That sounds good to me.

VANCE P. VICENTE CERNUDA: Yes. I think so. So, wait till Liajay gets back so we can go to the research recommendations so that we can add Jason's recommendation. Or in the document, Jason.

Jason?

JASON COPE: Yes. Yeah. Jason Cope yeah. No. That was just my recommendation of Rich's recommendation that that should go into the research recommendations. But I will say, everything I've seen here, all of this makes a lot of sense to me. Obviously, there's uncertainty here. The model is very sensitive to that final index value, which has shown, if you take that final index value out, it's less of an increase. That's why you see the model kind of leveling off and not seeing as much recruitment and dropping the R to 0 and all that stuff.

But that's an extension. It just so happens you get these assessments where you're building an index, and it's picking up an important abundance dynamic. And it's saying it's going up instead of leveling off or going down, and that makes a difference. So, I'm not surprised to see the behavior in the retrospective. And so, all of this is making, personally, sense to me.

And, I guess I would say that this assessment, to me, is useful for management recommendations. And so, I would, if people are ready, propose that motion.

VANCE P. VICENTE CERNUDA: Okay. I need somebody to write it down so we can vote on it. Skyler?

SKYLER ROSE SAGARESE: Yes. Skyler Sagarese. I did draft a research recommendation in that document that I suggest. Please re-word if you see fit.

I do want to caution when we start talking about the environmental linkages and I mean, Jason mentioned it. It's like a-- it's more of a hypothesis testing of mechanisms. It's really important for us to hypothesize what exactly we think is being affected. Number one, do we think the warming ocean temperatures

have been affecting our growth parameters? Has it been affecting recruitment estimates? All of the above?

I think we just want to be clear on what exactly we would want to look at because then we'd have to find all the different data streams to be able to look for quantitative evidence of those relationships. So, please, please re-word re-write it as needed. I just drafted something quickly there.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Skyler. Kevin?

KEVIN MCCARTHY: Thank you, Vance. Kevin McCarthy, I would just add for the SSC, just the information this is exactly the kind of thing that we can investigate within the SEDAR 103 process. You know, these linkages between environmental events, environmental data and other data streams. So, this is a really timely recommendation from you all.

Thanks.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Kevin. Yeah. We're waiting for Adyan to finish the table.

ADYAN RÍOS: All set. So, I've added the ABC in metric tons based on the P^* of 0.45 and the sigma of 0.5, as well as the corresponding values in pounds.

VANCE P. VICENTE CERNUDA: Yes. Thank you very much. That's good. If you can enlarge it a little bit, let us look at it carefully, and then, we have to vote whether we accept these final SSC review and decisions for the SEDAR 91. U.S. Caribbean Spiny Lobster Puerto Rico. So, let's look at this carefully. Richard? Richard?

RICHARD APPELDOORN: Yeah. Just so we're aware of what's going on, we're ruling on the OFLs, not the ABCs because that requires the P^* , which is the Council's decision, and they haven't made that decision yet. Those are what they would be if the Council continues using the same P^* value.

VANCE P. VICENTE CERNUDA: Graciela.

GRACIELA GARCÍA-MOLINER: But the SSC has-- this Graciela, the SSC has to recommend the ABC. You can make a statement like, "We've done this with the P^* of, what was it, 0.45." Right? But if the Council decides [inaudible] the ABC. But we need to do that here.

RICHARD APPELDOORN: Alright. Thank you for that clarification.

VANCE P. VICENTE CERNUDA: Thanks. Yes. That is correct.

ADYAN RÍOS: I just caught that I'm using a P^* of 0.45. Okay. Well, never mind. For a second, I was looking at the map I said, "I used 0.45," but that's what I was intending to use. We are good.

GRACIELA GARCÍA-MOLINER: Don't scare me.

VANCE P. VICENTE CERNUDA: Jason Cope.

JASON COPE: Yes. Thank you, chair. This is Jason Cope. I am curious about the 3-year average. What is that? Is that there just to show that? Is that something that's on the table as a suggested, either, OFL/ABC. So, I would like to talk about it if it is a proposal.

VANCE P. VICENTE CERNUDA: Adyan Ríos.

ADYAN RÍOS: Thank you, Vance. Let me see here real quick if-- Okay. No, I don't see Sarah online. So, this is just what the Council has been doing for most all of the species that we've recently worked with and had stock assessment-based management advice.

That is intended to, I guess, reflect what's easier for management, to keep one number on the books for multiple years. So, I will see if anybody else is raising their hand to speak to as to why this has been kind of like a default way of providing information. I'm not seeing any other hands.

JASON COPE: Could I point out something with it because that makes that makes sense. And on averages, again, you would much rather not have things bouncing around and so forth. My concern here is something that you pointed out, which was because this is above, at this point, a target and we're fishing down to a target when you start taking averages of fishing down to a target you by definition will be overfishing and so my worry is that that 3-year ABC is higher than the MSY 30% SPR OFL. So, that top-- yeah. Whatever that would be.

ADYAN RÍOS: Yeah.

JASON COPE: So, cell b2, that is smaller than whatever-- e bottom row.

ADYAN RÍOS: Mhmm.

JASON COPE: And so that's my worries. Anytime you're fishing down to a target, taking averages, I think, sounds scary. What would be the alternative what folks do is say, "Oh, you're above target. Well, then just fish at MSY."

ADYAN RÍOS: Mhmm.

JASON COPE: At a constant, and then it becomes that constant catch. So, it captures the same thing, but you avoid that troublesome thing. Plus, you build in a little more precaution, given the system and all that sort of stuff. So, maybe that's an alternative suggestion is to use the MSY 30% SPR and take the ABC from there.

ADYAN RÍOS: Correct. I believe that's done in other regions as well in this sort of situation of either taking the ramp or building in at just getting to the MSY proxy with that as your OFL.

JASON COPE: Yeah. You don't want to-- people don't deserve to be penalized because an average was taken that is basically allowing them to conduct overfishing but not intending to. You know what I mean? It was just like, well, this is in the books. But if we can show clearly that in, 2 or 3 years, in 3 years, that will be technically overfishing.

KEVIN MCCARTHY: Mhmm.

JASON COPE: Yeah. That seems like that's not a great thing, and that's not fair to the communities fishing this. And so, something that's above that-- or something that's below that average, but certainly in line with MSY would seem to buffer any uncertainties and kind of protect the community a bit more. But I'd love to hear what others have to say.

VANCE P. VICENTE CERNUDA: Richard, can you jump on this, please?

RICHARD APPELDOORN: Oh, I was going to ask whether Adyan could give us the ABCs that would correspond to the 30% SPR estimate?

ADYAN RÍOS: Yes, I can.

RICHARD APPELDOORN: Or, is the suggestion we don't lower the ABC and we actually fish for that 502,000 pounds?

JASON COPE: I think you'd want to continue with the control rule, because at some point, you're going to get yourself up against that MSY. Assuming everything is correct, the assessment won't change, and everything that would be leading you to fishing at the OFL, which I don't think our control rule intends that. So, Rich, I agree. It'd be good to see what the ACL of that 227 looks like. It's probably in the low 200s.

ADYAN RÍOS: Okay.

RICHARD APPELDOORN: And one last request would be, what is the current ABC?

GRACIELA GARCÍA-MOLINER: Richard, the current ABC is 376,452 pounds. That's the ABC. Could you hear me? No? Okay.

So, the current ABC is 376,452. And usually, the spiny lobster ACL equals 0.95 times the ABC that the SSC provides.

VANCE P. VICENTE CERNUDA: Jason Cope.

JASON COPE: Yeah. Jason Cope. Thank you, Mr. Chair. I just want to make sure that we're all following the same thing here. If I'm seeing this right, there's a significant bump up even though we are keeping the same MSY proxy, we are keeping the same productivity of the stock because we haven't changed growth, natural mortality and, all importantly, steepness.

The thing that's really changed is with the flipping on of the recruitments and this new index has bumped up, as Adyan has shown, the scale of the stock. The stock has moved upward. And it's also changed what the current stock status is, how depleted it is from an unfished state. And the combination of those two things, but really, mainly, that bump up in that R0 value is really what's pushing this up. And we also show that that's very sensitive to that final index point still going up.

So, I'm just making sure that we all realize that this has increased from the last time because of, mainly, an increase in scale that has a lot to do with that increase in that index. And that final index value, in particular shown through the retrospectives, is very sensitive because you will get a drop in that R0 if that increase, for some reason, wasn't real. But we do believe it is real, and so that's what we're going off of. That's the best available information.

I propose that this model is the best thing, or useful for management. But just an awareness here. So, I think that still

makes me think, using a 3-year average is definitely not the right thing to do. Doing something more like going with the MSY constant, still raising the ultimate ABC here, with an eye on the fact of what's the population doing? Is that index going to still be going up? Is it going to be leveling off? We don't know yet. We'll know in a couple years when we get more data, but just something to keep an eye on.

So, again, I think my leaning towards a constant catch based off the MSY proxy is more prudent than an average. Thanks.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Jason. Richard Appeldoorn.

RICHARD APPELDOORN: Yeah. So, as, I guess, a point of direction, we need to first make the formal motion that, the analysis is suitable for making management advice. And then secondly, a motion, at least for me, reflecting Jason's arguments as to why we would recommend ABC that comes from the current, 30% SPR MSY value.

VANCE P. VICENTE CERNUDA: Yes, Richard. Maybe you can start writing up the second motion because I think the first motion that you mentioned, I think, is clear. We're going to ask for a motion that states that the results presented in the stock assessment report are useful for providing management advice and developing fishing level recommendations for the Council. That will be the first motion. Then the second motion, I wasn't clear.

So, if you can write it down, I appreciate it.

RICHARD APPELDOORN: Well, I'll make a motion that we take your wording on what you just read as the first motion that we should be addressing. And I would ask Jason to draft the second motion because he had arguments for why we should be a little bit more conservative in a ramping down situation.

JASON COPE: This is Jason. I'm happy to do that. Where do I get that document?

RICHARD APPELDOORN: And also that the sensitivity to that last recruitment point.

JASON COPE: Yeah.

LIAJAY RIVERA GARCÍA: Hi, Jason. This is Liajay. The document is available in the SSC folder. However, I have it at hand as

well. But we have right now the SSC review and decisions table provided by Adyan shared on screen.

So, I don't know if you want to write it directly or if you want me to present it on the screen for everybody.

JASON COPE: I mean, I can just write it right on the screen. I can [crosstalk]

LIAJAY RIVERA GARCÍA: Okay. I'll send you the link.

JASON COPE: Okay. Thank you.

LIAJAY RIVERA GARCÍA: Okay. So, Kiara sent it to you via email.

VANCE P. VICENTE CERNUDA: Adyan Ríos.

ADYAN RÍOS: Thank you, Vance. Adyan Ríos. I was going to just stop sharing my screen and send this updated table to you via email, if that sounds good.

VANCE P. VICENTE CERNUDA: Yes. Thank you. Jason Cope, please. Yeah.

JASON COPE: This is Jason Cope. I'm happy to second motion number two.

VANCE P. VICENTE CERNUDA: Okay. So, I'll read the motion. Motion number one for today. Well, number two. I'm sorry.

The results presented in the SEDAR 91 U.S. Caribbean Spiny Lobster Puerto Rico are useful for providing management advice and developing fishing level recommendations for the Council.
Written by Jason. Right?

Jason?

JASON COPE: Oh, sorry. I should lower my hand.

VANCE P. VICENTE CERNUDA: Okay. Thank you. The motion was proposed by Richard Appeldoorn and second by Jason Cope. So, any more discussion before we vote? I hear none.

We move to-- I'm sorry, Richard. Richard?

RICHARD APPELDOORN: Do we want to put it in the very beginning? "The SSC finds" not in the very beginning. Okay. Yeah. Fine.

"The SSC finds the results." That's what's on record who's making the motion.

VANCE P. VICENTE CERNUDA: Okay. So, now it—

(Part of Dr. Vicente Cernuda's comments are inaudible on the audio recording.)

RICHARD APPELDOORN: "Finds *that* the results."

VANCE P. VICENTE CERNUDA: Pardon?

RICHARD APPELDOORN: After "results," put in the word "that." No, excuse me. Before the word "results" is where the "that" goes. "Finds that the results—" yes. Thank you.

VANCE P. VICENTE CERNUDA: Okay. So, I'll read it again. The SSC finds that the results presented—

(Part of Dr. Vicente Cernuda's comments are inaudible on the audio recording.)

RICHARD APPELDOORN: Vance, you're breaking up.

VANCE P. VICENTE CERNUDA: I'm sorry. I can read it again.

The SSC finds that the results presented in the SEDAR 91 U.S. Caribbean Spiny Lobster, Puerto Rico, are useful for providing management advice and developing fishing level recommendations for the Council.

Are you happy with that, Richard?

RICHARD APPELDOORN: I'm just elated.

VANCE P. VICENTE CERNUDA: Jason?

JASON COPE: Looks great.

VANCE P. VICENTE CERNUDA: So, we're going to vote on this motion. Okay. I'll start with Tarsila Seara.

TARSILA SEARA: Tarsila Seara, yes.

VANCE P. VICENTE CERNUDA: Juan J. Cruz?

JUAN J. CRUZ-MOTTA: J.J. Cruz, yes.

VANCE P. VICENTE CERNUDA: Elizabeth Kadison? Jason Cope?

JASON COPE: Yes.

LIAJAY RIVERA GARCÍA: Richard Appeldoorn, can you hear us?

RICHARD APPELDOORN: I can hear you now.

LIAJAY RIVERA GARCÍA: Okay. So, I'll transfer my mic to Vance.

VANCE P. VICENTE CERNUDA: Thank you, Richard. Skyler Sagarese?

SKYLER ROSE SAGARESE: Yes.

VANCE P. VICENTE CERNUDA: Todd Gedamke?

TODD GEDAMKE: Yes.

VANCE P. VICENTE CERNUDA: Walter Keithly?

WALTER KEITHLY: I will abstain.

VANCE P. VICENTE CERNUDA: Okay. One abstain. Vance Vicente, yes. ¿Elizabeth Kadison?

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Sí, ya había votado ya. Yes, Richard ya votó. Yeah. Okay. Thank you all.

So, the motion carries unanimously except for Walter Keithly who has abstained. *Motion carries.*

RICHARD APPELDOORN: Well, that should be 8, yes? One abstention. Or am I miscounting?

VANCE P. VICENTE CERNUDA: Yeah. We're waiting, for Jason to complete motion number three.

JASON COPE: Sure is wordy. I think it's mostly there. It probably needs some wordsmithing, particularly at the last sentence, but go ahead and have folks review it.

VANCE P. VICENTE CERNUDA: Okay. So, I will read it for review. Motion Three by Jason Cope. The stock-- motion three reads, "The stock is currently above target and, therefore, experiencing a fishing down to the MSY." Hold on.

Can you all hear me?

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Okay. Okay. Again, motion three. I begin. *"The stock is currently above target and, therefore, experiencing a fishing down to the MSY proxy. In addition, the new stock assessment shows an increase in the overall size of the population, that is a higher unfinished population size, which leads to an increase in catches with all other things being equal. The increase in stock scale is greatly influenced by the final point in the new abundance indices, which adds further uncertainty in the model, between parenthesis, as shown in the retrospective analysis. This condition lead to a 3-year average ABC that will exceed the proxy-MSY OFL in 2029. It is proposed instead to use the ABC that is derived from the OFL based on the proxy-MSY, between parenthesis, F at SPR equal 30%, close parenthesis, as a constant catch value for management."*

That's the way it reads right now. Open for discussion. Richard Appeldoorn?

RICHARD APPELDOORN: Two things. First one's a question. That first sentence, should it be that "the analysis shows the stock is currently above target?"

ELIZABETH KADISON: Yes.

RICHARD APPELDOORN: Okay.

And then the second one is, the last sentence where it says, "it is proposed." I would like to change--

VANCE P. VICENTE CERNUDA: Can you repeat your first comment? Beginning the sentence, what did you say? "The" what "stock"?

RICHARD APPELDOORN: "The current analysis shows the stock."

VANCE P. VICENTE CERNUDA: Okay. Hold on. "The current analysis shows us the stock is currently above target." Okay. Next.

RICHARD APPELDOORN: The last sentence that begins with--

VANCE P. VICENTE CERNUDA: "It is proposed." Yeah.

RICHARD APPELDOORN: I think should read "the SSC recommends" or "SSC proposes." Yes.

VANCE P. VICENTE CERNUDA: Okay. "The SSC recommends" elimina ese y entonces, "it is proposed instead." "Recommends to use"

RICHARD APPELDOORN: No, leave "instead."

VANCE P. VICENTE CERNUDA: "Recommends to use"

RICHARD APPELDOORN: You could put "instead" in front of "the SSC."

VANCE P. VICENTE CERNUDA: Okay. Pásalo para allá.

RICHARD APPELDOORN: And a comma after "instead."

VANCE P. VICENTE CERNUDA: So, it reads, "Instead, comma, the SSC recommends to use the ABC that is derived from the OFL based on the proxy- MSY, parenthesis, F at SPR equal 30%, close parenthesis, as a constant catch value for management."

Is that what you want?

RICHARD APPELDOORN: Looks good to me. And I will second the motion.

VANCE P. VICENTE CERNUDA: Okay. So, motion by Jason Cope, seconded by Richard Appeldoorn. Sí, sí, ya vi. Pa'llá voy. So, it's open for open for--

RICHARD APPELDOORN: Please, spell the name correctly.

VANCE P. VICENTE CERNUDA: Open for further discussion. Skyler?

SKYLER ROSE SAGARESE: Skyler Sagarese. Just a friendly amendment. Maybe start that motion by saying, "The current assessment indicates that the stock is currently above target" to define this was from a stock assessment.

ELIZABETH KADISON: Yeah.

RICHARD APPELDOORN: Right.

VANCE P. VICENTE CERNUDA: Skyler Sagarese?

SKYLER ROSE SAGARESE: Yeah. Skyler Sagarese. I'm not sure we have to include it in this motion, but in the past, we've said how those interim years of forecasted catches should be. And Adyan showed us using the 3-year average from 2022 to 2024 as the placeholders for 2025 and 2026. Do we have to provide

support for that in this motion, or can we just say that whatever results that were presented to us were acceptable?

RICHARD APPELDOORN: Well, that information is part of the record.

SKYLER SAGARESE: Yes. Skyler Sagarese. I just wanted to confirm because last time, for Saint Thomas/Saint John, we literally made a motion specifically saying that. But if that's baked into what Adyan presented to us, then I'm happy with that.

VANCE P. VICENTE CERNUDA: Yes. Write it down just to see if he can follow motion three or it should be a separate one. Skyler, if you can write it down, that'll be useful. Adyan Rios, come in.

ADYAN RÍOS: Yeah. No. I was just wondering if the sentence about "these conditions lead to a 3-year average ABC that will exceed the proxy MSY OFL in 2029." I just wanted to point out that that's been true in the past when we've used the 3-year average. So, while it's still correct, I think the average approach leads to, like, it being lower in 2027, that there's presumably, like, buildup that allows the average to exceed the OFL for 2029. So, I'm just getting back into the mechanics of that argument.

And then I also just wanted to point out what the current landings are at above 250.

VANCE P. VICENTE CERNUDA: Yes. Thanks. I don't see any problems in including that as part of motion three. Are there any comments? I don't hear any further comments, so I have to read it again before we vote.

So, here we go. "The current assessment indicates that the stock is currently above target and, therefore, experiencing a fishing down to the MSY proxy. In addition, the new stock assessment shows an increase in the overall size of the population. Parenthesis, *id est*, that is, a higher unfished population size, close parenthesis, and comma, which leads to an increase in catches with all other things being equal. This increase in stock scale is greatly influenced by the final point in the new abundance indices, which adds further uncertainty in the model. Parenthesis, as shown in the retrospective analysis, close parenthesis, and period. These conditions lead to a 3-year average ABC that will exceed the proxy-MSY OFL in 2029. Instead, the SSC recommends to use the ABC that is derived from the OFL based on the proxy-MSY, parenthesis, F at SPR equal 30%, close

parenthesis, as a constant catch value for management. Further, the SSC recommends using the 2022 dash 2024 landings average for each fleet as the provisional landing values for 2025 and 2026."

The floor is open for further discussion.

So, shall there be no further discussion, we will go through the voting process, beginning with Tarsila Seara.

TARSILA SEARA: Tarsila Seara, yes.

VANCE P. VICENTE CERNUDA: ¿Lo estás apuntando? Okay. J.J. Cruz?

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Elizabeth Kadison?

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Jason Cope?

JASON COPE: Yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn?

RICHARD APPELDOORN: Yes.

VANCE P. VICENTE CERNUDA: Skyler Sagarese?

SKYLER ROSE SAGARESE: Yes.

VANCE P. VICENTE CERNUDA: Todd Gedamke?

TODD GEDAMKE: Todd Gedamke, yes.

VANCE P. VICENTE CERNUDA: Walter Keithly?

WALTER KEITHLY: Walter Keithly will abstain, again.

VANCE P. VICENTE CERNUDA: Good. And, Vance Vicente, yes. So, this is a unanimous decision to move the motion ¿Qué dijo? ¿Quién? ¿No? Walter, did you abstain? I didn't understand.

¿De verdad? Okay. I'm sorry. There's-- yes. There's one abstention. Walter Keithly. I misheard you. So, with one abstention, *the motion carries*.

Adyan, do you need to make any other comments, or are you ready

to begin with the SEDAR 84 Caribbean Yellowtail Snapper, Puerto Rico final review?

ADYAN RÍOS: Do we want to take a break?

VANCE P. VICENTE CERNUDA: Okay.

ADYAN RÍOS: Thank you.

VANCE P. VICENTE CERNUDA: We'll be back at--

WALTER KEITHLY: Chairman, this is Walter. I had asked for a couple of minutes.

VANCE P. VICENTE CERNUDA: Okay. Okay. Walter, go ahead.

WALTER KEITHLY: Thank you, Mr. Chairman. I hate to bring up some of the stuff this late in the game, but I'm going to. Perhaps Kevin or Adyan can answer the first question. In the summary of the Puerto Rico spiny lobster SEDAR 91 additional sensitivity runs, under the first sentence in the background and objectives, it is stated that the SSC requested additional sensitivity runs for the Puerto Rico stock. Graciela had sent us an email on September 5th, 2025, saying we were not going to be reviewing it.

And the only thing I could find in the minutes was Kevin's discussion that they had some additional indices that they wanted to look into. But I never saw anywhere where I said the SSC had asked for any additional sensitivity runs. Perhaps I am mistaken. I'd like Kevin or somebody to answer that, then I have another question.

VANCE P. VICENTE CERNUDA: Let Kevin answer the first one, please.

KEVIN MCCARTHY: Yeah. Thank you, Mr. Chair. Kevin McCarthy here. You're not wrong, Walter. That's a typo.

That should have read that the Council requested this, not the SSC. The Council requested this in their August 2025 meeting. We had a lengthy discussion then, and we talked about additional runs to include the indices of abundance if they could be produced and they were. We also added, I think, another year in the time series. So, we brought it from 2023 as the terminal year to 2024.

So, you're not incorrect. It was not the SSC. It was the

Council. So, we should correct that in an updated version of the document.

WALTER KEITHLY: Before that clarification, which brings me to the next issue though, you gave this report, the initial 91 assessment, to the Council before it went to the SSC. And I don't know if that is traditional protocol or not, but it's going to be beside the point. But I have to believe the Council raised some issues with 91, Puerto Rico 91, SEDAR 91, only because it was showing the stock to be overfished with overfishing occurring.

I have to believe that if everything was rosy, they would have not asked for any additional analysis. Am I incorrect on that comment? Or do you think I am?

VANCE P. VICENTE CERNUDA: Yeah. Kevin.

KEVIN MCCARTHY: Yeah. Kevin McCarthy. Well, I can't speak to the motivations of the of the Council when it comes to overfished versus not. But some additional background was that the Puerto Rico DRNA brought to the Council there, and I showed this yesterday-- Well, I showed one of the figures yesterday that, was from, Matos et al., working paper.

It was a figure out of a working paper for SEDAR 91 data workshop. And at that time, because it was a nominal index, the panel, the SEDAR data workshop panel elected not to include it, because it was a nominal index, and it wasn't recommended for use in the modeling. So, there was-- I believe, there was a presentation. There was certainly discussion from DRNA, at the Council meeting, that they had additional information that supported the anecdotal information of fishers that the catches-- that the abundance was a lot higher in recent years. So, they took the data in a sort of initial analysis supporting what the fishers were saying.

And I think based on that information, whatever other motivation they may have had, but based on that information on this abundance of data, they requested that the Science Center do some additional analyses with those abundance data.

WALTER KEITHLY: This Walter. I actually agree with you the abundance data had I would have seen it earlier. But it's just the process that bothers me that. Yes, I fully suspect that if it had shown a rosy picture, there would not have been this additional analysis being conducted.

One last question, though. I do-- something that's always bothered me with many of these assessments, but especially lobster. When you're using a steepness parameter of 0.99, doesn't that strongly suggest some and possibly quite a bit of external recruitment? And, again, especially with lobster, because you have this-- I'm not a biologist, and somebody with a life history background can possibly help me. But they have a long platonic stage of floating in the water and so forth. And it's like 9 months or something as I recall.

Shouldn't-- I would think that the much of the production for Puerto Rico would come from other areas throughout the Caribbean and maybe South America even. Can somebody help me out there?

ELIZABETH KADISON: I would like.

WALTER KEITHLY: I don't hear-- let me finish up my comments. I haven't heard anything yet, and I'll be quiet after I make one last comment. That if, in fact, that is correct, this large amount of external recruitment, then it seems you'd have a different MSY where MSY would be dependent on fishing effort in other nations or areas, not just what is happening locally in Puerto Rico. And I'll stop there. Thank you, Mr. Chairman.

VANCE P. VICENTE CERNUDA: Oh, thank you. Thank you very much, Walter. Kevin?

KEVIN MCCARTHY: Yes. Thank you, Mr. Chair. Kevin McCarthy. So, I don't disagree with you, Walter. Again, yes, you would certainly suspect that there is an awful lot of connectivity across the Caribbean for something that is so long in the plankton.

I think the steepness, whether or not that means it's recruitment from outside Puerto Rico, which I certainly suspect it is, there's certainly a disconnect between recruitment and the local population. Right? There's not that strong tie between the two. So, whether that means you don't need a lot of animals to produce a gazillion other recruits, or whether that means they're all coming from outside, we'd have to have some other information that was not included within this stock assessment to get at that.

But I don't disagree. It certainly is the most reasonable hypothesis that with such long lived planktonic larvae, they're going to be coming from places outside of the region, of Puerto Rico. By the region, I mean, the U.S. Caribbean. They could be coming from wherever.

WALTER KEITHLY: This is Walter again. Would that then not lead to conclusion that you don't have a single MSY, but a different MSY for each level of fishing in other areas.

And that's the reason I voted to abstain from the last two motions, by the way. If something just bothers me about what we're doing here, the way we've handled this.

KEVIN MCCARTHY: Well, certainly, lobsters are of interest to WECAFC to do a more comprehensive or broader scale assessment of some kind. Now, what kind of success are they going to have given the available data across the region? I don't know. But WECAFC certainly has got working groups that are concerned with things like lobster and conch as well, although they're not as long in the plankton. But I'm sure they move around quite a bit.

VANCE P. VICENTE CERNUDA: Yes. We have, Jason Cope.

JASON COPE: Yeah. This is Jason Cope. Two comments. One, to Walter's observation about assessment scrutiny. I agree, Walter.

That is not a mirage. It's something we should definitely be thoughtful about because, and this happens all over the world, assessments that bring big changes often get way more scrutiny than things that report things that are easier to maybe uptake. And so, that's just something-- I think your point is a very important one that we should be on guard for, because we should be as objective as possible. That's why we have the best available scientific information, sort of qualities.

It doesn't matter what the results are. It's how it was done. What's the process? How do we do things? So, I just want to affirm to you that I think your observation is an important one, and we should always have that on the front of our mind.

For the second one about steepness, and it is a strong assumption in this assessment that steepness is 0.99. Maybe what you just said is worthy of a research recommendation just to say steepness is kind of pinned at that really high thing. It's done for a transparent reason because of outside recruitment. But what does that mean for the overall uncertainty in the assessment? I find that a very reasonable thing and an important one to capture in the research recommendations, just something to revisit in the next assessment.

Thanks.

VANCE P. VICENTE CERNUDA: Yes. Thank you. Thank you, Jason. Adyan requested a 15-minute break, so we'll be back at 02:45.

(Whereupon, a brief recess was taken.)

VANCE P. VICENTE CERNUDA: Welcome back to the afternoon session of the SSC meeting of April 9th, 2026. It's 02:45.

As soon as Adyan Ríos is ready, she will be presenting us the SEDAR 84 Caribbean Yellowtail Snapper, Puerto Rico final review. So, anytime that you're ready, Adyan, we're ready.

**SEDAR 84 CARIBBEAN YELLOWTAIL SNAPPER PUERTO RICO: FINAL
REVIEW—ADYAN RÍOS, CARIBBEAN BRANCH SEFSC, NOAA FISHERIES**

ADYAN RÍOS: Thank you, Vance. I'm getting set up.

Okay. We are ready to get started with the SEDAR 84 Yellowtail Snapper review for Puerto Rico at the Caribbean Fishes Management Council SSC meeting on April 9th, 2026.

I'm going to provide a bit of background to start us off. And so, SEDAR 84 was a benchmark assessment that addressed the stocks of Caribbean yellowtail snapper in Puerto Rico and Saint Thomas/Saint John, and stoplight parrotfish in Saint Croix. It consisted of an in-person data workshop in 2024, a series of webinars, and an in-person review workshop in 2025.

The stock assessment report became available in August 2025. And in September 2025, in anticipation of the review that we're having now, the SSC discussed with us about additional model runs just after our last SSC meeting, I believe it was in August, a discussion about the results from the CIE reviews, which were also summarized and presented to the Council at the last Council meeting. And we'll talk a little bit more about those going forward.

These supplemental runs extend the terminal year from 2022 to 2024 and investigate parameters of steepness, the average length at maximum age, and the degree of dome shaped selectivity for the NCRMP, fishery-independent survey. And then, just like our last presentation, I included this comment about being here to review and what we, the SSC is tasked with, which is the recommendation as to the best available science and data, and whether the results are useful for providing management advice.

Continuing into some of the background, for this species, this species has island-based fisheries management plans effective as

of October 2022, and it has annual catch limits. The annual catch limit for Snapper Unit 5, which only has one species. So, the annual catch limit for yellowtail snapper for that entire unit is 315,806 pounds. And that was based off of the approach, I'll discuss it further, but it uses the reference years of 1988 to 2011. It's based on commercial landings, but it applies to all harvests. And just like the understanding and implementation of annual catch limits, it corresponds with accountability measures when those are exceeded in the current fishery management plans.

So, this plot shows us in pounds. I think later plots are in metric tons, but this plot was one that was used during the assessment webinars, basically to show the different components. So, we have a different-- even though there's only one fleet in the model, that fleet is made up mostly of hand lines, a little bit of sein, a little bit of trap, and a little bit of recreational catch as well.

I've added some additional information here. We see that the year with the highest landings was about 2,000, up over, close to 700,000 pounds. And then, we also see these lines that are referencing the current ACL, the current ABC, and the current SYL. I'll talk a little bit about those in a moment. There's just a lot to talk about on this slide.

We also have lines showing when the federal size limit was implemented. It was implemented with like a ramp. I think it was 8 inches, 9 inches, 10 inches, all the way up to 12. And so, the 12 inches total length kicks in a little bit later. And then we also have the year noted here when Puerto Rico also adopted a corresponding, matching size limit for territorial waters. So, that's designating the years where those were implemented.

Next, I want to point out that the recreational landings were calculated as 7.78% of the commercial lines. So, the green represents 7.78% of the blue. And that came from comparing the available MRIP information. So, the landings that we have from MRIP for those years, comparing those to vertical lines, and only to the vertical lines because that was deemed to be more similar to the recreational component that also targets yellowtail snapper.

And one more note there as to why the MRIP data are not used. The MRIP data, in some years, have very low sampling, and so they're flagged for being highly uncertain. And so, instead of using those data directly, we just developed this ratio and then applied that ratio across all years so that we would also have

estimates of recreational catch outside of the years for which we have those MRIP data.

I also wanted to just point out a little bit more about the current management, so how the current ACL and ABC are derived. And so, the SYL is a sustainable yield level, and it represents a level that the Council has confidence, can be sustained based on historical trends, an evaluation of the best scientific information available at the time when that decision was made, which included the SSC's productivity susceptibility rankings that factored into the buffers and scalars that buffer the ABC from the SYL.

As you can see, the recent last 15-- or it's been, let's see, 2008. Since 2008, landings have not exceeded the ACL or the ABC that we currently have. I guess it goes even further back. So, we go back to 2004 or years where those landings were higher. In recent years, we're not seeing that increase.

I'll also come back to this at the end when we're just, again, revisiting some of the ancillary information that connects to the trends that we see across various of the model runs. But what I want to also point out is the start of the time series. We know that we're starting in a period of time when the stock was already quite fished. That was the reason for that federal size limit.

I also have some slides near the end that kind of provide a reference as to anecdotes or evidence presented in the original fishery management plan that implemented this size limit, of that concern of smaller yellowtail snapper being caught than previously. And then, I don't have species specific data going further back, but we do know that we do have like a reference that tells us a little bit about the total landings for all species. And so, we do know that for a finfish, like, yellowtail snapper, that the landings prior to 1983 were substantial. And so, that's just another, as we have this time series of landings up, I just wanted to make sure that I touch on a few of those points. And, again, that the majority of the landings come from the lines year group.

Here we go. So, in 1986, we have-- just a bit more background. In 1986, we had the 8 inches total length size limit increased one inch per year. So, that was fully effective in 1989 according to the fishery management plan. Then in 1990, there was a requirement for the fish to be landed intact.

In 2005, there was a comprehensive amendment. In 2012, there was

a recreational bag limit as well as the implementation of the ACL. And there was an implementation of the ACL based on those two sectors. So, a specific commercial ACL and a specific recreational ACL. And then that was reevaluated, and then later just one ACL based on commercial data established in 2022.

Just to also orient us to the regulations in Puerto Rico. So, the first regulation was in 1936, which banned the use of nets at river mouths. This captures, I think, a lot of information of the events for Puerto Rico, but some of these have more details, therein. But I just kind of included what I thought was tangentially kind of relevant to yellowtail snapper.

So, we have 1998. The law was amended. Wait. No. The law Regulation 278 goes in effect in 1998 with amendments in 2004, 2005, 2009, and 2010. In 2004, they have the 10.5-inch fork length, and so that corresponds to the 12-inch total length size limit.

In 2004, beach seins were prohibited from river mouths. Then seins were prohibited in jurisdictional waters. Then seins were allowed again, but not at river mouths. And again, I think the seins are a little bit relevant just because we do have some small level of catch from the seins in the early years, and that does reflect, I think, generally smaller fish. But I don't really think of yellowtail snappers hanging out at the river mouth.

All right. So, moving forward. We also, I guess I'm jumping ahead a little bit here, but since we're thinking about size limits and regulations, I wanted to bring up the use of the time blocks that were explored in SEDAR 84 for yellowtail snapper in Puerto Rico. We have the original implementation in 1989 of the size limits going to the 12-inch total length. And then in 2004, we have the corresponding size limit in Puerto Rico.

Then in 2010, we saw some regulations, not particularly related to yellowtail snapper, but I had been kind of asked to just, when we looked at this length composition data for our commercial fleet, try and understand when these shifts in fishing behavior might have occurred. And this is another kind of topic where local ecological knowledge and conversations with, like, not just conversations, but strategic data collection that informs these types of decisions would also be helpful to conduct. But if you kind of look at this plot, if I took these lines off, you'd see that we really stopped seeing the 21-centimeter fish right about that time when Puerto Rico adopted the size limit. So, we don't see a huge change in our

size composition when the federal size limit went in. And so, there is no time block at this time.

I did have one time block here, and I did notice that there also seems to be a shift happening after 2010. And I'm not sure if it might relate to what was happening with other species, but there's a time block in our models for 2010. And on the right here, this shows the logistics selectivity for our commercial fleet, and it just shows that we do see the targeting, presumably, the targeting and the effective selectivity going a little bit larger during that time lock and then returning to something. It's subtle. It's not a huge difference.

So, you could argue potentially for not having time blocks, but I did think that this one in particular, the 2004, when the size limit is effective both in territorial and in federal waters did make sense. And I think that we did hear a lot during the data workshop about targeting nature of the fishery, the chumming, the targeting going out certain times, certain moons, and attracting snapper of a of a given size.

And so, that also kind of plays into potential for dome shaped selectivity. But, as you'll see, the models for all three of the SEDAR 84 are more on the limited side. And so, that was not explored, in particular because, also, we saw large yellowtail snapper in the in the TIP data, in the length composition data that we get from the port samplers.

Okay. So, that's what I kind of wanted to cover as far as the background for regulations and how it plays into some of the modeling decisions that factor into our time blocks, which particularly were tied to the selectivity and the targeting nature of fishing for yellowtail snapper.

That brings me to the assessment history. So, just referencing some of the previous work that has been done for spiny lobster in the-- sorry, for yellowtail snapper in the Caribbean. We have a study by Rich Appeldoorn in 1992 of broader reef fish assessment and analyzing length frequencies. However, for management advice and in particular, too, I guess, what we determined in our analysis for the data workshop report was characterizing that as limited in scope and the data resolution.

We also have a 2005 SEDAR 8. This explored trends in CPUE and length frequency changes, but there was insufficient data to parameterize models. And so, SEDAR 8 was unable to determine stock status. We also have SEDAR 46 which applied Tom Carruthers Data-Limited Methods Toolkit to the available data. SEDAR 46

evaluated six species across island units. So, two for Puerto Rico, two for Saint Thomas, and two for Saint Croix. And that included yellowtail snapper in Puerto Rico. However, the results were ultimately not used for management advice, even though it did receive best scientific information available at the time.

That brings us to SEDAR 84. And so, the models for SEDAR 84 were fit using a catch time series for a single fleet. We have a fishery independent index of abundance. That is the National Coral Reef Monitoring Program. And we also have length composition data from both the fleet, so the commercial, and the fishery independent coral reef survey. And all these data were implemented in a data limited approach using stock synthesis.

So, jumping ahead a little bit to the conclusions of where did SEDAR 84 end up in its review. So, we have models that we'll summarize today, that were in the stock assessment report. A few additional models were in an addendum to the stock assessment report, and those were developed with the reviewers at the review workshop. And then we also have the models that have explored the parameter space and the rigidity that was highlighted by the CIE review.

The models presented in the stock assessment report were not found appropriate to be the basis for the management advice. So, that was the conclusion by the CIE review. The CIE reviewers did give us recommendations and did express some of the main concerns. And some of those were the models being deterministic and sensitive to fixed assumptions. And the models were also difficult to isolate and clearly identify the most influential sources of uncertainty. We also identified key uncertainties, including initial equilibrium, natural mortality, steepness, and population processes.

So, in response to that model rigidity and those key uncertainties, we conducted a phased exploration of these parameters and also updated the data through 2024. I'll take a moment to just point out that these recommendations were-- these kinds of findings were true for all three of the models. So, all of the SEDAR 84. The yellowtail snapper in Puerto Rico, the yellowtail snapper in Saint Thomas/Saint John, and the stoplight parrotfish in Saint Croix.

What I want to highlight there is the reviewers and the way we spent the workshop. We really focused on exploring the most data rich of those three assessments, which is Puerto Rico, which is what we'll be talking about today. And so, a lot of the issues, that we talk about today are also true for the U.S. Virgin

Islands, with the U.S. Virgin Islands having additional complexities in that they have a much shorter time series, fewer port sampling, sample sizes. And in Saint Croix, we have the additional biological complexity of working with a species that also changes sex. So, the stoplight parrotfish does have the sex change, hermaphroditism.

I think that's just-- I know that a few of the SSC members can't be here tomorrow, so I think when it comes to the research recommendations, I think they might be similar today and tomorrow, based on those similarities. But I also wanted to point out that the additional work was invested in the richest data model, and incorporating some of those recommendations from the CIE reviewers.

Okay. That brings us to a summary of the sources of data. I mentioned briefly, but here we have them all on one slide. We have landings from self-reported fisher logbooks. We have length compositions from the port sampling. So, those are the fishery-dependent length compositions. We also have length compositions from the Fishery Independent Survey. We have the index of abundance from that fishery independent survey. And then we also have local and recent life history information available from the otolith analysis and gonad histology.

I have some of the kind of takeaways from the data workshop and from the assessment workshop coming up. So, I'll just share those with you.

So, the data workshop did recommend using the life history data that were made available in the SEDAR working papers. So, those were provided by Virginia, Jesus, and Noemí. Then we also have commercial landings with a start date in 1983. We accepted the use of the coat-specific expansion factors that were the proxies for 2020 to 2022 to be based on the years the average across 2014 to 2019.

We were asked to consider uncertainty around the landings. We were asked to identify and flag outliers, potential outliers in the commercial self-reported landings data. The data workshop recommended that discards would not be modeled and that they are to be negligible. So, this is saying that although we know there's discards due to the size limit, this model is assuming that all of those discards survive. So, we're not accounting for discarded mortality.

The recommendations continue with utilizing the TIP lengths for the available years to inform selectivity and annual population

trends. The data workshop recommended using the National Coral Reef Monitoring Program data from 2014 to 2022. These data go back, I think, to 2001. However, prior to 2014, they were only focused on the Southwest-- or on the West Coast of Puerto Rico, in the Parguera region. And the review workshop, so in 2014, that spatial scope of that survey changes to cover the entire island. And so, that justified that decision from 2014 to 2022. There were recommendations from the CIE to explore taking that back further, but that also raises questions as to like the spatial structure comparability.

The reviewers also recommended trying to unify the data between Saint Thomas and Saint John and Puerto Rico. But that also is something we explored, and it increased the complexity of the model to a point where, I really thought that that's different from what our parameters going into the assessment were. So like, the terms of reference really state that we have our island specific management and our island specific models. So, that's why you won't see that kind of explored further.

We explored it in the review workshop where we also tried various, like, different selectivities and other approaches. But today's-- Or not today, but the additional, the supplemental sensitivity runs really focused on some of the fixed parameters, and not so much in redefining that structure or spatial scope or the years that were included for the data in the models.

Lastly, the data workshop recommended not considering fishery-dependent information for an index of abundance. That comes back to those conversations about targeting. Yeah. So, I think there might be a little more to recall there, but that was what our discussions and decisions were at the time. So, I think it's an important note to mention that with the index of abundance and the work that went into the standardization for spiny lobster, I think there might be potential for looking into that into further depth for SEDAR 103.

On, SEDAR 103 we're in the webinar stages of reviewing the data prior to the methods workshops, the in-person method workshop. It is a procedural workshop, and I think that's something that might be revisited but not available at this time.

VANCE P. VICENTE CERNUDA: Adyan, Kevin needs to intervene.

ADYAN RÍOS: Yeah. Thank you for letting me know. Yes. Go ahead, Kevin.

KEVIN MCCARTHY: Thank you, Mr. Chair. Kevin McCarthy. So,

Adyan, also, I think in those conversations due to the way the yellowtail fishery is conducted, there was real concern for hyperstability in a fishery-dependent index. So, I think that was a major concern as well just due to the nature of the way the fishery operates. So, that was another issue that came up and why we preferred, "we" being the panel, preferred the fishery-independent survey over an attempt to put together a standardized index from fishery-dependent data. Thanks.

VANCE P. VICENTE CERNUDA: Thank you, Kevin.

ADYAN RÍOS: Thank so much, Kevin. Okay. Following the workshop, the data workshop, we looked into the landings outliers and retained them as valid trips. We also accepted and structured the model as having one commercial fleet. That model being stock synthesis, and that stock synthesis was deemed to be compatible with the available data and our standard practices.

Our model was configured with one area, one fleet, and one survey. It went from 1983 to 2022, and the 40% SPR was used as a proxy for MSY. Then we tested sensitivities for growth, the initial equilibrium, and the way we tested those sensitivities in the model stability were through, looking at the gradients on the parameter estimates, investigating the fits, so looking at the residual fits to the data, developing likelihood profiles for key parameters, and also running those retrospectives and jitter analyses.

So, I'm going to tell a bit of the story of the assessment development that's in the stock assessment report, the review workshop report, and the supplemental sensitivities document. So, I'm going to start at the beginning.

And so, we began the data limited models using what's called super period length compositions. The length composition data, there's years where the sample sizes are quite on the low side. So, we're talking under 30 or under 50 trips that were sampled in a year. And so, that's one potential reason why you might pull information is that there's not a lot of information for individual years, so you might pull and combine information across years when you're in that situation. On the flip side of that, SS also knows, like, you tell it how many samples are in a year for it to understand whether there's a year with higher samples.

So, it's kind of, like, relative. Like, it's making sure that SS knows that a year with more samples is given more weight than a year with very few samples. So, it is also possible to not

aggregate and leave those data in. However, we also had discussions about how the targeting nature of the sampling-- oh, sorry, not of the sampling of fishing, of targeting certain sizes very effectively, which raised some concerns as to the potential for the length data to not be a reference of cohort strength and more so of that efficiency in targeting specific sizes or those preferences in targeting specific sizes over time. And in that situation, the super year approach allows us to still fit to the data and use it to understand the selectivity and understand and model the size of the fish being removed from the population but not allow the trends in these sizes to influence directly cohort strength as it's modeled in this forward structured, forward projecting age structured model.

And then, I guess, of note, also, we start with that assumption of external recruitment related to fixing steepness at 0.99 and also fixing the uncertainty around the recruitment, so the variability around recruitment at 0.7. So, the model development process then looked at the growth equation that was used in the model.

The survey data, the NCRMP survey data saw very small fish, and this growth shows that these fish grow very, very fast. But the NCRMP data shows a large proportion of fish grow under 12 centimeters, which is pretty small. And these fish grow to 12 centimeters, or I think they grow to, like, a little bit higher than that very quickly. And so, the growth model became-- fitting those small fish in the NCRMP data with the selectivity based off of the model's understanding of what sizes are available for that survey to be seeing those fish come into existence based on this growth curve in the model. And so, it became an important attribute that we looked into further in the sensitivity runs that came after the review workshop as well. So, those recent suite of sensitivity runs also take a-- we'll be talking more about growth later.

Okay. Then we also looked at the assumptions of, just, that continuous recruitment. So, that is not estimating the recruitment deviation, so only having that long, that overall average recruitment, and also increasing catch uncertainty as was requested by the data workshop. Of note, during these models, the catch data were still predicted exactly because we weren't giving the model that flexibility of individual annual Fs. And so, that's something that was also explored following the-- in later sensitivity runs.

The assessment development went on to incorporate the indices of

abundance, the fishery, the annual length composition data as opposed to the aggregated one, so the super year. Sometimes I also call it the pooled approach. We also incorporated dome shaped selectivity for that fishery independent survey.

Dome shaped selectivity was justified based on the sizes that we're seeing. And so, the survey's seeing-- it's a survey that operates on coral reefs and it's seeing a smaller yellowtail snapper than we are seeing in the commercial fleet. We talked a little bit about time blocks earlier, so those were implemented in this later stage, as well as turning on recruitment deviations. And I do want to note that those recruitment deviations were turned on for all years, even though our indices don't start until 2014. And so, that's also something that we come back to in later explorations.

I've walked you through what was on that last slide. I basically talked you through everything we have here. But, again, like, in case there's a specific model that we want to revisit, this is just that table that allows me to go back to finding it and to showing that progression towards those steps that I described on the previous slide.

That brings us to the model development that was explored during the workshop, and that made it into the addendum that the reviewers referenced in their CIE reviews. And the first, review workshop model changed the model from a two-sex model to a single sex model, so fewer parameters, even though those parameters were being, fixed to the same information. So, this simplifies the model.

We'll also talk about further model simplification steps later in the next slide. Just because when you're trying to run those experiments about understanding this parameter space, it's helpful and important to simplify where you can, to really be able to isolate the effects of key changes. And so, that was one of those simplifications. We also changed the F method to estimate annual S so that the data would not-- so, that the uncertainty that we were trying to reflect in the catches would still be represented and carried into the model.

That also brought us to bumping up the catch standard error to 0.3. This was also because we're seeing this kind of, not tug of war, but this competing between the model fitting the catch data versus the index and the length data, and so, that also brought us to investigating the survey standard errors and realizing that those needed to be adjusted to log space. And so, those were also corrected. I think they just increased very slightly

or decreased very slightly.

But that brings us to what the reviewers and the team at the review workshop kind of considered to be and say how can we better understand this model? What can we try and have it do? Or how can we improve some of our understanding of the key uncertainties?

One of the first things was to try and estimate growth. This is kind of an experiment because we really don't have age data in the model. So, it's kind of just saying, what does the model reconcile between predicting those catches, predicting that index, and predicting the length composition? What estimated growth did it expect? And depending on different settings, it estimated it lower, higher, or similar to where it was. But this is, I think one of the research recommendations I've included later, it also alludes to the Florida model for-- not Florida, the Southeastern U.S. model for the yellowtail snapper, where those data have been incorporated into SS. And so, it does give SS more information to really estimate where that, especially that growth during those small years. And we'll look at the growth information that we have and again, why it's difficult to understand that growth for those very young fish.

So, that's not something-- Estimating growth is something I consider doing further in the sensitivity runs that we've talked about recently, but we actually don't have a model that's structured to estimate growth. So, it's an experiment that we ventured into during the review workshop, and I did not revisit that.

But what I did revisit was looking at a fixed alternative value, and we'll talk about that a little bit later. But it does tell us a little bit about using an alternative value, a higher maximum length, does kind of knock the model into, in some cases, into a implausible scenario of very low productivity. And so, that's something we'll discuss a little bit later, but I did want to just kind of revisit kind of the key uncertainties and some of the important points that came up and that are represented in the stock assessment report and in the addendum.

That brings us to the next models that we see here, trying to increase the data for the survey. So, trying to include those additional years of information when only La Parguera was sampled. So, that adds, an additional survey.

We also explored that while trying to see if that estimated growth. We had some convergence problems when we tried to just

add complexity to the model, but still have a lot of rigidity in some of these assumptions, of key assumptions of these parameters. And then, the exploration and recommendation of, "well, okay. So, maybe the model needs a little bit more information. So, what if we kind of pull in the Saint Thomas/Saint John data into a larger Puerto Rico, Saint Thomas/Saint John model," which we ran it at the time. I see the strength in or the logic of wanting to include more data and how close these islands are, but when you also look at the data, the landings from Puerto Rico are much higher than the Saint Thomas/Saint John data. So, it's become still, kind of, like a Puerto Rico driven model with some information being incorporated from the two indices, the two fishery independent indices that we do have from Saint Thomas and Saint John.

There's the traditional NCRMP, and then there's a series of years for which they went into deeper water. And so, they have those two indices that tell us a little bit more about the difference in the size composition in those two different domains and those two different depths that are sampled by the regular coral reef program and then the deep coral reef program.

This just summarizes the ones that made it into the report, but we tried working with this model and looking into different ways of trying to understand the model dynamics and the key sensitivities and the key uncertainties that would help make some of the assumptions and address some of the concerns with the model rigidity. And so, that tells the story of how we got to where we ended up, and then what we tried next to kind of explore the parameter space and just communicate what consistencies we see across model runs. So, that's what we'll talk about going forward.

So, now we come to the runs that were prepared in response to exploring that model rigidity and those key assumptions. And we did so with this kind of phased approach where we start with the review workshop one model. So, that model that had a couple of really good suggestions for simplification to a single sex. Then we also corrected catch units. I'll touch on that in a upcoming slide, and we'll also look at the implications of that.

The next kind of stage of development was turning off recruitment deviations. So, as I mentioned, recruitment deviations were on for all years. And what I ended up trying later in the model development was recruitment deviations, but only for the years that have the information from the indices that is intended-- indices of abundance telling us about what's in the water, telling us about recruitment, telling us about

that relative abundance.

And so, that's a step that we, you know, I turn it off, but then I intentionally turn it back on in a different way. And that's important to note because the recruitment deviations in a lot of the models that we were exploring at the review workshop, when those were all on, they can pick up a lot of the dynamics of other attributes, of other attributes in the model, and so that can be a bit of a concern. So, you really kind of want to develop your model and then turn on recruitment deviations. You really want to develop your model, understanding some of the key uncertainties and ways that the model fits the data without recruitment deviations, as well as then with them, and only using them in years where you think that the model really can inform recruitment signals.

So, after just kind of this brief cleanup, right, I then updated the model through 2024. So, we had two additional years of data because the previous model went through 2022. And then I took some additional structural simplification steps, as well as a direct recommendation from the CIE review. So, I guess I'll come back to this in a minute because I just want to briefly talk about all the stages.

Then I looked at the sensitivity of specific parameters by looking at and using informed estimates to base, like, what is a value, a plausible value for this based off of a reference or based off of a justification that we'll get into later, and then just doing that in a single factor sensitivity, and then looking at a bit of the permutation of those scenarios, of the combinations of those alternative parameters. And then lastly, I looked at the recruitment estimation with specific runs that I'll kind of hopefully clarify to you soon.

I want to come back to structural simplification and just the steps that were done to try and improve the model in a way that would allow me to understand, to isolate the effects of the uncertainties that we wanted to look into.

So, I have a plot for it later in the presentation, but the first one was just using a Lorenzen m. And so, instead of applying the same natural mortality to all ages, this scales the natural mortality to be applied at different levels at age, but to effectively average out to the same overall natural mortality. And so, the natural mortality is much higher for younger fish, than it is for older fish.

I also adjusted the growth, and we'll see that and talk a little

bit more on that on a on a dedicated slide. But in brief, I adjusted the settlement age to be from 0 to 1, and so that allows fish to kind of grow linearly to the size at age one from 0 instead of trying to use the von Bertalanffy growth to understand what size those very young fish, those young of the year, what size they are.

I also simplified the model to only one settlement. So, previously, we were using 4 settlements, and that was intentional to account for the annual spawning-- the ability of this species to spawn year-round that we saw in the gonad analysis and the life history information. However, to simplify the model, and especially because I was looking at the selectivities, and this creates four different selectivities, or season specific selectivities, for those settlement seasons, I simplified that, and I think that was also a good recommendation, because we do want to work with a simple model. This is a data limited kind of approach and adding that kind of seasonal dynamic, while it's in line with the biology of this species, the one settlement is not necessarily a step we would take in a very data limited approach. So, that was just an additional simplification.

The situation for estimating those really small fish was still challenging, and so, originally, we had fish bend under 9 centimeters, and so we were estimating the fish that were observed in the in the coral reef survey. They saw fish less than nine. They saw fish between nine and twelve. And so, we were trying to kind of really predict or the model was trying to fit to those data that we see. That's kind of challenging for the model to really predict those very small fish, especially given the growth curve, which shows that these fish grow so fast. So, they're only that size for, like, an instant. So, how could the survey have seen them?

So, to alleviate how those data were being fit, and to improve the fit overall, I adopted a bin that was all the way to twelve. So, instead of zero to nine and nine to twelve, the smallest bin just captures everything before your second bin, and so our second bin now starts at twelve centimeters. And then we use the 3-centimeter bins, from there until, I believe, 48 centimeters plus group. Okay.

Now we get into the combos of the factors that I explained above. And I had some convergence and bounding on when I just kind of grouped them all. So, then I took like a bit of a more structured approach and just grouped a few of them. We'll also talk about another moving piece in this model, which is the

domed selectivity.

So, we talked about domed selectivity earlier, about how it's meant to reflect like a window of the sizes that are exposed to a gear or to a given survey, and that can be because of the gear in particular, or it can be spatial, like, certain sizes might not be in the same places. And so, dome shaped selectivity is what we justified for the survey.

But what's important to note is that the model, like, can move around and how much dome between estimating the stock dynamics of the virgin, you know, the unfished stock size, the unfished spawning stock size, and all of the fishing mortality, in addition to estimating the level of that dome, those tend to be correlated. Because the higher the dome-- so imagine the dome not going all the way down to zero. The higher that dome, the more the model is telling, for that selectivity, the model is inferring that I should be seeing these fish. And so, if they're not there, that's because they haven't grown or they've been fished out, or they weren't recruited, as opposed to a dome that goes all the way down and then when you don't see the fish, you say, "Oh, I don't see them because they're not seen by this survey." And so, they're probably out there. That's called cryptic biomass. So, they're out there, but they're just not seen by this survey.

And so, that dome can be very influential. That assumption of how much cryptic biomass is out there and how much of these large individuals, what percent, like, what probability of these large individuals are expected to be seen in the areas surveyed by the coral reef survey, by the divers, is also related to the model dynamics in that way. And in order to really isolate-- So, this was another variable that causes a bit of trouble because it can move around so much when you're trying to understand and isolate the effects of other variables. And so, I fixed it, and so that gets me, so that the combination of these structural simplifications gets us to the simplified model that I then, I believe, is simplified and in a good place to then explore and understand sensitivity of important parameters individually, so isolating effects, that wasn't really possible prior to making these simplifications and these kind of ending up with this Model 15.

Just for reference, I don't think I mentioned this earlier, but this is just the key. So, if there are runs that we want to look at directly, this is kind of just the shortcut for me knowing to go look it up.

And so, we've got the model run. We've just made it all the way to model 15. We've got the terminal year in there. The letter represents what stage. So, we've got the stage where I removed-- the first stage was a, and then b, and then c, and then I got a little creative over here or d, e, and f. I didn't get creative. The p's are the creative part. I don't remember why I used p.

Anyways. So, we've got that shortcut and, I guess, just the description of the labels that allow us to kind of, these are the labels that I use on the figures. So, this is just, again, just orienting you back to the key.

Okay. So, I think I'm going to keep going through the slides because I do have this slide coming back again later to talk more about the multifactor and the recruitment estimation and the outcomes of those runs. Let's see.

Our next slide will tell us a little bit more about the alternative length that I explored. So, that's L1, the estimated selectivity [inaudible] that I that I looked into. Whether I estimated or fixed it to an alternative value. And so, we did that for the domed selectivity, as well as for steepness.

Okay, so that brings us to our next table to explain. So, here are the parameters that I was able to explore during these, for these additional sensitivity runs and to try and isolate their effects. So, I did that for the length at the maximum age, the dome shaped selectivity, the steepness, and whether or not we use recruitment deviations.

And this first column of values tells us what the parameters were in the simplified model. And so, it used our L infinity of 42.2. Kevin, do you have a question? Okay.

VANCE P. VICENTE CERNUDA: Oh. Yes, Kevin. Go ahead.

KEVIN MCCARTHY: No. That was a mistake. Didn't mean to I must have hit something on my--

ADYAN RÍOS: Okay, continuing. The first column is the parameters of that simplified, so that model 15. And so, we have a fixed L infinity of 42.2. We have the fixed dome selectivity of -2, about -2, -1.9. We have a fixed steepness of 0.99, and we have recruitment deviations turned off.

Then we have the alternate values explored first in those single sensitivities and later in the combined, the combination of sensitivity runs. And then lastly, it was as to whether these

parameters were also included in versions where they were estimated or not. And so, the L infinity was not estimated. However, we did explore the model's estimates of the dome shape selectivity as well as the steepness. And then ultimately also turning on those recruitment deviations only for the years of 2014 to 2022.

Even though our indices go through 2023 and our terminal year is 2024, these were kind of chosen as those years of good-- of the model being able to be informed by the indices and carrying over that recruitment signal.

Okay. So, we're going to now cover-- I'm just going to jump back on slide. So, we're going to cover some of the details that go into the correction and the structural simplification. So, when I presented this plot on the left, which is in pounds, I had calculated the recreational landings with that appropriate 7 point, I believe it was 78%.

However--

GRACIELA GARCÍA-MOLINER: Apologies to all. We're working on it.

(Whereupon, a brief recess was taken.)

LIAJAY RIVERA GARCÍA: Good afternoon, everybody, and welcome again. This is the SSC meeting backup link. We have just created it, so we apologize for the inconveniences that recently happened, and it went outside of our power as it was being spammed. So, we are waiting for the rest of the people to come into the meeting. If you see if you don't see someone who was there, please share this link with them.

We try to gather all the people we had in the list, but it's better to double check once we wait here for the rest. So, we're going to give it, like, two or three minutes to see everybody there. We see most of the SSC members are coming in, but we had other DAP, OEAP, and EBFM TAP members here. So, thank you for your patience.

Although we have quorum, we are in communication with Adyan, and she will be joining in a couple of minutes. So, stand by.

Hi, Adyan. We see you back again.

ADYAN RÍOS: Hi.

LIAJAY RIVERA GARCÍA: So, we are giving you co-host, and

you're-- Okay. We can see your screen. Thank you.

ADYAN RÍOS: Okay. Let's give one more second for Kevin to join. And I do think we'll be able to get through the presentation in the remaining hour. It just, we might not have a lot of time for discussion and questions. So, let's just see where we end up. But again, like Kevin said, tomorrow's discussion of the U.S. Virgin Island models includes a lot of redundant topics of the presentation that we've covered today.

Okay. I will proceed. We were getting back into things. I wanted to just briefly touch on the correction to the catch. And so, as I explained earlier, that almost 8% that made up recreational catch, when I had estimated this with the data for metric tons, I had accidentally carried in a 0.8 just from earlier when we were exploring different ratios thinking that I think the error comes from being close to that 7%, but 80% is very different than almost 8%.

Since that's applied across all years, what it effectively does is scale everything and so adding these additional years of information and revisiting the equations that created that allowed us to spot that mistake and correct it. And so, since in the model we're just using metric tons, this is what the catch time series was when it was over expanded to have that ratio incorrect versus now that it is correct, as well as those additional 2 years of data.

Oh, wait, the 2 years of data aren't shown in this version, I don't think. 2021, 2022. They're not. I'll show those later. So, this was the first step that I did. It was to correct that. Or maybe they are. Yes, I think this is '21, '22, '23, '24.

Okay. And so, this is just showing you the plot corresponding to those components. So, I just wanted to, again, double check that now this has been corrected and in metric tons. We do have the information accurately showing that that maximum is 300. 300 in that correction.

Next, I want to show you the NCRMP density index. And so, this is the index that we said was island wide. It starts in 2014, and we have 2014, 2016, 2019, 2021, and 2023. We also have the data available. They've already processed their data for 2025, but it is not included in this model because this model has a terminal year of 2023.

I wonder if it's possible to kind of include that one year of information in projections and forecast, but we can come-- we're

not kind of making a strong recommendation to use any particular model. We'll kind of get to that conclusion at the end. But what we're seeing is how these models are responding, what the parameter space and the uncertainty that's been explored, and how that relates to current management. But it is good news to see that over-- this is-- since 2014, we see a blip down in 2016, but overall, the index shows it's been pretty steady in those years. And then we see that most recent years showing a pretty drastic increase, that 2025 data point for the survey.

Okay, so before we move on as well, I also wanted to-- before we move on to, like, the results from the models, I also wanted to show the additional length composition information. That also goes now with an additional year for the survey and an additional two years of commercial data, the port sampled commercial fleet length composition. So, those are going through 2024 now.

Next, I want to just kind of dive into a bit of the implications of some of these changes and explorations. So, first we have that landings correction. So, the dynamics are quite consistent. What changes is the scale. And so, that's what we kind of expect when the landings change, especially as, like, a scaler, right? Like, a multiplier across all years. We see that affecting the scale of the model, but not the trends and not the fits. So, the report also has the selectivities and, I believe, yeah, more tables and information about this. But overall, I just wanted to present that this is not something-- I have got to close my door. I'll be right back.

So, one, this change is not having a big effect on our interpretation of the stock status and of the stock trends over time for that structure of the model. Then, we turn off the recruitment deviations. And so, this led to a bit of an important change.

So, first, we kind of did this in a couple different approaches, but the one I'm presenting in the report and in the table is-- Oh, wait, no, this is right. So, we have our review workshop, then we have our corrected catch units, and this is showing you the fit to the catch data, then the fit to the catch data when we turn off the recruitment deviations. And the fit to the catch data without the recruitment deviations kind of highlights this conflict between the data inputs.

Because without recruitment deviations, when the model is fitting, you know, assuming an annual average recruitment across all years, it doesn't want to predict these catches. It predicts

much lower catches over this period, and then higher catches in the more recent period. So, that's something that I wanted to also simplify and in a way correct, because we only have indices starting in the later years, so I think it's important to apply that same philosophy that we talked about previously of really only turning on recruitment years when we think we have information to help inform those cohorts that are being predicted and forward projected in the model. And so, to return the model to fitting the catches without recruitment deviations, I reduced the CV down.

And so, increasing the CV was something that we had explored during the review workshop because we were expecting to see some uncertainty in the catches, so we kept ramping that up. And then, when I turned those recruitment deviations off, I saw I was able to understand a little bit more about what those recruitment deviations were doing. And so, it does seem like an improvement to turn recruitment deviations off, have it the average recruitment overall years based on the data and the model. But then later you'll see that I do turn them back on as an experiment once we've established the model and understood more of the uncertainties, I do turn them back on to help bring that dynamic nature of the biological population into the model.

We do, just like we've talked about with Spiny Lobster, when we do have an index and we have a model that's responsive to that index, we're set up to be able to make quicker kind of management advice about what we expect to happen in the future. So, it's really great to have indices and to have those indices be incorporated into the model in a way that's dynamic. So, if we see those indices increasing, the model is able to interpret that is because the underlying population is increasing, or alternatively, if those indices are decreasing, the underlying population is decreasing.

Okay, so that brings us to model six. So, I just wanted to show you what that step in the development process of simplifying and isolating the effects of the individual components and decisions of those assumptions that went into the models.

I also alluded to earlier about that wiggle room and where the dome ends up related to also estimating other parameters. And so, I'm showing here the selectivities associated with the model runs that follow that same story. And so, ultimately, we see this selectivity going from 0.4 down to closer to 0.2. Those are probability. So, above 25 centimeters, the probability of still being seen by the survey was 40% down to 20%. And so, that has, when it's interpreted along with the length composition data, it

interprets, "okay, well, I'm not seeing fish above 25 at a high probability because I don't expect to see them, or I'm not seeing them because they're just not there." And so, this is just another, important, attribute that was that I was also able to isolate and explore in the subsequent runs.

Now I want to get to describing the changes we made to growth. So, originally, we were using von Bertalanffy growth equation, which incorporates the K and the L infinity. And then we also had the model, I had adjusted the model to start at 0, size 0 for age 0 fish.

And this, recall that the National Coral Reef Survey sees a lot of fish less than 10 centimeters, and so that's not a lot of opportunity that the model was allowing for them to be seen and exist at or very short period of time, very high very low CVs on those young fish. And the CVs that I had also kind of included just based off of looking at the distribution of the data that we have in the working papers, I had included pretty wide CVs on the older fish as well. And what this does is it really allows the model, when we were exploring, potentially estimating or adjusting this to different values, you're not able to really isolate the effect of that adjustment if there's a really high CV because you still are able to-- the model still allows that variability around that estimate.

So, in the simplification and in the attempt to isolate the factors to better understand the sensitivities of this model, I adopted the growth on the right, which has higher CV for the small individuals, lower CV for the large individuals, and a faster growth to age 1, all the way through the size that corresponds with where the von Bertalanffy growth kicks in at that size.

Here we also have the natural mortality, how it was rescaled to be higher on the youngest individuals. Okay. The report has the-- I think I have them in the slides as well later. The comparison of the outcome of these changes, of the changes in growth and the changes in the simplified model, compared to prior to the simplification. And then, as well as compared to after the simplification.

Here's where we get to the growth information. And I guess I mentioned alternative 50.8 briefly when we were talking about the alternative estimates. I just wanted to point out where I got that. And so, the information from the data workshop working paper that we used came from this fit, the fixed T naught. And so, we used the 424 and the associated K.

But I also wanted to just revisit and show our growth. You know, we have-- It's very common to have fewer individuals at that smallest age 0. And so, that's, again, a big topic in this model of, we have this index of abundance, we're seeing small individuals, we want to use that information, but we also need to be thoughtful about how we do that with the growth curve.

And then, I do have information here as well about what they use in SEDAR 96. So, they used an L infinity of 42 as well, but they actually use that-- they're estimating growth inside SS. So, they actually estimated, I think, at 38. And they also estimated their T naught. I think it was much higher. I think it was, like, somewhere, like, an 18, or something, centimeters. And they also use a much, well, not much. They used a lower maximum age of 20. However, we do see an individual that is 26 in the U.S. Caribbean, specific data.

We also see how the kind of origin of the information is coming from fishery-dependent and fishery-independent sources, and that aligns nicely with the size limit. However, we do see that, like, we do see this similar spread. We do see this similar spread in the SEDAR 96 data. So, when it came to, kind of exploring the sensitivity to this and trying to determine a value to just really test the limits, kind of, like, explore the model space.

I could do this with, like, uncertainty grid or a likelihood profile where I try, like, a range of bunch of parameters. But because there were so many different things that I was exploring, I kept it simple, and I just chose a value based on alternative fits to this same data. So, that's where that value of 50.8 comes in. But again, the von Bertalanffy fit that was recommended by the data workshop was this 42.4. So, I do report the effects of that.

The effects of that are what we'll see when we look at the combinations of the models that end up in this implausible scenario, what we call these implausible scenarios, and that are documented in the report, are all associated pretty much with when we use this larger L infinity. And so, this kind of shows that if we entertain the hypothesis that the L infinity was much higher than what we're seeing by fitting directly to the data with that fixed T naught, then that would mean that the model's not really converging on a plausible population trajectory. And so, it just provides that context of all the consistency that we see across the models with the 42.2 and then this kind of jump to the implausible state of really highly depleted and low

productivity that wouldn't support current catches. So, that's what defines that, those runs as being implausible.

So, I did want to just bring us back to this and back to kind of the modifications that I made to the growth in order to try and isolate the effects of some of the key parameters and dynamics in the model. Okay. That brings us to just talking a little bit-- Yeah, go ahead.

I'm sorry.

VANCE P. VICENTE CERNUDA: Richard? Yeah.

RICHARD APPELDOORN: In that graph where you show all the points of age and length, I understand how you get the age of the fishery dependent ones. How do you get the age of the fishery independent ones? Were those also-- those were captured but just not in the commercial fishery?

ADYAN RÍOS: Correct. Those are, I think I--

RICHARD APPELDOORN: Okay. They're not from the divers. That's fine. that's all I need.

ADYAN RÍOS: Right. Okay. So, the blue ones come from purchasing fish from fishermen, and then the red ones are from intentionally seeking out fish of those sizes, not through the fishery.

Okay. So, this brings us to just kind of this kind of forest level view of everything that was explored in the recent report and in the efforts to understand the model rigidity and those key assumptions and their effects on trends and on scale and such.

And so, on the left here, I've highlighted in blue the ones that we, like, particularly discussed and looked at the steps into it. And so, there's also additional plots in the report that show comparing 1, 2, 6, and 7, and then 7, 15, and, I think, 33. So, this is just showing that ramp to how I got to this model 33.

And then also, we talked a little bit about what the alternative values were. So, that alternative length of 50.8, what turning on the estimation for that dome selectivity, turning on the estimation for the steepness, or fixing those to those two alternative values that I included. I used 0.8 for steepness, and that was based similar to what was used in the SEDAR in

Southeast United States. And the alternative selectivity was at that, I think it was at that, like, higher 40 compared to the estimate that I fixed it at, which was closer to the 20% probability of seeing those large fish in the dive, in the domain that is available to the divers.

In red, you see the versions that either bound or converge in this highly, highly depleted scenario. And all of those, except one, are all associated with that larger length. And so, also when we use that alternative steepness and estimate that selectivity, it kind of shows that-- it kind of also takes the model to different kind of interpretation of what's been going on. But what we see across all the other runs, in our single factor sensitivity and our multiple factor sensitivity grid, do align with the trend that we'll be kind of showing going forward, which is showing that the stock started at a highly depleted state as supported by information that we have from the late seventies prior to when this assessment begins in the eighties. And then, just also factoring in our catch series and our length data and these indices, kind of, corroborating all of that signal that is supported by the various other runs and combinations explored.

I also took the-- So, in addition to the single factor selectivity, I also took the simplified model and estimated recruitment only for those years with the index. And then I also looked at estimating the selectivity and estimating the selectivity and the steepness, and I've got those comparisons.

And so, they're just showing that they corroborate in the trend that we see, especially across all years. But, then we do see this like growth in the spawning stock biomass suggesting what we kind of conclude in the report as all of these models and this refinement to isolate and identify the effects of these particular components, all corroborate that current management. So, that current ACL, the current landings are consistent with what we're able to explore and see here. So, instead of saying, like, potentially saying, this is the model for which management advice should be based on. It's kind of saying, this suite of models and these explorations show that the current management is effectively allowing seeing increases in our spawning stock biomass.

So, it is a limitation of data limited methods, and it highlights the importance of using SS and evaluating these detailed assumptions, but also potentially what we have coming up with SEDAR 103 of investigating approaches that also allow us to understand what's happening across the trends and what are

the data telling us, and how does that help us understand how current management is expected to be operating. So, is it being effective at maintaining the stock in a good place? And what we see now is that with the recent time series of landings, which we focused on a little bit at the beginning, we're seeing these increases.

And so, that's presented in report with the various comparisons between the ones highlighted in blue. And then there's also, I believe, likelihood tables and other information, other tables presented in the report for all of the runs. And so, this is just that kind of forest level view of the situation where the model is not being in a consistent story, and then all the other instances where it is, and then what those were.

So, I'll focus on some of those key, kind of, changes made. And in these plots, the labels are always in the plot on the top right. And so, we've got the model with the-- turning back on the recruitment deviations here.

So, here we're going from the model where we turned off recruitment deviations, which is in blue, followed by the model where we extended the data one year, followed by the model where we've simplified the dynamics, and then followed by the model where we estimated recruitment trends. So, that captures what we're seeing as far as the fit to the index, the estimated spawning output, the estimates of F being very high at the start of the time series, but declining over time, and then also incorporating the recruitment deviations only in the later years.

So, here we have the comparison of the recruitment estimation. So, only on the models, the last three models, where we were estimating recruitment deviations. So, you see how recruitment deviations allow that dynamic fit to the index of abundance in the top left here. And then we have the runs where we estimate the end selectivity, as well as the end selectivity and the steepness. And so, those are not deviating far from-- I guess, the tables are in the report, I don't have those tables here. But, again, just highlighting that we do see a model that starts with very high depletion, but we do see that F has gone down. And then in recent years, the models estimate that low F during this period where we're seeing the spawning output increase.

VANCE P. VICENTE CERNUDA: Adyan, sorry to interrupt, but Skyler needs to come in.

ADYAN RÍOS: Yes, please.

SKYLER ROSE SAGARESE: Yeah. Skyler Sagarese. I just had a question about-- if you go back one slide, I believe. Go back one. When you show those aged year recruitments, how well estimated are your rec devs?

So those seem to have really large bounds on them. I'm wondering if when you do estimate them, if they have CVs above one, meaning that they aren't well estimated. So, I'm just curious about that.

JASON COPE: Adyan, you might be muted. I don't hear anyone. Am I the only one?

ADYAN RÍOS: Thank you. I was talking and I was muted. Okay. I'll back up. Yes.

Thank you so much, Skyler. I've made a note to myself to pull that up because I do see your point very, very much so. Also, I think there might not be a lot of information in the final years of the data. There are fewer sample sizes and things like that. And so, in order to estimate these recruitment deviations, you need to have that index of abundance informing your cohorts, but then also some signal in your length composition data or in some other element that really allows you to infer that there's been cohorts coming into existence, strong cohorts.

So, I only have a few more slides left, so I'm just going to finish those up, and then I will pull up the plot that tells me about the, that we looked at earlier for lobster, that tells whether the recruitment deviations are being informed well by the data.

Okay, so this last couple slides just goes into some of the references that I found that kind of highlight what was happening before '83. And so, this slide shows shallow water reef fish landings, commercial plus recreational, from '75 to '82. And we do see, like, obviously, this isn't just yellowtail snapper, but we've got-- let's see, shallow water reef fish.

We've got lobster over here. We've got reef fish. Oops. Just showing that by the time we're starting our data series in '83, this is past the period of really higher, much higher exploitation. And so, we don't have this broken out by species, but we also have the observation in the federal register, I believe, it's where I got this, of reporting the large percentage of fish that were being caught below the size limit, what eventually became the size limit. So, this is what prompted

the creation of the size limit.

And so, prior to-- Or let's see. I think I don't have the years associated with this table. That could be something nice to add, but it's from the same source. That's linked in slides as well. But just pointing out, again, that, like, we are starting from high depletion. So, that is also something that we see from the model runs. And those that consistently converge and provided that consistent trend.

So, we need to come back to the SSC review and decisions. I just copied this from the other presentation, but the recommendation that we put forth in the review of the sensitivity runs was that current management is seemingly-- what we're seeing here is not suggesting that there's concerns with current management where it's at.

Okay, that ends that presentation. So, I'm going to pull up the R4SS just to take a quick look at one of the first run before we're estimating--

Yeah. So, it really-- this is the plot that we looked at earlier as to high values show that the recruitment is not informed. And what we're seeing is it's not, so these are, this is kind of reflective of our index. We don't have data in every year of our index, so it doesn't have information, which is an interesting result that it's, kind of, responding to the lack of information in that year, it appears.

Skyler does that kind of help with-- Oh, go ahead, Jason.

JASON COPE: Well, let me-- This is Jason. Let me let Skyler answer first.

SKYLER ROSE SAGARESE: Yeah, Skyler Sagarese. Yeah. Thanks, Adyan. This is helpful. This is kind of what I expected.

I mean, it's not terrible, but it's-- yeah. As you mentioned, because that index is not every year, it definitely questions whether these are trustworthy enough to consider.

JASON COPE: Umm. This is Jason.

VANCE P. VICENTE CERNUDA: Jason?

JASON COPE: Yeah. Thank you, Mr. Chair. This is Jason Cope. Adyan, do you mind going to-- so, you have length compositions in here. Can we go to that? Yeah.

Great. And go ahead and scroll down. So, here are the residual plots. I'm just curious if-- I mean, because you technically, you should have some-- you are getting smaller individuals. You would think that you would have some information on recruits from this. And I was just curious if in the earlier years where you're not estimating recruitments, if we're seeing a pattern, And, it's kind of hard to-- yeah. Maybe go down to the mean, mean length plots a little farther down. Oh, this might-- I think that's the--

ADYAN RÍOS: Yeah. I am sorry. I just also like looking at it without the fit first as well. By the gear.

JASON COPE: Sure.

ADYAN RÍOS: And then I'll go back to the to the mean one, now.

JASON COPE: Sure. And I know this is kind of hard because we have to overlay, in our brains, selectivity changes. Right? Because you have the selectivity changes. And this is-- and so I got a little confused with the proposed reference model.

Is it with this the recruits at the very end on? or is it off?

ADYAN RÍOS: So, this is estimating recruitment deviations?

JASON COPE: At the very end.

ADYAN RÍOS: At the very end.

JASON COPE: Yeah. Like, 2011 forward or 2014, whatever it was. Yeah. But does it also have a catch variance as well?

ADYAN RÍOS: It does, but it doesn't veer too far off.

JASON COPE: It's not too far off. Yeah. Because the interesting thing is because the recruits-- I'm curious if because the recruits are on, they soak up any differences between the catch from the time that they're turned on onward. But before that, because there are no recruitment estimates, that's where the model is able to adjust itself where it may have adjusted for recruitment, now it's doing it through catches.

I'm just kind of curious, if you ran a model with recruits being estimated for the whole time series and you had your CVs on; would you see any differences in the catches? I don't know if-- I don't know if you would.

ADYAN RÍOS: That was--

JASON COPE: Did you have one?

ADYAN RÍOS: Yeah. That was this one. Wait. No. That's when I turn off the recruitment deviation.

JASON COPE: Yeah. You turn it off. Yeah. Then it's all-- yeah. Then it's all catches. The catches soak up all of the process errors.

ADYAN RÍOS: Mhmm.

JASON COPE: Yeah. So, that's exactly what you-- I'm not surprised you see that, and that's definitely not desirable because you don't know why it's-- yeah. It's population processes are now being translated through catches. So, you have something where it's kind of a hybrid where you're letting it do process error from whatever it was 2011 or 2014 onward.

ADYAN RÍOS: Yeah.

JASON COPE: And then behind that, it's able to adjust the catches. My curiosity is if you did leave the catch CV at 0.1, but turn on recruitment for the whole time series, estimate the variance, and then look at that plot that you just pulled up that Skyler requested.

ADYAN RÍOS: Yeah.

JASON COPE: I'm curious to see if the difference in catch goes away and it soaks up that process there through recruitment and if those are actually informed. Because those would be informed not by the index, but by your length comps, which is absolutely reasonable. That's what length comp should be doing if they're catching kind of smaller individuals. So, more of a curiosity runs for me because that might reconcile some stuff too.

ADYAN RÍOS: Yeah. So, I can run that, and then maybe send it out by email since I know you're not here tomorrow? But what would say is recall the conversation too about the concern about our commercial length composition data? About that targeting behavior and how initially we were exploring it as a super year? So, I do see the value in running that as an experiment to understand, like, where does it go. But like, my gut still tells me that we were still concerned about using those data for cohort signals.

JASON COPE: So, okay. So, with that with that comment, are you suggesting that they might be good enough to capture-- Basically, the-- and I think you said this maybe earlier. The lengths might be good enough to get your selectivity, but that's it. We don't want them messing around.

And so, if that's the case, you could-- and this is done. You fit this model like you just did now, and then you go back in, you fix your selectivity curves that you think are realistic and that have been defined by these length comps.

ADYAN RÍOS: Yes.

JASON COPE: But you drop the lengths totally. You get them out of there because they did their job. You fix to the selectivities that you think are reasonable from those lengths, and then you let the model run forward. And like you said, you're probably not going to have any ability to estimate recruits beforehand. You basically have the exact same model.

Another way to do this would be just to go into the lambdas, make your-- basically, use your control file, new, your control new file. Fix your selectivities. So, turn those phases off in that control new. Go down and turn the lambdas to 0 for the length comps and then just rerun your exact model that you have here. And that would take out your concern of those lengths still being in there.

And even if they're not-- even if they're not informing recruits because you've turned them off, they're still in the likelihood and who knows what the heck they're doing in order to reconcile their fits to that data early on. Because it's still-- those data are still in there and the dot model's like, oh, we have got to fit these. And it may be pulling your model in ways that you don't want.

And so, this becomes basically an age structured production model but with smart selectivities defined by your lengths instead of these surplus production models that just assume everything's equal to maturity and all this stuff. So, it's a nice setup of an age structured production model. And I think it may do exactly what you're doing removing who knows what those lengths are kind of moving around right now, which might be your catches in the past.

ADYAN RÍOS: Right.

JASON COPE: Anyway, something to look at. Again, is this, like, a sensitivity suggestion, or is this a future research recommendation? I don't know. But it's definitely a curious run that I think might be useful.

ADYAN RÍOS: Thanks, Jason. I think it would be like a sensitivity suggestion if there's still a chance that we think that one of these models would be a base case. In the report, I've included, like, the range of MSY proxies from the various models and just, kind of, in the ballpark of current management. But still, like, that would be refined with the base case with the strongest support for all of the parameters and the uncertainty that we can capture.

I do think that research recommendations involve better understanding. I think I included those key ones in the report that suggested understanding dome selectivity. So, understanding the probability of the divers observing large yellowtail snapper. And so, I think that can be done with, like, if there's another survey in another area that we can then, kind of, help understand selectivities across surveys for getting at better characterizing that dome. Yeah. Go ahead, Jason.

JASON COPE: Yeah. Thank you, Jason Cope. Also, can you remind me and my apologies for not remembering. You've noted one of the really important aspects or characters of this assessment is that when the data start, the thing is already, like, massively depleted.

ADYAN RÍOS: Mhmm.

JASON COPE: I mean, it just can't even go much lower. All it can do is kind of go up, and that lower bound is going to constrain and let them all do something. Can you remind me how it gets to such a low value? I'm assuming it's an equilibrium catch.

ADYAN RÍOS: Yes.

JASON COPE: Yeah. And, again, I know this has been probably said 1000000 times. How did that come about that level, and what was it?

ADYAN RÍOS: So, we used the 3-year geometric mean for the fleets as the input, and then the CV on catch still allows it to deviate a little bit. So, I think the report has the realized catches for each run. And I think that's one of the ones where it deviates. Let's see here.

You see that first year really ramping up?

JASON COPE: Yeah.

ADYAN RÍOS: And then same with the Fs, which I do think I have that.

JASON COPE: Yeah. The Fs are wild. Yeah. They're really, really high, and that's reflecting that incoming. But the-- so, are you saying that the equilibrium catch also had air on it? So, it was able.

ADYAN RÍOS: Yes.

JASON COPE: Okay. And is that in a table? So I'm just-- I guess, from those plots, I could tell the F is, like, "woah. This thing is high."

ADYAN RÍOS: Mhmm.

JASON COPE: What is the realized? I just may have missed it in the in the PDF. What is the realized estimated equilibrium catch in metric tons? It has got to be, like, massive to get it so low, I would think.

VANCE P. VICENTE CERNUDA: Richard?

ADYAN RÍOS: Yeah.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn?

RICHARD APPELDOORN: A comment on how much this is depleted. It's depleted. I don't think there's any question about that and we don't have good species-specific data from that, but we do have good family or reasonably good family specific data. And unlike almost every other family you could think of, except maybe dolphinfish, snappers as a proportion of the catch go up, substantially. And so, they're withstanding a lot of this degree of exploitation.

Now, and yellowtail is the most pelagic like of the snappers and probably is able to withstand it even more. Just to let you know, looking at this percentage of the catch at snappers, in 1970 it was 20%. In 2010, was 50% and that's almost a straight line. There's variance around that. And of course, that's going to reflect bringing in particularly the queen snapper fishery and the areas associated with that that drives that up.

But snappers, as a whole are withstanding fishing pressure a lot greater than a lot of the other family.

VANCE P. VICENTE CERNUDA: Richard?

RICHARD APPELDOORN: That's my comment.

VANCE P. VICENTE CERNUDA: Yeah. Richard, I need to ask you for a favor. I have to leave. I have a very important meeting. I have three vessels, cable lane vessels in the North Atlantic, and I am the environmental supervisor, and I must have a meeting with them, now. So, I need to leave.

RICHARD APPELDOORN: It is five o'clock. It is five o'clock. Are we adjourning till tomorrow?

VANCE P. VICENTE CERNUDA: Well, okay. If that's the case, that's better. But, okay, maybe we can adjourn and continue the discussion tomorrow. So, it's 05:00. So, we adjourn this meeting until tomorrow.

Bye.

GERSON N. MARTÍNEZ: Alright, people. Stay safe.

JASON COPE: Bye, everyone.

(Whereupon, the meeting recessed for the day on April 9th, 2024.)

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APRIL 10, 2026

FRIDAY AFTERNOON SESSION

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VANCE P. VICENTE CERNUDA: Ahora sí, ok. Good afternoon, SSC, Chairs and participants. Today is April 10th, 2026. This is the third and last day of the first 2026 SSC meeting. This is the first of the SSC meetings, and this is a virtual meeting.

So, welcome back. So, let's begin with the roll call, and then we will discuss the agenda for today. So, first, Tarsila Seara? Tarsila Seara?

Juan J. Cruz is going to be a little bit late, and he'll be coming in in the next 5 or 10 minutes.

Elizabeth Kadison? Michelle is excused. Michelle Schärer is excused. Jason Cope? Hold on. We have a little bit of a technical problem.

LIAJAY RIVERA GARCÍA: Good morning, everybody. This is Liajay Rivera. Good afternoon, everybody. This is Liajay Rivera. We would like to make a note.

We have made a different or several changes in the security settings. So, now for a turn, please raise your hand. We have turned off the cameras and the audios. Any chat, any message that you send will be directly sent to the host and co-host, and those will be Kiara and myself. So, please, if you want to raise a turn beside the option of raising the hand in Zoom, you can write us to ask for a turn to speak.

Now I think we are ready to make the roll call. We have given you permissions to speak. So, Mr. Chair, you may continue.

VANCE P. VICENTE CERNUDA: Kate Zamboni, yes. Please, come in.

KATHERINE M. ZAMBONI: Let's see. Did I unmute myself? Okay. I was just wondering if everyone understood which link to use. When there weren't responses with the roll call, I wondered if people were using the alternative link.

But if the no response was because of the enhanced security settings that may not be an issue.

LIAJAY RIVERA GARCÍA: Correctly. I wanted to-- This is Liajay, for the record. Yes. We wanted to make that note first so everybody was sure that we were going to continue using the same link, but that was because we ensured that the security settings were upgraded.

So, now it is going to be more restricted, but you still have access. Just reach out to Kiara and myself. But it's the same link as in the federal register.

Oh, yeah. And that if they and-- yes, they can turn the raise hand button in the task bar of the Zoom, or they can just write to us directly in the chat.

VANCE P. VICENTE CERNUDA: Okay. Let's see how it works. Let's go through the roll call. Tarsila Seara? Juan J Cruz has excused himself. He'll be coming a little bit later in the meeting. Okay. He's already in. Okay. So, he's present.

JUAN J. CRUZ-MOTTA: Yeah. Good afternoon. I made it. J.J. Cruz here. Thank you.

VANCE P. VICENTE CERNUDA: Welcome, J.J. Elizabeth Kadison?

ELIZABETH KADISON: Yes, present. Thank you. Elizabeth Kadison.

VANCE P. VICENTE CERNUDA: Michelle Schärer has been excused. Jason Cope? Jason Cope, has also been excused. ¿Reni García? Jorge García.

JORGE R. GARCÍA-SAIS: Presente.

VANCE P. VICENTE CERNUDA: Qué bien, gracias. Richard Appeldoorn?

RICHARD APPELDOORN: Okay. I'm here. I have trouble unmuting. Present.

VANCE P. VICENTE CERNUDA: Thank you. Skyler Sagarese? Okay. Present.

SKYLER ROSE SAGARESE: Skyler Sagarese, present.

VANCE P. VICENTE CERNUDA: Thank you. Todd Gedamke, Partially excused. Walter Keithly? Walter Keithly?

WALTER KEITHLY: I am here.

VANCE P. VICENTE CERNUDA: Good. And Tarsila Seara?

TARSILA SEARA: I'm here. Can you hear me?

VANCE P. VICENTE CERNUDA: Yes. We can hear you, now. Okay. Those members that are here in the conference room. Oh, the-- I'm sorry.

I'm sorry. DAP Chairs. Julian Magras?

JULIAN MAGRAS: Julian Magras, present. Good afternoon, everyone.

VANCE P. VICENTE CERNUDA: Thank you. Gerson Martínez?

GERSON N. MARTÍNEZ: Gerson Martínez, presente.

VANCE P. VICENTE CERNUDA: Bienvenido. Nelson Crespo?

NELSON CRESPO: Good afternoon, everyone. Nelson Crespo, present.

VANCE P. VICENTE CERNUDA: Sennai is not present. And Jannette Ramos the OEAP chair is excused.

VANCE P. VICENTE CERNUDA: Okay. Now the conference members.

KIARA M. MATÍAS ROJAS: Buenas tardes. Kiara Matías, Council Staff.

LIAJAY RIVERA GARCÍA: Buenas tardes. Liajay Rivera, Council Staff.

GRACIELA GARCÍA-MOLINER: Graciela García Moliner, Council Staff.

VANCE P. VICENTE CERNUDA: Vance Vicente, Chair of the SSC. And the rest.

ADYAN RÍOS: Okay. Liajay for the record. We'll read the Zoom participant list. Adyan Ríos, Alberto Fort, Carlos Farchette, Derek Soto, Emily Ott. I have an iPhone. I believe it is Julian, correct?

Jesús Rivera-Hernández, Kate Zamboni, Katherine Goodwin, Kevin McCarthy, Martha Prada, Refik Orhun, Stephanie Martínez. And a phone number ending in 216; Please provide your name in the chat. Thank you. That is all, Mr. Chair.

So, we provided here a meeting recap of yesterday. This will be later available, but it's just a summary of what was approved, including the first and second day, starting with the verbatim transcriptions, the adoption of the agenda, the SEDAR 91 Caribbean Spiny Lobster on the first day with a motion for the determination of the assessment as best scientific information available. And on the second day, yesterday, we continued with the discussion of SEDAR 91, Puerto Rico. We also started the discussion for SEDAR 84 with the Caribbean Yellowtail Snapper for Puerto Rico and continued in the afternoon. And now, Mr. Chair, I will delegate to you the rest of the agenda.

VANCE P. VICENTE CERNUDA: Okay. Good afternoon again. We have for today's agenda five items to cover. Number one, we will continue with and complete the final review on SEDAR 84 Caribbean Yellowtail Snapper for Puerto Rico for approval/disapproval of the stock assessment report and thus

discussion also on OFL and ABCs, and develop and list the research recommendations. Adyan Rios will be the speaker.

Second, we will initiate and then complete the final review on SEDAR 84 U.S. Caribbean Yellowtail Snapper Saint Thomas/Saint John for approval/disapproval of the stock assessment report and recommendations on OFL and ABCs and develop and list the research recommendations. The speaker will be Adyan Ríos also.

Third, we'll initiate and complete the final review on SEDAR 84 Caribbean Stoplight Parrotfish Saint Croix for approval/disapproval of the stock assessment report and discussions on the recommended OFL and ABCs and develop and list the research recommendation. The speaker will be Adyan Ríos.

Then the last speaker will be Liajay Rivera, who will update us on SEDAR 103. As you know, well, SEDAR 103 is headed towards providing the development and application of alternate stock assessment methods for Caribbean island-based FMP species.

Then, will discuss what should we cover in the next meeting, this year's meeting, so that we can discuss that and present it in the next Council meeting. So, are there any comments or any proposed changes or recommendations to today's agenda? It's going to be a little bit busy, so we may have to extend past 05:00 today. But, anyhow, I'm open to discussions on the agenda.

Okay. Nobody? So, the agenda-- We will follow the agenda that I just presented. And then, if Adyan Ríos is ready, she will continue and try to complete the final review of SEDAR 84 Caribbean Yellowtail Snapper for Puerto Rico for approval/disapproval of the stock assessment report. So, Adyan Ríos, whenever you're ready, we're ready for you.

ADYAN RÍOS: Thank you, Vance. One second.

Okay. So, yesterday, we covered the slides that are in the slide deck that was shared yesterday as well. And we talked about the model development during the assessment, the model development during the review workshop, and then the subsequent sensitivities, investigating key parameters, and how those do show that the model continues to have that sensitivity and alternate kind of scenario outcome, particularly considering the alternative growth and the alternative, steepness, especially those combined.

And, we began our discussion and, Jason Cope had done a recommendation of extending the recruitment deviations over the

entire time with the fixed selectivities, as a way to address the concern that's documented throughout the assessment of whether the TIP length data should be used as cohort to inform cohort recruitment, and whether the model should be fitting to those or whether those should be just being used to inform selectivity. And so, that is very in line with the development and the concerns that have been raised and been looked into. Jason had asked whether that is a recommendation at this point-- or, sorry, a request or a recommendation. I think that's where we left off our discussion.

I am able to-- it is kind of straightforward for implementing, but we still, like, I have looked into it, and we still are in this situation of the uncertainty in that selectivity and in that steepness. And we can make the same assumption-- Well, it's possible to say, "Well, we want to also assume a steepness, like the 0.99 that we did for lobster. But I think we lack the same kind of understanding of the stock connectivity and the extent of self-recruitment, to make that assumption for some of the species, some of the finfish. I think that we would want to further evaluate that.

And so, that's another potential reason for making this more of a research recommendation and a methodological recommendation into the upcoming SEDAR 103. I also wanted to highlight some texts from the stock assessment report, from the CIE reviewers. Where is it? I think it's in here.

VANCE P. VICENTE CERNUDA: I have a quick question for you.

ADYAN RÍOS: Please go ahead.

VANCE P. VICENTE CERNUDA: See if you can help me. If you recall the review workshop models, the SEDAR 84 PR Yellowtail review workshop model. There was one model that you were requested to make a run to consider the Puerto Rico and Saint Thomas/Saint John as one single stock. And I see that the model PRSTTJRw1, you need to cover that. And then, it does not converge. Can you explain a little bit about, if you recall that request, then what "does not converge" mean, please?

ADYAN RÍOS: Yeah. So, the model that Vance is referring to is the CIE reviewers recommendation to include Saint Thomas and Saint John data into a single model with Puerto Rico and use the longer time series of the indices. And so, in the explorations between that assessment-- So not converging means that the model couldn't determine a best combination of parameters to fit the data.

So, when we initiate the model with respective parameters for the dynamics that we're accounting for, like, we're estimating the R naught and the selectivities, if the model goes into a space where it just really stops fitting the data and hits values for those parameters that are very unlikely, that's referred to as a model that doesn't converge.

In those runs, we were, by increasing the spatial scope, we were also increasing the complexity of the model to have additional fleets and additional surveys, which corresponds to a multiple of the sensitivities because each-- Sorry, not sensitivities, *selectivities*, because each of those fleets and surveys gets its corresponding parameters, like, accompanying its respective data that the model then also tries to fit.

I think there's-- And I think I mentioned this yesterday, that there's biological relevance to this recommendation and to this, I'll call it, like, an experiment as well, as developing the models in this wider scope. However, like, going back to our terms of reference and how SEDAR 84 is kind of intended for the purpose of island-based management advice and the determined scope of island-based assessments, that was not further pursued.

And so, we kind of, instead of pursuing additional complexity, we kind of took the approach of addressing other concerns that the CIE brought up, which related to inability to isolate the effects of specific uncertainties. And so, the approach that we took for the additional sensitivities didn't follow that path. It followed the path of how we can simplify the model and explore key uncertainties to better describe and understand the scope of the model.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Adyan. We have Tarsila and then Skyler.

TARSILA SEARA: Hi. I just wanted to say, Vance, I'm having a really hard time hearing you, your mic.

VANCE P. VICENTE CERNUDA: Can you hear me well?

TARSILA SEARA: That was better. Yes.

VANCE P. VICENTE CERNUDA: Okay. I'll speak louder. Thank you. Okay, Tarsila. Go ahead.

TARSILA SEARA: That was it. I just had my hand up to say that, that I was having hard time hearing you.

VANCE P. VICENTE CERNUDA: Okay. Thank you, Tarsila. Skyler?

SKYLER ROSE SAGARESE: Skyler Sagarese. Just following up on that, splitting by island platforms versus doing an entire kind of area wide model. I think that was good of the reviewers to point out, but I think expecting Adyan and Kevin and his team to build such a model in such a short amount of time and then be able to evaluate, as Adyan mentioned yesterday, when you add all that into a single model, there's a lot of complexity. How do you set up the stock dynamics? It would be a big Puerto Rico based model because most of the data comes from Puerto Rico. So, just to bring that up.

I'm hoping that with SEDAR 103, these are the kinds of questions that we can talk about during there and say, "well, given how we manage these complexes, what would be the most feasible and most streamlined way for us to assess our stock so it can get used?" So, I just wanted to bring that up, and I'm really looking forward to 103 to kind of look at some of those questions. Because that really wasn't in the term of reference. It was, specifically, build a model for each island platform.

VANCE P. VICENTE CERNUDA: Thank you, Skyler. Anybody else, before Adyan can continue?

SKYLER ROSE SAGARESE: Skyler Sagarese. Yeah. Sorry. I should have followed up. Adyan, I did have another question.

When you estimate steepness in that model 35, what is the model estimating? What's the value?

ADYAN RÍOS: Yes. It does go to 0.8, so I can verify that real quick. So, it's 0.87.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn.

RICHARD APPELDOORN: So, how did you come up with 0.87? I mean, I share the reviewers concern about the steepness of 0.99. There's nothing in their biology or in biophysical models that have been run or what we know about dispersal from genetics that would suggest this would be a species where all the recruitment would be totally independent of whatever the spawning stock is. So, I would be very uncomfortable with a 0.99. I'm just wondering where-- so 0.87 is better, just wondering where that came from.

ADYAN RÍOS: So that was, freely estimated. So, it was a freely

estimated parameter in model run rate. Yeah.

RICHARD APPELDOORN: Inside the model run?

ADYAN RÍOS: Yeah.

RICHARD APPELDOORN: Oh, okay.

ADYAN RÍOS: So, this is the relationship between spawners and spawning and recruitment, and with 0.99 we're assuming that this is a line. But this isn't saying that as your stock gets smaller, you get lower recruitment. And this is the model that will have the recruitment deviations only in those recent years, estimating both the level of the dome and the steepness.

VANCE P. VICENTE CERNUDA: Richard, anything else?

RICHARD APPELDOORN: No. Now, could you show the first graph you showed first? That went cut out by too quickly. Okay. And explain that again.

ADYAN RÍOS: So, this is the stock recruit curve. So, this, like, going down is basically saying, like, at a given spawning output. So, when your stock is at a given size, how much recruitment you would expect based on a curve. And then the recruitment deviations are estimated off of that. So, this is the kind of underlying how the model predicts annual recruitment based on that curve, unless you have information that also informs what those deviations from that curve are.

And so, in the more recent years, we have estimated recruitment deviations. And this is a plot of what those deviations are. So, the good years of recruitment compared to the base that is expected at a given stock size.

VANCE P. VICENTE CERNUDA: Richard?

RICHARD APPELDOORN: Yes, I just wanted to comment that, thank you for explaining to me that actually looks pretty good. Certainly better than an open assumption. Thanks.

VANCE P. VICENTE CERNUDA: Okay. Thank you, Richard. Are there any more questions for Adyan? If not, Adyan, can you continue?

ADYAN RÍOS: Yes. So, I think it comes back now time to kind of determine the recommendations moving forward about, like how the data were prepared, how the data were put into SS the extent of the explorations understanding that there are, like, capacity

limitations on what can be done on the SEDAR calendar and everything. So, I want to, again, just highlight-- I guess I wanted to highlight some of the, like, reviewer comments. And so, Rich already-- I had one on the screen earlier related to steepness. We do have this model estimating.

We do have this== oh, shoot. Am I showing lobster?

VANCE P. VICENTE CERNUDA: Okay. Kevin McCarthy, please.

KEVIN MCCARTHY: That's the wrong one. Yeah. This is Kevin McCarthy. Yeah. Adyan, I was just going to say, I think we're looking at lobster there.

ADYAN RÍOS: Thank you. Okay. Let me pull up the right one. Nope. Not it. Here we go. Uh-huh. Here we go. Wrong.

My brain was, like, so used to seeing it that I was like, "Yep. This looks good."

Okay. So, here we're in the right place now. So, we were talking about model 35 estimating H in that final selectivity. I would come back to the reviewers' recommendation of wanting to also explore uncertainty into other attributes. And so, I think it's also very challenging to do a full uncertainty grid approach.

So, it's important to, kind of, in the model development process, when we're determining what those key uncertainties would be, that those would be conversations of a panel to inform what plausible alternative values should be explored as sensitivity. So, the approach that we took so far was just, kind of, "well, let's explore some extremes to understand this model," but we didn't have those conversations and those, I guess, alternate inputs.

Like, this is our main recommended input, but what is an alternate recommended input that we care about testing the model sensitivity to? I think that's another important consideration.

We also have the indices starting in this later year. We have the indices starting in 2014. So, there's also-- we're not using the information that's existing from before that time, and the reviewers did kind of want us to use that. And I think that's going to be true too for the U.S. Virgin Islands where our models start in 2012. A strong recommendation from our reviewers was to have conversations about hindcasting, having conversations about what hypotheses we can entertain, for the periods of time before our model starts, so that we can either,

start the model further back or come have stronger priors or understanding of what should be happening in those first years of the model.

I also wanted to highlight the research recommendations section of the respective CIE review documents. And I think one of those key recommendations, too, relates to understanding where that selectivity should be.

Let me see if there was another key section I wanted to highlight. Yeah. This other paragraph right above is also very relevant, because it talks about how all of the model's explored sensitivity, but there's that tradeoff between fitting catch versus fitting the surveys. And considering the estimation of growth, which is something to do also cautiously when we don't have the growth data in the model.

I think there was a few other key points that kind of despite the efforts to explore additional sensitivity, we still are in this situation of considering how might we further simplify the model like Jason recommended yesterday by not using the length, the commercial length data to inform the-- to not fit to those data and only use those for the selectivities. That was one recommendation. And then we also have the recommendations from the CIE reviewers.

And so, this really just puts a lot of options on the table that feel like really great advice and considerations for the future. And so, whether we do that now and continue to attempt to work with this model, as a recommendation from the SSC or recommend to incorporate the lessons learned into 103 and really take some of the weaknesses of where we ended up into the conversations that need to happen in order to start to kind of reenter utilizing these data with alternative methods, including the approach that Jason included yesterday, which is referred to as the age structured production model, which, yeah, aims to treat the stock more just like a production model, but while accounting for age and using an age structured model. But it's simplified in that it addresses the concerns that we brought up about the commercial length data and whether the model should try to fit to that.

One more key point there is also our time blocks and how they were just, kind of, loosely informed by the data. And I think it's really important to have conversations and have LEK data about when those time blocks really need to be considered. Because I explored multiple versions, like 3-, 4-, or 5-time blocks, which adds a lot of complexity to the model. I ended up

just keeping the 2-time blocks that we discussed. But I think that those should really be driven by conversations about changes in how the fishery was operating.

And so, those are other types of really important components of information that I think could play into future development.

VANCE P. VICENTE CERNUDA: So, I understand that that's a question on the floor. I don't have any comments. Maybe Richard, who has a more in-depth knowledge of this matter can answer or partially answer your request. Okay, Richard.

RICHARD APPELDOORN: So, probably not. I think what we have is what we have. I think Adyan is right that there's more discussion and more data that needs to be brought forth before really trying to seek improvement on some of these issues. It's getting a little bit beyond what they were tasked to do initially, relative to what can be done in the future. So, if the general sense is kind of orient some of these questions toward future research, that's where I would go.

Skyler is probably the more knowledgeable person on the models, maybe she can comment more.

VANCE P. VICENTE CERNUDA: Skyler.

SKYLER ROSE SAGARESE: Skyler Sagarese. So, I've been trying to sit back and see what other SSC members have to say. I have just recently joined this SSC, so I'm kind of catching up on this process at the end of the-- you know, towards the end of the process. I've seen a ton of work that was done in preparation during actual SEDAR, but I've also seen all this work that Adyan has done since the review workshop, which technically is considered, what, post-SEDAR. But what I've seen with a lot of the changes she'd made, like, for example, that simplified 15 model, I think all of those changes were justified.

I think exploring some of the requests, like estimating growth, we don't really have the data to trust what the model wants to estimate for growth. I think some of those decisions you've used the best available data that were put forth, for example, the life history data. You know, I think you sat back and you thought about it, like, looking at the recruitment deviation. So, I'm struggling because I feel like you've gotten almost to the finish line, and I could see some of these later models that you've presented, whether it's the simplified 15, where maybe we don't necessarily trust the recruitment deviation estimation or the model 33, 34, 35. So, I'm surprised the model estimates a

reasonable steepness.

I'm pretty surprised with that. And I think when you fit and estimated that NCRMP ending parameter for selectivity, it seemed that you did get a better fit on those length composition data that you put in. So, I'm not necessarily-- I don't necessarily think we want to just punt this. I think that if we had a discussion and maybe we're able to see diagnostics, if we picked a candidate model, I don't necessarily think that it wouldn't be up to look at providing management advice. But I can also recognize that I'm here at the end of the process.

If there was a lot more concern, so you know, not to put Adyan and Kevin on the spot, but I would ask them, do they think these models are sufficient to provide management advice? Personally, I quite haven't seen enough of the diagnostics and everything, the whole picture, to a 100% jump behind one of them yet, but I don't necessarily think that we're-- you know, I think a little more could be done just to show us, and potentially we could set catch from this model. That's just kind of my thoughts on this. Again, I'm curious what other SSC members think on this.

VANCE P. VICENTE CERNUDA: Good. We're having some technical problems. Hold on. Okay. Can you hear me?

Kevin McCarthy is online.

KEVIN MCCARTHY: I can hear you, Vance. This is Kevin. I took my hand down because it sounded like Skyler wanted to chat with the SSC, and I'm perfectly happy to wait, while that discussion takes place.

RICHARD APPELDOORN: Vance, I don't know if you're calling on me. I can't hear anything.

If others can hear me, I'll just go ahead with my comments.

VANCE P. VICENTE CERNUDA: Yes, Richard, go ahead please.

RICHARD APPELDOORN: Okay. Yes, my look at what we've seen is I'm impressed by the amount of work that's been done, and I think, in its totality, what's been done would represent the best we could do at the moment. But we've certainly identified some things that could be done in the future. But, I, like Skyler, I'm a little question about whether we are there for management advice yet.

VANCE P. VICENTE CERNUDA: Elizabeth, please.

ELIZABETH KADISON: Hang on. I can't get-- oh, wait a minute. Yeah. Thank you. I am not a modeler, and I feel completely overwhelmed with this. But I have been through now a few of these meetings, and I was there for the review workshop when Adyan presented these to us. And there were actually hired guns. There were modelers there at the table.

I'm just, I mean, the amount of work that's gone into this is just unbelievable. And, Adyan has just done everything possible to modify, to rerun these things and make things work. I mean, the diagnostics for the original models were shown at those meetings and they weren't great. The consensus was that the original models and even the ones that were modified while we were all there were not really ready for management.

I kind of feel like what's going on now is that we're still sort of in the same boat. A lot of work, a lot of improvements. But, whether you want to take a model that just doesn't actually seem like it has enough good data input to work really well, to use that for management, I don't think it's ready or I don't think that it should be done.

VANCE P. VICENTE CERNUDA: Yes. Thank you very much, Elizabeth. Any further, any other comment on this topic? Hold on. J.J., please come in.

JUAN J. CRUZ-MOTTA: Yes. Hi, Skyler. Just in general, so because you're starting with the SSC, you know my general position is, in general when we do this stock assessment, which is the way we have always been doing, my position has always been that we should be managing ensemble of species instead of one species at a time. So, based on that principle and recognizing the amazing work that the Fisheries Science Center is doing, I tend not to go into the needy-greedy and start criticizing the different runs and the different shortcomings and let the discussion go among the people that actually understand the needy-greedy of these models. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, J.J. I have a comment. I think at this point, we pretty much agree with the conclusions of the review committee. I can't remember what specifically-- what specific research recommendations were made, but I believe that they're not going to be any different from the ones that we've been thinking about.

So, if somebody can start writing down a motion or a conclusion that the SSC believes that the-- hold on. --that the assessment

does represent the best available science. I think that we agree with that, the best available science. I think that there seems to be a general agreement. The results presented in the stock assembly reports, at present, cannot be useful for providing management advice unless the following research recommendations become implemented, or something like that.

So, if you could-- if anybody-- Richard, can you help me write something up like that and put it on the screen so we can make, a decision or vote, please? Richard?

RICHARD APPELDOORN: So, just to simplify things, take the one for lobster, the first motion and substitute, SEDAR 84 Yellowtail and the wording would be the same. Yeah. Something like that.

VANCE P. VICENTE CERNUDA: Yes. So, let's-- Richard, are you writing something down or you just wanting to bring up-- Okay. We have motion number 4. *The SSC considered the assessment of SEDAR 84 U.S. Yellowtail Snapper for Puerto Rico to represent the best available science.*

This is a motion by Richard Appeldoorn. It needs to be second. Any second? Skyler?

SKYLER ROSE SAGARESE: Skyler Sagarese. Yeah. I second that motion.

VANCE P. VICENTE CERNUDA: Okay. So, the motion has been seconded by Skyler Sagarese. Any further discussion on this before we go for a vote? There seems to be any. So, let's begin with the voting process.

Let me read it once again. This will be motion number 4. "The SSC considers the assessment for SEDAR 84, U.S. Yellowtail Snapper for Puerto Rico to represent the best available science." Yeah, Tarsila?

TARSILA SEARA: Tarsila Seara, I believe yes.

VANCE P. VICENTE CERNUDA: Kadison, Elizabeth?

ELIZABETH KADISON: Yes. Yes.

VANCE P. VICENTE CERNUDA: Okay. Richard Appeldoorn?

RICHARD APPELDOORN: Yes. Appeldoorn, yes.

VANCE P. VICENTE CERNUDA: Reni García. Reni? Jorge García, can you hear me? Okay. Reni?

JORGE R. GARCÍA-SAIS: Ahora. I abstain. I abstain.

VANCE P. VICENTE CERNUDA: Thank you. Keithly, Walter?

WALTER KEITHLY: I will abstain.

VANCE P. VICENTE CERNUDA: J.J. Cruz? J.J.?

JUAN J. CRUZ-MOTTA: Thank you. I was unable to unmute. I will abstain as well. Thank you.

VANCE P. VICENTE CERNUDA: ¿Que dijo?

JUAN J. CRUZ-MOTTA: Abstain.

VANCE P. VICENTE CERNUDA: Okay. Todd Gedamke? He's excused. Okay. Skyler Sagarese?

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

VANCE P. VICENTE CERNUDA: Jason is excused. Vance Vicente, I say yes.

Okay, so there are 5 yes, 3 abstain, and there's 3 absentees. So, with majority, the motion, "The SSC considers the assessment for SEDAR 84 U.S. Yellowtail Snapper for Puerto Rico to represent the best available science." *The motion moves.*

Yes. Like I suggested, I believe that the review committee listed a series of research recommendations. I don't have them with me right now, if any of you have them, have these recommendations, we would like to see it.

Maybe Adyan has them, we can see because they're, I believe, that they're going to be very similar, and they'll both concur. But I don't know. I will have to look at the list. Kevin?

KEVIN MCCARTHY: Yes. Thank you, Mr. Chair. Kevin McCarthy. So, I don't have the list right at hand, Vance.

But what I would say is, as a suggestion to the SSC while you're deliberating any sort of research recommendations for this, the ones that are going to come out of-- I think I'm right about this. The ones that are going to come out of the CIE review, which are valid, of course, but they're really going to be aimed

at this kind of stock assessment model. Right? They're going to be-- they're responding to what was presented to them last summer.

And so, those are all valid recommendations, but I would also suggest that in light of the SEDAR 103 process, which is really considering a much broader range of options, the SSC might consider that as well. You know, what is the better way to do this? Certainly, the CIE focused on this kind of SS 3 modeling approach, but there may be some other ways. I know that J.J., for one, has some other ways of doing this. So, there could be some other broader array of recommendations that aren't limited to what other kind of model we might run.

Now that doesn't mean you couldn't say, "Well, okay. Let's not try this kind of stage structured model. Let's do something simpler, or let's do something that involves more species aggregations or something. It's entirely up to you, obviously. But what I'm getting at is, you could consider a broader array of possibilities for how to provide management advice for Puerto Rico yellowtail snapper that are not limited to the kind of modeling environment we are currently using.

That's it. Thank you.

VANCE P. VICENTE CERNUDA: No. I agree. I agree. To prepare as a recommendation by the SSC to look at this issue, stock assessment for Puerto Rico in a more holistic way and to include the questions as part of the SEDAR 103, which is looking for alternative ways of doing it, of making an assessment. But I'm not ready to write that up.

So, Kevin, I'm going to ask you to please, please write down a holistic recommendation, research recommendation that will cover different possibilities of making stock assessments for the yellowtail snapper, Puerto Rico. Can you do that?

KEVIN MCCARTHY: This is Kevin. I'm not really comfortable writing motions for the SSC, Vance. I would have done it a couple years ago when I was on the SSC, but I feel like that's a bad look when the Science Center is writing motions for the for the SSC.

Now, clearly, you all get to vote for it and change it and all of that. I also think it's a difficult one in the sense that what we're going to need, what the panel for SEDAR 103 is going to need are very specific recommendations.

Now, whether this is the time you want to do that is up to you, of course, but I think it would require some very specific recommendations that could be tested. And I certainly wouldn't want to speak for the SSC on what they think might make for good alternatives and whether or not you want to tackle that here. That might take some thinking and some consideration that maybe beyond the scope of this meeting, but that's up to you, of course.

But I think that needs-- those kinds of things are going to require some conversations among the SSC because I think they do need to be very specific if they're going to be actionable in SEDAR 103.

VANCE P. VICENTE CERNUDA: Thank you. That's a very good point. Can we have Kate Zamboni?

KATHERINE M. ZAMBONI: Thank you, Mr. Chair. Kate Zamboni for the record. Just on the screen, it says "it moves," "the motion moves." It passes, and it might just be clearer if the record reflect that the motion passed.

Thanks. No. You don't have to change what the motion says. Below where you have the count of the votes, says "motion moves," "motion passes." Yep.

VANCE P. VICENTE CERNUDA: Can you can you repeat, please, Kate? Okay. ¿Ah? ¿Ya? ¿Qué así?

¿Motion passes? ¿Qué? ¿Y qué pasa? Ah, okay. Walter Keithley.

WALTER KEITHLY: Mr. Chairman, while our Council attorney is with us, this may be an appropriate time to ask the question. I agree with J.J. I'd like to do a stock assessment. I think it makes sense to conduct a stock assessment on an ensemble of species. But is that permitted under the current reauthorization of the Magnuson Act, I guess?

VANCE P. VICENTE CERNUDA: J.J.

JUAN J. CRUZ-MOTTA: Okay. This is a nonlegal expert opinion. And after several discussions with the group of people at NOAA doing EBFM research I believe, yes. I believe and it is my understanding that what the legislation says is that we need to have reference points. And if that's the case, we can have alternative reference points for ensembles, rather than a reference point for a single species such as ACL, ABC, etcetera. Thank you.

But the legal advice will be appreciated for this question.

VANCE P. VICENTE CERNUDA: Walter?

WALTER KEITHLY: I'm sorry, Mr. Chairman. I forgot to take my hand down, but I will make a comment. I will follow-up. If this is permitted, I would recommend looking at ensembles of species for consideration in a stock assessment that would take some time, I'm sure. It would take quite a bit of expertise to do so. But I do believe that is the best way to proceed in the future. Thank you.

VANCE P. VICENTE CERNUDA: Yeah, thank you, Walter. Kate Zamboni?

KATHERINE M. ZAMBONI: Zamboni. Yeah. Thank you, Mr. Chair. Kate Zamboni, I guess you can't just unmute yourself. So, that was the whole point of the instructions at the beginning.

Yes. I agree with J.J. I think I think it can be done. How are the outputs actually used to determine the reference points? I can't answer that right now, but I think the SSC could look at an ensemble. I don't think there's anything in the law that would prevent that.

VANCE P. VICENTE CERNUDA: Thank you, Kate. Kevin McCarthy.

KEVIN MCCARTHY: Thank you, Mr. Chair. Kevin McCarthy. So, a couple of comments. One is, of course, this is very much on the table for SEDAR 103, this kind of ensemble approach. So, yeah, I think that everybody's in agreement that there are alternative ways and maybe better ways to do things in the region. I don't disagree at all.

I'm happy to do something that is the right fit and the right size of analysis that provides management advice to the Council. It doesn't matter to me what that looks like as long as it's doable and it's something we can enact in the near future, not in some far-off distant future that we don't have the data for at this time. So, I think that actionable things that we can move forward with sooner rather than later, I'm all for it.

The other thing I would say is the Pacific Islands have that kind of approach. They have an ensemble of species that they do pretty straightforward production models as I understand it. I could be wrong on this, but pretty straightforward analyses that cover a lot of species in one series of analyses. There are some

caveats with that, of course. Nothing is the magic answer in all cases. And that's one of the reasons why we've invited some Pacific Islands colleagues to be involved in SEDAR 103.

In fact, in a couple of months, I think maybe in June, they're going to be presenting, at one of the SEDAR 103 webinars, their approaches. They'll talk about their data and data challenges. They have a lot of the same concerns that we have in the Caribbean, and they'll be presenting their approach and their analyses and critically how they use those data to inform management and the results of those analyses to inform management. So, I'm all for it. And I think-- and it's very much on the table for SEDAR 103.

Thanks.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Kevin. Reni Garcia.

JORGE R. GARCÍA-SAIS: Yes. Thanks, Vance. What I wanted to say was that I have strong reservations for considering yellowtail snapper into a group of species for assessment. The reason is that the fishery for yellowtail snapper is very highly specific, you know. Nowadays, the largest fishery effort on yellowtail snapper is fishing at night with lights, and it's just for yellowtail snapper.

So, the full dynamics of the fishery of yellowtail snapper is associated with that species and not with a group of species. Like, for example, what you would do for parrotfish which used to be taken on fish traps and nets. Or even other species that are taken into groups. The fishing effort for Yellowtail snapper is very specific for that species.

I abstain from the motion because I still believe that there's a lot of things going on that are determining the status of the yellowtail snapper fisheries and other species as well. I've said this many times and I've been very hesitant to favor or any kind of best available science for fishery of any of these species without a good measurement of effort.

That effort is a key aspect, I mean, it is a key aspect of the entire fishery because this effort is changing, is changing year to year. You know, we're looking at a reduction in the fisheries, we're looking at a change of the, at least in Puerto Rico, of fishermen that used to fish a whole variety of fishes, including yellowtail snappers, moving into deepwater snappers because they're paid a much higher price. You know, all these things are really important in this kind of assessment, you

know.

And then we are going into a model that is highly sophisticated, that would fit data that we don't have, you know. And in the case of yellowtail snapper, the killer on top of everything is that the yellowtail snapper is a species that is highly aggregated, its distribution is highly aggregated. So, it's very likely that if you have small sample sizes like we have you are going to enter into the burden and the uncertainty of patchy species distributions, you know. And that brings huge uncertainty.

I believe, from my standpoint, I am not a modeler, but I believe from my past experiences in these meetings is that we are looking at a relatively small sample sizes of data that are infected by high variability associated with the patchy distribution of these species and other snappers as well, you know.

So, that's my take, you know. I've said it so many times that I don't even have sometimes the initiative to say it again, but I believe that if we don't have strong data on catch per unit effort for these species, we need to have an index, a socioeconomic index that would suggest or be used, or could be used as a proxy of effort for these species. Otherwise, we are actually looking at data, a supermodel that is working at 10% of its capabilities because of the nature of the data that we are inputting.

So, that's my take and I'm sorry if I'm out of the park here.

VANCE P. VICENTE CERNUDA: No, you're not, Reni. Thanks a lot. I agree with you 100% that this yellowtail snapper in Puerto Rico, the fishery, is very species specific. I agree because I have been with fisher out there, and they're very specifically pursuing that fish specifically, not anything else. So, I agree with you about that.

On the other hand, the models are using the information that is available. Well, not available, but best available. There's other data that is not available that is good. But I agree then that maybe using the SEDAR 103 goals is going to be helping us a lot in this, like providing recent catch per unit effort and everything. That will be very, very helpful.

But thank you. No, you were not out of place. You were very good. We have. J.J., please.

JUAN J. CRUZ-MOTTA: Thank you. I would like to second Reni's request, position, opinion, that we actually need a lot of CPUE effort estimations. I believe the Science Center has started doing something on that regard. I don't know if by writing it down-- and we have said this in other assessments, in other forums, but I don't know if writing it down here will make their life easier, the Science Center's, to get further funding for that purpose. That's, one thing.

The second is, Reni, let's suppose when you fish for yellowtail, also for deepwater snapper, let's suppose for sake of argument that you are only catching that species. There is no bycatch, at all. Let's suppose. Even if that's the case, that your highly targeted fishery gets only yellowtail snapper, it doesn't mean that in reality these animals don't live in ensembles. And in order to manage yellowtail, we need to understand that ensemble. So, the ensemble idea is not because you fish them together. Of course, that's very important, especially for trap, as you mentioned.

But independently of that, we also need to understand how these animals operate in nature, which are in groups, in ensembles, with highly correlated structures. So, when I refer to managing ensemble, I'm saying managing the species as it happens to be in nature, which is in groups, in ensembles. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you, J.J. Before we go back to Walter, the more I see the need for the SSC to develop a research recommendation that will comprise all of what we've been talking about, which will be emphasizing alternative methods, alternative stock assessment methods, including increased effort in determining catch per unit effort and all these words. Just a general recommendation by the SSC that states that we certainly need more information, even though the information available was the one that was used. But we need more information, specially looking at alternative ways of assessing the stock of the yellowtail snapper in Puerto Rico or something like that.

If somebody can start writing up something like that before the end of the meeting and offer it as a motion that the SSC recommends the following, which should comprise what we have been discussing this afternoon. Then we have Walter and then Adyan.

WALTER KEITHLY: Thank you, Mr. Chairman. Again, I should just put my hand down because J.J. expressed my thoughts pretty well. I think that, yeah, I don't disagree with many that yellowtail

may be a targeted species, but you still have these ensembles of species in a given carrying capacity. And that, to me, is the primary reason for trying to do a stock assessment at the ensemble level rather than at the individual species level. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Walter. Adyan Ríos?

ADYAN RÍOS: Thank you, Vance. I also wanted to highlight the information that we have from fishery-independent surveys. So, the Coral Reef Monitoring Program, the one that we looked at in this model, does have data through 2025. However, this was only looking at through 2024. It's on slide 21 of the yellowtail Puerto Rico model. It's a survey that's doing the same sampling design every year, and it's picking up an increase in yellowtail snapper. And it particularly sees small yellowtail snappers. So, I think there's also a lot of support and need for continuing these data in order to have that as a resource of fishery independent information as well.

VANCE P. VICENTE CERNUDA: Yes, thank you, Adyan. Reni García.

JORGE R. GARCÍA-SAIS: Oh, yeah. Thank you again. I just wanted to comment because you mentioned about those research projects that should be a priority and I believe that since we badly need data on catch per unit effort, I think that we should start thinking or putting more emphasis in the roles that fishermen and that commercial fishermen may take in terms of-- they run the research projects for us. You know, they're providing us the data because we don't want scientists fishing or affecting the stocks by increasing fishing effort. Whereas the fishermen are already-- that's their job, they're already doing it. They can provide a lot of information that we have, for a very long time, in need of, you know. Right now, the information that we get from annual catch is just not enough, you know. The information is good but it's not good enough, you know.

If we would have more scientifically directed information from their work in the field, because essentially, they work like scientists, you know. They work just like us, you know. We write papers and get funded by proposals and do our management stuff based on our information, and they sell their catch. But essentially, they are doing our fieldwork. When they're in the field they're actually developing research information.

So, I believe that if we could have fishermen transcend more into the science field at least for this particular purpose of bringing up capture per unit effort data, that would be a step

forward. I would patronize that. I would support that. I mean we'll have to talk about it a lot and plan it well. I think that they're the only ones that can do it, you know.

Because I mean any scientist can go and do maybe a year or 2 or 3, but we need to do this on-- we need to make a projection on long term for this kind of thing. We would have done it 10 years ago, now the story would have been much different. Since we, at least from my experience, we're so skeptic from going into social science indices to evaluate our fishery when there's nothing else, you know. I mean, I don't know why the years keep going by and keep going by and we do not integrate social science indices of fishery of demand into our assessments.

So, I am really skeptical to follow-up on these pathways of really high-end models when we don't have the best data to run them. And that's my take. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thanks again, Reni Garcia. We have Walter Keithly and then Skyler Sagarese. Come in Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. Just real quickly. Adyan probably has better memory than I do. I did look at SEDAR 46, to get ready for this meeting as I recall they had a catch per unit effort index for yellowtail snapper for Puerto Rico in it. And, again, Adyan may want to explain why she considers that it is inappropriate to use it now. I don't like using an index from fishery-dependent data, but Adyan may want to weigh in on that a little bit more. And if I'm correct there was an index specified in SEDAR 46.

VANCE P. VICENTE CERNUDA: Thank you, Walter. We have Skyler, then J.J., then Adyan, Tarsila. Come in, Skyler, please.

SKYLER ROSE SAGARESE: Yes. Skyler Sagarese. So, Walter, perfect timing. I was actually the co-lead for SEDAR 46, 10 years ago. At the time, we did have a nominal index for yellowtail snapper.

We came, we presented an index-based method where we would have adjusted catch advice, based on that trend in that index. And ultimately the SSC decided not to use it because of the concerns that it wasn't a standardized index. So, I just wanted to add that background for SEDAR 46.

But I do want to just highlight, it might be worth tabling some of this discussion till after we see the rest of SEDAR 84, because I think I'm really excited for SEDAR 103. I think a lot of these, what we're talking about now really are bigger picture

recommendations, what we want to see in the next assessment and for the future.

I think rather than trying to jam what we have into a specific assessment type, for example, SEDAR 46, we wanted to use DLM tool. We looked at index based, length based, data limited approaches. We tried it. It didn't work ultimately. Adyan, more recently, tried stock synthesis and took what you had available. So, I think if, as the SSC, if we could focus on a bigger picture, like, for example, data.

I wasn't aware that the TIP data, there was a lot of concern during the process that they weren't representative. So, to me, a clear role of SEDAR 103 is to say, for the TIP data, is this a common problem for everything? So, does this mean we do not have fishery dependent length composition data for any of the species that we feel are representative? Or for example, talking about, now that we have an approach to standardize the fishery dependent data to develop an index of abundance, could this be done for more stocks or as a complex, instead of doing specific species? Could you develop an index for, say, one of the snapper units? So I think bigger picture, like, we've had these assessments.

We've tried to get something out of it by piecing what we could together. But I think we really want to start from the beginning and say, "Here are the data pieces. We've got the fishery independent NCRMP data." You know, "how useful could these be?" And then once we know what pieces of data we trust, long term spatially covering more of the area, once we know what we can work with, I think then we can approach this and say, "okay, what assessment platform do we want to" or "can we?" "What's feasible?"

So just some background there. But I think a lot of this will be relevant for the other stocks we still have to discuss.

VANCE P. VICENTE CERNUDA: Yes. Thank you. J.J.?

JUAN J. CRUZ-MOTTA: Thank you. Thank you. I'm going to be brief because I see Tarsila has raised her hand, and perhaps we're going in the same direction. So, I just want to say two brief things.

First of all, reading the message of Kevin on the chat. I wanted to mention that the Science Center already has a couple of projects going into the cooperative direction. Also, to mention that several-- And I would say those have a strong biological

component. On top of that, I know of several proposals that have been put forward to measure effort using fishers knowledge and developing this system in which the, given that is run, developed and run by fishermen, then it can be sustained over time, but mostly concentrating on the socioeconomic part.

And even though, and this is my opinion, I'd say my personal opinion. Even though I feel like we talk and we say it and the word socioeconomic comes to the table once and again, I feel that proportionally proposals related to socioeconomics are underfunded or less funded in relation to proposals that are still collecting, very important, I'm not saying it's not, biological information. Thank you very much.

VANCE P. VICENTE CERNUDA: Adyan Rios, please.

ADYAN RÍOS: Thank you. Skyler already addressed SEDAR 46 question when I raised my hand, but I did also want to revisit her suggestion about, the-- Well, I'll leave it to you all, just waiting for the remaining presentations and similar situations that we have for the other models.

VANCE P. VICENTE CERNUDA: Okay. Thank you. Tarsila?

TARSILA SEARA: Yes. Thank you. This is Tarsila. Yeah. I mean, well said, J.J. I think you raised a really important point and similar to what I was going to say.

I also wanted to say, of course, Reni, I agree with everything you said. But I also wanted to emphasize that I think that there are a lot of efforts in the right direction. I think you know, SEDAR 103 is a good example of that. I think the Science Center is putting some effort into really trying to answer these questions and try to sort of move us in that direction.

And I also just wanted to say this is not an issue that is exclusive to the Caribbean. This is something that we're seeing developing in all other regions. I'll say from my experience as the Social Sciences Branch Chief in the Northeast Fishery Science Center, in many ways, we're actually taking more steps, in the Caribbean than we are in a much data and resource richer region. I think that is important to acknowledge.

But similarly to what J.J. said, I think it can be frustrating when-- it seems like we all agree this is an important direction to go. But when rubber meets the road, when it comes to funding, when it comes to actually putting a lot of these research projects into practice, there are a lot of challenges

particularly regarding support and funding for those types of research. So, I just wanted to acknowledge that for the record. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Tarsila. Walter Keithly.

WALTER KEITHLY: Thank you, Mr. Chairman. I could get into this socioeconomic discussion, having been involved in it for 40 plus years now. But I think I'll leave that aside and just say that I agree totally with what Skyler said a few minutes ago, especially in terms of looking at that TIP data to see if it is representative of the recorded catch data.

Again, it was at the last meeting, SSC meeting, I mentioned that it's the first and highest recommendation of one of the previous SEDARs, but it's yet to be done. So, I think it's on that we take steps to ensure the quality of the data before moving on to just running additional models. Thank you.

VANCE P. VICENTE CERNUDA: Yes, thank you, Walter. Yeah. Adyan, do you have anything else to add?

ADYAN RÍOS: No, Vance. Thank you.

VANCE P. VICENTE CERNUDA: Por eso. Yes. Before we conclude, on the Puerto Rico yellowtail snapper and going to the Virgin Islands yellowtail snapper, needs to write down a motion that should sound like this. Okay? It should sound like, the SSC finds that the results presented in the stock assessment reports are not at present useful for providing management advice and developing fishing level recommendations for the Councils until presently produced data, such as the one being gathered by SEDAR 103 and other information that will become available in the future becomes analyzed, integrated, and implemented, or something like that.

So, I need help. Can anybody volunteer to write something up? Maybe, Richard, can I rely on you again? Okay, Richard.

RICHARD APPELDOORN: I'd be willing to, is this what's on the-- I would take the first part of that until the word "until," and I'd delete that, the rest of it, and that would be my motion. Just as simple as not ready yet. We're going to make separate recommendations for future activities and I think that would stay separate.

LIAJAY RIVERA GARCÍA: Richard, this is Liajay. Does it read

better? Can you hear me?

RICHARD APPELDOORN: I'm reading it. It reads fine.

LIAJAY RIVERA GARCÍA: Thank you.

VANCE P. VICENTE CERNUDA: So, motion number 5, the motion presented by, Richard Appeldoorn, reads the following. *"The SSC finds that the results presented in the SEDAR 84 U.S. Yellowtail Snapper for Puerto Rico are not at present useful for providing management advice and developing fishing level recommendations for the Council."* This motion needs to be seconded. Reni?

JORGE R. GARCÍA-SAIS: I second it.

VANCE P. VICENTE CERNUDA: Thank you. Seconded by Reinaldo García. Think we had plenty of discussions on this, but if anybody wants to add any other items related to this motion, the floor is open. ¿Quién? Reni García.

JORGE R. GARCÍA-SAIS: Ah, okay. I think I just left my raised hand. But let me let me give you something else that I do agree with the participants that argue that our TIP data is highly useful and should have more prominence in our analysis and I agree with that completely. I believe that at present that TIP data is pure gold in this kind of assessment and I wish we had much more of it than what we have available at present, you know.

At least it provides particularly relevant information on fishing effort and length distributions and upper species and that is precious information for us. I wish we had much more of it, you know. So, I just wanted to add that I agree with that 100%.

VANCE P. VICENTE CERNUDA: Yes. I agree what you just said is what I recommended earlier, that all this discussion or the data that we have so far is not sufficient, should be rounded up by a as a research recommendation. So, if anybody can start preparing a research recommendation which is holistic enough that would incorporate all the issues that have been brought on the discussion of this issue.

JORGE R. GARCÍA-SAIS: Vance, I think that I still have a open microphone here. I think that what we should emphasize, I mean, my perspective, is the fact that we cannot keep relying on annual catch as a proxy for MSY, you know. I think that we've been-- well, how many years is it going to be now? More than 10

years? 12? 14? I don't know, 15 years with the same kind of problem, dragging the problem forever and ever. You know, we don't have catch per unit effort data, so, well, so we use proxies for the annual catch. Then, the annual catch of Puerto Rico doesn't mean anything; we have to put expansion factors to it, you know.

Look, what kind of uncertainty do you think that brings? You know? I mean, it's a miracle if any model even runs on it, you know?

So, I insist that we have to do something to gather reliable capture per effort data, you know. We cannot, I mean it's really not real that we can keep doing this kind of assessment without capture per unit effort data, you know. I don't know. At least I am not a modeler. I don't know how-- I just remember my friend Jorge Cabello, que en paz descansa, he always told me, "Reni, models are as good as the information you put in them," you know.

And from what I have seen we have some constraints on the information that we can input into these models, you know. And we should really transcend our limitations of making fishery assessment based on proxies and information that are misleading and that are just full of uncertainty, you know. And my reservations in all this, you know.

I really would like to be able to say that everything looks fine, but for me, from my perspective, it doesn't, you know. So, thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you. Thank you, Reni. I think that we all agree so far. But I think we have to wrap up this motion 5 and go to voting, and maybe we can add another slide where we can make a general recommendation, research or non-research recommendation on how the SSC feels with regards to the stock assessment for the Puerto Rico yellowtail snapper.

Okay? But I think that we have to go now and vote for motion number 5, which reads "The SSC finds that the results presented in the SEDAR 84 U.S. Yellowtail Snapper for Puerto Rico are not, at present, useful for providing management advice, and developing fishing level recommendations for the Council." So, the floor is open for voting. Tarsila Seara?

TARSILA SEARA: Yes. Tarsila. Yes.

VANCE P. VICENTE CERNUDA: Elizabeth Kadison?

ELIZABETH KADISON: Elizabeth Kadison, yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn? Richard?

RICHARD APPELDOORN: Yeah. I was waiting to be unmuted. I vote yes, Appeldoorn.

VANCE P. VICENTE CERNUDA: Reni García.

JORGE R. GARCÍA-SAIS: Waiting to be unmuted?.

VANCE P. VICENTE CERNUDA: Reni García.

JORGE R. GARCÍA-SAIS: Yes, yes.

VANCE P. VICENTE CERNUDA: Walter Keithly.

WALTER KEITHLY: Since I abstained on the previous motion, I'm not sure it makes sense to do anything on this motion, so I will abstain on it.

VANCE P. VICENTE CERNUDA: Okay. Thank you. Okay. J.J?

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Sagarese, Skyler?

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

VANCE P. VICENTE CERNUDA: And lastly, Vance Vicente, yes.

So, we have 7 yes, one abstain, and 3 absentees. So, *motion number 5 carries.*

Before moving into the yellowtail snapper, U.S. Virgin Islands, does the committee want to prepare a general overall recommendation? It doesn't have to be a research recommendation that would incorporate all of the issues and these issues that we discussed during this stock assessment analysis? Or shall we just continue to the Virgin Islands? Yellowtail snapper, Virgin Islands. If I don't hear anything, we will move too, specifically, to Richard?

RICHARD APPELDOORN: Yeah. From previous commentary, I think we will be facing similar questions, on the same species for the Virgin Islands, and it would be beneficial just to wait till we do that and then do a joint recommendation. That's how I

understood.

VANCE P. VICENTE CERNUDA: I agree. Yes. I agree with you. So, let's continue. It's 02:35. So, we will now initiate and complete the final review on SEDAR 84 U.S. Caribbean Yellowtail Snappers Saint Thomas/ Saint John for approval/disapproval of the stock assessment report, recommended OFL, ABC, and develop and list the research recommendations. So, Adyan Ríos, whenever you're ready, you may commence your presentation.

**SEDAR 84 CARIBBEAN YELLOWTAIL SNAPPER ST. THOMAS/ST. JOHN:
FINAL REVIEW—ADYAN RÍOS, CARIBBEAN BRANCH SEFSC, NOAA FISHERIES**

ADYAN RÍOS: Thank you, Vance. Okay. So, let's get started.

Just with some background, I've got some information about the current management, which is similar to Puerto Rico with the island-based management plan effective in October 2022. We have the yellowtail snapper unit 4 with the 88,952 pounds ACL and information about that there.

We have federal management history here. So, the 8-inches implemented in 1986, 12-inches in 1989, and so forth, similar to what we saw for Puerto Rico. The same assessment history is included here because, these assessments looked at the Caribbean stock. So, we had the 1992 Appeldoorn et al., which used a length frequency analysis, and the SEDAR 8, which attempted to look at CPUE trends and length frequency data.

And we also have spoken a little bit about SEDAR 46. It was ultimately not used for management. Again, we brought up those concerns and considerations of the nominal CPUE that was not standardized. That is shown here. Okay. We'll go forward talking about our data and our methods.

So, similar to the Puerto Rico model, we have landings, length composition from the commercial fleet. We have the length compositions from the survey, as well as the index of abundance from the National Coral Reef Monitoring Program. And then we also had life history information from samples from the U.S. Caribbean.

Okay, so here are some summaries from the data workshop. So, to use the life history data made available, to only start the model in 2012. Prior to 2012, the landings were not species specific. Consider bias on the information. So, just kind of acknowledging that we do have uncertainty in our data. Look into the individual outliers and the trip reports. And then, group

gears based on the comparisons and analyses that are done with the TIP data. And lastly here, assume commercial discards are negligible, just like we did for Puerto Rico.

Their recommendation was to use the TIP data with the corresponding years of the species-specific landings data and to also use the NCRMP data from 2012 to 2022, and to not consider fishery-dependent information for indices of abundance. So, again, that recommendation concerns with that might affect how the index might need additional effort or information and context to become a standardized index that is meant to track the abundance in the water.

Following the data workshop, the landings and outliers were investigated and retained as valid trips. The panel recommended a single combined commercial fleet configuration, similar to what we saw for Puerto Rico. But now it is-- let's see, yes. No, that is correct. Similar to what we saw for Puerto Rico. Again, this information about the modeling approach is also the same. So, we have stock synthesis, SPR, and the tools for working with stock synthesis to develop reports and to develop diagnostics. This progression of the assessment method is also the same as what we saw yesterday.

So, initiating the model and without the survey data and then incorporating that in, and then also, eventually, estimating recruitment deviations. That brings us to a summary of the models that were developed during the assessment report and then during the review workshop. And then, I did want to highlight that these explorations were guided by the experts, the Center of Independent Experts. That's what CIE stands for. And so, these models in the bottom table were based on their recommendations that we explored during the review workshop. But again, this provides a context of all the runs that were presented in the various reports. And also, the additional context that following the review workshop, the focus of our effort was to be kind of exclusively on the Puerto Rico model because of that long time series, longer time series. This model starts in 2012, so the uncertainty in the start year is amplified, and it's a relatively short time series.

So, I'm going to go into just a quick summary, and then I was recommending so just kind of the takeaway message and some of the key results that came out of those models that we looked at during the review workshop, and then kind of show you all the data components that went into the process.

But here I wanted to kind of note some key statements from the

addendum about how, like, these models had additional work done on them, but they still remained preliminary. So, the ones that ended up in that stock assessment report addendum.

These models are kind of steps towards improving and better understanding, but I just wanted to highlight that, where we ended up in the process, and kind of stopped investing our time, kind of furthering this along. And so, that's what we spent that time looking at the Puerto Rico model and then as well as the prioritized lobster sensitivities.

This is from the CIE report. So, they found that SS incorporated the data, but the data were not robust enough. So, like, they comment on that short time series. And so, we see also a conflict in the data fitting the catch, the length, and the indices. And they made some explicit research recommendations, and I can pull those up after we get through these two presentations to kind of revisit what priorities the CIE reviewers thought were very important to move forward.

But briefly here, they recommended further data collection, consideration of alternative modeling approaches, and integration of historical information. And I think that relates to some of the data that existed earlier, but needs to be kind of thoughtfully included, and especially, like, a longer time series of catch. How do we get to a longer time series of catch when we don't explicitly have the species-specific data? But perhaps there are some analyses or conversations we could have to understand plausible historical information.

So, that brings us to the model for, like, the furthest developed model. Well, I guess I can go back and also talk a little bit about what the reviewers recommended.

So, first, we did a little bit of the same cleanup that we did for-- or same modifications that we did for Puerto Rico. So, simplifying to a single sex model, allowing estimation of annual Fs, increasing the uncertainty around the catch, and correcting the units of that catch standard error. And then, the next ones kind of looked into how sensitive is the model to-- or the potential for estimating growth, as well as the maximum age, a lower maximum age. And we also looked at those considerations of combining models, but that was not, kind of, further pursued at this time.

And so, that brings us to the RW1 model that I have in this presentation, just kind of highlighting the growth that was used, the fit to the catch and to the indices. And so, we see

that we have indices. We have two indices, the NCRMP as well as the Deep Coral Reef Monitoring Program. And so, it's great to have that information, but we don't have a model that's really fitting well to that information.

Similar to Puerto Rico, we have dome shaped selectivity, and we saw that the Deep NCRMP was observing larger individuals than the shallower survey. So, that's also very useful information to continue collecting as we move forward. But at this time, the model, with its short time-- well, relatively short time series and the parameters being estimated, namely the initial equilibrium catch, here the recruitment deviations were also being estimated, and the model was robust to key decisions similar to the ones that we discussed yesterday, but they were not further explored.

And so, that just brings me to, kind of, where I wanted to get as far as the explanation as to where we ended with this model. And then, I just wanted to provide a background on the data that went in. And so, I'll talk about that now and the way the model was set up. This will be relatively quick because it's very similar to the model that we've already reviewed for Puerto Rico. So, the same tool, the same structure, shorter time series, and then the same types of diagnostics.

Here's the time series of landings. So, we have a little over 30,000 pounds, going down to a little under 20,000 pounds in our time series of 10 years. And then, here we have the time series when we think about all of the snappers, with yellowtail snapper being this darkest purple in the time period where it's species-specific but not having a breakdown of what those landings were when it comes to all snappers in the period before. So, that's just another limitation of why the start year was 2012, but also important to know that, like, well, what might we be able to incorporate or interpret about what was happening before 2012 might be an important consideration and improvement to the data that we analyze and try and understand. Because right now we're just working with 10 years of data, on a species that we've got living to be 26.

Here we have information on the number of trips. So, we're not really factoring in the CPUE data, but we do have this presented to just kind of give an idea that there are probably important dynamics of CPUE, but that requires the standardization in order to be able to reflect that what we're seeing from CPUE is reflective of changes in the stock and not changes in how they're fished or how they're targeted or how good people are at catching them.

Here we have the information breakdown of the landings but by gear group. And so, that just shows you the collective, you know, everything was collected into one gear group for the handline. So, that was just considered the one fleet. But we do have other types of gears that catch smaller percentages of the total.

Next, we'll look at the sample sizes for the TIP data. So, 85% of TIP length data for the yellowtail snapper came from handlines, and that's used in the model for the commercial fleet. It's important to note that just-- and this was true for the last model, but I don't think we went into detail on this one. There are multiple lengths for trips, and to account for that we're using the number of trips as, like, the metric of saying which years have more information. So, we're not saying, like, a year with more samples-- well, tends to correlate, but the way that we kind of understand what's a good year or a year with a lot of information or fewer information in the model, we provide the number of sample trips at that time series, the number of sample trips per year.

Here we have the information of where those data came from. And so, recall that our model is really going from 2012 to 2022. And, prior to that, we do have information. We do have length samples, sporadically, but we're not using the information prior to 2012. And also, in the information that we have after 2012, there are a few years with relatively more samples and then some gaps as well.

So, I think the TIP data also needs to be sustained, right? And I know there's a lot of work in evaluating the design of how that's collected and how that can be optimized. I think that's important to consider as well so that we continue to have port sampling length data from the removals that we see realized by the fishery.

Here we have the time series just showing you what-- so since we're not using the data prior to 2012, how does the data from 2012 on compare to the entire data? And so that's just showing you that it's very similar. We don't really see, like, a big shift in the distribution of the recent data being different from the data overall.

And then just for the more recent data, we do have just a breakdown of what gears those data represent and how those distributions are slightly different based on the gear with the kind of, handlines and the rod and reel capturing slightly

larger on average fish than what they see in the yellowtail snapper that are caught in traps. The majority, by far, of these samples, you see, like, the sample sizes here hit 100, 700, and then 7,000.

Lastly, we have the National Coral Reef Monitor Program. And so, we discussed this for Puerto Rico, and we talked about the incorporation of that into the model. And then there's 3 years of an additional deep survey, down to 60 meters. Those years are 2020 to 2022. And it's really useful to have that difference between the two surveys being able to compare the size distributions going on in the same years between the two different habitats.

Here we have the, like, context of how far back these data go, but how our model only starts in 2012. So, again, another limitation of data that was not incorporated based on the decisions of structuring the model and all that. And then we alluded to the research recommendations of trying to start and use like a longer time series or potentially using other methods that may not require as much information in order to be able to fit to the data and determine what was happening at that 2012 start year. And so, we have this broken down by the depth as well as the type of habitat and then where they saw more of the yellowtail snapper.

And just another way of pointing out that this survey looks at all of the habitat in the depth range. And so, it does this stratified approach of allocating effort to these different habitats in order to come up with density estimates that become the index of abundance that we're able to use to infer what's happening to the stock in the water.

And then, here is that information for the deep survey. On the right here, we have the index that we have for yellowtail snapper, fishery-independent information from the NCRMP in that solid line going further back. And then where we're using was 2012 forward, as well as the Deep NCRMP, which is 2020, 2021, 2022. And this also shows the number of sites, and the number of yellowtail snappers that they saw.

Lastly, we have life history information based on 1,554 samples, collected from 2013 to 2023, and specifically in the U.S. Caribbean. This information was provided by the working papers that are on the SEDAR website. And we also have, kind of, some keynotes here that they didn't see, kind of, like, sexual dimorphism and they reported their maximum length and their maximum age. Same information we discussed yesterday about

sexual maturity and growth.

I think we're coming to the end here, just the same table that we saw yesterday. A little bit more information about maturity. Considerations about natural mortality that we talked about in the report, but we just kept the maximum age above 26.

And so, yeah, so I just wanted to, again, present the information that went into the models, tell you the story about how those models were developed, provide kind of some context about where we ended up. And those are the slides that I have for the Saint Thomas/Saint John Yellowtail Snapper. But I do have, again, like, all the runs. I also have the reports open to help me along if there's any questions or specific requests to see something in particular.

VANCE P. VICENTE CERNUDA: Any questions? The floor is open for questions. Richard Appeldoorn?

RICHARD APPELDOORN: So, I just have one question and that had to do with the assumption of no discards, which I think is probably reasonable for Puerto Rico, but in a demand based fishery in the Virgin Islands, I would think, if there isn't a demand for that species or that size of individual or something, it's going to go back. That's kind of what one is led to believe in a demand made fishery. Otherwise, it would be, "oh, I just don't go fish for those species and I don't catch them if there isn't a demand." So, I'm just wondering whether that assumption was really looked at for the Virgin Islands.

ADYAN RÍOS: Thank you, Rich. That's really important. And I think it's something to consider for all species in the region, because another factor that plays into that is if they're also targeting a specific size, then you would use a different selectivity. So, it affects both what we refer to as the retention and the discard mortality or the targeting, as well as what you would kind of understand as for the specific sizes being targeted.

I think that we may not have discussed it further specifically to the Virgin Islands. I'm trying to recall back to the data workshop, but just that any individuals that would be caught that were undersized, I guess, would be the main concern would be released. And so, let me double check something here. But, yeah, so does any-- let me see. I think that's an important consideration to note and to consider as we kind of have-- even though we're looking at the same species, there's a different dynamic to the fishery.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Adyan. Adyan, I have a question. How is the recreational data for the yellowtail snapper fisheries being recorded, or reported, in the Saint Thomas/Saint John area?

ADYAN RÍOS: I will defer that. I believe it is in progress. Kevin? Yeah.

VANCE P. VICENTE CERNUDA: Kevin?

KEVIN MCCARTHY: Yeah. Thank you, Vance. Kevin McCarthy. Yeah. So, as I think everybody knows, there hasn't been consistent recreational fishing reported. I think there have been a number of short-term projects there.

I think DFW is working on, and I don't know where this stands, but they were working on voluntary reporting. But in recent years, we've been, we being the Science Center has been working with DFW to develop a survey, a port sampling survey that is still in the works. We're still doing some preliminary kinds of things. So, we don't have recreational catch data going into this model, because the data aren't available.

VANCE P. VICENTE CERNUDA: Okay. Thank you, Richard, very much. Sennai, can you come in?

SENNAI HABTES: Yes, I'm here. Thanks, Vance. Sennai Habtes for the record. Just to address both points first to Rich's regarding discards.

So, the commercial catch reports do have the opportunity for the fishers to list discards. It's also a question asked in the TIP surveys. We don't see much reported regarding yellowtail snapper. The fishery itself is somewhat smaller. It's a limited number of fishers that are regularly targeting yellowtail, and it's similar-

(Part of Dr. Habtes' comments are inaudible on the audio recording.)

Julian Magras has attested to are highly selective because they are demand based.

The fishers know what they're targeting, the size, and they mainly go after these fish, yellowtail in particular, on the full moon. So, it is somewhat selective. Am I saying there are no discards? No. But I would say it's probably a highly small

amount and really selective amount based on the way that they fish and a small number of trips based on the number of fishers comparably. Has that always been the case? I can't say, but in the last 4 to 5 years, which comprise a larger part of the data set that's what we would see.

In terms of recreational fishing, in past it's been collected using a jot form survey. It's very small numbers that are being reported, and the data is based on self-reported, and we aren't sure of the uncertainty in it. We're moving to a harvest reporting tool that will be part of the recreational fishing licensing platform that we've recently launched. That's still in development. It will be mandatory for for-hire fleets, but will still be voluntary for other recreational.

In addition, as Kevin mentioned, we're working towards the development of TIP like Creole and interview surveys that will be done in the territory that we've been doing effort reporting associated with that to get them started. And we hope to have that moving into fruition towards the end of the year, the beginning of next year.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Sennai. Now we have Richard Appeldoorn and then Walter Keithly.

RICHARD APPELDOORN: Thank you, Vance. This is a question for Adyan. Just in general, and this thing applies for Puerto Rico, just how much of an impact does not having an estimate of recreational harvest have on what the outputs might be. Since we're not accepting it for management, it's just a general kind of question. But I'll point out that I tried to estimate recreational landings up until 2022. And, for Yellowtail, I was getting, that the recreational catch was somewhere between 24 and 30% of the commercial catch.

That was estimated in a very different way than your approach. And it's based on the MRIP stuff, which if you're familiar with that, their results are considered confident for about three species off the top of my head. So, there's a lot of variability in there, and that's why I didn't bother to bring it up in the Puerto Rico sense. But does it really have a major impact if we're missing part of that catch?

ADYAN RÍOS: Thank you, Rich. So, this has come up for all of our assessments that lack that information, as well as spiny lobster comes to mind as well. What we kind of are assuming is that if the ratio that you mentioned, so that 20 or 30%, has stayed the same over time, then it's effectively just a matter

of units of what we're putting into the model. And so, we might be off of the scale, but we're remaining within the same units when we're looking at total commercial catch compared to the total commercial catch potential.

I think that was also, kind of, when we corrected the model yesterday, when I showed that of how it affects the scale, when you're not accounting for a component like that, it does affect the scale, but you're kind of scaling what the model's predicting your OFL and your MSY based on the catches you did tell it about. And so, if there's a different scale, it will retain the same trends and provide a different scale of allowable catch.

However, if the trend that is recreational catch is not the same, so if recreational catch like doubled and went to 50% or 60% in some years and then back to being a small component on other years, then that would be affecting your trends of your fishing mortality in a way that would not be being captured accurately by these models.

VANCE P. VICENTE CERNUDA: Thank you, Adyan. We have Walter.

WALTER KEITHLY: I lowered my hand, Mr. Chairman. Everything's been covered that I was thinking about. Thank you.

VANCE P. VICENTE CERNUDA: Okay. I'll give Adyan a 15-minute break. Come back at 03:15. Or at 03:20. I'm sorry. At 03:20.

(Whereupon, a brief recess was taken.)

VANCE P. VICENTE CERNUDA: Well, hello. Good afternoon. Welcome back to the afternoon session of the last day of our 2026 SSC meeting.

I think that Adyan has completed her presentation, and the floor is open for any discussions on her presentation. So, anybody that needs to ask a question, please do. Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. It doesn't look like Grac-- oh, there's Graciela. She might be able to help me. I lowered my hand previously, but I'm going to bring it up anyway now, on two issues. With respect to the discards, if I'm not mistaken, I may be, it may just be for Puerto Rico. MRAG did a study some years ago, looking at discards. Again, it is relatively old now, but maybe of some value. I just don't remember if it was just Puerto Rico or it include the Virgin Islands.

The second point, Richard just asked about the recreational catch. The impact of recreational catch will have on dock assessments. I brought this question up several times in the past. I know if Puerto Rico assumes 7.8%, which was reasonable based on MRIP data and all, or MERFs data I guess it was at the time. But if I understand you, Richard, you figured it was 20 to 30% for the Virgin Islands?

VANCE P. VICENTE CERNUDA: Richard, can you answer?

RICHARD APPELDOORN: Yeah. That was for Puerto Rico, not the Virgin Islands. And it used a very different method than what Adyan was using. And it is based on very reasonable but unknown assumptions, etcetera, etcetera. So that's the number that came out. That doesn't mean I put a lot of weight on it, but it does kind of show how much uncertainty we have in what's going on.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Richard. Walter?

WALTER KEITHLY: Follow-up question. Does anybody have any idea whether you would expect the recreational yellowtail snapper harvest catch to be larger in the Virgin Islands than in Puerto Rico or less than. And I understand they may not have the answer, but I'd be-- let me put it this way. If there is significant recreational catch, it would indeed impact your stock assessment results unless there's a high correlation between-- unless it's a scaler of the commercial catch. Let's put it that way. Thank you.

VANCE P. VICENTE CERNUDA: Okay. Adyan, can you respond to that?

ADYAN RÍOS: So, I don't know whether there's more or less, in comparison, in the Virgin Islands for recreational catch of yellowtail snapper or if the recreational fishery operates very differently or targets the same sizes. So, this is a key uncertainty of information that can affect the models. And so, I think that it is important to highlight the importance of collecting those data and having that information.

We've made the assumption of no recreational fishing, and so that's-- or of that not being captured, right? So the total is just being reflective of commercial catch. So, that is something that is a caveat of the methodology. But if the majority of the catch and how we manage the species can be compatible, then I think that's an assumption that we've had to make in some instances, for example, with spiny lobster. And there might be justifications for species where we might not want to be okay

with that same assumption.

VANCE P. VICENTE CERNUDA: Yep. Thank you, Adyan. We have next Skyler.

SKYLER ROSE SAGARESE: Yes, Skyler Sagarese. Just to highlight. I think this kind of issue is not unique just to the stock on this island platform. So, this is the kind of information, thinking bigger picture for SEDAR 103. There might not be a lot of quantitative data to look at discards and discard mortality, but here is where local ecological knowledge from fishermen and who've been participating in these fisheries for decades can kind of feed in and give us at least some sort of picture that we could be considering with the assessment.

There are ways we can configure recreational landings in the stock assessment, but we really-- the decisions really need to be based on some kind of information. And I think in this case, I'm hoping that the local ecological knowledge would really help kind of hone-in on some hy-- at least hypotheses of what has been happening for all the stocks and all the islands as needed.

VANCE P. VICENTE CERNUDA: Thank you, Skyler.

GRACIELA GARCÍA-MOLINER: So, Walter, in answering your question, there was a discard study by MRAG in Saint Thomas, a pilot work in 2006. I was looking very quickly through the report, trying to figure out if there was any information on the yellowtail snapper. There is some information on the on the yellowtail snapper but it represents a very small amount of discards. So, they did that for Puerto Rico, for Saint Thomas, and for Saint Croix. But just the pilot. There was no follow-up.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Graciela. Any other comments or questions for Adyan? Okay. Well, if not, we have to bring up the-- to reiterate the last two motions that we had for Puerto Rico, but changing to the U.S. Virgin Islands.

Yes. Skyler. Sorry.

SKYLER ROSE SAGARESE: Skyler Sagarese. Mr. Chair, I've drafted one that-- can I paste it into the motions to try to meet both of those requirements?

VANCE P. VICENTE CERNUDA: Yes.

SKYLER ROSE SAGARESE: Okay. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Julian, come in. We're going to read your comments.

Okay. Go ahead.

LIAJAY RIVERA GARCÍA: So, Mr. Chair, I'll read Julian's message. It says, Okay. So, Julian said, "The number is very small for recreational yellowtail fishing in U.S.V.I." Discards. No, no, it doesn't say that.

Can you tell me the number of what, specifically, in the message?

It says, "Tell them the number is very small for recreational yellowtail fishing in U.S.V.I."

VANCE P. VICENTE CERNUDA: Thank you, Julian, wherever you are. So, I will read motion number 6 prepared by Skyler Sagarese. Motion number 6 reads, *"The SSC considers the assessment of SEDAR 84 U.S. Caribbean Yellowtail Snapper for Saint Thomas and Saint John to represent the best available science. However, given the uncertainties noted during the review workshop, the results are not useful for providing management advice and developing fishing level recommendations for the Council at this time."* that integrates the two into one motion. So, thank you.

So, let's go for discussion. Any discussion on motion number 6? Motion by Skyler Sagarese? Richard? Richard and then Walter Keithly.

RICHARD APPELDOORN: I just want to second the motion.

VANCE P. VICENTE CERNUDA: Motion has been seconded by Richard Appeldoorn. Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. I was actually going the opposite direction. I was going to ask if we could break this into two separate motions because some of the SSC members may not agree with the first part of the motion, but would agree with the second part of the motion. Thank you.

VANCE P. VICENTE CERNUDA: Sí. Separada, sí lo sé. Okay. So, I guess that you're right. So, we'll have to-- we'll split it again like we did before.

Is that what you want here Walter?

WALTER KEITHLY: Well, that's what I would recommend.

VANCE P. VICENTE CERNUDA: Okay. So, let's split it in half just the way we wrote it before, and we'll read it again. So, this will be-- so, motion number 6 would then read, "The SSC considers the assessment for SEDAR 84 U.S. Caribbean Yellowtail Snapper for Saint Thomas and Saint John to represent the best available science." That's motion by Skyler Sagarese. It was second by Richard Appeldoorn. Walter?

WALTER KEITHLY: Yes. Well, what is your question, Mr. Chairman?

VANCE P. VICENTE CERNUDA: Hold on. Hold on a second. Yes. Give us a few minutes. We have some technical problems we need to solve. Hold on.

Yes. Please, look at the screen, Skyler. Do you agree in separating the two motions just like we did for the yellowtail snapper for Puerto Rico?

SKYLER ROSE SAGARESE: Skyler Sagarese, yes. I do.

VANCE P. VICENTE CERNUDA: Okay. Thank you. So, then we'll do it separately because, like, Walter said some may say "yes" on the first one and "no" on the second one, and it's better to keep them separated. But thank you. And Richard is second. I mean, he seconded this motion.

So, we have motion number 6, motion by Skyler Sagarese, seconded by Richard Appeldoorn. "The SSC considers the assessment for SEDAR 84, U.S. Caribbean Yellowtail Snapper for Saint Thomas and Saint John to represent the best available science. Any further discussions on this? Okay. No.

And then we proceed with the voting process. I will read-- hold on. Okay. Okay. Tarsila I'm sorry.

Tarsila Seara?

TARSILA SEARA: Hi. Yes. I vote yes.

VANCE P. VICENTE CERNUDA: Elizabeth Kadison?

ELIZABETH KADISON: Absolutely. Yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn?

RICHARD APPELDOORN: Yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn? Yes. Okay. Sorry. Reni García?

JORGE R. GARCÍA-SAIS: Yes.

VANCE P. VICENTE CERNUDA: Walter Keithly? Abstain.

WALTER KEITHLY: No, because of the TIP data not being thoroughly analyzed.

VANCE P. VICENTE CERNUDA: Okay. So, Walter Keithly, no. Cruz, J.J.?

JUAN J. CRUZ-MOTTA: Even though it contradicts my previous vote, I say yes.

VANCE P. VICENTE CERNUDA: Okay. No. Okay. Ah, J.J. Cruz said yes? Okay.

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Skyler Sagarese?

SKYLER ROSE SAGARESE: Skyler Sagarese. Yes.

VANCE P. VICENTE CERNUDA: And Vance Vicente, yes. So, the results of the voting are 7 voted, "yes," one "no," and there are 3 absentees. *So, motion number 6 is accepted. Moves on.*

Now we'll see this, the second motion, motion number 7.

LIAJAY RIVERA GARCÍA: Hi, Skyler. This is Liajay for the record. Does it read as you presented previously?

SKYLER ROSE SAGARESE: Yes. The only thing is I added that, basically, why we're saying it's not useful. That we're leaning on. Let me try it--

VANCE P. VICENTE CERNUDA: Skyler, couldn't hear you. We could not hear you. Can you repeat, please?

SKYLER ROSE SAGARESE: Yes. So, my suggestion would be "Given the uncertainties noted during the review workshop," and then I would say "the SSC finds that the results presented are not at present useful." I-- yeah. Because at least that provides why we say it's not useful, that those uncertainties still exist.

VANCE P. VICENTE CERNUDA: Hello? Then the motion is by you, and

then it will be a second by Richard Appeldoorn? Yeah, Richard, do you second it? Richard?

RICHARD APPELDOORN: Yeah. I've said twice now that I second it.

VANCE P. VICENTE CERNUDA: We couldn't hear it. Ahí. Escribelo. Voy a leerlo.

Okay. Motion number 7 reads, "*Given the uncertainties noted during the review workshop, the SSC finds that the results presented in the SEDAR 84 U.S. Yellowtail Snapper for Saint Thomas/Saint John are not at present useful for providing management advice and developing fishing level recommendations for the Council.*"

This motion was submitted by Skyler Sagarese and seconded by Richard Appeldoorn. Any discussions? I hear no further discussions, so please begin the voting process.

Okay. Tarsila Seara?

TARSILA SEARA: I vote yes.

VANCE P. VICENTE CERNUDA: Elizabeth Kadison.

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn? Richard Appeldoorn?

RICHARD APPELDOORN: Yes, again.

VANCE P. VICENTE CERNUDA: Yes, bueno. Reni García?

JORGE R. GARCÍA-SAIS: Yes.

VANCE P. VICENTE CERNUDA: Thank you. Walter Keithly?

WALTER KEITHLY: Yes.

VANCE P. VICENTE CERNUDA: Wow. J.J. Cruz?

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Skyler Sagarese?

SKYLER ROSE SAGARESE: Yes.

VANCE P. VICENTE CERNUDA: Vance Vicente? Yes. So, we have-- todos "yes," ¿verdad? So, we have a unanimous decision. 8 "yes." Please note that there are three members that are absent. So, therefore, *the motion moves.*

Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. I just wanted to put on the record. I voted no on the first motion, not because of anything that Adyan had done. I found that very competent. But, again, going back to the last SSC meeting, I made the point that we really have to look at this TIP data in detail to see if it is representative of the catch given that it is used quite a bit in these assessments.

Thank you.

VANCE P. VICENTE CERNUDA: Okay. Thank you. I think we can note that once we complete SEDAR 84, we'll make the research recommendations or any general comment that the SSC wants to make to the Council on SEDAR 84. So, I suggest that we move on to the next topic, which is the stoplight parrotfish. Let me see.

Oops. My computer went off. Hold on. Okay. Yes.

Okay. So, then if Adyan Ríos is ready, we'll initiate and complete the final review on SEDAR 84 Caribbean stoplight parrotfish Saint Croix for approval/disapproval of the stock assessment report recommended or recommended OFL or ABC, and develop and list the research recommendations. And Adyan Rios will be the presenter. So, Adyan, when you're ready, we're ready.

**SEDAR 84 CARIBBEAN STOPLIGHT PARROTFISH ST. CROIX: FINAL
REVIEW—ADYAN RÍOS, CARIBBEAN BRANCH SOUTHEAST FISHERIES SCIENCE
CENTER (SEFSC), NOAA FISHERIES**

ADYAN RÍOS: Thank you, Vance. All right. We have a similar structured presentation for U.S. Virgin Islands, Caribbean Stoplight Parrotfish. And just starting with the current management, also having the fishery-- the island-specific fishery management plans in 2022. And then it's part of Parrotfish Unit 2, which has a limit of 72,365 pounds.

There are two indicators in this stock unit, so I think I'll cover that on the next slide. Those indicators reflect how the unit is managed. So, if the ACL of those two indicators exceeds

this ACL for that unit, then it closes for all, for the entire stock complex.

Then, here's just for context what those stock complexes are. So, I was referring to parrotfish 2, which is where the stoplight parrotfish is, with redfin also as an indicator species. And then we also have princess, queen, redband, redtail, and striped parrotfish. The scope of the SEDAR 84 for Saint Croix was just for stoplight parrotfish.

There's another parrotfish complex, that's parrotfish 1, which doesn't have an ACL because it's been prohibited since 2012. And that includes the blue, the midnight, and the rainbow.

We had a ban on gillnets and trammel nets in 2005 in federal waters. We have the ban of the blue, midnight and rainbow parrotfish in 2012. The implementation of an ACL for all parrotfish in 2012 as well, for those that are not prohibited. As well as a 9-inch size limit in 2013. As far as management history for the U.S. Virgin Islands, there was a buy-back of gillnets and trammel nets in 2008.

For assessment history, this species was also looked at in SEDAR 46, but as we discussed earlier, it was not used for management. At the time, there were only 3 years of species-specific landings data.

So, for data and methods, that's what we'll discuss next. We'll follow kind of like the same structure as our last presentation. We've got landings, length compositions from the commercial fleet. And then, we have life compositions and an index of abundance from the fishery-independent survey. And we have life history information from samples from the region.

These are the recommendations that came out of the data workshop. So, to use the light tissue data; start commercial landings data in 2012; to identify and flag outliers; utilize the various diving gears to establish a dive gear group; to assume that discards are negligible; to use the TIP length data from 2012 to 2022; to use the survey data, the National Coral Reef Monitoring Program data from 2012 to 2022; to not use fishery-dependent information as an index of abundance.

After the data workshop, the life history working paper was finalized and the assessment panel accepted landing outliers as valid trips. So, the structuring and the model development approach is similar with the exception that this model also takes into consideration the biology of the sex change that we

have for stoplight parrotfish. But again, we use stock synthesis and the same practices and approaches.

Again, beginning with structuring the models, factoring in the biology, the hermaphroditism, the continuous recruitment, and the increased catch uncertainty. And then, also adding in the indices for the index, investigating whether to use the composite, so the pooled composition data versus the annual, specific annual length compositions and also investigating the ability to estimate recruitment deviations.

So, this, again, just describes how the models were structured, one area, one fleet, one survey. And then, the sensitivities and the diagnostics developed during the stock assessment process that are included in the stock assessment report. And this table summarizes the steps going into the model that were included in the report, and then the ones that were refined at the review workshop.

Again, refined in a similar way where we also simplified the model, those annual Fs. And instead of treating hermaphroditism as sex change from-- I always get it mixed up, from one sex becoming the other, we accounted for that in a single sex model by reducing fecundity. So, as this transition, it changes their fecundity as they become male.

That brings us to this slide. This slide is the same as we saw for the previous presentation. Just noting that that's the work that was accomplished under the timeframe of the review workshop. And subsequently, these models were not further developed. And then again, the CIE highlighted important attributes like the short timeframe and the information that's available, but not being used, right? We know there's longer time series of TIP. I'll show you more, we'll dive a little bit deeper into the data on the subsequent slides, but I wanted to just kind of emphasize the parallel situation for Saint Croix parrotfish.

I wanted to just, kind of, provide some visuals of the model that was developed at the review workshop. And so, we were looking into the different selectivities as well. So, here we're looking at a selectivity for NCRMP that sees all sizes as opposed to the dome. That was a discussion based on the habitat of this species being more similar to the habitats encountered in the survey and the depths.

And then, we also have the fit to the catch. And again, like, the model being very sensitive, and then that's described

further in the report to that initial year. How do we allow the model to estimate equilibrium catches in that start year of the model? Then here in the bottom right of this left panel, we have the index, and we see that the model's not fitting the index very well. It is, however, fitting the length data of the survey. So, that's what we see in the top right. We see that the average size went down in 2015 compared to other years of this survey. Okay.

So, I just wanted to kind of-- that's what I consider the furthest developed model included in that addendum in the report, which shows that it still has potential, but also work to do and assumptions to further consider, like, that start year and what we can do with other important assumptions like steepness and growth.

So, that brings us to taking a look at the landings and that short time series. Again, 10 years, I guess 11. So, we go from 2012 to 2022, and we have, that's 40,000 down to a little bit under 20. So, we are seeing a decline in landings that goes under 10,000 pounds and then picks back up. And that decline happened between 2017 and 2018, but it came back to kind of the same level afterwards.

Similar to the presentation we saw earlier today, we've got species-specific information that starts in the middle of 2011. And so, the species-specific data for the full year starts in 2012. And we've got a stoplight in this teal color. It goes like this darkest color, then it goes to this blue, then we get to this more blue color, and then we get to that teal color, with the biggest one here where my mouse is. But we don't know the composition prior to 2012. But we do know that there were substantial landings overall of all parrotfish.

Here's information about the number of trips. And so, when we see that decline in the landings that we saw from 2018 and 2019, we also see a corresponding decline in the effort. And then, we have the information by gear groups here where we have the scuba gear group, which has the most landings. And then, all the other gear groups that were not part of that have some increase in 2015 and 2016, 2017, and a little bit in recent years. But the majority of the landings comes from the scuba gear.

Next, looking at the length composition data. 98% of the length is from that diving gear. However, that's only 66 trips in that entire time period. So, that's only 66 trips and 1000 length measurements over all of those years. And so, that was incorporated into the model. But, again, like, the model takes

into account which years have more information by knowing how many trips were sampled each year. And that's why it was a consideration also to pull this data to only inform selectivity. Well, that was also part of the model development and considerations because of some years having low or no samples.

So, here we see the relative amount of samples, like, the proportion of total samples that we have for Saint Croix stoplight parrotfish. Prior to our start year in 2012, there's quite a bit of samples that came from the pots and traps to the fishing pots. And then afterwards, most of the samples come from diving, but they're not being sampled every year. So, that is something to recommend that that data would be very important for the type of model that we're using in order to try and fit to the selectivities and understand the size and dynamics of the fishery capturing stoplight parrotfish in Saint Croix.

As far as comparing the data during 2012 to the data prior to 2012, we do see that we don't really see like a shift in the average size. So, this is comparing the data that we use compared to all of the available data. And we see that there's not a shift that kind of states that like, "oh, something drastic is different in the recent period." I guess there are a little bit fewer large fish here, but then it flips over here. So, I guess, this is also sensitive to sample size. So, I won't read too much into it, but it is a useful plot that helps us kind of determine how and see whether there are any major shifts in the average size or in the distribution of sizes.

Next, we go to the fishery-independent survey. We have information about this survey having been regionally restricted. So, only being in a certain part of the island from 2001 to 2011 and then going island wide and also changing in its methodology. But in the years that we used in the model, like, everything is consistent. So, that was the 2012 forward.

We also have multiple lengths per guide. So, similar to what we talked about, how the model weighs the individual years of information for the commercial length data by the amount of trips that were sampled; the model also weighs the relative years, the information, the length compositions by size, by year, based on the number of dives each year, the number of sites. And so, that's shown here. You see that we've got 262, 239, 181, 314, and 148 dives in that period of time that we are using this data and quite a lot of stoplight parrotfish, too. So, the number of total lengths that were reported by the divers.

This shows the breakdown of where those fish were observed. And also, at what depths. And this information all gets factored into developing the index, which is an estimate of density. And here we have that information. And then if you remember that the model starts in 2012, so what it's using is this-- it's not using this entire time series because when the fishery logbook becomes species-specific, as well as when they have adopted their current methodology. The data previously are calibrated, but there's additional uncertainty that gets factored in when you're calibrating data from the different survey types.

That's good to do because you are, kind of, converting to the same units. And so, I think it's important to also reconsider and think about what we might be able to do with this data prior to 2012 so that we're not working with such a short time series. And I think it's also important to continue to collect these data.

For life history information, there were 1,800 samples from 2013 to 2023 from across the U.S. Caribbean. We do have sexual dimorphism reported. And then, we'll take a look at the length age curve on our next slide. We have a maximum age of 433 millimeters and the oldest aged fish of 20 years.

And then, we also had information about maturity and reproductive phases, so that the females and males are spawning capable year-round. Not all females transition. So, some females stay female all time. And that the majority of fish less than three, were female. Between four to fifteen, there were similar proportions of males and females.

Here is the length/age relationship. So, the growth fit with von Bertalanffy growth. And we've got L Infinity. I don't have it. I think I don't have it on this slide, but I can look it up really quick. So, around 30 a little higher, 300 millimeters. And then very few individuals were above 35, I think it was reported in the last slide. Let's see. "Very few females greater than 35 centimeters," like, 351 millimeters. So, that's represented by the x's. The x's are the males. But they did report that the largest individual observed was still female and the oldest individuals were also female.

So, that creates like a very interesting, but also complicated way to incorporate this into SS because the maturity function that we were initially using, sorry, the hermaphroditism is just a function of the probability of changing sex at a given age. And so, that was also, I think, improved when we went to the single sex model where you can, kind of, take this observation

or this reality that we're seeing of there being females that never change, and factor that in a little bit more fine-tuned. So, I think that was an improvement in that approach of the review workshop development.

Yeah, so here is the size limit. So, the L_{∞} that was used with the fork length and the fixed T_0 . So, 33.2 centimeters. On models that we use, I have to use centimeters. So, it's just where my mind's up.

A little bit about the CVs, just showing those and how the growth was reflected in the SS model. A little bit about maturity and hermaphroditism. So, we have the information about when they mature, so at an age of about 1.6, and when they transition on average at 4.5, and the associated lengths in millimeters.

Here's information about fecundity. Wait, sorry, no. Oh, the distribution by age. So, these are the individual ages, and these are the individual lengths. And so, we do see that sexual dimorphism here shown by the males being skewed to the right. So, we've got red being females, gray being transition, and blue being males. However, we do see some females at some of the largest ages. You also see what we discussed earlier in the bullet point of when the majority-- when we see the most frequency of fish begin transitioning, the gray bars.

So, this is a table that just shows different sources of information for natural mortality, but we use the maximum age from the recent SEDAR. Maximum age of 20 corresponding to a 0.27 estimate of M .

So, that just brings us to some of the kind of summary and discussion points that we had at the review workshop. Just that we developed the models in a stepwise approach, increasing complexity and taking into account each decision of incorporating information or refining the model. The outcomes are similar to the last assessments in that natural mortality and initial patch are very important parameters and components of the dynamics of the model that are influential.

We also have a short time series and coarse length bins in some years. So, there's the data in 2012 and 2015 use 5-centimeter bins. And so, the survey data went to one centimeter collecting, estimating the size of fish based on the centimeter instead of rounding. They did that more recently, and so there's a period of time where we have coarse length bins versus very specific bins, which is important when we're trying to predict

recruitment with the observation of the small fish that we see in the diver survey. And so, factoring that into the model also makes that a bit of a limitation for seeing those individual sizes.

And then we were estimating recruitment deviations and that those were informed by the fishery-independent data, but that the model still remained in this preliminary state of having been investigated and developed thoughtfully but still having highly influential uncertainties. I think that was preliminary models. So, I'm not going to talk a little bit about that.

Assessment research recommendations. I think I just wanted to get to-- let's see if I have anything else from the review workshop. No.

Okay, so yeah, so there's some of the research recommendations that are in the stock assessment report from the assessment process and from the data workshop process. But I think what we wanted to also revisit today was those from the CIE review. And so, we do have those, a section of-- let's see. I have it open somewhere.

I guess while I look for the research recommendations from the CIE review, I'll just check in and see if there are any questions. Yeah, I'm not seeing any.

I'll just point out that on page 151 of the stoplight parrotfish, I think, this is in all three reports because they've got them kind of stacked. But we do have the research, the CIE research recommendations for the different species. I think something to try in the future with SS is to incorporate the length and age data and allow SS to estimate growth. I think that's going to be something to consider in the future. Increase the time series for all key data streams. You consider alternative approaches.

So, this is related to modeling approaches. I believe that right before this there are also research recommendations for data. Quite a few short-term and long-term. Short-term or hindcasting, so making better use of the data prior to 2012. Investigating alternative mortality and growth. Investigating potential for CPUE or considering bycatch or whether the species is opportunistically targeted. Investigating connectivity and how that has implications for informing steepness.

Then some long-term ones. Like, ensuring that sample sizes include small and large fish. Maintain and expand commercial

monitoring programs. Concerns about, or recommendations to include more spatial and temporal coverage of the surveys, of the diver surveys, and to incorporate recreational fishery data. So, those are the ones for stoplight parrotfish in Saint Croix. And then the report also has the CIE review summary for yellowtail snapper in Saint Thomas/Saint John and Puerto Rico, as well as the research recommendations related to assessment methodology in the next section.

So, these assessment reports are on the SEDAR website, and this chapter is in all of them. So, this is the response that the report has for Term of Reference 5.

That's all that I have. So, I'm just hanging tight to know about any questions or any considerations that we need to discuss before, that we're able to discuss today.

QUESTION/COMMENTS

VANCE P. VICENTE CERNUDA: Okay. So, the floor is open for discussions and questions. So, anybody come in? Raise your hand. Again, we're getting no questions.

No, nothing back from the members, from the public. So, let's see. Hold on. Richard Appeldoorn?

RICHARD APPELDOORN: I don't have any questions, other than are we even in a position to say whether this is the best available science approach? I think it's too data limited. And, given that, hopefully something might come out of SEDAR 103. But I'm not even sure we can make a recommendation at this point whether this is the best available-- whether this represents the best available science. It's good science, but I think they did the best job they could with the available information, but I'm not sure it's the only approach, and that's kind of where I'm stuck.

VANCE P. VICENTE CERNUDA: Yeah. I agree, Richard. Let's write down the motions regarding-- hold on. Walter?

WALTER KEITHLY: Yes. Thank you, Mr. Chairman. Adyan, you showed a graph of total parrotfish landings starting at the beginning, then in 2012 you broke it down to individual species when the data became available. I don't think-- yeah.

Do you have that information for trips by any chance? I'm just kind of wondering about it just the way it coincides so closely, the reduction in parrotfish landings of these specific species with the disaggregation of parrotfish. That just leads me to

wonder whether fishermen simply are not filling it out like they used to.

That's why I was wondering whether the trips would show the same pattern.

ADYAN RÍOS: Yeah. I don't have that easily available. Those data do exist to tell us how many trips were taken in the years prior to 2012, but the time series that made it into our reports was from 2012 on.

WALTER KEITHLY: As a follow-up, do they have an unclassified parrotfish category in the logbooks?

ADYAN RÍOS: Let's see. I don't believe-- is anyone from the Virgin Islands able to answer that about whether there's an unspecified parrotfish still on the logbooks or whether it's all species-specific?

VANCE P. VICENTE CERNUDA: I don't hear any answer for that, but I do remember, Reni García pointing out in one of our previous meetings regarding the stoplight parrotfish that there might be some taxonomic issues. This species is not very easily identifiable from other smaller parrotfish. So, that might create a higher degree of uncertainty. Reni, can you expand on this, please? Reni García?

Ah, Okay. Elizabeth, please.

ELIZABETH KADISON: Yes. I think the uncertainty may be a little higher because what I found is, for one thing, and some of the commercial guys could speak on this, but the local names for parrotfish are different than the common names that we use. I have found that-- and I'm not saying-- probably on Saint Croix where these guys are specifically targeting parrotfish they probably know, but I've had to, collecting parrotfish for like Virginia, explained to fishermen that the terminal male and the female were the same species, like they thought they were different species. So, I think there may be a little bit of ambiguity here and uncertainty in identifying species in some of those catches.

VANCE P. VICENTE CERNUDA: Yes. Thank you. That's what I thought we discussed in one of our previous SSC meetings. I was a little bit concerned before regarding the Lmax because most of the samples are done in shallow water, especially for the commercial catch. But I do have information that the larger males do go into deeper water, down to 90 feet, 100 feet and, well,

sometimes they're not taken into account.

But looking at NCRMP data, they have collected samples at deeper depths, between 30, what, and 60 meters, something like that. And this has probably been taken into account, but that is that the larger fishes are in deeper water. We have a next. Walter Keithly.

WALTER KEITHLY: Thank you, Mr. Chairman. Again, I want to go back to the question that I asked a few minutes ago and got sidestepped on another issue there. I just would strongly recommend that Adyan check to make sure that there's not an unclassified category of parrotfish. Now, I've made that mistake myself, and it can be embarrassing. So, just double check because, again, just the way those landings dropped so sharply just about the time that they started separating out the species just raises a red flag to me.

Thank you, Mr. Chairman.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Walter. Kevin McCarthy?

KEVIN MCCARTHY: Yeah. Thank you, Mr. Chair. Was just typing in the chat that-- this is Kevin McCarthy. Walter, I've got that answer to your question. So, I'm looking at the reporting forms from Saint Croix since they switched over. So, basically, the 2012 forward, there is not an unclassified or just a snapper entry that you can make-- that's on the form. What they could do as fishers is they could write in. There's always the option to write in. There's a couple of spaces at the bottom of the forms where you could just write in parrotfish.

It's not showing up, and as far as I can tell, it's kind of tough with these colors, but it looks like that really dark color that is parrotfishes for the first half of this, with all the high bars, I don't see that again, I don't think, since 2012. So it could be that if they don't know what it is, they don't report it. It could be because we do have a big drop in the number of just the overall landings of parrotfish. Now whether that's driven by reporting or something else, who knows?

But I don't think that there's an option for-- there's not on the form a clear option for reporting parrotfishes. However, again, there's that write in option or the, just, "I don't know what this is. I know it's a parrotfish. I don't see parrotfishes on the form. So, I'm not reporting."

I'm not saying anybody's doing that, but there are a variety of options that people could take. But checking a box that says parrotfish is not an option. It's not on the form.

WALTER KEITHLY: Thank you.

VANCE P. VICENTE CERNUDA: Thank you, Kevin. Richard?

RICHARD APPELDOORN: The drop is really occurring in 2010. So, that's before the forms go into effect. It does coincide with the imposition of ACLs, if I recall correctly. And we have had issues before in Saint Croix, with respect to conch, about whether there was deliberate underreporting, and I'm not saying anyone's doing that. But if you're a conspiracy theorist, that's one thing to consider.

The other question I had is when did the gillnet ban, go into effect? Does that lead to a big drop in landings?

VANCE P. VICENTE CERNUDA: Yes. Thank you, Richard. Any further questions or discussions for Adyan? Yeah. Richard, you want to make the motion to include the information.

RICHARD APPELDOORN: No. I'm not ready for that.

VANCE P. VICENTE CERNUDA: Okay. But, yeah, we're going to be putting the two motions on the screen regarding the quality of the data and its usefulness for fishery management advice, fisheries advice. So, hold on.

So, we have motion 8 number, in the screen. It hasn't been, proposed by anybody yet, so we'll be waiting. But we'll read it. "The SSC considers the assessment for SEDAR 84 U.S. stoplight parrotfish for Saint Croix to represent the best available science.

Skyler?

SKYLER ROSE SAGARESE: Yes. Skyler Sagarese. I don't want to-- Just a comment first. Before, I'm thinking, I heard some concerns that this may not represent the best available science, but I'm just sitting here thinking, how else could we have assessed this stock?

Because in this case, we had clear data limitations. The length composition data is so sparse in the most recent years, so we really couldn't have used the data limited method just looking at lengths. The index of abundance. I think this is something

moving forward with 103. We should really be careful and critical of using that NCRMP data and the DCRMP. I think they're really-- there's a lot of promise there.

But I'm just thinking how-- I think what Adyan put together here, I'm not sure anyone could have done a better job given all the limitations as well as the expectation to be using a more advanced assessment model. And I know she built it consecutively. So, I'm struggling.

To me, this is the best attempt. I think spiny or spotlight parrotfish was always going to be a challenge, and it was chosen for that very reason to try to break these methods. But I really think Adyan tried the best she could.

I just wanted to add my perspective on that.

VANCE P. VICENTE CERNUDA: Reni García.

JORGE R. GARCÍA-SAIS: Yes. I want to make a comment regarding the length distribution data for parrotfish associated with the NCRMP surveys. The area of survey, which is a radius of 7 meters, is too large to actually provide an accurate assessment of the amount of small recruitment size parrotfishes within that cylinder. The area where a small parrotfish swims, within that radius, is a small portion of the cylinder. So, if you are doing the survey in the center, you're likely to see the small parrotfish recruitment. I'm talking about one to 5-centimeters parrotfishes within your immediate area, perhaps the first 2, 3 meters.

But aside from that, 4, 5, 6, 7, 8-- 7 meters, it's not possible. It's not possible to provide an adequate quantitative assessment of the size distribution of parrotfishes across the entire range. And the sizes that are going to be underrepresented are going to be small sizes. Perhaps nobody has done a careful analysis of this, but having done the NCRMP surveys for many years, and doing the transect that-- I go through the entire transect, I can see the distribution of fish across the entire transect. It's very different, you know.

So, I don't know. What I'm trying to say is that the actual size distribution of parrotfish across the entire range from recruits to full adults is not adequately represented by this method. It has limitations. The worse the visibility, the more that difference becomes evident. So, if you are working in a place that has a limited visibility or even if it's 7-meter because that's the minimum visibility that you can have to make the

survey. They tell you if the visibility is under 7-meters, don't do it. Most people end up doing it anyway.

I'll tell you it's almost impossible to see 2, 3-centimeter parrotfish 7-meters from your point. Okay? So quantitatively the relative composition of small fish relative to the big fishes decreases as you go out of your-- as you increase your distance from your center towards the 7 meters. That's my take.

So, every method has its own limitations and its advantages and that is one of the disadvantages that I've seen on the NCRMP methodology compared to, for example, transect, belt transect methodology. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Reni. That's a valid point. We have now J.J.

JUAN J. CRUZ-MOTTA: Thank you. I just want to go back to Skyler's comment and just say that precisely that comment was the comment that made me change my mind on the way I voted for the yellowtail in Puerto Rico, which I abstained, and then for Saint Thomas, I say, "yes." I totally agree with Skyler. I mean, like, with what the Science Center and Adyan has that's the best--

VANCE P. VICENTE CERNUDA: J.J. we cannot hear you. Can you speak up?

JUAN J. CRUZ-MOTTA: Yeah. I'm speaking. Hello? Hello?

VANCE P. VICENTE CERNUDA: Oh, you are, but very lightly.

JUAN J. CRUZ-MOTTA: Ah, okay. Okay. What about now?

VANCE P. VICENTE CERNUDA: That's better. Go ahead.

JUAN J. CRUZ-MOTTA: Yeah. I have full-- okay. Anyhow, I was saying that the comment that Skyler made before, it was the comment that made me-- I mean, that's the logic that made me change my vote from the Puerto Rico Yellowtail assessment to the Saint Thomas yellowtail assessment. I totally agree with that view. The Science Center, Adyan that's the best she was able to pull up given the data that was available.

Now, I have a question about the SEDAR process. Is it possible to stop the SEDAR process at any stage? For example, these limitations about the data were clear from the very beginning when we had the data workshop, but still, we went ahead with the

SEDAR. Is it possible for the data workshop, or is it possible for the people, for that panel to say, "hey, guys, this is what we have. This is the data we have. We do believe we cannot run an assessment with this. So, we recommend we stop the process right now." Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, J.J. Elizabeth?

ELIZABETH KADISON: Yeah. I agree pretty much with what Skyler said. I mean, I think that we're data limited, and Adyan did a great job with this. However, there is one data set that I'm not sure why it's not included here and that is the Territorial Coral Reef Monitoring Program, the TCRMP, which is territorial, and we do have fixed sites that we sample every year on Saint Croix and Saint Thomas and Saint John and those are belt transects. We use belt transects.

Having done both, the NCRMP surveys and the TCRMP, the territorial surveys, I agree that belt transects do capture those newly recruited little, tiny stuff like parrotfish. So, maybe this is something that can be brought up in SEDAR 103, to incorporate those other independent-fisheries datasets into these models. But that data does exist. We've been doing those surveys since 2002. We have a really long dataset on Saint Croix. Thank you.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Kevin.

KEVIN MCCARTHY: Yep. Thank you, Vance. Kevin McCarthy. A couple of things. I'll respond to Elizabeth as well as J.J. So, J.J., I think we could make this SEDAR process more nimble and responsive to those kinds of concerns if we get it written up in terms of reference in a way that-- I mean, this is my perspective. I don't know what SEDAR would have to say about this. But in my mind, if we're going to revamp the way we do business, let's also revamp the process that is SEDAR because no matter what we do, we're going to have some kind of review process, whether it's SEDAR, which is likely to continue to be even though we may do different kinds of analyses.

Let's think about how we write into, and we obviously would have to talk to SEDAR about this, write into the terms of reference that under X circumstances we can stop the process because the data are insufficient to carry on with the assessment and it would just be a waste of money. So, I'm all for that. My travel budget is as limited as anybody. So, if we don't have to spend money on something that is not going to result in a result, then I'm all for it.

On the other hand, SEDAR 103 is looking for alternatives to these kinds of species and data limitations because a data limitation for a state structured stock assessment may be very different than some sort of data limited approach or some kind of species grouping approach, that kind of thing. So, maybe we'll be able to solve some of those concerns with SEDAR 103, well, that remains to be seen.

And then as far as the TCRMP and those other kinds of surveys. This is a process that we could improve with SEDAR as well because the data call goes out and if we don't know about it and no 1, knows who to ask, I think we're better at that than we were a few years ago through a number of collaborative working groups. We're more aware of the available data in the region. But I think in this case, when the data call went out, SEDAR staff and others may not have been aware of some of those fishery independent surveys as important as they are. And so, it was either requested-- or sorry, it was either not requested, or people were unaware of it. I think that's how we ended up not having it.

The other side of that is we have asked people for data and everybody's busy. It's not a lot of people's jobs to be involved in SEDAR. So, they don't have time, or the dataset is-- we're aware of it, but there's no one at the workshop to represent it. So, that makes it very difficult to incorporate those data when you don't understand them. I'm not making excuses. This is just the reality of the way the process works.

So, I think there are two ways that we should improve the SEDAR process at the same time we're trying to improve the way we provide management advice and the way the Council is aware of how to use that maybe that new manage device. I'm trying to sweep a lot of things into the SEDAR 103 tent and the process itself. The SEDAR process itself is one of those. I think we can improve how we engage with people to get the right data in the house. And as J.J. was saying, if we're just up against severe data limitations and it does not look promising, there ought to be a way to put on the brakes.

Thanks.

VANCE P. VICENTE CERNUDA: Yeah. Kevin, I'm going to interrupt a little bit here. We're getting out of focus. This discussion about SEDAR, framework, template, how it can be changed through the terms of reference. I mean, even in the last SEDAR meeting that I participated in, even the external committee, they

suggested that they may-- to consider different methods other than SEDAR.

But I think we are already in the SEDAR process. SEDAR 84, U.S. Stoplight Parrotfish for Saint Croix. We need to complete this, and this is a topic that may be discussed, just not in this meeting. Thank you. Richard?

RICHARD APPELDOORN: I'm going to second the motion.

VANCE P. VICENTE CERNUDA: Okay. So, Richard, second motion number 8. Again, I will read it. *"The SSC considers the assessment for SEDAR 84 U.S. Stoplight Parrotfish for Saint Croix to represent the best available sciences."*

We already, I think, had the discussions. I think we are ready to go through the voting process. So, we'll start the voting process. First, we'll have Tarsila Seara. Tarsila?

SKYLER ROSE SAGARESE: Hi. I vote yes. Emphasis on "available."

VANCE P. VICENTE CERNUDA: Okay. Yes, you said? Okay. Elizabeth Kadison?

ELIZABETH KADISON: Yes.

VANCE P. VICENTE CERNUDA: Richard Appeldoorn?

RICHARD APPELDOORN: Appeldoorn, yes.

VANCE P. VICENTE CERNUDA: Reni García?

JORGE R. GARCÍA-SAIS: Yes.

VANCE P. VICENTE CERNUDA: Walter Keithly?

WALTER KEITHLY: I will abstain.

VANCE P. VICENTE CERNUDA: I knew it. J.J.?

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Sagarese? Skyler Sagarese?

SKYLER ROSE SAGARESE: Yes. Yes. Skyler Sagarese. Yes.

VANCE P. VICENTE CERNUDA: And Vance Vicente, yes. So, the result is we have motion number 8. We have 7 "yes," one 1

abstention. And remember that we have 3 members, SSC members, who are absent. So, that is the majority. *So, motion number 8 carries.*

Again, I'll read motion number 9 as it is stated on the screen, and then we need to have somebody make the motion and then second it. But I will read the motion first. *"The SSC finds that the results presented in the SEDAR 84 U.S. Stoplight Parrotfish for Saint Croix are not at present useful for providing management advice and developing fishing levels recommendations for the Council."* Anybody wants to approve that motion or present that motion?

RICHARD APPELDOORN: Well, moved.

VANCE P. VICENTE CERNUDA: Hello? Okay. Thank you, Richard. So, the motion has been moved by Richard Appeldoorn. Any second?

Elizabeth?

ELIZABETH KADISON: I second the motion.

VANCE P. VICENTE CERNUDA: Thank you, Elizabeth. So, we're ready for the voting process. Let's begin.

TARSILA SEARA: Are we ready?

VANCE P. VICENTE CERNUDA: Hello. Yes. Can you hear me?

TARSILA SEARA: I can hear you now.

VANCE P. VICENTE CERNUDA: Okay.

TARSILA SEARA: Are we voting?

VANCE P. VICENTE CERNUDA: Yes. We're voting.

TARSILA SEARA: Okay. So, this is Tarsila. I vote yes.

VANCE P. VICENTE CERNUDA: Sorry about that. Hold on. Okay.

ELIZABETH KADISON: Elizabeth Kadison, yes.

RICHARD APPELDOORN: Richard Appeldoorn, yes.

JORGE R. GARCÍA-SAIS: ¿Me están pregando a mí? Hello, estas entrecortado, soy yo. Estas entrecortado.

Reni García, Yes.

VANCE P. VICENTE CERNUDA: Walter Keithly.

WALTER KEITHLY: I will abstain, again.

VANCE P. VICENTE CERNUDA: Okay. J.J.

JUAN J. CRUZ-MOTTA: Yes.

VANCE P. VICENTE CERNUDA: Skyler Sagarese?

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

VANCE P. VICENTE CERNUDA: So, one abstention. Therefore, and 7 "yes." *So, motion number 9 carries.*

Skyler, can we see the recommendation, the new recommendations of 2022?

SSC FINAL RECOMMENDATIONS FOR SEDAR 84 YELLOWTAIL SNAPPER PR

SKYLER ROSE SAGARESE: Yes. Skyler Sagarese, I just want to mention that I started drafting these before I captured the discussions that we've had, but please add to it, edit it. I just tried to kind of highlight some of the things that have been brought up. Mr. Chair, do you want me to read them, or do you want to give people some time to edit, add, remove? I can read them, and then people can maybe think about--

VANCE P. VICENTE CERNUDA: No, it's okay. I can read them if you--

SKYLER ROSE SAGARESE: Okay. Perfect. Yes. Go ahead, Mr. Chair.

VANCE P. VICENTE CERNUDA: Okay. SSC recommendations for SEDAR 84 Yellowtail Snapper, Puerto Rico. The recommendations are, one, continued evaluation of life history parameters for this stock. Two, evaluate stock connectivity to determine whether local recruitment contributes to the stock or if recruits are primarily obtained from surrounding areas. Number three, consider simpler assessment implementations such as an age-structure production model. This could be beneficial in situations where the representativeness of the TIP length composition is questionable, which was noted for the yellowtail snapper in Puerto Rico. Number four, increased data collection for recreational landing. Five, investigate whether landings time series can be extended back in time with either available

data or local ecological knowledge. So, I have read the recommendations. Any comments or suggestion? J.J.?

JUAN J. CRUZ-MOTTA: Yes. I would say that not only for this one, for all the stocks or all the recommendations to include what Reni suggested about initiating or increasing research into effort. Thank you.

VANCE P. VICENTE CERNUDA: ¿Lo oíste bien? Yeah. We could not hear you well, J.J.

JUAN J. CRUZ-MOTTA: Ah, because I wasn't unmuted. Sorry.

VANCE P. VICENTE CERNUDA: Okay. Say it slowly. Say it slowly so that Liajay will be able to write it

JUAN J. CRUZ-MOTTA: Investigate fishing effort. That is it.

LIAJAY RIVERA GARCÍA: Thank you, J.J. We couldn't hear it.

VANCE P. VICENTE CERNUDA: Tarsila?

TARSILA SEARA: Yes. I was just going to suggest, either to include in some of the recommendations or to make a recommendation to increase or to-- I am try to think of the wording, but to have more cooperative research efforts to collect some of the data that we need. That will be some of the data that's already mentioned here. So, I don't know if you want to just have a catch all sort of increase cooperative research efforts to collect data mentioned or data needs or something like that. Somebody help me, please.

VANCE P. VICENTE CERNUDA: Okay. See if you like it, "increased cooperative research effort to collect data that has been mentioned in the meeting." "Mentioned." Just leave it "mentioned." Elizabeth?

ELIZABETH KADISON: I would say to continue fisheries independent data collection and to increase or to, yeah, to increase fisheries-independent data collected deeper, deeper than 30 meters.

LIAJAY RIVERA GARCÍA: Sorry, Elizabeth. Is this another recommendation? Because I'm writing on the numbers-- on recommendation number 7.

ELIZABETH KADISON: No. This is number 8. This is fisheries-independent data.

LIAJAY RIVERA GARCÍA: And, again, for all the SSC members, this document is available for you so you can enter it straight into the document and write. But for now, I can provide the typing. Increase?

ELIZABETH KADISON: Okay. So, yeah, fisheries-independent sampling in deepwater, deeper than 30 meters.

VANCE P. VICENTE CERNUDA: Richard?

RICHARD APPELDOORN: Yeah. Maybe Tarsila could help on this. This is a new one. Initiate a sustained data collection effort for local knowledge to inform assessments.

VANCE P. VICENTE CERNUDA: Initiate a sustained data collection effort. "Initiate" not "initiated." Okay. Can you repeat it, Richard?

She's writing it down now. "Initiate a sustained"

RICHARD APPELDOORN: Initiate a sustained data collection program—

VANCE P. VICENTE CERNUDA: "Data collection program."

RICHARD APPELDOORN: --for local knowledge--

VANCE P. VICENTE CERNUDA: "For local knowledge."

RICHARD APPELDOORN: --to inform assessments.

VANCE P. VICENTE CERNUDA: Didn't hear you.

RICHARD APPELDOORN: Well, they did.

VANCE P. VICENTE CERNUDA: We can't--

LIAJAY RIVERA GARCÍA: Richard, we can't hear you.

VANCE P. VICENTE CERNUDA: We cannot hear you.

RICHARD APPELDOORN: You have the right writing. That's correct. Take out the question mark. Put in a period. There you go.

Tarsila, would you like to make that better?

TARSILA SEARA: No, I think this looks good. I would just say local ecological knowledge for consistency.

VANCE P. VICENTE CERNUDA: Local ecological knowledge. Ecological knowledge. Tarsila?

TARSILA SEARA: Yes. one suggestion. I think just on number 9. Yes, I think it's-- oh, actually, you know what? Never mind because we're talking specifically about the assessment. So, I'm sorry. I'll lower my hand.

VANCE P. VICENTE CERNUDA: Okay, Richard.

RICHARD APPELDOORN: So, I did not want to limit to the word ecological because I think the same type of data collection program could get information that might be pertinent to say effort calculations, which is not exactly ecological. But I understand that LEK is the standard acronym that's used, so I could go either way.

VANCE P. VICENTE CERNUDA: We didn't hear you clearly, but you mean to eliminate "ecological" and just leave it "for local knowledge to inform assessment"?

RICHARD APPELDOORN: First of all, assessments, plural. And what I was saying is that I'll go ahead and agree with Tarsila's inclusion of "ecological" because that's kind of the way it's always stated, but I think we're looking to collect more than just ecological knowledge.

VANCE P. VICENTE CERNUDA: Okay. That's right. I think we can eliminate ecological knowledge. I mean, "ecological." Just to keep it local so that it is ample enough to collect other kind of information or socioeconomic information.

Walter?

WALTER KEITHLY: Thank you, Mr. Chairman. I didn't want to get involved in this, but I will. I would just recommend deleting "to informed assessments." There's only a number of reasons to get that e-- any type of knowledge. I don't know exactly what you meant by "ecological knowledge" but goes beyond informing assessments. And it may be just as important rather than to inform, to put in the assessment, to verify or solidify the assessment after it's done. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Walter. Tarsila?

TARSILA SEARA: Yes. Just to follow-up on Walter's comment because this is the-- that's the reason why I raised my hand before and gave up. So, I guess I have a question. Are we specifically talking here, these recommendations are specific to the assessment, or are these recommendations general research recommendations?

Because I stopped myself because I was going to say something similar to what Walter said, but then I realized, I think we're making recommendations to improve the assessment. And I just want to make sure that that's correct.

VANCE P. VICENTE CERNUDA: Richard, can you answer that?

RICHARD APPELDOORN: Yeah, I put that in because I thought we had to be specific to the assessments, but I would put this under every list of data collections we need. To answer Walter's comment, the things he talked about, to me, constitute informing assessments, whether it's before or after the fact. And I'll accept "ecological" if we're talking about human ecology.

So, I would put the assessments in there. I'm fine with it not being in there because we just desperately need this kind of information and there's-- we scream about it every year and there's been no movement to try and get a sustained data collection effort that can bring this kind of stuff into play.

VANCE P. VICENTE CERNUDA: Yeah, thank you Richard. We have now Tarsila and then Walter.

TARSILA SEARA: Yes, thank you. I forgot to mention this to clarify before. So, under local ecological knowledge, we're not just talking about natural biological environmental data. Richard is correct. The term encompasses the ecosystem, including humans and human activities as an integral part of the ecosystem.

So, local ecological knowledge encompasses more than just biological or environmental data, just to make that clear.

VANCE P. VICENTE CERNUDA: Yes. Thank you, Tarsila. I agree. Walter?

WALTER KEITHLY: I'll pass, Mr. Chairman. We've gone beyond the time limit as it is. I'm happy with either way, any way you put that number 9.

VANCE P. VICENTE CERNUDA: Okay. Thank you, Walter. Are there

any other research recommendations or any further comments? So, Skyler, we go to your SSC recommendation for SEDAR 84 Yellowtail Snapper Saint Thomas/Saint John. It's being displayed on the screen.

You want me to read them? Or would you like to read them?

SSC RECOMMENDATIONS FOR SEDAR 84 YELLOWTAIL SNAPPER STT/STJ

SKYLER ROSE SAGARESE: Skyler Sagarese. go ahead, Mr. Chair. A lot of it's similar from what we talked about, but there might be, I think, one specific one about discarding that we didn't really touch on. But we did specifically touch on for this, but please read them.

VANCE P. VICENTE CERNUDA: Okay. Well, I'll read them quickly then. Continuous evaluation of-- number one, continued evaluation of life history parameters for this stock. Two, evaluate stock connectivity to determine whether local recruitment contributes to the stock or if records are primarily obtained from surrounding areas. Three, increase data collection for recreational landings. Four, investigate whether landings time series can be extended back in with either available data or local ecological knowledge. Five, increase data collection for determining discards for both commercial and recreational fisheries, and consider alternative approaches using local ecological knowledge as needed.

That sounds great.

SSC RECOMMENDATIONS FOR SEDAR 84 STOPLIGHT PARROTFISH STX

VANCE P. VICENTE CERNUDA: Yes, Skyler. This is, your recommendations for the Saint Croix stoplight parrotfish.

One, "continued" debe de ser "continue," elimina la "d." Continue evaluation of live history parameters for this stock. Increase data collection for recreational landing. Investigate whether landing time series can be extended back in time with either available data or local ecological knowledge. Those are very pertinent. ¿Qué más? Do you want to say any additions, Skyler?

SKYLER ROSE SAGARESE: There might have been-- maybe there's one worth adding about-- I think Reni mentioned the utility of the NCRMP survey for this species. I thought that was interesting to hear. I wonder if, like, reevaluate the utility of the NCRMP and DCRMP surveys. If that was just specific for this stock, that

might be a good one to include. The NCRMP, sorry, and DCRMP. The deep CRMP and DCRMP.

But, please, someone else more familiar with the ins and outs of those data streams, please rework.

VANCE P. VICENTE CERNUDA: Yes, Elizabeth.

ELIZABETH KADISON: Yes, Skyler. DCRMP has never been used on Saint Croix because it's a survey method that's used in water from 30 meters to 60 meters, and there's just not a lot of shelf on the Saint Croix platform that is that depth range. Most of it is less than 30 meters and then it drops off to 2,000 meters. So, DCRMP has never been considered a viable fisheries-independent survey method for Saint Croix the way it has been for Saint Thomas where we tried it for 3 years and it was really, I believe, successful.

So, I think DCRMP is something that could be used in Saint Thomas/Saint John, and Puerto Rico, but it's not really used on Saint Croix for stoplight parrotfish.

VANCE P. VICENTE CERNUDA: Okay. Thank you. Yes, Skyler.

ELIZABETH KADISON: So, you could take DCRMP out of that and just use NCRMP.

VANCE P. VICENTE CERNUDA: Reni?

JORGE R. GARCÍA-SAIS: Yes. No. I wanted to say that there is quite a bit of area in the 30 to 50 meters at Lang Bank, Saint Croix. We've done we've done baseline surveys there, and there's quite a quite a bit of data associated with that. There are several benthic habitats that are within that 30-to-50-meter range and even deeper because there's a coral reef there that goes down to more than 60 meters.

So, at least for the part of, or the section of Lang Bank, the easternmost coast of Saint Croix, there is quite a bit of sea floor in the 30-to-50-meter.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Reni. We have Richard?

JORGE R. GARCÍA-SAIS: But at least our surveys are indicative that there is quite a bit of benthic habitat within that depth range.

VANCE P. VICENTE CERNUDA: Thank you. Richard?

RICHARD APPELDOORN: Yeah. Two things. What was mentioned was in fact the TCRMP. So, that should be put back into that statement four, or recommendation four, NCRMP and TCRMP.

And I would like to see, both, for this and for the previous set-- not "D0," "T" as in Thomas.

ELIZABETH KADISON: Territorial.

RICHARD APPELDOORN: Yes.

I'd like the statements on local ecological knowledge copied into this one and the previous one. And the previous one.

Nope, going too far. No, no, no, no. That is not what I'm saying. Now, back one page. Right there. Put in statement 9 from the one above; the that you just copied. The lower one, copy it there. Thank you.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Richard. We have Tarsila.

TARSILA SEARA: Yes. I just wanted to suggest that we copy and paste the statement about cooperative research into these recommendations as well.

VANCE P. VICENTE CERNUDA: Walter?

WALTER KEITHLY: Thanks, Mr. Kevin. Look. I'm sorry, everybody, but I have to leave. I just got a call, said my tax returns are ready, and I'm headed out to town tomorrow for weeks. So, I need to go pick them up. I just want to let everybody know. Thanks for the meeting. Bye-bye.

VANCE P. VICENTE CERNUDA: Okay. Bye. Richard?

RICHARD APPELDOORN: Unless anybody else has comments, I'd like to move that the slate of recommendations that we have be approved by the SSC.

VANCE P. VICENTE CERNUDA: Okay. Okay. Let us write it down. Hold on. If you can repeat it, that's good.

RICHARD APPELDOORN: So, this would, I guess, go on top of that list. The SSC recommends the following-- I don't what you would call them-- the following improvements the initiated. Someone

can help with the wording on that.

GRACIELA GARCÍA-MOLINER: But is it all of the recommendations that we just worked on or--

RICHARD APPELDOORN: Yes.

GRACIELA GARCÍA-MOLINER: Okay.

RICHARD APPELDOORN: One vote takes care of everything.

GRACIELA GARCÍA-MOLINER: Right. Thanks.

RICHARD APPELDOORN: So, *the SSC makes the following recommendations related to SEDAR 91 and 84.*

So, the SSC makes the following recommendations. That will work.

VANCE P. VICENTE CERNUDA: Okay. We need somebody to second motion number 10, which reads, "The SSC makes the following recommendations related to SEDAR 91 and SEDAR 84." Richard?

RICHARD APPELDOORN: Yeah. I want to add something. The SSC endorses the recommendations made-- no, this would be in the very beginning. The SSC-- no, after "SSC." yes, good. --Endorses the recommendations made by the data and review committee panels. Is that correct?

And make the additional-- and also makes the following recommendations. Just delete, don't keep writing the same thing twice. Oh, is it the data panel or the data committee, review committee, review panel? Which is the right word there?

VANCE P. VICENTE CERNUDA: I think it was the review panel.

RICHARD APPELDOORN: Okay.

VANCE P. VICENTE CERNUDA: No problem. Reni García?

JORGE R. GARCÍA-SAIS: Second the motion.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Reni. So, I guess that we had enough discussions, so we'll go through the voting process.

ELIZABETH KADISON: Elizabeth Kadison, yes.

RICHARD APPELDOORN: Rich Appeldoorn, yes.

TARSILA SEARA: Tarsila, yes.

JORGE R. GARCÍA-SAIS: Reni García, yes.

JUAN J. CRUZ-MOTTA: J.J. Cruz, yes.

SKYLER ROSE SAGARESE: Skyler Sagarese, yes.

VANCE P. VICENTE CERNUDA: And Vance Vicente, yes. Thank you all. Okay. So, for this motion there were 7 "yes," 4 absent. *The motion carries on.*

Okay. Thanks for the efforts and discussions on SEDAR 91 and SEDAR 84. Now, we are moving to SEDAR 103. As I previously mentioned, SEDAR 103 is headed towards providing development and application of alternate stock assessment methods for the Caribbean Island-Based FMP species. So, we have Liajay giving us a brief update on what has happened in the last months regarding SEDAR 103. So, I leave the floor to Liajay Rivera. Thank you.

SEDAR 103 UPDATE-LIAJAY RIVERA GARCÍA, CFMC

LIAJAY RIVERA GARCÍA: Thank you, Mr. Chair, and thank you everybody. Can people hear me clearly in Zoom? Okay. Kevin, can you hear me well? Okay. Good.

So, again, thank you, Mr. Chair, and thank you to all the people that have stayed and endured the meeting. So, today I'm going to do a small recap of what was presented at the last SSC meeting provided by Kevin, which were first of the presented terms of reference for method development and the method applications. You can find them on the SEDAR webpage.

He also presented what was previewed by SEDAR 103 participants and provided a tentative schedule that was expected to start in fall of 2025. So, I'm going to be providing status updates of what has happened so far. So, allow me a second so I can present the next presentation. Okay.

All right. So, now a brief summary what was new about SEDAR. It is about reviewing and recommend options for alternative assessment approaches to better inform management of U.S. Caribbean federally managed species. It's important for the approaches likely to differ among species and species groups. The goal of is to have analytical approaches recommended for most federally managed species in The U.S. Caribbean.

Now, as I said, it was expected to start in late 2025, but due to the government shutdown, we delayed it and started with the scoping webinars in January 2026. Another main highlight that I wanted to point out today is that the in-person workshop will be happening on August 17th through the 21st in Miami, Florida. The details are to be provided later.

So, here is the SEDAR 103 schedule for the data webinars only. These are the five webinars that we have. We are done with the first three, I would say. The data scoping webinar, the first data webinar and the second. The next one, which will be on April 29th, will be next, followed by the rest.

We wanted to highlight that these webinars have already discussed the scope of work, the reference documents. The data webinars have been very, very well attended. I would say, yes. And so, we are anticipating, as Kevin said, the continuation of the fishery-independent data sources, ecosystem, related life history data review, morphometrics database. That will be the next webinar.

So, said that, once the data webinars are done-- I'm sorry, before that, these are the SEDAR 103 datasets presented today. This refers to data webinar one and data webinar two. The data webinar one included managed history, data triage, MRIP, Puerto Rico DRNA recreational port sampling, reporting history. I could go down the list, but this is already available in the folder. You can read it there and I'll make it available online, so I don't have to keep on reading.

Now, once all the data webinars are done, we're going to proceed with the methods. Here we have the In-Person Methods Development Workshop within the schedule highlighted in yellow. It will be starting in July and running until November. The dates are yet to be determined. We need to send polls, and we are not there yet for these ones. We are very far from this ahead.

For the next year, we will proceed with the assessment application webinars. Also to be determined. We will also have an in-person review expected for spring 2027. And that, of course, is subject to changes. So, keep an eye on that.

What else? Here we have the SEDAR web page, if you would like to access the reference documents presented, the working papers, the terms of reference, and the project schedule.

So, this is a very brief summary. But again, if you have more questions about it, let me know. Thank you. And Kevin, you can

also chime in if you think I missed something.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Liajay. Any questions for Liajay regarding the SEDAR 103 page scheduling?

LIAJAY RIVERA GARCÍA: So, one last thing. We'll be contacting the members for the following in-person workshop in Miami. So, just be aware.

NEXT MEETING

VANCE P. VICENTE CERNUDA: So, regarding the next SSC meetings, [inaudible] you can think about it in the meantime, and then we can communicate by email if you want any further ideas. But for the next Council meeting, I will be giving a summary of these last 3 days' meeting, which, thanks to all of you, have been very productive. I thank all of you for your effort and time. So, I think this is it. I think we are ready to adjourn.

And, again, thank you very much. Are there any comments before I close down?

Kevin?

KEVIN MCCARTHY: Yeah. Thanks, Vance. Kevin McCarthy. I just want to thank the committee, and thanks for all your hard work and attention and your great input with suggestions and recommendations. I really appreciate you getting through four stock assessments in the course of three afternoons; it's a lot of work and I really appreciate your efforts. Thanks very much. And thanks all to everybody else who joined and had comments and input as well. Have a great weekend, everybody.

VANCE P. VICENTE CERNUDA: Thank you. You're very much welcome. Richard?

RICHARD APPELDOORN: Yeah, I wanted to thank, in particular, Adyan for all those presentations. I thought, in particular, the first one, Puerto Rico's spiny lobster, I think was the best presentation she's ever given. I really appreciated it. The others might have been just as well, but then I started having my brain too full of stuff. So, it suffered a little on my part.

But I really want to appreciate Adyan's efforts in presenting all this stuff and, of course, all the work that's gone into it.

VANCE P. VICENTE CERNUDA: Yeah. Thank you, Richard. And I also want to-- this meeting could have not taken place without the help of Liajay Rivera, Kiara, and, like always, Graciela

García-Moliner, and the Council in general. So, I really want to specifically thank you and Alberto for taping all the information and keeping all the telecommunications going on despite the hacking event. So, thank you all, and have a good weekend.

(Whereupon, the meeting adjourned on April 10th, 2026.)