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TABLE OF MOTIONS

PAGE 91: Motion to accept the statement on the tech memo. The motion carried on page 92.

PAGE 94: Amendment for the PR FMP to modify the seasonal closures for fishing for or possession of red hind in federal waters west of 67 degrees, 10 minutes west longitude and for the Tourmaline and Abrir la Sierra red hind spawning aggregation areas to December 15 to March 15 each year. The motion carried on page 102.

PAGE 104: Support the implementation of continued long-term FSA monitoring to determine changes in the spawning stock populations of red hind off western Puerto Rico. The motion carried on page 105.

PAGE 112: The SSC requests the council to ask SEFSC to evaluate the seasonal closure (from February 1 to April 30) for red, black, tiger, yellowfin, and yellowedge grouper in federal waters in the U.S. Caribbean, as applicable, to ensure it coincides with the timing of the spawning aggregations for these species. The motion carried on page 113.

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**CFMC SSC
Webinar**

July 14, 2021

The Scientific and Statistical Committee of the Caribbean Fishery Management Council convened via webinar on Wednesday morning, July 14, 2021, and was called to order at 10:08 o'clock a.m. by Chairman Richard Appeldoorn.

**CALL TO ORDER AND ROLL CALL
ADOPTION OF AGENDA**

RICHARD APPELDOORN: Good morning, everybody. It's July 14, 10:08 a.m., Atlantic Standard Time, and this is the SSC meeting. I think the first thing would be the roll call, and I'm going to call out the names of the SSC members, and they can indicate their presence. I am Rich Appeldoorn, SSC Chair. Doug.

DOUG GREGORY: Good morning. Doug Gregory.

RICHARD APPELDOORN: Jason. Jason, are you there? You're speaking, but I'm not hearing, according to your microphone icon. We will come back to Jason, and see if we can get his --

JASON COPE: Did that help at all?

RICHARD APPELDOORN: Perfect. Thank you.

KEVIN MCCARTHY: Good morning. Kevin McCarthy.

RICHARD APPELDOORN: Michelle.

MICHELLE SCHARER: Buenos dias. Michelle Scharer.

RICHARD APPELDOORN: Todd.

TODD GEDAMKE: Good morning. Todd Gedamke, and it's good to hear some voices that I haven't heard in a while.

RICHARD APPELDOORN: Walter.

WALTER KEITHLY: Good morning. This is Walter.

RICHARD APPELDOORN: All right. Also on the call are Liajay Rivera.

LIAJAY RIVERA: Buenos dias. Liajay Rivera.

RICHARD APPELDOORN: Graciela.

GRACIELA GARCIA-MOLINER: I am here.

RICHARD APPELDOORN: Okay. Our trusted interpreter, Bill Cordero.

BILL CORDERO: Very good morning. Present.

RICHARD APPELDOORN: Iris Oliveras.

IRIS OLIVERAS: Buenos dias. Iris Oliveras.

RICHARD APPELDOORN: Jocelyn D'Ambrosio.

JOCELYN D'AMBROSIO: This is Jocelyn D'Ambrosio, NOAA Office of General Counsel.

RICHARD APPELDOORN: Marcos Hanke.

MARCOS HANKE: Good morning, everyone. Marcos Hanke here.

RICHARD APPELDOORN: Maria Lopez.

MARIA LOPEZ: Good morning. Maria Lopez, NOAA Fisheries.

RICHARD APPELDOORN: Nelson Crespo.

NELSON CRESPO: Good morning, everyone. Nelson Crespo.

RICHARD APPELDOORN: Orian Tzadik.

ORIAN TZADIK: Good morning, everyone. Orian Tzadik, Pew Charitable Trusts.

RICHARD APPELDOORN: Rachel Eckley.

RACHEL ECKLEY: Good morning. I'm Rachel, and I'm a contractor for NOAA Fisheries.

RICHARD APPELDOORN: Refik Orhun.

REFIK ORHUN: Good morning. Refik Orhun, NOAA Fisheries, Miami.

RICHARD APPELDOORN: Sarah Stephenson. Sarah has texted that she's having audio issues, but she's here. Vanessa Ramirez.

VANESSA RAMIREZ: Good morning. Vanessa Ramirez.

RICHARD APPELDOORN: Okay. Thanks, everybody. Liajay, I guess we're looking at your screen, and can you put up the agenda?

LIAJAY RIVERA: Sure.

IRIS OLIVERAS: Good morning. Iris Oliveras.

RICHARD APPELDOORN: Thank you, Iris.

LIAJAY RIVERA: Can you see it?

RICHARD APPELDOORN: Can you scroll a little bit, so we can see the rest of the morning there? We have several things on the agenda today, and the first is going to be a couple of updates, and then we're going into the main part of the meeting, which is going to be looking at the draft tech memo of data-poor ACL advice, and the second one is going to be relative to Dr. Scharer's letter about red hind spawning aggregations and the timing of those relative to the closures for the west coast of Puerto Rico, and the third item is on the electronic reporting and other electronic monitoring issues, and so we'll get an update on those and see if there's some things that we can recommend for all three of these things.

Getting back to the beginning of that agenda, which are some updates, I will start with, first, welcoming Todd Gedamke back onto the SSC. For those who don't remember, Todd was a very critical member in the early and middle and almost all of our stages of trying to come up with ACL methodologies for the new island-based plans, and it's great to have him back, and so welcome, Todd.

TODD GEDAMKE: Thank you, Richard.

RICHARD APPELDOORN: Secondly, an announcement that Kevin, who we all know and love, is now the head of what the Caribbean Branch in the Southeast Fisheries Science Center, and so we're glad to have Kevin with that responsibility, and so he just brings more to the table here, and I would ask Kevin to, if he would, just to tell us a little bit about what the Caribbean Branch is and how this may change how we're interacting with the Southeast Center and what his role is going to be in overseeing that. Kevin.

INTRODUCTION CARIBBEAN BRANCHES SEFSC-SERO STAFF

KEVIN MCCARTHY: Sure. Thanks, Richard. I will just take a minute or two, because I went through this at one of the recent council meetings, but I guess we haven't done it here, and so the Caribbean Branch is now a dedicated region-specific branch within the Science Center, and the branch is located in Miami, but we interact with people who are also at the Science Center and doing Caribbean work, and they may be in the Pascagoula Lab, or the Panama City Lab, or other labs throughout the Southeast that are part of the Science Center, and so the Southeast Fisheries Science Center isn't strictly a Miami operation, and we've got other labs from Galveston, Texas to Beaufort, North Carolina, and so there are a lot of folks who are doing work in the Caribbean.

One of the tasks of the Caribbean Branch is to try to get a handle on who all is doing what, and not so much to tell them what to do, although we will be quick to point out what we think the priorities might be, in terms of research in the region, but that's one of our -- One of our tasks is to try and get the Science Center away from just a bunch of independent operators who might be duplicating effort and not utilizing resources in ways that might benefit a number of projects, to get them away from just focusing on single-project approaches.

Anyway, that's one of our tasks, and I will just introduce -- Not everybody is on the call, but I will just let you know who all is in the Caribbean Branch, and so couple of folks you know, and a couple of people you may not yet have met, and so we've got a couple of assessment folks. Nancie Cummings, who I think many of you may know, she is one of our assessment leads, and Adyan Rios, who I think many of you may also know, is another one of our assessment leads.

Our branch is unique in the Science Center, in that we will have a mix of assessment personnel as well as more data-centric folks, and so Stephanie Martinez is one of our data analysts, and she's not going to be doing -- She's not going to be leading assessments, but she will be doing a lot of the research and a lot of the analyses that informs stock assessments, and Refik Orhun is another one of our data analysts, and, again, like Stephanie, he won't be leading assessments, but he will be doing a lot of the research and development and analyses that go into assessments.

Refik spent a lot of time working in the Gulf, doing things like commercial landings and that sort of stuff, and he's going to shift that expertise down to the Caribbean. Stephanie started with us, fresh out of graduate school, about six months before

COVID hit, and so she's been -- She's had an interesting first couple of years at the Science Center, given the COVID situation.

Just a quick rundown on some of the other things that we're doing, and we're probably working on something on the order of seventeen projects in the region, and these range from improving port sampling design and improving technology that may better our means of sampling, dockside sampling.

We've got a number of trap selectivity projects going on, and this is an item that came out of the recent spiny lobster stock assessment, that we needed to get a better handle on what gear selectivity might be, and so we've got a number of projects looking at that.

We're also working on an index of lobster recruitment, and we've got a number of life history projects going on, and that's consistently an issue for any stock assessment. If you don't have life history information, you've got a real handicap in trying to get a stock assessment done, and so that's true wherever you are, Alaska or the Caribbean or wherever.

Then we're also working directly with Puerto Rico DNER staff to automate the correction factor calculation, and so that's been a very laborious project every year that requires a lot of time and effort, and we're going to work towards automating that, which we think will improve the availability of when those correction factors are able to be used, and so, rather than having a long delay in the year following the survey that collected the data for calculating those correction factors, we think we're going to improve that turnaround time dramatically.

We're working in collaboration with a lot of folks in the region, and I mentioned the Puerto Rico DNER, but we're also working with the Virgin Islands Department of Fish and Wildlife, the University of the Virgin Islands, the U.S. Park Service, and we've also got contracts with several consultants in the region, and we're also -- Just a little preview, and I'm not particularly working on this project, but we've got folks at the Science Center, in the Fisheries Statistics Division, who are working with DNER to move the electronic logbook reports, the storage of those reports, into a different database, so they're not up on a -- I think, now, they're on a -- I could be wrong about this, but I believe they're up on the vendor's cloud server, and we're going to move that to -- Not to Miami, but to ACCSP, where a lot of the Gulf and Atlantic landings data are stored, and so that will provide better accessibility, and we

can merge that with the existing database that is housed in Miami for more ready delivery of landings data, landings and effort data.

That's a very brief overview of a number of the things we've got going on, but we're excited to have this branch, and we're now focused on the Caribbean, rather than having sort of ad hoc groups that get together to resolve particular issues and then take their eyes off of the Caribbean for a while, until we're called back. Now we've got people who are focused on the region and developing projects and programs to better our data and better our analyses that we use those data for, and so thanks very much.

NATIONAL SSC AUGUST 2020 UPDATE 2022

RICHARD APPELDOORN: Thank you, Kevin. Do any committee members have any questions for Kevin about the Caribbean Branch and what appears to be the abundance of really key projects that they're involved in? If not, then I will go to the second update item, and that is the status of the National SSC meeting.

This is a meeting that was scheduled to take place last year, in August, and we were working toward a virtual meeting this August, but we just recently got the go ahead to postpone the meeting to 2022, to try and salvage an in-person meeting, and the data for this was just announced, and so it's going to be August 15 through 17 in Sitka, Alaska.

The subject of that national SSC meeting is going to be ecosystem-based fisheries management, looking at three kinds of issues, and one is going to be ecosystem indicators and how those can be incorporated into stock assessment, and the second one is going to be on the information needs, as they apply to trying to assess interacting fisheries, and the third thing would be how to deal with species whose distributions are shifting, due to climate change.

We'll be developing -- We have a conference call that's being set up shortly, and it will probably be in August, to kind of get back into working on this thing and setting up the speakers, because we'll have to reschedule everything, and most likely the team going from here will be myself, J.J. Cruz, and Tarsila, because they are the ones working on the ecosystem indicators for our region and trying to move the ecosystem-based management plan forward, and so that's my update. Is there any questions on the national SSC meeting?

I am not hearing, and let's go into our first major topic, and that is the Draft Tech Memo on Data-Poor ACLs, and, Jason, you're going to give a presentation, or an overview, of what this is all about, and our role is to advise the council on what this means and possibly how we might be able to apply this and is this a good strategy, does it apply to our region, and, if so, how would we go forward, and are there species that we initially may want to tackle with something like this, and so, Jason, if you're ready, you can go, and I see that we have Vance that has joined us. Good morning, Vance.

DRAFT TECH MEMO DATA-POOR ACLs

JASON COPE: I think we have maybe a little more than an hour together now, given that I think we've got fifteen minutes extra, and I just want to encourage folks, as I present these slides, please do ask questions through the presentation, and you don't have to wait until the end to get into it. I'm going to present, and let me share my screen.

TODD GEDAMKE: Jason, since I'm -- Thank you for the welcome back, Richard, and, just procedurally, Jason just asked us to jump in, and I know about handwaving, and, Richard, how would you like us to jump in? Just as I did, or is there a procedure for us to step in here without me disrupting everything?

RICHARD APPELDOORN: I will actually put that back to Jason. Would you like comments during your presentation, or do you want people to wait?

JASON COPE: I welcome comments during the presentation. One thing I will say, getting at Todd's question, is I am sharing my full screen with you all, and I cannot see hands, and I can't see anything, and so, if someone can monitor that sort of thing, and I'm also comfortable if someone wants to just kind of take themselves off mute and speak. I mean, if that gets out of control, we can do something, but I'm fine like, Todd, you just kind of started talking, and that's fine with me as well. Thank you.

RICHARD APPELDOORN: All right, and, before you get started, Reni Garcia has now joined us as well, and so good morning, Reni.

JORGE GARCIA-SAIS: Hi, guys.

RICHARD APPELDOORN: Let's go ahead, Jason.

JASON COPE: All right. Well, Todd, welcome. It's so good to have you with the SSC again, and you're going to be terrific to discuss this tech memo with and with the group here, and, Kevin, congratulations. The Caribbean Branch is just really, really exciting, and so I'm grateful for these new developments here.

What I am going to attempt to do is walk us through this tech memo, the different parts, and try to highlight the bits that will be, in particular, relevant to our SSC here, and I think that this tech memo, overall, is one that is very, very pertinent to what we do here, as a group, and what the council is trying to do, and so this should be a good discussion.

I also can't see the participants list, and, Skyler, I saw you on there, and Skyler has done a ton of work on this tech memo. If there happens to be anyone else on that list that I can't see that also contributed to this, please don't hesitate to speak up.

I presume that everyone has this document, and I'm not sure if you went through it or not, but I will do by my best to give you an outline and answer any questions you have, and so the background of this, and let's remind ourselves -- Let's go back about a little over decade, back in the reauthorized Magnuson Act back in 2009 that had us raise the bar of how we were going to measure overfishing and try to eradicate overfishing in our federally-managed stocks.

What that required was setting an OFL, and so we have this limit, and then we would have some sort of way of defining, through the SSC, an ABC, and, ultimately, an annual catch limit, an ACL, that would help us kind of maintain a buffer away from the OFL, to kind of ensure that we don't go over that limit.

That is the simple version of it, and it was defined, pretty explicitly, as being a numbers or weight-based metric of fishing mortality, and so we usually call that catch, right, and so the catch being the number or weight or biomass of individuals from a population being removed.

In 2016, after a few years of kind of seeing how this was being implemented and what challenges have arisen, we noticed that there are several stocks that setting weight and/or numbers-based catch limits are next to impossible, and we just don't have the information content to do that, or, even if we set them, managing to those, and actually recording the catches is a challenge that makes it a highly imperfect way to go about managing these stocks.

There was some thought, through this national working group, of National Standard 1 -- There were several working groups, and this one was tasked with the idea of rethinking how we could tackle the issue of ACLs under data-limited situations, and so that is -- Out of several years of work, and several years of review, and it's ongoing, that is what this tech memo is attempting to do, is provide some very pointed guidance on how to maybe go about doing an alternative to a number or weight-based approach ACL.

We have the tech memo, and that's what we're going to talk about, and there is a comment period that's ongoing, and this was first discussed and presented to the CCC in May, and we've been going around to the different SSCs and presenting this material, to get feedback as well, and I will tell you where you can send your feedback, beyond just our group, and we're going to have our own feedback, right, but, if you have other feedback, or want to share it with others, and want them to give some feedback, I will give you some contacts at the end of this presentation.

The tech memo is laid out, and, one, it kind of gives some legal context, and there is a lot of really important legal stuff to get -- To think through, and a lot of the review time has honestly been kind of thinking through that sort of legal side of things, and so a little bit of background there, and then getting into the actual data-limited assessment methods and what they can and can't do under different data availabilities.

Then we get into the specifics of what happens when you can't set a number or weight-based ACL, and we call this the (h)(2) provision and what kind of flexibility it offers us to do something that is not a weight or number-based catch, and so we'll get into that here.

So the legal context, we talked about this, and we needed to set ACLs, and we're trying to prevent overfishing, and one thing that the ACL does is it should be triggering some sort of accountability measure, to keep you ultimately away from whatever your OFL measurement is, and so, if you exceed the ACL, you're not technically overfishing, but you are triggering accountability measures that say we're beyond where we think we safely should be, and we're nearing a place where we don't want to go, which is the OFL.

The standard approach are numbers or weight-based, but there is a provision in there, and it's called the (h)(2), that says that

council may recommend alternative approaches to specifying what an ACL is, and it has kind of this broad recommendation that it should comply with the MSA, which of course it should, and it needs to be articulated in a fishery management plan, and so what is this (h) (2)?

It says that, under limited circumstances, and I think what that is really getting at is, under very specific, and you're articulating it clearly, that you might not be able to fit the standard what they call reference points here, and we're talking about number or weight-based OFLs, ACLs, et cetera, and so one of those things that is identified in this provision is that the data are just not available to set those reference points, and we'll talk about what that means, not having the right data, here in a moment.

Then, once you have identified that you're under this sort of situation that fits this (h) (2) provision, then the councils may propose alternative approaches, and I think that's what we're going to talk about here, is how relevant is that to the Caribbean, and it seems to be extraordinarily relevant to what we're trying to do.

The other thing that was recognized is that, over the last decade or so, we've developed a lot of different ways to tackle data-limited situations, to still provide science-based metrics that can help support decision-making in our fishery management councils.

We're trying to figure out how best to use the data that we have and what do those methods -- They don't all produce the exact same metric, and so what they produce -- How can you turn them into a manageable metric, something that fits what we're trying to do here, and then understanding what sort of uncertainty is brought about through using these methods that have maybe less data and have more assumptions.

All right, and so this kind of a lot of color all of a sudden, and it's not pure text, and what we're talking about here, what I am presenting to you here, is it's basically a decision tree that kind of outlines, in the broadest way, all of these different types of data scenarios, and so we're starting from the top, and all these kind of brown-colored shapes are data scenarios, and they are, through this decision tree, leading us through and down to a type of assessment, and so, moving from right to left, you are becoming less and less data limited, and so the most data limited here on the right, generally, and then all the way over to a statistical catch-at-age sort of thing,

where you are integrating different types of data.

What are those data that we're talking about? The first type of data that we can consider are do we have a record, a recorded history, of the removals, and so landings and discards and so forth, and can we say whether those -- Whether we're actually monitoring that currently.

If you do have that, you can move to this side, this left side, the big arrow, and, basically, everything on this left side has some capacity, even in its most data-limited sense, to inform weight or number-based ACLs, and so, for instance, you have a catch history and some life history information, but, even if you don't have any biological composition, which we're talking about length compositions, or age compositions, and you don't have any sort of index of abundance, what you are left with are these catch estimator approaches, which we've talked a lot about, and this is the DBSRA and the DCAC and the catch scalar approaches. These are all these sorts of things.

In the document, this bifurcation is really outlined, and it goes through and says is how you should identify whether you should be invoking these alternative ACLs, or, if you can, even if you're data-limited, still try to do a number or weight-based ACL, and so it outlines those methods, outlines what you should do, and so this side, again, is kind of supporting our typical approach of trying to set those types of ACLs.

Now, over on this other side, you either don't have a catch history or you cannot reliably monitor catch, and that puts you over on this other side, which basically says the metric of number or weight-based measurement of fishing mortality just does not fit the system we're trying to manage, and, in that case, you have a bunch of different methods that will give you alternative measures.

For instance, you don't have any catches, but maybe you have some biological compositions, and that's all you have, is some lengths, and that sends us to our length-based approaches, and Todd has definitely been a developer of this type of thing, estimating mortality, and we're going to get into that here a little bit later, but that's one of the things that we outlined in this document as an example of saying what if you only have some lengths, and what can you do with that?

Can that give you any sort of measurement of the status of the fishing mortality in the population, and, if so, can you set that -- Can you compare that fishing mortality to an appropriate

fishing mortality rate reference point, and so we're going to get that here in a second, but, for all of you looking at a figure like this, remember that this is putting us over kind of on the (h)(2) side, and this is keeping us on our typical weight or numbers-based catch limits, but with less data and probably a bit more uncertainty. A quick pause. Any questions or clarifications at this point?

RICHARD APPELDOORN: Jason, can you back to that slide?

JASON COPE: Sure.

RICHARD APPELDOORN: This is perhaps getting ahead of things, but most of what we've done is done in our catch estimator approaches, and this was on your left-hand side there, but that was difficult and fraught with uncertainty, and I don't think anybody is really happy with it, other than I think we came up with a standardized methodology of approaching that, and so some of the things that are going to come in on the (h)(2) side, like this index approaches, or indicator approaches, are these something that we can now also apply on top of our catch estimator approach?

JASON COPE: Yes, and that, Rich, is a really good question. One, I'm in agreement that the catch estimator approaches were supposed to be kind of the one-size-fits-all data-limited thing to do ACLs, and, as we've discovered, they just don't work all the time, and it's misappropriating what it can do in certain situations, and so that's exactly right.

This (h)(2) provision allows us to redefine the situation, saying we cannot set these weight and numbers-based, and we need to do something else, and then we need to justify what that something else is, and that's exactly right. Now, we are able to -- This is what the tech memo is arguing and is trying to provide guidance for.

You have the capacity, and the sort of option, to consider non-weight and number-based methods, for instance the length-based methods. Now we have to talk about how we can actually do that, and we'll get to that in a second, but, yes, that's what this is hopefully allowing us to think better through, is what's the appropriate metric that we can measure that's going to get us the best ability to manage these stocks, instead of just trying to fit them into a metric that just does not work for the system. Does that answer your question?

RICHARD APPELDOORN: Not exactly, but partially. Just to

clarify, what I'm talking about is we do have catch estimators for a lot of the species, and a lot of them -- Well, maybe they fall into this thing about, in the end, there isn't really that much data, but I am thinking about can we have our catch estimator as an indicator and have something else as an indicator, so that we can get into like a multi-indicator approach, which is using, basically, both sides of that figure?

JASON COPE: Yes, absolutely. There is no reason that should not be an option. Now, did that answer your question?

RICHARD APPELDOORN: Yes. Thank you.

JASON COPE: Great. That's part of the interesting aspect of this, is the creativity to link things into maybe a multiple indicator, because the ultimate multiple indicator is the integrated model that integrates all of those indicators into one signal, and that's what we're trying to do, but so often, in our data-limited situations, we don't have a capacity, because of just the lack of data, to link those indicators into one approach, and so this multiple-indicator option, maybe some CPUE, and maybe even a catch estimator approach, is definitely on the table.

All right, and so, again, the paper, or the memo, takes kind of two roads. One road is, all right, you're sticking with trying to come up with weight or number-based ACLs, and so, if that's the case, and you can justify doing that, even under these data-limited situations, you should always be identifying the data gaps, and it's really good to hear how the Caribbean branch is being structured with an emphasis on data, right, and we should not be fine with the fact that we can just set these really rough OFLs and ACLs, and we want to improve our data streams, and so identifying the data gaps is definitely a high recommendation when doing data-limited number or weight-based ACL setting.

Then that also gets into this whole discussion on how do you set the uncertainty level for those sorts of things, and the SSC -- This is one of the main things that we talk about, and so that's still also a really important thing, and, if you find yourself trying to do way too much reasoning into that, with what you have, to maintain this weight or number-based ACL, and it just is obviously a bad fit to the system, you need to consider these other things, whether that's in a multiple-indicator approach, like Rich is saying, or maybe it's going completely to that (h)(2) side, where you forego number and weight-based ACLs and you base them on some other metric.

Then you will see that we have some really strong language about the pitfalls of using average catch and catch scalars and those sorts of things. We can do better than that, and so there's a lot of discussion about that in the tech memo.

Okay, and so now let's go back to that left side, where we are limited in our ability to set those numbers and weight-based ACLs, and so what can we do there? This is where we're seeing like length-based methods and indicator-based methods and those sorts of things, and they can still provide some really important signals in the population for us to set management measures around, and they can comply with the MSA, given this (h)(2) provision.

Stocks that qualify for this, they're the ones that lack data needed to effectively specify or manage with an ACL expressed as the amount of fish, whether numbers or of weights.

We provide this flow chart that kind of helps someone think about whether their particular stock in question fits the (h)(2) provision or fits the more traditional approach, and so you can ask yourself, do you have complete time series of removals, or do you have one year of absolute abundance, like someone went out and did a census on a reef of a population or something like that. Do you have recent annual removals and life history and so forth?

If you have those things, you're going to go back to that one side of setting a number or weight-based ACL, and then you can figure out, through that decision tree, the type of approach you might use, but, here, you will see that, okay, you have that potential of doing this, but then this big question of, okay, you could set these things, but are you actually going to be able to monitor the removals in numbers or weights, and, if you're not, and this is a really important point, and, if you really can't monitor that well, that does not become a good metric to base management decisions around.

That would, again, send you over to this side, which is this alternative ACL consideration, and this is talking about could you, in this particular instance, estimate fishing mortality rate, and this is -- A lot of the time, this is what we do through those length-based methods, or some sort of ability to track fishing rate in some way, and, if you can, you can consider a rate-based ACL.

If not, you're going to have to think through some alternative

methods that may satisfy the MSA, or you might have to just say we need data, and we need it as soon as possible, and we need some lengths, and let's go get some lengths, and let's build from here, always remembering that principle that we're trying to build upward from data limitations, as best we can, and not just be satisfied with where we are, but we're resource and data-limited, and so it's a balance, as we all know.

This is, again, just another diagram that's in there that explains this sort of thought process to figure out where you are at. Are you on the traditional ACL side or on the alternative ACL side, and, if on the alternative ACL side, what metric might you consider using?

With that, the tech memo breaks down how you would actually do something like this, and it uses this idea of using rates, rate-based ACLs, instead of catches in numbers or weights, and it has a lot of the same principles as a number or weight-based approach, right, and it has the same buffering principle.

You can buffer from -- If you can come up with a fishing rate that represents an overfishing level, which is basically FMSY, or something like it -- If you can come up with that, you can buffer away from that to something we call an F ACL, or an F ABC, and so we can do that sort of thing. It's the same principles, but just a different metric.

What would this look like? Here's an example, and we've got some examples in the document there, where say you have mean lengths, and the mean length indicates 9.4 inches corresponds to something you don't want to reduce the population below, and then you come up with a buffer, saying ten is going to be the ABC, and 10.2 is going to be the ACL, and that's going to come through some sort of discussion of how to set that buffer and how big it should be, all of those considerations, but you can see, theoretically, that, if you can monitor the mean length, in this particular very simple situation, you can see if you're dropping below something you want to be at, which would then indicate that your fishing rate is too high.

Obviously, these methods come with a whole host of assumptions, assumptions about recruitment, assumptions about a population's equilibrium behavior, and there is lots of things to think about here, and those are the types of uncertainties that you may want to build into the buffer or build into the reference points that you are going to set with this, but, just conceptually, hopefully we can see that we can -- Instead of just setting a catch limit that we could never hope to actually measure, or

think that it's anywhere near, quote, unquote, correct, or unbiased, this might be a much more direct way to get a signal from the population, saying we're doing too much to it right now, or maybe we're doing too little, and it doesn't always have to be about cutting catches back, right and we just want to measure some signal in the population, so that we can manage it.

Then it plays through the system just like it would play out through our management measures, and you can set size limits and time-area closures to kind of meet these objectives that you're setting through the reference points, and so, really, the major parts of the system are all still intact. The only thing you're swapping out is the metric by which you are defining overfishing, going from a number or weight-based catch to a rate, in this case.

TODD GEDAMKE: Jason, would you mind going back to that slide, because I would just like to stare at it and realize that the hole that I pounded into the concrete block wall actually is there, and this makes me extremely happy to see this on the screen, and I was just wondering, for me, and maybe -- I am coming, obviously, back into the conversation, but could you just explain to me -- Like this tech memo, and -- I mean, politically, where are we at with the implementation of this type of thing?

I mean, is this on the table currently, or is this -- Are we giving advice, right now, to review this and say, yes, I love this idea, and this is something that we can work with, or where are we in that, because that sentence has always been in the ACL guidance, and now it's being expanded upon, which makes me so, so happy, and everyone in the Caribbean should be really happy about this, and so just give me the three-sentence context of where is Headquarters at on this? Where is the base on this? Is it moving forward?

JASON COPE: Excellent question on this, and so, as you may have seen in one of those original earlier slides, we started this back in 2016, and it was written within a couple of years, but, since then, the ensuing years have been a lot of briefings, a lot of kind of revisioning, not in the concept, but in the way that it's presented, because -- Like, Todd, you have the history and the development side of this, to kind of see that -- Like you said, this is something that you have experienced and have been trying to kind of raise up, and the provision has been there.

This tech memo is basically trying to just open that provision

wide open, to say this is something that can truly consider, if it fits certain situations, and so it is currently being taken around to all of the SSCs, and we're trying to get feedback, and so we're in that major feedback level, which means General Counsel has felt comfortable enough to have this being presented to councils, presented to SSCs, getting feedback, and this is basically water check time, right, checking the temperature of the water, and how are we feeling with this, and did we miss anything major, and so that's where we're at.

I think this October is when they're hoping to kind of complete that sort of collection of input and to get this thing implemented, like this get thing promoted in a way that folks feel comfortable that they can have these discussions and move forward.

Like you said, this is already -- It's already there, and we're trying to flesh it out, so that people can realize that they can try this and do this and go for it. Did that kind of get at your point?

TODD GEDAMKE: That did, and, Jason, thank you, and I know you have been integral in many, many phases of this, but this is the white paper that we discussed for the last whatever number of years, and I am thrilled to see it, and so thank you for putting this forward, and, I mean, I'm going to be a huge thumbs-up on this one, and so keep on trucking, and thank you.

JASON COPE: Yes, and Skyler put together a really nice example of parrotfish, that's in the document, that folks can take a look at that is region-specific to us, what we're talking about here, as a thought experiment, just to show, to demonstrate, how this actually happens.

Todd, like you were saying, conceptually, we've known that this is kind of where we need to move towards, and I think we've benefitted from the fact that so many more tools have kind of been put in the toolbox, over the last few years, to really kind of put all the pieces together and give a lot of options, under a variety of scenarios, and so it is really exciting, and I'm glad to hear your enthusiasm for this, because I think this is a critical discussion to have, and this is a huge opportunity for us to improve what we're able to do.

TODD GEDAMKE: This is massive. For everyone in the Caribbean, this is just massive. I mean, Jason, you talked just about the length example there, and there is massive assumptions on there. I mean, there is things that you really have to take into

consideration, but this body can discuss those assumptions, and we can discuss it in terms of the buffers, as opposed to a black-box scenario, where we all look at it and go, I have no idea, but this is when the SSC here really gets to put their experience and their knowledge into these approaches and really discussing buffers based on assumptions that we can all discuss, and so, anyway, thank you, Jason.

JASON COPE: Yes, I'm with you. Thank you for that.

DOUG GREGORY: I have a question for Graciela. Has the tech document been distributed to the SSC? I don't recall receiving it.

GRACIELA GARCIA-MOLINER: Yes, we did, and I can send it to you again, and so I will forward that to you right now.

DOUG GREGORY: I appreciate it. Thank you.

JASON COPE: Yes, please do take a look, and, like I said, there is a several month period open here for additional comments, and, here, we're talking about it as an SSC, and we're going to have -- We've got a good forty-five minutes, I believe, left to dig into stuff, so we can provide a statement to the council, but we have more time, and I am always happy to receive questions and talk about this, and so, over the next couple of months, if something pops in, just please reach out to me about those things.

There are some really important parts of this, right, and we want to connect all the dots. Monitoring is very important, and it can be tricky with these fishing rates, or extremely tricky with catches, right, and they're just sometimes hard to get, but, if you flipped over to something like a fishing rate, you need to realize that those fishing rates are often composites over time, and they can be lagged, and Todd was just talking about that there is a lot of assumptions that we would want to think through on how to interpret this metric and do it in a way that we can actually monitor it over time and not just do a one-and-done thing and then walk away and then hope that we gain more data over the years to improve our methods.

We want to think about how we can apply these methods, in a reoccurring fashion, to continue to inform us while, in parallel, developing these data and monitoring methods that are going to help us get better data, to maybe move toward something else, another method.

That is going to be talked about, as well as accountability measures, and you can imagine -- So we're talking about overfishing limits right here, and we're talking about rates of fishing, and there is a parallel process going on with the tech memo that's talking about stock status and how do we determine stock status in data-limited situations, and overfished status, those sorts of things, and so there's another tech memo that's being developed on that side.

Right here, we're talking explicitly and specifically about overfishing, and measuring it, and accounting for it, and that's something we often want to check in on. Now, is that every single year that you have to check in on it? I don't know, and so the cadence of that, given the method that you're going to use, you want to think through that.

We're getting close to the end of this presentation, and we'll have just an open discussion, or an opportunity for that, and so, again, this fits in with everything that -- We're not radically changing the system.

We're opening the system up to a different metric and then applying the same standards, right, and it has to be MSA, best scientific information available, right, and these are the types of things that we need to continue to certify, in a way, say that that's what this is, and this idea about the data collection programs just becomes paramount. It becomes a really important discussion point, along with the characterization of uncertainty and all these other things.

Really, what you want to be doing is progressing towards a standard ACL approach, and what's really nice about this is it's putting you in the game, on the ground, moving towards the standard ACL, but still doing something in the meantime, still monitoring things, still gathering data, and then, at some point, it would be great to be able to convert over to the number and weight-based, because that is a more real-time measure of what's going on.

It is ultimately, if it's something you can collect, easier to monitor overfishing directly, but it's something that you can work towards. I think what's been difficult, in the past, is that that's been the standard, and, when you can't meet the standard, you're kind of sitting in chaos, or just what do we do, and so you start putting numbers out there that really don't connect with the population and sustainability, and we're hoping now that this just opens up the creativity of the groups working on these issues, to allow us to do the most appropriate thing in

the moment and work towards better data and stock assessments in the future.

I am going to end it there, and Marian McPherson has been the lead on this, and she's just been amazing, and Stephanie has been incredible, presenting this to councils and SSCs, and the two of them are the people to send your comments to.

You are welcome to send them to me as well, and I can shuttle them over to Marian and Stephanie, but those are the two folks that, if you want to add additional comments, after you've really dug into the tech memo, please do that by the beginning of October, and that's the deadline that's set, and so you've got a couple of months, three months or so, to do that, and I will stop there, as far as the presentation, and open up for more discussion and go from there.

RICHARD APPELDOORN: Thank you, Jason. Maybe a question to Graciela. In light of where our comments are to be sent, is the SSC being charged, by the council, to make recommendations to the council that they will then forward to the appropriate people concerning this, Marian or Stephanie or whoever, or are we to make our recommendations directly to these people?

GRACIELA GARCIA-MOLINER: I think that you have to make the recommendations to the council.

RICHARD APPELDOORN: That would be my understanding.

GRACIELA GARCIA-MOLINER: Yes.

RICHARD APPELDOORN: Is there a "but"?

GRACIELA GARCIA-MOLINER: Well, I was going to say that I don't know if, being a member of the SSC, that you would be submitting comments outside the council process, and so I think that it would be best if -- You will be presenting this to the council on July 21, and then, if you need further input from SSC members, et cetera, to formalize the letter, or the recommendations, but I think that it needs to go through the council process, and so the council, and the council will make the -- So the SSC recommends, and then submit all the information. I don't have a call for input directly from the SSC. The call that I have is from the council to the SSC, and do you see the difference? Jason, I have a question for you. Do you know if they are receiving separate comments from the SSC members?

JASON COPE: I don't know, and I don't think that I want to give a definitive answer to that, because I don't know, and Marian and Stephanie have been the two that have often presented this, and they have ended with this slide, welcoming people to submit additional comments.

Now, I don't know if that is because these were open meetings, and other people are welcome to, and so I don't know what the appropriateness is of that. I would guess that someone -- Like, as an SSC, our job is to bring a statement forward to the council.

As individual members of the SSC, if you have questions or comments, I don't see why it's inappropriate to send -- Like what's a comment, right, and they could be just like, oh, could you explain this more, or there could be some sort of like this could improve it, versus I hate this idea, and this is terrible, and this is going to ruin things, or something like that. That might be a stronger thing that might raise a concern, if someone is on the SSC, but that wasn't talked about on the SSC, but only done as an individual, and so I can see where that could be an issue, but I don't know, and we could ask Marian, and maybe that's the easiest thing to do.

JOCELYN D'AMBROSIO: Rich, would it be all right if I offered a comment?

RICHARD APPELDOORN: Yes. Go ahead, Jocelyn.

JOCELYN D'AMBROSIO: Thank you. I think, just in terms of what Jason was getting at, in terms of which capacity you're commenting on, and so I think, if you were an individual SSC member who wanted to submit comments, you could just say that you were submitting them in your capacity as an individual, and you could note that you're on the SSC, but just make it clear what capacity, and I think it would be helpful though, if the SSC, on the whole, had comments that they could recommend to the council to give, or they could ask the council that they would like to submit this on behalf of the SSC, with your approval, through a slightly more formalized process, just so the agency kind of knows how to weight them.

Is this the Caribbean Council's opinion, or is this their SSC's opinion, or is this just individuals with experience and their opinion? I think they would definitely want feedback from all sources, but it's just a matter of clarifying which capacity you're providing that feedback.

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RICHARD APPELDOORN: Thank you. With that, we're open for discussion, and, again, I think the kind of questions before us are ones that -- You know, does this look good, and we've certainly had expressions that were certainly favorable to that.

Does it apply, or how much would it apply, to our situation here in the Caribbean, and do we have any recommendations on how we would move forward with something like this, once we have it, and are there case studies that we would like to have checked out, and it's an open discussion on this document and its implications for the U.S. Caribbean, and maybe I will just point the finger at Todd, since he's already kind of familiar with a lot of this and has expressed enthusiasm of how this could be applied.

TODD GEDAMKE: Oh, Richard, I missed you. Sure. I mean, I have nothing but great things to say about this, and I'm so hesitant to open my mouth, because Richard is not only going to point the finger at me to comment now, but he's going to point the finger at me to write something, which makes me nervous, but I think that the bottom line is that slide that I commented on for Jason is where the council -- Where the SSC, and many members of us, have discussed for many, many years.

The reality was that we didn't have some of the data to support many of the other methods, and the only thing that we were primarily focused on, or working off of, was the TIP data and the length structure, and so something like that approach, just as a base point, or even a multi-index point, and I think we had talked, at one point, about using CPUE in tandem with the length, but, once we have the flexibility, the data evaluation process can be almost species specific.

I think what Jason said is the most important, and I want to make sure that people understand, and this is not a one-off sort of thing. Once you do the -- I like the way you phrased it too, in that you -- If we look at lengths, there's going to be an assumption about recruitment, and you need to track that the next year, because you're going to be making some strong assumptions, and you don't let this sit for five years, and so I think that the important thing, and what is totally doable, throughout the entire Caribbean, is to get better length information, right off the bat.

You could be in this game next year, easy, to start getting that length information to start working with and getting those

numbers up, and so I like the idea of the case study, Richard, but this is the white paper that we discussed, and, like I said, I'm hesitant to say, but this is -- I am really glad that the rest of the data-poor stocks in other regions has driven this to come up, because the Caribbean and Hawaii were at the forefront of this discussion, and the impetus, the driving force, of this white paper came out driven by members of other regions, too.

I mean, I have nothing but -- This is the flexibility that we have been looking for, and asking for, for ages, and so I think that, in whatever way this body can provide support for this, that we should, and I'm not sure -- Jason, for comments, we don't need to be specific on comments, and, in terms of the tech memo, I have not gone through it in detail, and I skimmed it, and I just went, yahoo for it, but I think figuring out how to basically say we're in full support of this.

Then, Richard, it would depend on do you want to do a how-would-this-actually-operate sort of thing, with, in the Caribbean, we have had length information available, and we can improve it in this way, and this is how we would move forward, or do we basically look at this now and say we have reviewed the tech memo document, and we are in full support of these developments, and we would be excited to implement an index or a multi-index monitoring approach, once we are allowed the flexibility on this.

I mean, that's really -- There's my wholehearted -- I have got nothing negative to say about this at all, and I'm thrilled, because a lot of this stuff that's on the ground, a lot of the stuff that Kevin -- Kevin, by the way, congratulations, and I said it to you before, but a lot of the stuff that Kevin is running around crazy, with all these projects, and there is going to be data that are going to be poking in, more data.

Knowing that we might be looking at let's say a length index, or a biological maturity schedule index, or something like that, those projects, and the things that are being developed, we could start feeding into those in the very near future, as this works its way through the political system. That's all I've got.

RICHARD APPELDOORN: Okay. I wish I could write faster.

TODD GEDAMKE: I think the question, and I think Graciela asked it in some way, and you did too, is what -- Basically, and, Jason, guide us on what is the best way, unless anyone has any reservations or concern, and I can't imagine, and please voice

them, but what is the best way that we can say thank you from the Caribbean?

JASON COPE: I think the first thing, for our SSC statement, and I think, Todd, you started writing some of the statement, possibly, if folks are in agreement with some of the words that you said, and that type of thing I think is going to -- Is really important.

Like you said, all along, the U.S. Caribbean has been one of the focal points of this type of thing. Now, like I said, this thing has been years in development, and one of the things -- People have asked for examples, and we have worked through examples, and so we have those things to look at, and Skyler did one for the U.S. Caribbean, stoplight parrotfish, and so we have that example available, but the other thing to note is that we went and asked every region to list out every single one of your species in your FMPs and tell us which ones would possibly qualify for this (h)(2), just to get a handle on the size of this thing, and this is where -- I know I'm being recorded, and I'm not giving you a hard number, but, every time we do that exercise, and I'm not claiming this to be right, but it seems to be floating somewhere between 20 to 30 percent of stocks are flirting with this (h)(2).

This isn't like a 1 percent problem. This is a problem that is all over the place, in all of the councils, some more than others, but, as far as you said, like the Western Pacific and U.S. Caribbean, and this is -- And Alaska, to be honest, but this is hugely relevant, and we have the tools, the ideas, and the ability to link these things together for really good approaches for management, and this is just pushing that idea that we also have the legal ability to do so.

TODD GEDAMKE: Jason, thanks for that number, because I am looking at this, and a lot of the numbers floating around were even higher than that initially, from just conversations, and it's good to see that you got enough feedback to put in that realm, and I think you have 10 or 20 percent in there that are dealing with reliable catch series, and reliable effort series, to justify some of the other approaches, but, anyway, yes, I am all for this, and, other than writing a massive document, I will assist in making sure this gets forward as best we can.

JASON COPE: Just to say like -- I mean, I think we put together a statement, right, but I do think that feedback to Marian and Stephanie, just personal, saying, look, this is why this is important, and I appreciate this tech memo, and that type of

stuff really matters, because they are going all over the place trying to communicate the ideas in this, and making sure that all levels of NMFS understands what's going on, because this is a wide-reaching issue, and so getting -- If you do have -- I mean, even simple, positive feedback like that, like this is the direction we need to be heading, this is good -- Anything like that to them, just so they know, and, again, it's a temperature taking checks, and it's people checking in and saying we've needed this for a long time, and this is moving this along, and thank you, and that is important. That is really helpful to understand that it's getting through to people.

TODD GEDAMKE: Jason, I will drop both of them a note, and I started my comment on this saying it's good to see that the cement blocks, where I pounded my head -- That these people have been fighting a battle, and they're going to get a note from me on this, and maybe the SSC, too. Whatever other comments, let's make sure that we support, because I'm sure that this has not been an easy process for them to push forward.

JASON COPE: Yes.

RICHARD APPELDOORN: Any other comments from SSC members, particularly maybe Doug, since you have a background in assessment?

DOUG GREGORY: I think this is a long time coming, to look at this, because we've been hamstrung. I mean, the Gulf Council has a number of species, and so does the South Atlantic Council, that fall in this category of data-poor, and so, yes, I thought what Todd said earlier was good, but it would make for a long motion. I could support it.

RICHARD APPELDOORN: I think we could probably break it down into some short statements, and we have a raised hand from Marcos Hanke. Marcos.

MARCOS HANKE: Thank you for the opportunity, and I just want to -- Because I have been involved with the council for so many years, but exactly what you just presented is what the council has been requesting over the years, and I'm pretty sure we're going to have positive feedback from the council on this, because it has been loud and clear from the different council members requesting for this, and one added value is that it's open for potential participation from the industry on this new way of collecting data or monitoring the landings, which is a point, for sure, that fishermen and the stakeholders will appreciate. Thank you. This is a very, very good thing. Thank

you.

RICHARD APPELDOORN: Just to put this into some context, and I will be making up numbers here, but there's something like a hundred species that we have been dealing with in the management plans, and, to be able to deal with that, we really used heavily the concept of indicator species, and we have something like thirty indicator species, maybe, and then this is multiplied by the number of platforms that need to be looked at.

Even some of those indicator species were ones that -- They were the indicator because there was some data, and so, even in our best cases, they are ones that, in addition to the data that's available, having some other rate-based indicators would be, I think, a very valuable contribution to try and deal with this.

I am sort of overwhelmed by, if we're implementing something like this, how we would do it, and we would certainly have to prioritize where we look, because there's just so many species, and we would not want to tackle everything together.

Another aspect of context is, on the good side, we are, I think, rapidly, although there's still work to do, moving ahead with improving greatly the quality of the catch data, and, here, I'm talking about the work that Todd's company has been doing, and Kevin gave us a brief background on that from the last meeting, and we're hoping that Todd will be able to give us some more detail and review in coming meetings, but being able to get statistically-valid estimates of what the catches are and vastly increasing the amount of length information that is coming with that and automating a lot of this stuff, so it happens rapidly and is available quickly, I think is going to be something that, one, opens up these rate-based methods much more, because we're getting more of the length data, but, also, two, providing information that may shift a lot of these species into the realm of being able to use the more analytical stock assessment methods for the data-poor approaches.

The other thing, which we're going to hear about later on today, is the electronic monitoring and the electronic techniques for recording catches, which hopefully will also improve the availability and quality of the data that we have to work with and might make some of the stock assessment methods more applicable across-the-board, but allowing this to come up with the capability of doing multi-indicator approaches, to me, is outstanding.

Those are my comments, and, at some point, we're going to need

to have a statement of recommendations, and I am wondering whether it might be worth drafting something during the lunch break and then coming back to look at that statement, and how do people feel about that?

JASON COPE: Since it's quiet, I will say that I think that sounds good, and, Rich, you just mentioned, importantly, several connections of this to other things, and I think that's part of the statement, is to put this thing, this idea of an alternative ACL, into the bigger context of the data collection and of the multiple-indicator approach and of the working towards more integrated stock assessment, all of those sorts of things, and just expressing that this is one of the big kind of stepping stones in that kind of continuum to do this, and so I thought you captured a lot of really important bits in what you had just said, and so hopefully we can recover those.

RICHARD APPELDOORN: I am reminded that, back in 1992, I cowrote a paper with one of my students that was a length-based assessment, I think of lane snapper maybe, and we argued that this could be an approach that could be used across-the-board, and all it would take, really, to do would be to target the length frequency, collecting the length frequency data, or species of interest data, into windows so that you could get a snapshot of the length frequency distribution and catch per effort, or something like that, and then move on to the next species and rotate this around, and so it looks like now we might be getting to the point where, for a lot of the species, where they are common enough in the data that we will be able to get the kinds of data that we need to, as you said, have either multiple indicators or a more integrated stock assessment. There will still be those species which are rare enough that we're never going to be able to do that.

JASON COPE: As Todd said, knowing that we can do these types of things, you can go out and -- Setting aside rare things, that are just hard to sample, you can fill those gaps. You can go get the lengths now, for next year, to be able to analyze them and get some -- So you can get in the game pretty quickly with one year of data, of length comps, as a start, and build from there, which I think that's part of the message here, is that this is all about building up towards a very interconnected, robust management system for all of these stocks.

Because we now have all of these new kind of tools and steppingstones here, we just need to know where we're at with each of them, and then can build forward from there, and so I think something like that, in the statement, is probably

appropriate.

TODD GEDAMKE: Richard, may I?

RICHARD APPELDOORN: Yes, please.

TODD GEDAMKE: Just procedurally, and I'm sorry about jumping in, and I asked about it during the talk, and I won't go off into the tangents, and I look forward to filling the SSC in on a little bit more of what we've done, but, as you mentioned, the pieces are all coming into play, and so we have 14,000 measurements, length measurements, from the last year of sampling that we did on the whole slew of species, and that was just us piloting some technology.

We will have the ability to not only pick up the most obvious ones, but, as Jason said, we've even got a backend that we're applying in other places, and, Jason, we will talk about San Paulo, Brazil, later, but we've actually come up with way of looking at lengths and tracking variability. People always ask how many fish do you need to measure, and that variability -- You can actually track that variability as you collect the length measurements, to determine whether you need to keep going out and fill those gaps.

There is a lot of pieces that are all coming into play here, and so the points that Jason just made, and for us to capture, and I agree with them wholeheartedly. I mean, I think that we're all doing a kumbaya moment here, and is there anyone that has any reservations about this, going down this road, because I think that -- Anyway, the pieces are in place to actually implement this in a very, very short period of time, before I think this will get through the full process.

RICHARD APPELDOORN: I have all kinds of reservations, starting with just being overwhelmed by the task at-hand, as we would decide how to implement this, because we're not talking 10 to 20 percent of our species. We're talking, I think, significantly more, and we have a lot of species to begin with, and so it's going to be an overwhelming kind of thing, and so we're going to have to set up some prioritization process, I think, to see where we want to apply this.

Of course, we're doing this at the same time as we are going through the SEDAR process with a species group, or two species groups, at a time, and so we're learning, at that end, where our limits are going to be as well, and so it's going to be a learning process, and this is not something that's going to just

happen overnight, and so I'm excited about being able to do this, but, when you look at it, it looks almost overwhelming, and so that gives me pause.

There are a lot of assumptions that people have talked about, especially recruitment dynamics, when you're talking about length, but there are ways to deal with those, if we have the data coming in, catch per effort being a really important one, and so I see all the fuzziness, the same way I saw fuzziness with all the other stuff, but, you know, there are ways to deal with that fuzziness and reduce it, so that we can have something to move forward with that we're confident is giving us valid information. I had one other point that just slipped my mind, and I will pass on it, and it will come back to me.

JASON COPE: Rich, can I respond to something that you said that made me think of something else?

RICHARD APPELDOORN: Yes. Go ahead.

JASON COPE: We talk a lot about data limitations, and that's real, and we also talk about resource limitations, but I think this is also bringing that issue up strikingly, right, and we just got updated on the fact that we now have a Caribbean branch, with two assessors and several data folks, which is awesome, but they are resource limited in the amount of folks that they have to do these things, and you're point out the overwhelming task at-hand if you unleash a bunch of methods that we can now do, and now you become resource limited and not so much data limited, because the data is sitting there, and you need people to actually do these things.

I don't want to overlook the fact that Adyan just produced, not that long ago, the most sophisticated stock assessment I think the Caribbean region has had the pleasure to pass through the council, and you want to support that, and that takes a lot of work to do those, but I think Adyan and Nancie are the only two assessors, and so that is -- I just -- When we have moments and opportunities, and I'm not sure where this comes in, and I don't know if this is part of an SSC statement or somewhere else, but just pointing out the fact that resource limitation starts to overtake data limitation in many of our regards, in the simple fact that, if we want more of this done, more resources need to be put towards personnel that can do these things, beyond just the collection of data, right?

We need good, qualified folks that can work that stuff up and process them and then put them into models and give us

information for us to review, and so I don't know where that goes, but I feel like it's the other real big issue that overhangs all of this stuff that can, again, hamstring us beyond just data limitation.

TODD GEDAMKE: One quick follow-up?

RICHARD APPELDOORN: Go ahead, Todd.

TODD GEDAMKE: Yes, Jason. Agreed. That is the ideal situation. When we reach the capacity of our assessment folks, we are doing great on the data realm, and Kevin mentioned that they're in the process of automating the correction factor, and I can remember the number of times we sat at the ACWG where we talked about a length pattern, where you basically were running every single species through a process each year, and so there's a whole other way of approaching things once this structure is allowed, whereas we're literally monitoring a --

Let's say length, and I also want to say that our statement needs to be generic and not specific on what we believe we are going to use, but that we are supportive of the overall structure allowing us to go outside of the old square peg and round hole, but, you know, we have the ability now to, or very close to it, to run forty or fifty species at the same time, with length information, and say, yes, these are the ones that need to go up on top for the assessment scientists, so we can start actually using these indicators, if we get that data, to start cherry-picking the ones right off the top that we have the most concern with.

That's going to be part of a broader strategy, as we move from data to capacity limitations, but, Jason, it's a good point, and I think that the statement that we make now is give us the flexibility, and let us look at this in the broader picture, and let us figure out how to make it work.

RICHARD APPELDOORN: Okay. Thank you, Todd. The last point, that I had forgotten, was that -- It refers back to a slide that Jason showed, and that was kind of like how do you manage relative to a rate, rather than a catch quota of some sort, and what I liked about that, and he mentioned three things of size limits, time and area closures, and gear modifications, and what I liked about this is that these -- We have those kinds of measures already in place, and it's not clear exactly how those measures, for the most part, directly relate to what the catch is, or will be.

We know, on one hand, if you cut out an area, that you're going to reduce the area to fishing, and so the fish in that area will not be caught, and so that reduces the potential for catch. On the other hand, those individuals should become bigger and be able to spawn more, and there are feedbacks that would help the fishery long-term, but those aren't direct things, and, yet, when we're talking about size limits and maintaining a mean size of a fish, or a ratio of mature to immature individuals, or something like that, there is direct feedback to those things, where we understand exactly what the management measure is trying to do relative to what the limits -- How the limits are going to be set.

To me, this is a really big plus that allows us to link our management measures more directly to the levels that we're trying to set through some kind of ACL process, and so my question is, does anybody think that's a strong point as well?

JASON COPE: I do. I think that's a great point.

RICHARD APPELDOORN: So, in my notes, as scattered as they are, I see that I have four points, and there could be a lot of stuff under each of these, but the first one basically is summarizing Todd, in a few words, was there is a strong endorsement for this approach and that it's going to be very applicable for the Caribbean Council, and it would allow us to implement multi-indicator approaches, which we desperately, or definitely, think would be highly valuable.

While we're not going to be specific on here's what we want to do, it is very clear that things like length and maturity ratios and catch per effort are the kinds of indicators that could be applied, without denying that there are other ones that could also be done, and within this is also the fact that we have a much higher percentage of our stocks that would probably fit in the category that will benefit from being able to use these (h)(2) approaches.

The second point is the context which it fits into, and, again, it allows us to do a multi-indicator approach, even for those species where we have set catch limits, based on the catch records, and it will also allow us to improve -- We are trying to improve our indicator stock assessment methodologies, through SEDAR, and this fits along with those kinds of efforts for getting length information and life history information, et cetera.

Efforts to improve the data that's being collected, both in the

amount and the quality, both in Puerto Rico and the Virgin Islands and commercial and recreational, and we could highlight the example that Todd gave that, in just the pilot study of Puerto Rico, there were over 14,000 length measurements made, and the formation of the Caribbean Branch is another really positive step forming the context of which this approach goes into.

Third is that this will require a significant degree of prioritization, based not only on what are our most important species to look at, given the data that are available, what are the ones that we should be targeting for data collection, but also within the context, as noted, of the limits of data analysis within the Science Center.

Lastly, the point I made is that many of the management measures you would use to implement these indicators seem to be tied more toward the kind of management measures that we already have on top of just catch limits, such as size limits and closed seasons, et cetera, and so those are the four points that sort of came out of what I was listening to, and I don't know if anybody wants to elaborate or add anything else.

JASON COPE: Rich, can I just add a point on context? I think this is something that I believe Marcos brought up, and Todd, and yourself, that, just to frame this, this discussion has been going on for a long time in this region, and it's been desired for a long time, and now it seems that it's opening up, and so I just think it's important to recognize, and I'm sure folks, when they start to hear this, they will recognize it immediately, but just that this has been desired for a long time, and this is right kind of -- It's very consistent with what people have been mentioning would be the good direction, and we're finally kind of getting that higher-level guidance to go in that direction.

RICHARD APPELDOORN: Okay. I probably would have put that under the strong endorsement for the approach, but I will make sure that those points are captured.

DOUG GREGORY: I agree with what you're saying, and that's been the problem with National Standard 1 from the very beginning, and it all theoretically makes sense, and it's logical, and uncertainty, but, operationally, it's very difficult.

For instance, you can't really measure uncertainty very well, and I think we're going to have the same situation here. We wanted the flexibility to look at things differently, and it's being given to us, but I think, once we start to apply it, we're

going to run into operational problems and issues, and it's going to be a challenge, just like it's been since 2008 and 2009, and it's still going to be challenging, but we'll have more flexibility.

RICHARD APPELDOORN: Again, I wish I could write faster. At this point, it's ten minutes to twelve, and so we're right on schedule. The agenda calls us for going for another hour, to discuss the red hind situation, and then break for lunch. If everybody is good with that, we'll stay on that schedule.

Hearing nothing to the contrary, let's then go to the topic of the update on the west coast red hind fisheries and spawning aggregations and Dr. Scharer's concern for that, and so, Michelle, if you would give your presentation for that.

DR. SCHARER'S LETTER TO CFMC (2021 UPDATE TO WEST COAST RED HIND FSA)

MICHELLE SCHARER: I appreciate the time to be able to present these results of this research, and please interrupt me if we have any questions as I'm presenting, and basically the interest is hoping that this information will help us inform an ecosystem-based approach to fisheries management in the region and the potential for spawning closures to contribute to sustainable fisheries management.

This research has been going on since 2005, and it basically started with Caribbean Coral Reef Institute funding, and it was a small grant to Dr. David Mann, who at the time was at the University of South Florida, and he was the first one that taught us that red hind can produce sounds, and they are associated with a reproductive context when they aggregate to spawn. The persons I have listed here have been with us since then, and hopefully they agree with what I am presenting today.

As many of you know, red hind is probably the most important grouper resource we have in the Caribbean, in volume throughout the year, and it's important to note that this is a protogynous hermaphrodite, and, basically, all little red hind are female, and there comes a size, or a time, when they transition to become males.

Based on some the markers that Doctors Shapiro and Sadovy, sex reversal was documented, back then, at 280 millimeters, and so this is the average size when a red hind starts its sex reversal, and other measures that were made in the 1990s were the L-50 was 215, and, in the Bahamas, it was 235 millimeters.

Based on that historical data, we had a max age of seventeen years for red hind in Puerto Rico, and we are collaborating with Dr. Richard Nemeth, who preliminarily has shown that it's a little bit higher, and we have a reproductive strategy, where we're going call it, for short, and FSA, which is a fish spawning aggregation. The red hind can migrate up to thirty-three kilometers, as it was classified in the Virgin Islands by Dr. Nemeth, again.

The males migrate and arrive first at the aggregation, and they leave last, but, during the time that they are aggregated, they actually form harem groups, where one male aggregates in his territory, and then various females come into those territories to eventually spawn.

The sex ratios that have been documented so far have a very wide range, between one to four males per females and one to 115. The recent data that we collected in Puerto Rico has been one to eleven.

Also, the season when red hind are reproductively active ranges from December to April in the Caribbean and between May and July in the island of Bermuda, and this is important when we talk about those cues for spawning, which sometimes happens with the moon and sometimes with the water temperature or currents.

The courtship-associated sounds, which are those that were described by Dr. Mann, occur only during the time that there is an aggregation, and we have been able to describe these sounds, and we know they occur within a certain frequency band that we can actually hear underwater, but we also can record.

Recent work by Carlos Zayas identified multiple call types that red hind can produce when they are aggregated, and most of these are from males, but females are also found capable, and some of these particular sound types have different reproductive contexts.

On the right, there is a little graph here of preliminary data that has been collected for Puerto Rico, and the first column is red hind collected in the fishing area of western Puerto Rico, where 79 percent were female and 21 percent were male. On the east coast of Puerto Rico fishing grounds, this ratio was a little bit different, and there were more males than on the west coast, and specifically, during the spawning aggregation, we sampled one site off of western Puerto Rico, and we had a very different picture of the sex ratio.

Management-wise, we have had this seasonal closure from the first of December to the 28th of February that applies to the west coast EEZ, and this is beyond nine nautical miles from the west coast of Puerto Rico, and, in seasonally-closed areas off the west coast, in Abrir la Sierra, which is Buoy 6, we have these dates where all fishing is prohibited, and in Tourmaline, which is Buoy 8, we also have a total prohibition during this time. An important assumption here is --

RICHARD APPELDOORN: Michelle, can I interrupt?

MICHELLE SCHARER: Sure. Go ahead.

RICHARD APPELDOORN: I know you have the data, and I don't know whether you have the figure in your mind. However, you gave the sex ratios for the west coast aggregation, and do you have the ones for the MCD, which has been protected for a long time?

MICHELLE SCHARER: I don't have them in front of me, but I can look for that.

RICHARD APPELDOORN: My recollection is it was much, much closer to one-to-one.

MICHELLE SCHARER: Correct. I would have to search for that, because I don't have it in front of me. Sorry.

RICHARD APPELDOORN: But I think it's important that people recognize that this is not a healthy place to be, under one to twenty. Anyway, sorry. Go ahead.

TODD GEDAMKE: Richard, may I?

RICHARD APPELDOORN: Yes.

TODD GEDAMKE: I agree, and do you know sample sizes, like west coast versus east coast, because a proportion like this -- If we've got similar sample sizes, I agree with you entirely, because we didn't see a lot of hind on the west coast.

MICHELLE SCHARER: I can search for that.

TODD GEDAMKE: Michelle, not a specific number, but are you talking tens of fish, hundreds of fish, thousands of fish?

MICHELLE SCHARER: It's hundreds of fish.

TODD GEDAMKE: Cool. Thank you.

MICHELLE SCHARER: Okay, and so, basically, an important assumption here is that, off the west coast, we have compliance with the closed season in these areas of spawning aggregations, and I think there's a perception of a difference in the seasonal closed areas, like around Buoy 6 and around Buoy 8, where we've had more interventions, because all fishing is prohibited, versus within the EEZ, where the nine-nautical-mile extension isn't that clear, although we do have compatibility between local and EEZ waters.

In those other aggregation areas along the west coast of Puerto Rico, they can go fish for other things that are not red hind, and so there is possibly less interventions, because basically they can be in those areas fishing, and the chances of getting boarded and checking the catch are different than a closed area, which is more focused.

This is a description of what we've been doing at Abrir la Sierra, which is Buoy 6. The graph on the left is basically the area that was consistently sampled over time, and we also have, in the middle of that circle, that recorder, which is recording from December to June every year, and it records all of the ambient sounds in a small file of twenty seconds every five minutes, and that's day and night.

For the analysis that I will be showing today, we extract the 6:00 p.m. to 7:00 p.m. hour block, and, basically, there is less vessel interference there, and we can have a better signal of what we're looking for, which is actually the sound pressure levels, and these are the frequencies within we already know that red hind produce their sounds, and it's that band between 150 and 300 hertz, and so, while we are recording, we're also doing drift surveys to calculate densities and look at size structure, and what you see, those little plots there, each circle is the number of fish that we encounter in a thirty-second interval.

These are done drifting, because there are pretty strong currents in this region, especially when they aggregate, and so, if we were to cut out belt transects, it would be very complicated, and so we have GPS on our buoy, and we calibrate the time every thirty seconds, and we note how many fish we encounter, and that's how we get our density estimates.

This work was initiated in 2009, where we had listened for red hind around this area and zoomed-in here, because this is where

we got a greater signal response, and, basically, we try to go every month during the aggregation, but we don't always have a dedicated project to do this, and so we piggyback on other things or do whatever we can to get out there and do the same survey, but we're not really at the same time of day or the same day after the full moon, unfortunately, and so our density data isn't as good.

This is what we have, and so, over time, when we've done the surveys that we have gathered the density -- Every year we have a different number of surveys, and so the little boxes are how many surveys were conducted to get to that density estimate. As you can see, some years it's just one day that we can get out there, and other years it's been a little bit more.

It's really important to note that, during the time that red hind aggregate, the densities can change, from one day to the next, over tenfold, and so it's the same thing that we saw with SEDAR, during that process with FSA data.

If we compare that with what's going on in the Virgin Islands, the densities we're seeing off the west coast are basically the background densities that they're seeing back in 2005 to 2001 in the Virgin Islands, and so this is data from Rick Nemeth, who has been consistently doing surveys out in the Virgin Islands, and you can see how different those peaks can be and the magnitude of the density when there is a full moon, and, actually, there, they are spawning right on the full moon, and the rest of the year, between those full moons, are basically our highest density that we see off the west coast.

I must note that these are different methods. Out in the Virgin Islands, they are able to extend the belt transects on the seafloor and get these densities and replicate it, which is something that we can't do off the west coast of Puerto Rico, due to the current.

The results that I'm going to share with you today are results calculated by PhD student Eric Appeldoorn, and what he's doing is looking at the sound pressure levels in the bandwidth that includes the red hind courtship-associated sounds.

These time series are basically what we record, and we extract that sound pressure level within that bank, and this is the result that we get, and so the red hind are producing sound in that frequency band, but there are also other very loud sounds that can go across all frequency bands and affect this, and so these SPLs can be impacted by other sounds on the seafloor,

basically, but, when we see a lunar pattern in the increased SPL, the sound pressure level, and we confirm this with surveys, we are indicating that there is a red hind aggregation or the fish are actively producing sounds that are associated with their reproductive behaviors.

In 2011, we saw two different peaks, or times, of increased sound production, and one of those was in late December, that first peak, and the other one was in late January.

What you see on the top, those little balls, are actually the date of the full moon, and the number that I am referring to is what I am going to be calling a lunation, and so Lunation Zero means that full moon occurred prior to the winter solstice, which is generally December 21 or 22 of every year.

This is important, because, according to research published by Rick Nemeth in 2007, his predictions, based on his data, of when there should be a red hind aggregation, depends on how many days the full moon of January is after the winter solstice, and so, in this case, the full moon zero is -- Thanks to Virginia, we have data from the number that Todd was asking about.

In that first moon, we have an aggregation on Lunation One and a second aggregation on -- Sorry. On Lunation Zero and on Lunation One, and it's important that you notice these as we move on, and the red line is the date that there is an open season, and so I want to ask Virginia, if you're on there -- That was from the FSA on the west coast, and then we went back and sampled again, and do you remember how much that second sample was?

VIRGINIA SHERVETTE: I can pull it up. It will take me a couple of minutes.

MICHELLE SCHARER: Thanks for checking. We can go to the next slide, and that would be the results for 2012. In this case, we also recorded two separate times of increased sound production, one in late January and another in late February, but those were on two separate lunar cycles, what I am calling Lunation One and Lunation Two, and so, basically, that full moon after the winter solstice, and, again, the red line is when there is the end of the closed season at the site, and so, this year, everything looked good.

According to Rick Nemeth's predictions, it was supposed to be a two-peak spawn that year, one in January and one in February, based on the full moon of January being nineteen days after the

winter solstice.

In 2014, we started seeing something different, and we saw three peaks of increased sound production, one in early January, another plateau in February, and a separate, smaller peak in early March, and so that little peak in early March is after the end of the closed season, and, according to Nemeth's prediction, it was supposed to be a two-peak spawn in December and January, based on the January full moon being thirty-seven days after the winter solstice.

The reproductive activity this year was after the closed season ended in March, and this would have made that remaining part of the aggregation vulnerable to fishing during that year, not only because they were still aggregated, but, also, they still have to get back to their home range after the aggregation.

In 2014, we saw that peak after the closed season again, and there were three times of increased sound production, one in late December, one in late January, and another in late February, and these were also on three separate lunations of zero, one, and two, and, again, there could have been a vulnerable little peak there after the closed season ended.

In 2015, we recorded two main peaks of increased sound production, one in early January and February and then a little one in March, during the three separate lunations, but, as you can see, we're not seeing activity on Luration Zero. According to Nemeth's prediction, it was supposed to be a two-peak spawn, one in January and one in February, because the January full moon was fifteen days after the winter solstice.

In 2016, this year, we recorded two separate increases, the first in Luration One and the second in Luration Two, on the lunar cycle, and, according to Nemeth's prediction, it should have been a two-peak year again, one in December and one in January, and, this year, it seems like they were done by March 1. The increase in two peaks right before December 29, according to Eric, is he heard noise that some animals were biting on the hydrophone, and so it's possible that those first two elevations are not red hind, and this why sound pressure levels need to be clarified, to make sure that it is red hind that we're hearing.

In 2017, we had one minor peak in mid-December and two separate higher peaks in of increased sound production, one in late January and the other one in late February, in those two separate lunar cycles of Luration One and Two, and, according to

Nemeth's prediction, it was supposed to be a one-peak spawn in January, because the full moon was twenty-two days after the winter solstice, and there was a plateau of like the same peak in January, but, this year, it seems that the reproductive activity ended prior to the start of the open season.

In 2018, we had three peaks, as you can see in Lunation One, Two, and Three, and that last one was after the end of the closed season, and, in 2019, this is a year where we also saw three separate peaks, and that latter peak in March -- It seems like the red hind were still there, and so this year we were lucky that we had actual counts of the red hind calls, and so I included the sound pressure levels plotted on top of the actual courtship-associated sounds of red hind, and so the gray bars are the times during that hour that we actually heard different types of courtship-associated sounds being produced, and I shifted it to those two peaks, and you can see, on the bottom of the graph, those are the days after the full moon, and so red hind are not spawning right on the full moon.

They are taking about nine to fourteen days after the full moon to finish their communications, I guess, for the aggregation, and part of this is also plotted against temperature on the next slide, and we do have temperature plots on most of these deployments, and I just wanted to share with you how temperature is decreasing during that first part of the increased sound production of red hind, and, when it hits a low, and starts coming up, then it sort of wanes on sound production, and then, on that second peak in sound production, there is another dip in temperature.

What we have learned, from other studies, is that these are immediate cues for red hind either hydrating or spawning, and hydrating is usually twenty-four to forty-eight hours before spawning, and these differences in temperature could be just different currents or internal waves that are bringing deep waters, that are cooler, into the FSA site. We have seen that, with differing currents, when we're diving.

This is just to show how these sound pressure levels are responding, for the most part, to the sound of the courtship-associated sounds of red hind.

Next is 2020, and we had two separate peaks of increased sound production, one in late January and one in late February, and there is a variable pattern in March. According to Nemeth's prediction, there was supposed to be only one peak spawn, because the full moon was exactly twenty-one days after the

winter solstice, but it seems that, unless one of those latter peaks, and we need to check if this actually includes red hind calls or not, is due to them being present, and, finally, in 2021, which is the next slide, we also have sound pressure levels in three peaks, one on Lunar One, Lunar Two, and then a smaller one on Lunar 3, and, according to Nemeth, it was supposed to be a two year spawn, because the full moon was thirty-nine days after the winter solstice, and so, in this case, we could have had spawners out there still open to fishing after March 1.

That's the data that we've collected in the past ten years, and the way I'm summarizing it in the next slide is looking at the calendar from the red hind point of view, and so, on the X-axis, I have included the day after Lunation One, prior to Lunation Zero, and so Lunation Zero, again, is that full moon that occurs before the winter solstice, and then, from there on, on what date, every year, did we have red hind aggregated.

Each one of those bars is the year in which red hind were present on that day, over the whole 100 days after Lunation Zero, and then the long bars are projecting to the future where March 1 is going to be on that red hind calendar, and, according to what we've seen in the past, of what lunations they are using, is it one, two, or three, and so the two years that are green are two years where red hind should be done with their aggregation before March 1, and the other gray bars are the potential for red hind still being present after March 1 at the aggregation site.

I know this is very cluttered, but it was the best way I had to visually show what the expectation would be if they continue behaving like they have during the past ten years towards the future, and the next slide basically is a summary of the past and what we've seen every year, what lunar cycle the red hind are using, and, if it's a one, we saw a pronounced peak. If there is a 0.5, it looks like one of those shorter peaks, and, basically, if that peak extended after March 1, and so if the fish were present in March at the fish spawning aggregation, there is a one and, if they weren't present, they're in green, and the summary of the data I just presented is that score out of the past eleven years.

We had no problems with the red hind aggregations at Abrir la Sierra, but, 63 percent of the time, there were fish aggregated after March 1, and, in the future, if they continue using those same lunations, and looking at their calendar after that Lunation Zero, we would expect them to not need any help in two

of the next ten years, and, 80 percent of the time, they would be present after March 1 at the aggregation.

Basically, in conclusion, the times we've been monitoring there, we have not seen red hind present prior to December 15, and sometimes we can't there and check, but we have a recorder there, and we haven't really heard a lot of activity, except maybe one year, but we have detected activity in March 63 percent of the time.

The recommendation would be to revised those closed season dates in relation to the red hind calendar, so that the spawning stock benefits most from that ninety-day sacrifice when nobody can catch them, and we have recommended to shift, and not to extend, the closed season, to be able to protect that little peak that occurs early in March, but we really need to monitor the aggregations, just to make sure that those sound levels are actually red hind and what their densities are, so that we can adapt our closed seasons and increase the spawning stock protection or the recovery of threatened species, because we've also seen a similar pattern, although we don't have the same replicate of data to support this type of presentation, for black grouper aggregating in January,

Actually, within the Abrir la Sierra closed area, we have heard them. In the Virgin Islands, we have observed yellowfin grouper aggregating in May, and we know that closed season ends in April. In Bajo de Sico, we have seen Nassau grouper aggregating in April, but we know that closed season ends in March, and we have even seen some shifts in when queen conch is aggregating to reproduce, as early as June, and our closed season in our local waters doesn't start until August.

A lot of these things could be due to differences in temperature regimes, and I think we really need to look at that as well, the possibility, and other studies have seen chronology responding to shifts in when the low temperatures occur during the year or when temperatures warm, depending on where you are on the planet, and, finally, this type of data can be collected simultaneously at various fish spawning aggregations, to make sure that a low population is behaving in the same way.

We have some evidence of that at Mona Island, but we have very low densities there, and we've been doing this in collaboration with SEAMAP and NOAA and the university for some time, but we really need a dedicated project to continue this type of monitoring, and that's my talk. Are there questions or comments?

VANCE VICENTE: I would like to know if you have observed any variability in your acoustic information that may be related to topographical complexity or bottom type or benthic habitat types and variations in depths where these receivers, or recorders, are being placed.

MICHELLE SCHARER: That's a great question. The depth we are working at and the locations sound very different, but mainly due to current regimes and the other species present and boat traffic, and so we would have to look at that and measure what are those differences, depending on depth and benthic habitat.

VANCE VICENTE: Okay. Thank you.

RICHARD APPELDOORN: Just to reiterate a point that Michelle had made earlier that there are data on the call counts for most of these years, and that is really going to be the defining number that you would want to go with.

The sound levels are just really easy to produce, and so it's easy to show these in a comparative sense, whereas the actual call counts historically, over the length of this project, were made by different people, and we slightly count things differently, and so what's being developed, in collaboration with Laurent Cherubin and his people, are algorithms to record the different types of calls, and not just calls, but different types of calls, in a uniform manner.

That's something that will greatly enhance the comparability of these things, and you saw that one figure where she showed the call counts with the sound levels, and you can see there is a lot of peaks in there that may come from whales or things like that, which will make one period skyrocket relative to the next one, and so there is more definitive data, but that is going to still take a while to be worked out, but the sound levels should tell you the general patterns.

I would also note that -- Michelle didn't show one figure where you can see all the years stacked on top of each other, but, when you do that, what you see, which would be not surprising, is that the peaks one year shift a little bit to the left, and that is to say earlier, the next year, and earlier again the next year, and earlier again the next year, because the moon is occurring earlier in the year, until such point where it becomes too early in the year for the aggregation to form, and then a new aggregation starts forming out on the right, and so that's when we get those March aggregations.

Then, the next year, that aggregation that was in March will actually occur in February, and the reason we're getting differences between our observations and what Rick Nemeth was predicting is because of the differences in which the aggregations actually spawn. It's on the moon in the Virgin Islands, and as Michelle said, it's nine to fourteen days after the moon on the west coast of Puerto Rico.

Given that difference, something that might happen in a shift from February to January that might happen in the Virgin Islands doesn't happen quite yet, and you get that March aggregation forming, and so all the differences that she was seeing relative to the predictions have to do with this nine-to-fourteen-day offset about when the aggregations occur, but they are still just as predictable, but it's just that the cycle is different, because of this offset, and that's why we can have confidence about what's coming in the next ten years, because the cycles are very repetitive and predictable. Liajay, do you want to go back to the recommendations?

MICHELLE SCHARER: I just want to bring up -- Like, on the data that you asked about before, and so the sex ratio for red hind at the MCD in St. Thomas was one-to-three, and, at the aggregation at Lang Bank in St. Croix, it was one-to-nine, while, in Puerto Rico, on the west coast, it was one-to-seventeen, and so that one-to-eleven that I showed before was basically the average of all the sites from the study.

Then sample-size-wise, for Puerto Rico, we had ninety-two from the aggregation and 118 from the fishing grounds, and a total of 210 for the sex ratios that I showed at the beginning.

VIRGINIA SHERVETTE: We didn't have histology data for all of those, right?

MICHELLE SCHARER: It's possible. Right.

VIRGINIA SHERVETTE: We only had the histology data from the thirty-seven samples from 2018 for the aggregation site at Buoy 4 from Puerto Rico.

RICHARD APPELDOORN: Again, a little bit more context, and I wish that Rick Nemeth were here to comment, but, in addition to those sex ratios, comparing Puerto Rico and the Hind Bank and Lang Bank, there is also information on the lengths and ages of the fish, and, basically, where you have full protection, you have much bigger and older fish, and, where you don't, which was

the Buoy 4 location on the West Bank, which is not a closed area, but it is an aggregation site, you were getting those really skewed sex ratios, and the sizes and ages of the fish were much reduced.

We're looking at a situation where, as all these -- The two aggregation sites, and, well, the third one, considering Bajo de Sico, but those two aggregation sites on the western platform, while they have been closed for a long time, are still greatly underperforming what we've seen in particularly the Hind Bank MCD closure, because that's a year-round closure.

There are issues, and it really does look like, if we want to get better performance, we need to have a closer look at the management that we have implemented, and the -- Looking at the recommendations and conclusions that Michelle has, the first one says, okay, we're not getting much before December 15, and we are getting detections in March in 63 percent of the years, and that number goes up, for the next ten years, to 80 percent.

This is totally predictable, what we've seen, and so the current spawning period, closure, from December through February, while sufficient for red hind in the Virgin Islands, where additional studies were done, is not sufficient for protection, the same amount of protection, in Puerto Rico, at least on the west coast, and so that gets you the third point of should we be revising the closed season dates, and the recommendation, I think, was by fifteen days, and is that correct, Michelle?

MICHELLE SCHARER: Yes.

RICHARD APPELDOORN: Then the next one is -- So that's kind of like leading up to one recommendation, is that, if we want to have the same kind of protection that was initially envisioned when -- Based on the initial closures in the Virgin Islands, we need to shift the dates in Puerto Rico, because the schedules are not the same.

The second one is that we really need to continue monitoring these aggregations, to see how they respond, should we be able to make those changes to that closed season, and the last point was that this problem is not unique to red hind, and it is occurring with other groupers, because these are the ones we can listen to, and queen conch is a different story about how that happened, and I'm glad to go into that, but it is a different story, but the question is do we want to make recommendations, through the council, that the nature of the closed seasons, for at least the species we have this expanded information on, be

altered to comply with the timing of the aggregations that are indicated in those data? Go ahead, Doug.

DOUG GREGORY: I have a question about I guess the Puerto Rico aggregation, because the -- I might have missed this, but has the magnitude of the aggregation changed over time? I heard about the size of the fish and that some of them are aggregating outside the current season, and there is a smaller percentage of males in that aggregation, and so my first thought is, is the aggregation growing? Could it be that we have good recruitment there, or has the aggregation size also been declining, or aggregation sizes, I should say, and is there any way to determine that?

RICHARD APPELDOORN: Well, I would ask Liajay to go back to one of the earlier slides that shows the comparison of densities, and you will see why this is probably a question we can't answer. You have to go back through all the years. That one.

This is Abrir la Sierra, and we have also tried to look at other aggregations, particularly Mona, and Abrir la Sierra is the one we have the most data for, because it's closer to shore and somewhat in Puerto Rico, but this was all done, for the most part, as we can get there. Some years, we have some dedicated funding, and most years we don't.

You can see, for 2017 and 2020, there were similar numbers and similar densities, and, if you wanted -- If you look at -- Say go back to 2011, where we also have a fair amount of numbers, the error bars on all of these are so high that none of that is going to be significantly different, and so, when we don't have dedicated funding, we can't get out there, and the probably really is because the aggregations are so dynamic day-to-day, and even hour-to-hour.

If you do a site in the morning, and you do it right before sunset, you're going to get different numbers, because the females tend to hide a little bit during the day and really start coming out towards sunset, and so it's really difficult to get those kinds of comparative numbers, but you can take -- As Michelle did you can take these numbers, and our best one is two individuals per hundred meters squared, and that's the bottom of the graph at the MCD.

Comparative to what's happening both in St. Thomas and in St. Croix, the Puerto Rico aggregation densities are much, much lower, an order of magnitude lower, and so it's not an ideal way to compare things, but it is the comparisons that we have that I

think are valid, and so I don't think there's a lot of evidence that the red hind aggregations are growing or there is recruitment coming in, because the densities are so low, and so it's not a lot of small fish entering the population, and it's from not having the big ones, which will drive the size of sex change to a smaller size, and still you get this distortion of sex ratios that has been observed.

DOUG GREGORY: Thank you.

TODD GEDAMKE: Richard, a quick follow-up?

RICHARD APPELDOORN: Go ahead.

TODD GEDAMKE: Doug, good question, and I was along the same line on this. Two individuals per hectare, and I remember the early discussions, and how many individuals have been observed in this aggregation? I mean, right now, every time we go back to a density or a number that's very difficult for us to grab ahold of, a portion which gets down to tens of fish, and so how many -- If I remember correctly, you were looking at twenty or thirty individuals originally in the site, and so how many individuals are we talking about total?

MICHELLE SCHARER: What's in one of our drift surveys? The most that we've seen is forty-five.

TODD GEDAMKE: Well, you showed the -- The next question is going to be the scale, and so you are doing number divided by a hectare, and so that implies both density and the area, and so what I just want for everyone to understand is are we talking about -- Are we talking about -- Are you monitoring twenty square miles, which would then multiply out to 2,000 fish, or are you monitoring -- My next question is what's the detection range of what you're looking at, and so I'm trying to take apart these ratios that you're presenting, so that we understand Doug's question, which is magnitude. What are we looking at in terms of fish?

MICHELLE SCHARER: If you go back to the map, that circle there is 100 meters around the center where the recorder is, and that is where we drift, consistently through that area, and sometimes we start a hundred meters before, and sometimes we end up a hundred meters afterward, but we're always navigating through that area, and so it's a very small aggregation site.

TODD GEDAMKE: So the same question. How many fish?

MICHELLE SCHARER: What we've seen maximum on a survey is forty-five fish.

RICHARD APPELDOORN: Michelle, what's the width of the transect?

MICHELLE SCHARER: The width is four meters.

RICHARD APPELDOORN: So, typically, a drift will take you through that circle.

MICHELLE SCHARER: Correct.

RICHARD APPELDOORN: So that's forty-five fish in something that is four-by-200 meters.

MICHELLE SCHARER: Sometimes more.

TODD GEDAMKE: Okay, and so that's a diver transect and not an audio transect?

MICHELLE SCHARER: Correct.

TODD GEDAMKE: So what would be your guesstimate for aggregation size, and I say "guesstimate" because you're the expert.

MICHELLE SCHARER: 500 fish is a guesstimate.

TODD GEDAMKE: Michelle, first of all, great work, and I have some broader questions, or comments, that I would like to throw in at the end of this discussion, regarding our charge in here, but this type of acoustic work is long overdue, or not long overdue, and you've been the only person really driving it.

As you know, we've recently teamed up with the Cornell Bioacoustics Lab, and they're bringing some of their technology and algorithms into this arena, and so we should be able to start applying this passive hydrophone work in other places, and so, yeah, no, I think what you're demonstrating here, for this area, is really nice stuff.

RICHARD APPELDOORN: I have a follow-up comment. I would like to point out that we've done more acoustic surveys using the drift hydrophone, and the aggregation does extend a little bit north, and somewhat more to the south, than the area that we've been doing the parameter searches for, because that hundred-meter circle is basically the radius for which we think we're getting reasonable acoustic information from, and so we don't really pick up a lot from beyond that, but the aggregation

extends somewhat north and further south than what is depicted here, but this is also, again, from earlier work where we were seeing the most fish, and so that's why the hydrophone was put there and we focused on this area.

Similar work has been done in the MCD Hind Bank, and, again, the hydrophone was put in at the historical center of the red hind aggregation there, and so the acoustic information is monitoring a key, but not the entire, portion of any particular aggregation site, and so there's probably more than 500 fish, but it's not going to be much more.

MICHELLE SCHARER: Another point to keep in mind is that red hind aggregations are very spread along this shelf break, and so you will have an area, like a nucleus, of high density, and then you move off, and it gets low density, and then, further along the shelf, there's another nucleus of high density, and we do have hydrophones in other locations where this occurs, and they seem to be on the same schedule, but less fish.

VANCE VICENTE: Richard or Michelle, this other acoustic information that has been collected, specifically by Jose Rivera, on fishing aggregations and fish populations and so on, is there any relationship between his results and what you're finding, or these are two different types of studies?

MICHELLE SCHARER: Thanks for the question, Vance. What Jose Rivera was doing was active acoustics, and so he was actually using sonar to detect the swim bladders of fish in the water column, and what we're using is passive acoustics, and so we're just listening to the sound production of the fish when they're there, when they're active.

We do have data in similar areas, and we actually dove with Jose, when he was doing his surveys at the same site, and specifically at this site, in 2011 and 2010, I believe, and so there are areas where our data overlap, and we could look at that, once we find an algorithm that works for us.

VANCE VICENTE: Got it. Thank you.

RICHARD APPELDOORN: I would point out that Jose has published one or two things showing clusters of fish, which he was saying, because of when they were doing the surveys and their kind of location near the shelf edge, that there were potentially red hind.

I would say it was grossly overoptimistic, and, from what he was

seeing, and when we finally did the studies that Michelle is referring to, where he was taking -- We had all three sources of information together, and he was able to detect red hind like a meter off the bottom, after he finely-tuned the active acoustic signal, and so he got to the point where I think we could say, okay, now that's what a red hind aggregation would look like, which was not what he was reporting before, and he was talking about large masses of fish up in the water column, and so his earlier publications on aggregations were clusters of fish, but, as to what they were, it wasn't red hind aggregations.

Again, it's a question of funding. He sort of got this to the point where it might be applicable, and the funding for that kind of work ran out, and so it would be nice to, again, pick these things up and see if we could get some kind of clear counts, and, again, it depends on when you do the surveys.

That survey that he did, showing the fish that we believe were red hind, was done close to sunset, when the fish are more abundant and most active, and we know, from experience, when he was trying to capture yellowfin grouper at Mona, where the fish are up in the water column, that aggregation moves around a lot, and so your chance of just hitting that moving ball of fish are actually quite remote during any particular survey, and so it's actually difficult to find these things using these active techniques, depending on the species.

Any other questions for Michelle, in terms of the work presented? If not, we need to decide whether we want to make some recommendations and what those recommendations might be.

I guess I would summarize Michelle's recommendations as, one, there should be a shift in the red hind closed season by fifteen days, from December 15 to March 15. The second recommendation is that this same issue should be looked at in other species, particularly in the groupers that she mentioned, and the third recommendation is that there should be dedicated research toward these investigations, and I am not sure how that would be done, but we could make the recommendation to the council to that effect.

In the past, the council has had their own money, through the coral program, but the council certainly also advises MARFIN and the Cooperative Research Program and the other funding programs in NMFS about what their priorities are, and so that would be another avenue, should the council want to make those recommendations.

I will just start off with does anyone want to make a motion, or a recommendation, that the SSC recommends that, off the west coast of Puerto Rico, the closed season for red hind in the EEZ closed areas is shifted by fifteen days, to December 15 to March 15?

GRACIELA GARCIA-MOLINER: Richard, sorry to interrupt, but you have Reni that wants to say something, and he's looking for his microphone to speak, and let's see if we can unmute him from here, and do you want him to intervene now or wait?

RICHARD APPELDOORN: Otherwise, we're looking at silence, and so, yes, have him speak.

GRACIELA GARCIA-MOLINER: Okay. He doesn't have a microphone, and that's the problem, and so sorry about that. Let's see if he can write, in the chat, his comments.

RICHARD APPELDOORN: Or is there a way for him to call in?

GRACIELA GARCIA-MOLINER: Yes. He can dial in through one of the numbers that are in the Federal Register notice. I am just sending him one of the phone numbers, so that he can dial in. For some reason, he's getting a busy signal from one of the phone numbers. Let's see if he can call in now. We are trying another method, but it's not working. Richard, he won't be able to connect via phone.

RICHARD APPELDOORN: Okay. Well, here's my recommendation. I am suggesting that maybe we break for lunch, which would allow maybe time to fix this problem, so we can hear what Reni's comments are, and then we can go back to talking about whether we're going to make some recommendations or not.

Just a point of order, and I can't make a motion, as Chair, and can Michelle, as the presenter, put forth motions or specific recommendations?

GRACIELA GARCIA-MOLINER: I think so. That shouldn't be a problem.

RICHARD APPELDOORN: Okay. One other thing is, Todd, I was just thinking of numbers in my head, but, if you think of the fact that the transects were four meters wide, and you have a hundred-meter radius, that's twenty-five transects that fit into there. If the maximum was forty-five ever seen in a transect, and just use forty, because that multiplies nice, and, if you use that maximum, you come up with a thousand fish, and so that

should give you an idea of we're not really talking about lots and lots of fish here.

WALTER KEITHLY: Mr. Chairman, if I could make just a comment, or a suggestion, and, if someone prepares a motion in the lines of your discussion just a minute ago, I would ask that that individual provides a clear rationale associated with that motion. Thank you.

RICHARD APPELDOORN: Okay. What I was going to suggest was that, during the break, Michelle, why don't you draft some potential recommendations, with the rationale for them, and you don't have to go into excruciating detail, because we do have the record and your presentation to back up the statements that you would make, and you just need to refer to those in the statements, and then I would try to draft something relative to the use of the (h)(2) approach to assessments, based on the discussion and the points that I have raised and the comments that people have made, and then we'll come back after lunch and discuss those, and does that sound agreeable?

MICHELLE SCHARER: Yes, I can do that.

VANCE VICENTE: That's okay with me.

RICHARD APPELDOORN: Okay. Then I am suggesting that we break until 2:15.

GRACIELA GARCIA-MOLINER: Richard, you might want to have Alfredo right when we come back in. I am waiting to hear from him about his departure time this afternoon, and then do the motions after that.

RICHARD APPELDOORN: Okay. That's certainly possible. If you have an update for us when we get back, that will be great. All right, everybody. We're adjourned until 2:15.

(Whereupon, the meeting recessed for lunch on July 14, 2021.)

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JULY 14, 2021

WEDNESDAY AFTERNOON SESSION

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The Scientific and Statistical Committee of the Caribbean

Fishery Management Council convened via webinar on Wednesday afternoon, July 14, 2021, and was called to order at 2:15 o'clock p.m. by Chairman Richard Appeldoorn.

RICHARD APPELDOORN: Let me just start off with a couple of things. First of all, I did send, to you and Liajay, a draft text of -- I think they're more comments, rather than recommendations, but to the data-poor tech memo, and we'll look at that later on. Michelle, did you similarly draft something for the red hind?

MICHELLE SCHARER: Yes, sir.

RICHARD APPELDOORN: Okay. I had a conversation with Jocelyn, and I would just like to have this conversation now, and then we'll move on to the electronic monitoring. Subject to what we're doing with the red hind in particular, since that was presented by an SSC member, and I am intimately also involved in that work, since the SSC is being asked to look at this, in sort of a peer-review vetting manner, that neither she nor I should be involved in the decisions on those recommendations.

We'll get to these recommendations again later, but be advised that I will probably choose someone else actually to chair during that session, and Michelle and I will be available to answer questions, but we will otherwise not contribute to any statement that comes out of the SSC. Jocelyn, did you want to follow-up on anything, or did I state that pretty correctly?

JOCELYN D'AMBROSIO: Thanks, Richard. Yes, you stated that correctly. There is no specific conflict of interest rules that apply to the SSC members, but, looking at some of the conflict of interest rules that apply to peer review, that state that peer reviewers must not have contributed or participated in the development of the work product under review, my recommendation would be, as you said, for persons involved in that research not to participate in recommendations about the use of that research, and so recusing yourself from any voting I think would be the appropriate procedure.

Then, obviously, answering questions and all of that is perfectly fine, and stating your opinions, but just to add that extra layer of that independence to the review, which the council is seeking.

RICHARD APPELDOORN: Okay. Thank you, Jocelyn.

DOUG GREGORY: I have a question for Jocelyn.

RICHARD APPELDOORN: Go ahead, Doug.

DOUG GREGORY: We had a similar situation with the Gulf SSC over the Great Red Snapper Count, and it was my understanding that NOAA General Counsel has informed the Gulf Council staff that the SSC members that worked on that Great Red Snapper Count could also vote on management measures and stuff, and so if you could get with Mara and coordinate things, I would appreciate that.

JOCELYN D'AMBROSIO: Thanks, Doug. I spoke to Mara over the break, and she mentioned the Great Red Snapper Count and the review there. I think there's different rules that apply to council members and the SSC, but she did mention that she and others within NOAA General Counsel had looked at the National Standard 2 Guidelines, which talk about peer review and independence of the peer reviewers, and so just looking narrowly at that sort of idea and the function here of trying to review this data and recommend whether to rely on it for management measures. I think it makes sense to have those that conducted the research not participate in any recommendation about using the research, because -- And sort of reviewing the -- Just reviewing the scientific validity, basically, under those National Standard 2 type of ideas of best science.

Then, when it goes to the council, there would be different rules that would apply to the council members voting on any management measures to come out of using that research, and so just, at this SSC level, looking at review of the research, which is what the council wanted, should we take this research and make policy based on it, and it seems like they were asking for a vetting of that research.

Right now, we, obviously, know sort of the positions of the researchers, as they obviously recommend using that research, and so, just even thinking of it in that way, and the council already sort of has those opinions from the researchers and is looking for the opinion of the SSC.

DOUG GREGORY: Okay, because I get the impression that different SSCs are getting different advice, and that's all. Okay. Thank you very much.

RICHARD APPELDOORN: That may or may not be the case, but I think Jocelyn's recommendations for us are the conservative way to go, and so I certainly support that. We'll take up any recommendations or statements at the end, and so we can move on

to the topic of the electronic technology and electronic monitoring.

As Graciela mentioned, we're kind of pushing this up, because Alfredo has other commitments, and so I guess we'll go right to him, and he has been the leader of this effort in the U.S. Caribbean, and he represents ShellCatch, and they're the ones helping to develop and implement the monitoring programs, and so go ahead.

ELECTRONIC MONITORING

ALFREDO SFEIR: Thank you, Dr. Appeldoorn. I think it's been very interesting that, for close to three years now, we had fishers in a room, DNRA and DNER in the room, and we had The Nature Conservancy in the room, and we were all talking about how -- We had meetings with Graciela, and we were all discussing what do we want to do with this, why do we want to do it, and there were all these benefits that fishers would express, and the government agency, for science, and especially the fishers.

We have Nelson Crespo here, and I can see him in the meeting, and he's been one of the fundamental -- He's been one of the biggest contributors to this process, and I just want to shout-out and say hi, and I appreciate every one of you who have been here, because it wouldn't have been possible without a really unique level of collaboration.

If I may, I will share my screen, and so we want to basically give you an update on system growth and who is doing this and the NOAA integration scale up. The system, just to give you a brief review, is a mobile app, accompanied, or connected to, a management web-based system, and we have really customized and tailor-made it so that there could be better management and more ease of use from the fishers and take it a notch further and actually create a communication platform between the web and the fishers.

From our last meeting, and I think it was -- I don't remember if it was April of last year, but the users went up from 300 to now 780, and so it's a big jump of use, and Ricardo, the Acting Director of the Division of Commercial Fisheries Research and Management, says he's -- This is an account from him from a few weeks ago, and he says that the speed of receiving the data, as compared to before, has been very disruptive.

He has felt that him and his team have made the registration of the actual fishing very accessible and very agile, and then he

also mentions how important it is for him and his team to have direct connections with the fishers over the platform, which is something they didn't have before, and, really, few countries have, and what he is very interested in as well is how he's been matching the statistics reported with the actual activities occurring on the ground, and so just another thanks to the logos, as you see the organizations that have supported us here during the process.

We wanted to also explain, well, what's up with the connection with NOAA, and we got the database schemas on the 24th of June, and, as of last week, we were able to do the API integration test, and so the data -- We connected to the NOAA database, and so we're ready to go. We just need the green light from NOAA to give us the production deployment, and I want to thank everybody there, David Gloeckner and everybody there on the team, who were able to make this possible, and we're very happy to say that the databases are synced, and now we can have the data go to NOAA.

An additional thing to explain here is we were very lucky with The Nature Conservancy and the fishers, the Puerto Rican fishers, and we were able to connect and do an exchange program with the government of Chile and the Puerto Rican fishers are sitting there with the -- She was the director of the national fisheries program, and now she's the current sub-secretary of fisheries, and I wanted to share with you a brief video.

Basically, the objective of that meeting was to understand sort of how e-reporting was used in Chile and other countries, to try and figure out what's the scale-up potential, and what are the potential benefits, and I wanted to show that to you in this sub-titled video.

(Whereupon, a video was presented and was not transcribed.)

ALFREDO SFEIR: That was super nice, to have that exchange, and it was a technological exchange and user exchange and understanding, and, really, it was how this came about, because, thanks to Puerto Rico, we were able to end this project, and the Puerto Rican fishers and government, and we were able to improve this and expand it not only into Chile, but also into Belize and Ecuador and Peru, and so it was great to have that exchange. It was special.

I want to, basically, from there, discuss and show how this can scale, for discussion, this is what we have now, and this is the actual dashboard that has been an iterative process. Just to give you a bit of a reminder, the total species amount of data,

in pounds, fishing gear, number of trips, and this data has been evolving, because, initially, what we wanted -- We very much wanted to see how the user growth would grow and would go, and this was sort of our biggest concern, because our KPI was how many new fishers would go online, and then it started to evolve, and this is the beauty of these sort of data platforms, or projects, is that like managers start wanting to know, well, how many trips a day do we have.

Then, in addition to that, map data and sort of the latest data stream to the platform, and then, the other day, on Thursday, I think, Graciela said, hey, I want to know -- I want you to report spiny lobster on a monthly basis, and I said, look, Graciela, I will try to have it to you before the meeting, and we finished it two hours ago, or an hour ago, and so sorry, Graciela, for taking so long, but we actually finished it, and let's go to spiny lobster, and let's see how spiny lobster did on a monthly basis. I just sent a screenshot also to Daniel Matos, just so -- He really wanted to see it as well.

Here you have, by month, Graciela, and this will improve graphically, and this was just a proof of concept, and it's actually real, and so here you have the number of spiny lobsters caught per month, which is what you asked for, for 2020 and then 2021, and you can do it with any species, for anything that you want.

Then we also wanted to show you which data was rejected, because the nice thing -- One of the benefits of the platform is that it's able to show rejected data, and rejected -- What does that mean? It means when fishers either mistype something, or it's completely out of place, or something is wrong, and they reject the data, and I will show you that in a bit.

We also have a lot of lobster data input that was rejected in July, and so this is just a little bit of sort of what -- This is just the tip of the iceberg, in terms of what we can do with the data, and fishing -- The fishing process has also been evolving over time, and this is the data -- Because it turns into a management platform, we wanted to make, or help, fisheries agents at the statistics department, and DEP has used their time as best as possible, and most efficiently, and here you have the data that has not been reviewed, which is amazing how proactive, how on top of this, Puerto Rico is, really.

Then we can see -- They're only pending reviewing these fishing trips, and this is the data that has actually been reviewed, and there's a lot more, because we just have to go down, and there's

just a lot of data, and then here's the rejected data, and so you can -- All of these data points, you can click on and, oh, what a coincidence, and spiny lobster was rejected.

Here, they can actually edit the fishing trip. If they approve it, it goes back to review data, and then we also created a tab for data in process of addition, which there is none, and they have vetted everything, and then reports, and this is some of the stuff that we've been working on with Daniel to help him and the team get better results.

KEVIN MCCARTHY: Sorry to interrupt, but could I -- I have to say this, and you really shouldn't be showing confidential data like this.

ALFREDO SFEIR: Okay. Sorry.

KEVIN MCCARTHY: I don't know what the rules are within Puerto Rico, but that would have been a \$100,000 fine if this data came from a federal source, and so just be careful, because it's a real no-no.

ALFREDO SFEIR: All right. I guess what we'll do then, for the future, is create a demo user, so that we can just have demo data. Point taken.

KEVIN MCCARTHY: I'm sorry to come on so strong, but it's a real touchy issue, and we don't want the fishermen to come back at us and say, hey, I reported this under a certain set of rules that I understood, and now you guys are showing the world where I fish and how much I catch and everything else, and so you've really got to -- That's the concern, and you and I can have a chat offline and just -- I can tell you the kinds of rules that we operate under, just so we're not upsetting anybody and not stepping into a data presentation that maybe is going to cause concern for anybody.

ALFREDO SFEIR: Absolutely.

KEVIN MCCARTHY: Sorry to come on so strong.

ALFREDO SFEIR: No, and this is perfect, Kevin, and thank you so much. We have signed confidentiality agreements with several governments, and we don't -- This was my fault, completely my fault, and I thought the scientific committee was within this confidentiality, and so that was something that I did not calculate properly.

KEVIN MCCARTHY: This is a public meeting, and not everybody on the SSC, necessarily, gets to see confidential data, and certainly not from the outside, and so just a heads up.

ALFREDO SFEIR: Yes, and we can actually -- Whenever we meet, we can actually look deep into those clauses and make sure that you feel comfortable with whatever contractual relationship or policy you want us to -- We have over 60,000, for example, video data points that are nothing to do with this project, but other countries that have completely confidential -- Everything is really confidential, but, yes, I think I slipped here.

KEVIN MCCARTHY: No, that's all right, and, I mean, I don't think you -- You didn't give away the farm or anything, but it's just something to be aware of, and, right now, you would be operating -- Because you got these data from DNER, you would be operating under whatever confidentiality rules they have, but ours are certainly very -- They have some teeth, and so I just want you to be aware of that.

ALFREDO SFEIR: One of the contracts I had was, if any data left my video servers, then I would have a \$500,000 fine, once, and so I understand -- I completely understand it, and I have been exposed to that, and so, again, my apologies, and I'm looking forward to meeting with you to make sure this doesn't happen again, and it won't happen again, regardless of our meeting, but I look forward to meeting with you, again.

I guess I will just jump, really quickly, to then how we can scale, and this is something that I want to just echo -- Let me see if I can go back to --

GRACIELA GARCIA-MOLINER: Alfredo, I do have a question, if I may. The dashboard, in terms of the summary reports, is available to the public in general or --

ALFREDO SFEIR: No, just DRNA. It's completely -- The only people who can see this is Ricardo and Daniel and his team. It's not public. Does that answer your question?

GRACIELA GARCIA-MOLINER: Yes.

RICHARD APPELDOORN: Alfredo, I have a question, right where you are. You mentioned that the data gets reviewed, and some data gets rejected, and how are those linked? Is there like an automatic algorithm that rejects data?

ALFREDO SFEIR: No, it's a human -- It's Daniel and his team.

They call the fisher up, after they see that, and they're, like, what happened here and why, and they have different reasons why they reject it, and it's completely out of my hands.

RICHARD APPELDOORN: Right, but they -- So they are reviewing everything first, and, if something is amiss --

ALFREDO SFEIR: Exactly.

RICHARD APPELDOORN: Okay. Thank you.

ALFREDO SFEIR: Yes. Absolutely. Exactly, and so, in terms of the great presentation that I saw from Jessica Stephen, Dr. David Gloeckner, Alan Lowther, Farron Wallace, and Lawrence Beerkircher, and it was a very -- I loved the presentation, because it was basically looking into the future of where NOAA is going, or is, and so I just wanted to comment and share, additionally, and I'm sorry to be so quick here, which is the actual areas where this can scale, not only at the dashboard level, which is what I was showing you before, but also at the application level for remote electronic monitoring, which is the actual video footage of what's going on.

We wanted to just share with you the potential of linking the data to other data sources, and I know this is nothing new to you, but I think it's important, at the small-scale level, to be able to show, just very briefly, what we've been doing, and let me see if I can get to that. One second. I will share my screen right now here, and I will just jump here to the last part.

We all know about conservation issues, socioeconomics, in terms of giving fishers a better -- Getting them a better price and conservation and bycatch and all the need to monitor, given bycatch and climate change and all these things that are happening, and they need to know what's coming on the nets, and then there's issues that consumers want to know where fish is from.

We have, on the right side, and you can see traceability, and you saw a bit in the video that traceability can be linked directly to electronic reporting, and then we have a camera to the left-hand side, which is also something that can serve the remote electronic monitoring, within the same platform, within the same dashboard, that you saw.

We have had a lot of other organizations in the private sector actually jump in and be interested, because they are interested

also in working together to actually get the data, which, to the left, you see similar electronic reporting, but this is Ecuador, and a similar label, and then you have the restaurant information, and then you have the QR information, on the right, from the fisher, from the traceability, and so we're really leveraging -- You also have the fishing trip, by segment, that's been pre-approved by the fisher, to basically be able to show the end consumer like where the fishes come from, and so we do sign agreements here with the fishers, and they do sign a release that enables them to very proudly show their data.

Then all the way to the restaurant, which this is the QR for the restaurant, and this is all the way like -- Like e-reporting is just the start, and there are different things that we would love to consider, and this is just, very quickly, Belize, and we're doing it in Belize, and, again, you can see the camera on the vessel, and they use their own electronic -- It's our developed electronic reporting, which is very similar to Puerto Rico's, and the camera, as you can see on the vessel, and he went to fish for lobster over the weekend, and we have all the information, again, and we have the fisher and the restaurant QR, and it's going to Elvi's Kitchen, if any of you are in Belize and you want to eat some lobster. You'll be able to see where the lobster was fished.

Then, again, really a big thanks to the team, and Damaris is there as well, and other people and fishers, and, again, more of the same, and I just wanted to leave it there, and maybe there are some questions, but this is where -- You know, I would love to, I guess, in just the final few minutes, show you something we did in piloting with NOAA, and it's also been approved, and we're able to show this, because the fishers and NFWF and the fishers in Hawaii gave us the green light to share with you, and so I will share the screen here.

This system is being used now in Norway, and it's being used in southern California and fourteen other countries, and what we do is we basically join the electronic reporting data with the actual electronic monitoring data, and so it's basically validating the electronic reporting information, which is input by hand, and now this is automatic, and the scoring part is what we worked on with the fishers in Hawaii, with feedback from NOAA and NFWF.

Basically, what you log is you log fishing gear, target species, bycatch, and then we're starting to do AI. I mean, we're not starting. We have done AI for a while now, but I don't want to come out and say, oh, AI is a miracle, and it's still not

completely automatic, and then notes.

Here, you revise this set, and you can go faster and download the video and send it to a colleague, and that's within the confidentiality bubble, and this is that would be something very easily -- We could easily create a pilot of this system that would link into your electronic reporting, and, as a third tier, third level, we could also take it a step further into the restaurant, but I think that's getting way ahead of ourselves here in this meeting, and so that's it for demonstration.

I think there is obvious opportunities with taking electronic reporting to the charter vessels, and there is also electronic reporting to the actual recreational fisheries, because this system is already there, and then electronic monitoring, which is what I'm showing now, would be amazing to pilot with you in Puerto Rico, with one, two, or five vessels, and have a local experience with innovative and open fishers who were willing to do that, and so this is just a suggestion.

Finally, and now for real it's finally, we have a customer support platform, and, at first, we had five to seven calls a day, and now there are very, very few calls to the customer support platform.

Since our last meeting -- I think the CARES Act had money to send to fishers on a completely different project, and we basically created, on the app, the possibility for the fishers to write the form and apply for the funding, and we worked together there with Damaris and with Ricardo and Daniel, and then fishers were submitting forms and information to promote communication between -- Confidential communication between DRNA and the fishers, and so that's my presentation. Thank you.

RICHARD APPELDOORN: Thank you, Alfredo. I have a couple of questions, and so I will just start off first. Your electronic monitoring, is that being collated by some kind of AI software, or does someone have to actually read the video and record it by hand?

ALFREDO SFEIR: We're doing a hybrid. Today, like the biggest competition of the world, which is Archipelago and Satlink, and they're the leaders, and we're all using human reviewing, people, humans, but we're already -- Depending on a per-fishery basis, and depending on the client needs, we are walking towards using AI to determine length of mahi and number, counts, and so we are going in that direction, to complement the human, and eventually, hopefully, someday, take the human out of the

picture and have the human more in a supervisory role than collating.

RICHARD APPELDOORN: You mentioned mahi, and so I'm just going to frame that, and have you linked with the Dolphinfish Research Program?

ALFREDO SFEIR: No.

RICHARD APPELDOORN: Because they've been doing some monitoring of particularly recreational catch, and some commercial catch, in Puerto Rico, and they are very interested in this kind of approach, and so that might be something that you would like to do.

ALFREDO SFEIR: Thank you so much. I will jot that down. Thank you.

RICHARD APPELDOORN: I can give you some contacts.

ALFREDO SFEIR: Thank you so much for that.

RICHARD APPELDOORN: The second question is, in the reporting that's being done now, you mentioned location, and is that where it is caught or where it is landed or both, or --

ALFREDO SFEIR: For the actual electronic monitoring, the video?

RICHARD APPELDOORN: No, for the reporting.

ALFREDO SFEIR: For the reporting, no. Well, yes, but it's in the box scheme, and so --

RICHARD APPELDOORN: Okay. That's all I need to know, is the box scheme.

ALFREDO SFEIR: It is, but there's a five-mile, I think, and so it's not the exact location, but it's within the perimeter of the map.

RICHARD APPELDOORN: Okay. I think you were going to say that, in the monitoring program --

ALFREDO SFEIR: In the monitoring, it's exact, because it's where -- You have the GPS associated with the actual location, and so you jot it down on the scoring sheet, right under the video, and so you know exactly where they caught such a species, and you also know if they caught bycatch right there, and so

then you can do stuff there, in the future, with getting creative here with probabilities, and you can estimate like probability of catch of that species in the future, but this is stuff that we need to build with you, and it's not something that I come up with, and it's something that comes up in collaborative working efforts with people like you.

RICHARD APPELDOORN: Okay. One other question. You mentioned you're up to 700 users.

ALFREDO SFEIR: Yes.

RICHARD APPELDOORN: Those are independent people going out in boats?

ALFREDO SFEIR: Yes.

RICHARD APPELDOORN: What percentage of the -- Not the fisher population, because you could have multiple fishers on the boat, but, of the trip population, or the boat population, did that represent, just off the top of your head?

ALFREDO SFEIR: For boats, like I've gotten different figures, numbers, and it's like 1,100, I think, and Graciela can correct me, I think, or anybody on the call that is better equipped to answer that, but the latest figure I got was 780 out of 1,100.

RICHARD APPELDOORN: Okay. That's close enough for what I was thinking, and one last comment. I really like what you're doing.

ALFREDO SFEIR: Thank you.

RICHARD APPELDOORN: The only flaw was not inviting the entire SSC to Chile with you.

ALFREDO SFEIR: Next time.

RICHARD APPELDOORN: Maybe next time, yes. Any other questions from the SSC? Go ahead, Todd.

TODD GEDAMKE: First of all, I am thrilled to see the electronic reporting coming in. We talked about this back in the early days, and I was kind of involved with some of the early points, in 1997, and I know Josh Darwin fairly well from my graduate school days too, and so the development of your process, and I've been following for many years, and I know Josh from Santa Cruz days.

Anyway, I am thrilled that this is going on, and we've been working on a lot of the parallel issues, and we've been actually -- I like the way you said we're using humans and a morphed approach right now, because that's what we're also doing with some of the port sampling.

I did want to inform you, and the SSC, that we actually have four camera systems that are going out this weekend, or are starting to go out this weekend, onboard lobster vessels, and so we're doing a remote monitoring on four vessels, coming up, as part of the selectivity project, and, for those that -- I also have to appreciate your comments regarding AI.

There are people jumping out of the gate right now saying they've got it all under control, and no one has it all under control right now, but there are people that are putting webpages up saying they've got it, and you and I should have a conversation off to the side, but, for those on the SSC and looking at -- Write the word "Merlin" down, and that is a bird application that is developed by the Cornell Bioacoustics Lab.

We have received FIS funding, last year, to develop -- Basically to modify the Merlin AI app for application in Puerto Rico, and so, in terms of development on this, I think there is a leveraging component that we can talk about, Alfredo, with working with stuff, but, yes, we've got the same sort of video setup, and we're also doing the morphed approach right now, with basically selecting frames out and training the model, and training the algorithms, and we've got a lot of the stuff in the port sampling, and so there's a lot of parallel efforts going on here, and I'm glad to see this is all working, and you and I should touch base after this meeting.

ALFREDO SFEIR: Absolutely, Todd. Thank you so much. I'm really looking forward to that. Thank you.

VANCE VICENTE: I have one comment, if I may.

RICHARD APPELDOORN: Go ahead, Vance.

VANCE VICENTE: First, thanks for the presentation, and it was very instructive for me, and I was really impressed with how rapidly you were able to pull out a graph of the monthly variation in the catch of lobster, and I imagine that you could do the same thing as quickly in plotting the catch per unit effort, together with that graph, to see what percent of the catch may be explained by having more or less boats, and so I

think that's something very, very good.

One question, and, I mean, regarding the electronic reporting, how much more valid is the data being made? I mean, I'm saying like an individual who is willing to purposely inflate or deflate the numbers, and he can do that either in a written form or electronically, and, I mean, how much valid is the data with the electronic reporting? That's my question.

ALFREDO SFEIR: Dr. Vincente, that's an excellent question, and this is -- What it tried to do initially was it tried to get the paper out of the equation and improve management, because, in paper, you can also do the same, right, and then what you try to do is -- The idea has been to combine it with spot checks, right at the dock, to try and make the electronic reporting data more validated or more real, right, and so the beauty of the electronic monitoring is that, together with that, you have a very solid system, because the electronic reporting inputs stuff that electronic monitoring doesn't.

That is the ideal combination, and you can do many more things, but you're absolutely right, in that fishers can put in any number with electronic reporting, but the actual thing that we were tackling was actually going from paper-based to digital, and then I know the Department of Statistics has a strong effort to actually go and see at the dock whether this data is for real or not, and we all know that doesn't scale, and so that's why the electronic monitoring equipment is really a critical piece, because it scales the ability to not have to have human agents going to the actual dock, but everything can be done statistically, and you don't have to be everywhere.

This is just a very personal opinion, but, if you have a percentage of users using it, then you can curb down that process, and so this is where the review process is taking place at the statistics department, which is why, in the platform, I was showing that you could actually -- You have a lot of human eyes on what they are reporting, and so it's not like they report whatever they want and then it just gets taken as-is. Everybody is looking at the data, at least for now. Thank you, Dr. Vicente.

VANCE VICENTE: Thank you very much.

RICHARD APPELDOORN: Alfredo, we have a question from Nancie Cummings, and she asked what has been the validation results, by region, to date?

ALFREDO SFEIR: We're not involved in the validation, and so, unfortunately, I can't answer that, Nancie.

RICHARD APPELDOORN: Well, I have a question, which I'm going to think is for Kevin. Since you mentioned that you have this synced to NOAA now, this means that we now have the potential for this data to go directly to NOAA, and, Kevin, is this likely in the near future, and how will it enhance your job, in terms of I guess particularly looking at catch levels and for ACL monitoring and also for future SEDAR work?

KEVIN MCCARTHY: Right, and so, as Alfredo mentioned, they are working with some of the Science Center folks to get it into ACCSP, and so that is moving ahead quite rapidly. There was a similar initiative for electronic logbook reporting in the Gulf and the South Atlantic, and so a lot of the background work that had to be done to get the ACCSP database housing of the data -- We got that in line, so that the transition for moving the Caribbean data in, or the Puerto Rican data in, was a lot smoother.

It was a long haul to get that squared away for the Gulf and South Atlantic, but it was done in such a way that it looks like the Caribbean data was able to go in pretty quickly, and so what that will do is, one, it's going to save Daniel Matos' folks a lot of data entry, and a lot of the data entry will be taken off their backs.

I am hoping that we can, in the future, maybe build into the data entry program that you've got, or the application that you have got, Alfredo, to sort of, on the fly, make corrections, so that there's not this delay of having DRNA have to do some after-the-fact validation and then send the information back to the fishermen, especially if it's things like the date is wrong, and that's an impossible date, or that's an unlikely -- That's a typo, and, if those need to be fixed, and maybe you already do some of it, and maybe the application already does some of this, but, if that stuff could be added in, that's going to save some data issues in the future, and then there's not going to be this lag of back-and-forth with the fishers, to try and get the data sorted out.

It will -- If everybody moves over to it, and so that's a question that I have, and maybe you mentioned this, but what percentage of people who are likely to report are actually reporting using the electronic logbook approach rather than the paper forms, and that will get stuff into the database faster.

Once we are able to resolve the -- We're still going to be hung up with the correction factors, right, and so, until we get everybody reporting, we're not going to get past that, and so dealing with sort of ACL monitoring in near real time is always going to be affected by that.

I mean, it's great that we've got people getting data in faster. Until such time as we get near universal reporting, we're still going to have the correction factor lag, and that is just a matter of when can the surveys be done, or used to inform those correction factors, and that's typically mid-year, and so, if we get them in the summer, we might be doing some near real-time ACL monitoring maybe the last quarter of the year, and maybe that's wishful thinking, but we'll see how it progresses.

That is sort of a long-winded answer, but I think Vance was right, and I think Vance said it, and he was right on the money when he said, you know, these are still self-reported data, and we all know that self-reported data has some caveats, and so, I mean, that's what we're dealing with already, and so we haven't lost anything, in that sense, and the fact that things have sped up a lot, in terms of quickly the reports are getting in and getting put into a database, is just a really nice advance.

I guess my question is are there going to be essentially two databases? Is ShellCatch going to continue to -- I think that's where the data are housed right now, and is that going to continue, or will we have a system where the data are going directly to ACCSP and no longer on some other server?

ALFREDO SFEIR: I think -- Thank you for sharing your vision of the future of near-real-time data, and I think there is a lot of business rules that we can generate to make the process more efficient, and I think we have to remember, a little bit, why the system was created, and it was created for -- One of the principle goals was to export the data to NOAA. That was one of the main objectives.

The other objectives had to do with having a local, agile, Puerto Rican platform for management as well, and this is what was tailor made, and so, for us to develop this with all the partners involved, we had to work on -- Having had this particular technology that combines mobile and web and the registration process of fishers, et cetera, and these are all fine-tuned, user-experience-modeled features that have been very customized, so that the Department of Natural Resources and the statistics department in Puerto Rico could actually work with it.

It can go any way you want, Kevin. Like, if you want -- I mean, it's just about doing APIs, or I don't know if Puerto Rico wants to just do away with this platform and not have the benefits of the actual management features that we developed for them, but, you know, I think that it's completely their call and your call.

KEVIN MCCARTHY: Well, it's not my call. I mean, you all entered into -- Puerto Rico entered into a contract with you, and so whatever arrangement that is is entirely between --

ALFREDO SFEIR: Okay, and so it's their call then.

KEVIN MCCARTHY: I was just curious.

ALFREDO SFEIR: It's their call. It's on Amazon servers in the United States, and so it's their call.

KEVIN MCCARTHY: Right, and so I am just -- I was just curious, because I think it is really nice, and all of these features that you demonstrated are really, really useful. We're probably going to be pulling the data from ACCSP, because we're not part of that agreement that you have with Puerto Rico, unless they want to loop us in somehow, and then we have to discuss the details of that.

ALFREDO SFEIR: We would love that. We would love you to have it, but, like you said, we would love that. We would love for you to have a special area of the portal, but, like you very well clarified, they're the ones who call the shots, but we would love to have you.

KEVIN MCCARTHY: Yes, but, I mean, we're certainly -- We've got folks at the Science Center, and I'm not among them, but I used to work for them, that are -- They are data experts, and so there is a resource there, and they've spent a lot of time thinking about other kinds of electronic reporting, and so keeping up those conversations, and not to move in and take over, and that's not at all what I mean, but just to share knowledge and experience and expertise would be really nice, I think, moving forward with whatever additional projects you will be doing with Puerto Rico, and so I think there's a lot of opportunity there to collaborate, at least intellectually.

ALFREDO SFEIR: We would benefit greatly from that interaction. I am sorry that I have to run, and I'm about to miss my flight, and I really appreciate everybody letting me present this to you today and everybody who has actually been part of this process,

and we look forward to trying to improve and add additional features, and hopefully -- Our dream is to be able to interact with all of these technologies, so that we can actually help, just as one other player in this process of making management and fisheries better.

Thank you, and we have a lot to learn and to continue improving, and so thank you, and I hope to -- I will be available, and Graciela knows how to reach me, and I would like to reach out to you as well, all of you, but with the people that I have interacted with today, and I would love to reach out to you, and I will be available if anybody has any issues or questions. Thank you so much for the opportunity.

GRACIELA GARCIA-MOLINER: Richard, I see a question from Michelle in the chat, and so I will make sure that Alfredo sees it, because I don't see anyone from the DNER on the participant list.

TODD GEDAMKE: I think that -- Richard, may I?

RICHARD APPELDOORN: Please.

TODD GEDAMKE: I think I can answer Michelle's question and address a few things and also provide a lead-in to the red hind, and so, if you're ready to kind of -- Because I have an image of the red hind landings that I think will address both the correction factor question that Kevin raised, if I may put that up, but I think it will probably tail into our red hind discussion, and so, before I do that, I will let you decide how you would like to proceed.

RICHARD APPELDOORN: Well, I was going to go back to the issue of the data-poor tech memo, and so you're talking about something that is sort of bridging the electronic reporting and the red hind issue?

TODD GEDAMKE: Yes, and, I mean, basically, I just have a plot that is -- I mean, Kevin talked about the reporting and the lag.

RICHARD APPELDOORN: Go ahead and do it.

TODD GEDAMKE: Okay, and so I'm going to share my screen. Could someone allow me to do that? There we go. This is the red hind, but the key here is that we have, in the gray here, this is what is reported by the paper, and in the darker is what we estimated by having the port sampling.

Kevin was talking about a lag period for the correction factors, and I just wanted to show that, given all these advances, with the ability to actually have electronically-reported data and port sampling for certain species, at least a subset, there is the potential, in a very short period of time, to be able to get kind of not real-time correction factors, but the ability to hone-in on the correction factors earlier, in this case, and so you could actually subset out a certain number of participants that you know are part of the electronic reporting, and have the port samplers, and you would get this correction factor, which is the difference between the reported line and the estimated line here.

In this case, for red hind, you can see it's basically a one-to-one, and so that they're reporting seems to be pretty consistent with what we sampled, and so that's just a correction factor component.

Michelle, you asked about species ID on the reporting, and I think that -- I don't mean to speak for DRNA, but I think, in general, in fisheries as a whole, self-reported data -- The onus is on us to make sure that the species is reported correctly, and I think that the educating of the fishermen is one thing, but, in Puerto Rico in particular, and, in this case, I will just scroll up and show you all groupers.

The point here is that fishermen are basically reporting all their groupers as red hind, or the reverse, and so you have the category being dominated by red hind, rather than all the groupers, and the point here is just that there is going to have to be validation of both the species composition, from the scientific end to the self-reporting end, in addition to the correction factor, which gets us right at the ACL.

I think we're going to have to step into -- Those pieces are becoming more and more feasible to start doing closer to real-time, and I think Kevin said a six-month lag, or something like that, and I think we can be at that in the near future, in the next year or two, easy. I thought this would be a nice thing in the red hind discussion, and I could put this back up, if you want to jump over to the other stuff, or whatever you want to do.

RICHARD APPELDOORN: Todd, you already mentioned the efforts of trying to develop a fish-based Merlin system that would alleviate much of the identification process.

TODD GEDAMKE: Yes, and we have that set up, and we are teed-up,

and we are just waiting right now. The funds were basically -- There was an award, but, anyway, we're just waiting on that, and they are teed-up, and I'm meeting with them on Friday, and, basically, what we've seen in our port sampling -- The team in Puerto Rico did a phenomenal job. The really did a phenomenal -- Michelle, you would have been proud of this crowd, actually going through picture after picture after picture, and I think we have 67,000 pictures from a year and change from sampling, and that was used to validate all of my species ID in there.

The AI, which is being done both for birds, and they're doing it on the sounds also of birds, so that can actually identify the bird by the call, and so the algorithms they were talking about for red hind, and that same team of people is queued-up, and they are pumped to work in Puerto Rico, and so they're ready to roll, and you're right that that is going to take a lot of that issue out.

I mean, we've talked cardinal and wenchman forever and ever and ever, and I've got a guy here that is working for me, and he swears that he can tell them by visual, and I know that Michelle has sworn that for a while, but I can't tell the difference still, but the AI seems to be able to pick up differences, and so we're right on the verge of having tools that are really going to advance the amount of information, and the ability to use index sites and index people -- Like Alfredo was saying, you don't need to know the whole thing, but, if you know where to go take a look, you can do that.

If I may, I can even show -- Let's do this. We've got the ability, on the backend, just like -- None of this is confidential, because we've got the pounds landed, but we've got the ability now of even doing index sites like for deepwater snapper. For queen, we've got the ability of looking back and going, if we really want to know where queen is coming up, this is what is reported, and being able to look at the different places that are in there, and by species.

UNIDENTIFIED: Todd, it wasn't showing us whatever that thing was. I think you have to un-share this specific document and then re-share.

TODD GEDAMKE: I don't want to take over the stage here, but, if you would like me to, I am happy to, and so let's pause and re-share. There we go. Now can you see it, a map of Puerto Rico?

UNIDENTIFIED: Yes. It looks beautiful.

TODD GEDAMKE: Okay, and so thank you very much. I don't have red hind queued-up, because my task, right now, is to follow-up on deepwater snapper, but this is basically the same type of dashboard that Alfredo was showing, so that, as soon as the information is available, via either the tablet apps or via the ShellCatch type of app, we can look at by species.

For example, we can take a look at queen snapper and know that we've got most of it coming out of Nelson's home, and the people around Nelson, and you can also go and say, well, you know what, we have yellowtail snapper, which we still can't get a handle on, because they land them in the middle of the night, and so we can actually go back and look spatially at that same type of information, and this is the same type of progress that Alfredo was showing.

My role has been to do the port sampling end of things, and his role has been to do the reporting end of things, and, by meshing these two together, there is a lot of powerful information that can come out of it, for the correction factor in addition to the other components. Let me put this -- I will put the red hind back up, if you want, for now, or we can talk about it later. Richard, did you want me to put that red hind back up?

RICHARD APPELDOORN: No, not at the moment.

TODD GEDAMKE: You got it.

RICHARD APPELDOORN: Graciela, you said you didn't get my email with the text, and did Liajay get it?

GRACIELA GARCIA-MOLINER: Liajay, did you get it?

LIAJAY RIVERA: A message? No.

GRACIELA GARCIA-MOLINER: An email.

RICHARD APPELDOORN: An email with the text for the tech memo.

LIAJAY RIVERA: I have the potential motion for red hind closed season Word document.

GRACIELA GARCIA-MOLINER: We didn't get anything from Richard.

LIAJAY RIVERA: No.

RICHARD APPELDOORN: Okay. That's weird. Let me see if I can

get it to you here again. Okay. Apparently I forgot to hit "send".

GRACIELA GARCIA-MOLINER: Got it.

LIAJAY RIVERA: Okay. I have it now. I will share it in a moment.

SSC RECOMMENDATIONS TO CFMC

RICHARD APPELDOORN: All right, and so what I did was quickly put together something based on my notes and my thoughts and those from others who were expressing those, and I am not sure how useful any of this is. For adopting this as a motion, someone else has to present it as such.

The first part basically is enthusiasm over the idea and recognizing that there is some more work to be done and benefits and how it fits in with the larger context of what has been going on. All I can say is you read through it and decide if you like it or not.

JASON COPE: Rich, quick question, and I assume I'm kind of out of the circle on this one, because of my involvement?

RICHARD APPELDOORN: You can certainly help us formulate the statement that reflects what we were talking about.

JASON COPE: Okay.

RICHARD APPELDOORN: That would include -- I mean, you made some comments about -- You're obviously in support of this, because you helped develop it, but, if there something that would be beneficial to include, or not include, from the perspective of the Caribbean, I would like to hear it. Graciela, you sent by -- I don't know if it was chat or text or whatever, but a number of species that might benefit from this.

GRACIELA GARCIA-MOLINER: Maria had summarized for us the following, and so, in the EEZ, the species that made it into the island-based FMPs for each, Puerto Rico, St. Croix, and St. Thomas, is sixty-three, and I am just speaking about fish, finfish, and, of course, it includes lobster and queen conch, and so that makes sixty-five. There are forty-three for St. Croix and forty-seven for St. Thomas.

RICHARD APPELDOORN: These are the number of species in the plans?

GRACIELA GARCIA-MOLINER: Yes. You went through the process of selecting those that were already managed, species that occur more in the EEZ than in the state waters, economically important, ecologically important, et cetera, and the list was reduced to this many for the island-based FMPs.

RICHARD APPELDOORN: The first time was, wow, I didn't realize that we got it down so much, and there are people advocating that it should go even more, and so, if we want to actually put numbers of species in the statement, those are the numbers that are available, as Graciela just read them out.

TODD GEDAMKE: Richard, I thought -- The first thing I noticed was that too, and so is there -- Graciela, let me ask you this question in another way. Are there species that wouldn't benefit from this?

GRACIELA GARCIA-MOLINER: That won't benefit?

TODD GEDAMKE: That would not benefit from having flexibility?

GRACIELA GARCIA-MOLINER: No, and, actually, I had sent Richard a comment about everything maybe except lobster, but lobster would still benefit, because it's only a two or three of the new ABC Control Rule, and so all of them would benefit.

TODD GEDAMKE: Absolutely, and so get rid of -- Here's a couple of just editing things. "A large majority", line two, to "all", or "100 percent". I mean, given the large majority that would be eligible, I mean, all stocks in the U.S. Caribbean would benefit from this flexibility, because the ones that we're looking are, by default, only the ones that we have some information from, and the reality of it is that Graciela was listing sixty-three species, and we just talked about species ID issues, and there are eighty-seven species reported, I believe, in Puerto Rico, and we documented 286, or 287, species in the Atlantic.

The numbers are going to be increasing, and I think we should stress the point that this is a place where everything would benefit would this, and so that would be just one editing thing. Then the next one that I would have is the multi-indicator approach.

RICHARD APPELDOORN: Todd, could you just hang on? Could you let Liajay make that first one?

LIAJAY RIVERA: Could you repeat what would be the addition?

TODD GEDAMKE: Sure. Given that a large majority of stocks within the U.S. Caribbean -- "stocks within the U.S. Caribbean" -- I haven't figured out the exact language. Given the large majority of --

RICHARD APPELDOORN: How about just "given that all stocks" --

TODD GEDAMKE: Yes. There you go.

LIAJAY RIVERA: Done.

TODD GEDAMKE: Done. Go to -- Jason, weigh-in here, even though you might be compromised. "Multi-indicator approach", on line five, the "utilize multi-indicator approach", I think that it would be better not to box in there and just "alternative approaches", or something, because like the length example that Jason presented would not be a multi-indicator, and it would be a single indicator, and I don't know if we just want to generalize that or leave it as specific as "multi-indicator".

KEVIN MCCARTHY: I think general is better.

TODD GEDAMKE: Yes.

JASON COPE: Yes, general is better, and, if need be, you could put, in parentheses, "for example".

TODD GEDAMKE: Exactly.

JASON COPE: Then whatever you want to highlight, but, yes, the main thing should be general.

LIAJAY RIVERA: So this will be "general indicator"?

TODD GEDAMKE: Use "alternate", and then, in parentheses, "e.g." and then whatever was there before, the "multi-indicator approaches". Kevin and Jason, the "reference point", is that an issue, using the language "reference point" in this realm, on line two, four, six -- Two lines below where we're going. "Improve the number of species to be monitored against reference points", and I'm sorry, and I'm back in my NOAA hat of language, and is "reference points" going to box us into something, or is that the appropriate language to use?

RICHARD APPELDOORN: We're still stuck on the one above. "Multi-indicator" should be in parentheses, and then

"approaches", like that?

TODD GEDAMKE: Or "approaches" before the parentheses. You would have "alternative approaches (e.g., multi-indicator).

RICHARD APPELDOORN: Okay. So now we're down to reference points.

TODD GEDAMKE: I just wanted to make sure that, from the folks that are up on the language here, that "reference points" doesn't get us into biological reference points and it's generic enough, because we might be talking about a reference value, a reference -- I forget what we had as language in the control rule, but is "reference points" appropriate, and that's just my question, and I don't have any solution or comment.

JASON COPE: I mean, unless there was another term being used -- I mean, "reference point" can be pretty generic, and it's -- I mean, in fact, it's alternative reference points, because the typical is an OFL, which is what we're kind of converting away from, but, if there's a reference -- If "point" for some reason, connotes something very specific here, we could generalize it, but I can't say that -- In the tech memo itself, it does talk about reference points being the articulation of management objectives, and so it's more general.

RICHARD APPELDOORN: Would you like to add "alternative" in front or just leave it like it is?

TODD GEDAMKE: Given Jason's comments, I have no preference.

JASON COPE: I think it works either way, and I don't think it has to have it, because reference points are reference points, and they don't have to be -- They are whatever you make of them.

RICHARD APPELDOORN: Okay, and let's eliminate "alternative".

WALTER KEITHLY: Mr. Chairman, could I interject something here?

RICHARD APPELDOORN: Yes.

WALTER KEITHLY: We seem to be -- What is this, and I guess it's going to be a motion, but are we suggesting that we actually start using this new procedure or just to test it? I, myself, have some -- I know that I have listened to Todd and everybody else this morning, but I myself have some concerns regarding it, and I don't mind testing it somehow, but it just seems to me that there are a number of issues, like we talked about the

length-based issues, and what happens if the length -- Let's put it this way. If the length at catch is changing, simply because restaurants have a preference for a given size.

It's nothing to do with the biological status of the stock, but other economic factors, or social factors, may be influencing some of these indicators you're discussing, and, when it comes to multi-indicators, if they are in opposition to -- First of all, who would pick the multi-indicators, and what if they contradict each other in what you might expect?

I don't mind testing something like this, but we're going at it now like this is the greatest gift in the last century, and I am just concerned how quickly we seem to have rushed into it and accepting it without giving it a bit more thought. Thank you.

RICHARD APPELDOORN: Well, I don't think it's the greatest gift in the last century, but, in some timeframe, it might be, and I tried to address that in the last statement, which is not on the screen, and specifically just kind of parroting Doug's comments about there will be difficulties in making this operational, and that we recognize that. If we want to elaborate on that, we could.

JASON COPE: I mean, maybe another way to look at this, because Walter is bringing up a good point that this shouldn't be read in the sense that, oh, everything is all figured out, and you just have to X, Y, Z, and everything is going to be fine. As we've discussed, there's a lot of things that need to be thought through.

I mean, to Walter's example, right, you would have to update the selectivity assumption, and then that would -- That would reset what that metric means and what reference point you would have to set for the metric, and so that particular example is totally doable, and you can deal with that, but the general idea of thinking through and picking out the right metric and reference points, based on the data you have, these are things that we need to do, and I do think having that caution in here and saying this is where we want to get to, and this is realizing something that has been talked about for a long time, that does not take away the need for having a very thoughtful application of these methods, because there can be contradictions in multiple data sources, et cetera, but the general idea that we are now free to have those conversations and have those, have the capacity to pick out the right metrics, is a real advantage here.

WALTER KEITHLY: Again, I would like -- I think I would prefer that we simply say we have reviewed the report, and it has potential, and we would like to test it on a couple of species or whatever at this stage, to see how wide the application of this technique can be, and all I've been hearing from this discussion lately is, oh, it's all species, and everything else, and it just seems that we're really jumping the gun on this without giving it a bit more thought. Thank you.

VANCE VICENTE: I agree, Walter, and, reading the first sentence, for example, "The SSC strongly endorses the approach", and that's not the feeling that I get from the discussions back and forth among the participants, and I would say the SSC recommends to evaluate, or weight, this approach, but "strongly endorses", that, to me, is off the road immediately, and I agree with Walter that this has to be softened, because I don't see anything so affirmative coming out, from all the discussions that I have heard.

KEVIN MCCARTHY: I think that what I am -- What I thought we were seeing in this tech memo is that it provides some flexibility, and it doesn't box us into doing anything, right, and it's just allowing for some alternatives, should they be both appropriate, and even doable, because let's not forget there are going to be species, and maybe many of them, that are not necessarily going to have enough length data, for example, or life history data, for example, and so there's still going to be, I suspect, a number of species, and maybe a great many species, that don't even qualify for these data-limited approaches that may become part of our toolbox.

I think what I'm hearing from this tech memo is you're going to have a bigger toolbox, and it might work and it might not work, and you don't have to be boxed in by it, but you now have a way of getting some information that might inform management that is not -- That is broader and less data demanding than we've had in the past, because recall that we've seen a number -- The SSC has seen a number of assessment approaches that use data-limited techniques, and, essentially, it was, well, that's great, and we think you did a great job.

However, under our current management system, we can't really use those results, and this now is going to allow us to say, okay, we've got this data-limited approach, which we approve of, and we think it was well done, and we think it provides some information for management, and we are now in a place where we can use that and management can act on that advice in a way that it couldn't in the past, and that's how I'm hearing this.

DOUG GREGORY: Can we say something like "The SSC strongly encourages National Marine Fisheries Service to implement the approaches presented in the draft technical memo. We are especially interested in working with the (h)(2) flexibilities for our data-limited stocks." It says the same thing, but maybe not as over the top.

RICHARD APPELDOORN: Is that something you hopefully read?

DOUG GREGORY: Because NMFS has done this, and it's kind of finished, and so we just want them to implement it, and that might be the word, that "The SSC strongly encourages NMFS to implement the approaches presented in the draft technical memo, whatever it is, and we're particularly interested in working with the (h)(2) flexibilities for the Caribbean data-limited stocks."

The rest of that paragraph is fine, and I see people reacting to endorsing it and committing, and they're seeing it as a commitment, and it's not a commitment, as Kevin said.

TODD GEDAMKE: Richard, I think I can solve this with -- Doug, perfect point. "Flexibilities for data-limited stocks", and put that in place of the "approach". "The SSC strongly endorses the flexibilities for data-limited stocks presented in the draft tech memo on (h)(2)." Get rid of "approach" and put it right there.

RICHARD APPELDOORN: "The flexibilities".

TODD GEDAMKE: Then we're going to have to just wordsmith the next sentence. "Given that all stocks within --" Get rid of the word "approach", because that's what people are hanging up on. "Given that all stocks within the U.S. Caribbean would benefit" and --

LIAJAY RIVERA: Can you repeat that again? I'm sorry.

TODD GEDAMKE: "Given that all stocks within the U.S. Caribbean would benefit", and then delete everything up until -- Yes. Doug, I think is that what you were getting at?

DOUG GREGORY: Yes.

TODD GEDAMKE: From. Put a "from" right after --

WALTER KEITHLY: This still doesn't make sense. Endorses

flexibility for data-limited -- What are they, practicing yoga? I don't quite understand what is meant. Is it the procedure?

TODD GEDAMKE: "The flexibility".

DOUG GREGORY: Walter, you're confusing your personal life with this.

LIAJAY RIVERA: So endorses --

TODD GEDAMKE: The.

WALTER KEITHLY: The new procedure, or the flexibility of the new process, or the proposed process, in analyzing data-limited stocks, analyzing the status of data-limited stocks.

LIAJAY RIVERA: "The flexibility of new process", and is that what I heard, is "new process"?

WALTER KEITHLY: That's fine. "For assessing the status of data-limited stocks". I am against the word "strongly", and that's a subjective term, and I know that Doug used it, but I don't like it.

JASON COPE: This tech memo is specifically talking about overfishing, and so we probably want to make sure that it's not confused with relative stock status on any sort of biomass level or something like that.

WALTER KEITHLY: Good point.

JASON COPE: Yes, and so this is definitely only on overfishing, and I think we are getting to a good spot, and I want to assuage any concerns, and remember that flow chart, and probably not, because it was a while back, but there was a flow chart that I showed that walks through this process, and it actually -- It covers all of the things we're talking about, because what it says is, well, can you do normal ACLs, and, if no, okay, let's consider alternative ACLs, and can you do them this way, yes or no, and, if the answer is no, then it invokes data collection, and it invokes alternative options of thinking through things, and so it has, in the outline, built in, no commitment to doing any one way, or any one approach, and it just this openness to kind of find what's going to best work for the particular stock in question, and, if nothing works, then you're back to thinking hard about your data collection and monitoring and improving that, and so it has that built in, and so hopefully that makes not feel like you're getting pinned into any one method.

VANCE VICENTE: Going back to the first sentence, if I may, I think it should read, and I don't know, but "The SSC endorses the flexibility for the analysis of data-limited stocks, for the existing data of --" That's what I understood from the presentation, that we have this very limited data, and we are trying to use a different analysis, using a multi-variable analysis, which is -- At least that's the message that I got, and I don't know what you think.

JORGE GARCIA-SAIS: Richard, let me comment on something which is my impression here, and I see that this comes like -- If it would be a new, novel approach, and, in my opinion, from what I have seen, it's that these multi-indicator approaches have been used as part of the SEDAR assessments for a long time now, and so I don't know what is the excitement about going to these new venture, where I believe that most of these approaches have been part of the SEDAR processes for many times now, and the outcomes of those SEDAR processes have had a lot to do with the criteria for annual catch limits and all that final management criteria.

What I am surprised is that, within this framework, we have not heard anything about ecosystem-based management and how this new approach will merge with the ecosystem-based management that we've been talking about for the last three years. Thank you.

RICHARD APPELDOORN: All right, and so those are some good points. First, I would say that, yes, SEDAR has looked at particularly length-based information, because they have never been able to link that to ACLs or anything like that, and this is a process where we can do that, and so here's my recommendation, and your second point was very well taken, and we need to include that.

I would say "The SSC endorses the (h)(2) flexibilities", since that's what is in the title, and then I would get rid of "the new process", and then it would be "for assessing the overfishing status presented in the draft tech memo." I would just end it there, since we don't have to reiterate the (h)(2). Is that satisfactory to everybody?

LIAJAY RIVERA: You also have a comment from Jason in the chat.

JASON COPE: I had sent that before Rich made these comments, and so it's kind of doing the same sort of thing.

JOCELYN D'AMBROSIO: I actually had a question, based on something that Jason said earlier in the day, and I was

wondering if this memo is related to assessing stock status directly, or is to establishing the reference points that then would allow you to assess stock status, because I thought I heard, Jason, you say that there was a memo on stock status determinations more specifically, and this is sort of about the reference points that would go into those determinations.

JASON COPE: Yes, and so we've got the two sides, and we have like the overfishing side, and so what's the rate at which things are being removed, and is that too much, and then there's the MSST side of things, the actual overall status of the stock, and that second thing is being taken care of in a different tech memo, and this one, in particular, is how to define alternative metrics and reference points of fishing mortality that aren't our traditional OFL and ACLs based on weight and numbers, and so this is taking the OFL continuum down to ACL and saying we can't do them with numbers and biomass, and we're coming up with an alternative way to express fishing mortality through these other alternative data-limited methods that help us do that.

JOCELYN D'AMBROSIO: All right, and I think it might be better to say "flexibilities for determining reference points for assessing overfishing status", something like that that gets at these are just the reference points that then -- That's step one, and then step two is using those reference points to make those determinations, just so it's clear that we're sort of talking about flexibilities in establishing those management parameters and not necessarily -- Then how to use them is a different memo that is underway.

JASON COPE: Well, it's -- So let me clarify that. This one is, again, on the fishing mortality side, and it's basically how do we measure fishing mortality in these data-limited stocks, and, ideally, and what we've been told we needed to do, is come up with catch limits, and catch limits just reflect fishing mortality, but what we're saying is there a lot of stocks where we can't do that, and so we need an alternative metric, which really isn't an alternative metric, and it's still fishing mortality, but we have different approaches that aren't measuring the number or weight of animals coming out of the population, but instead are estimating directly, more directly, or I guess directly, the fishing mortality that's going on, and that's going to help us understand whether overfishing is occurring or not, and so it becomes a new metric of OFL and ACL, outside of numbers and weights.

Now, the other side, the other tech memo, is saying how do we determine the minimum stock size threshold and the current stock

size relative to that threshold, in order to determine whether something is overfished or not, and that is the other tech memo, and so that's another thing totally different than this, though the methods are related. You can use the same methods to do both, et cetera, and they are trying to accomplish two different things, and hopefully I'm making more sense than mud out of that.

VANCE VICENTE: Can I make a comment? If you go back to the first sentence, I think the way it should read is -- So far, the first line is good, "for assessing the overfishing status of data-limited stocks presented in the draft technical memo, given that all stocks within the U.S. Caribbean would benefit." Then erase the flexibility and the desire of the SSC and hugs and kisses and all that, and I just -- That is my comment.

WALTER KEITHLY: I would agree with Vance's statement.

RICHARD APPELDOORN: I am willing to live with that, but I think some of us are a lot more excited about this than maybe others, and, as Todd said, this is something that we've been advocating for a long time, and to express that, that we finally have something coming down the pike, I thought was a reasonable statement to express, but I am willing to go without it.

LIAJAY RIVERA: Okay, and so delete this part of the sentence?

RICHARD APPELDOORN: Yes.

JASON COPE: I mean, is the sentiment just too much for some? I am just curious, because it does seem contextually important to recognize that these methods have been shown before, but have not been able to kind of be taken in by the system, because of limitations, and that this has been talked about for years and years and years, and it's something that people have been working towards.

That seems very relevant and not just mushy, but it seems extremely relevant that there's a history here of presenting and developing these types of methods to get around that have been faced, and now the sort of -- I don't know if it's the legal side, or the guidance side or whatever, but it's now more openly embracing those things, and that's a real breakthrough.

RICHARD APPELDOORN: Do you have a non-mushy suggestion on how to word that?

JASON COPE: Who are you asking, Rich?

RICHARD APPELDOORN: You, because you actually expressed some things nicely there, and it's a question of whether you can recall it.

JASON COPE: I mean --

VANCE VICENTE: Just say it more bluntly and leave the emotions on the side.

JASON COPE: You could say it more factually. Just, for many years, and I'm not sure what the correct word -- I mean, it's basically -- I mean, it's the researchers in this area, right, and it's council members, and it's lots of people, and so I'm not sure how you want to identify that group, but, for many years, folks involved in the council process have been researching and developing and investigating these types of methods, because they seem more appropriate than what we had before, but we haven't been able to access them.

I mean, again, this is a breakthrough opportunity to actually implement a lot of these ideas that folks in the Caribbean Council have been talking about for many, many years and have already identified as possible solutions to some big, big challenges.

RICHARD APPELDOORN: But, Jason, you've got to go back to where Liajay was typing, and she got lost, and all those thoughts were lost.

LIAJAY RIVERA: You sped up suddenly, and I stopped. So sorry.

JASON COPE: Sorry. Okay. Maybe what can be said here is it has been long recognized that U.S. Caribbean fisheries faced a challenge meeting number and weight-based OFL measures. For years, researchers within the U.S. Caribbean have contributed to --

LIAJAY RIVERA: Slow. Researchers for --

JASON COPE: For years, researchers within the U.S. Caribbean have contributed, or developed, new methods and ideas that have confronted this challenge, but have not been accessible to managers, or to the council, or whatever group we would want to say there.

This is the point where we want to connect it to what we already have, right, and that's the historical, factual, hopefully

non-mushy part. Again, I don't know, and maybe this is too mushy, but this guidance provides a breakthrough to now access those tools that have been developed over many years to address these challenges.

RICHARD APPELDOORN: Just after "tools", and you don't need "developed", because that was in the previous sentence.

JASON COPE: Yes.

RICHARD APPELDOORN: To access those tools --

JASON COPE: And apply them to prevent overfishing. Something like that.

RICHARD APPELDOORN: I think the first "many years folks involved" now gets deleted, because that's in the -- After "OFL measures", there is a period, and you can start a new sentence. After "accessible" is a period.

JASON COPE: It should say, "challenge, but have not been accessible", and I think that's maybe one point here where folks can help, and I don't know if it's true that they're just not acceptable, or accessible, but, to put it just factually, the council has not felt that they could adopt those approaches, even though this (h)(2) has kind of been sitting in this NS 1 for this whole time, right, and it's been sitting there, but it hasn't really ever been activated or really brought to the forefront.

I am not suggesting that we need to put all this verbiage in, but I am just talking through this, and so maybe folks can help fix that part, and it's not that there --

VANCE VICENTE: If we were to include such a sentence, and the sentence is more about historical background, it should come first, and it should be the first sentence, which justifies why the SSC endorses the (h)(2), and then we go into the SSC endorses. Like, therefore, the SSC endorses the rest, and the other thing is it has been long recognized -- I would say the council and this committee have long recognized, and it has been -- We are talking about the council and the committees and the advisors and NMFS experts and so on, and so has recognized that U.S. Caribbean fisheries, blah, blah, blah.

JASON COPE: So delete "long" is that what you're saying?

RICHARD APPELDOORN: No.

VANCE VICENTE: No, and I'm saying who is "it", and is it the council? Like the main subject of what we're talking about, and we know who we're talking about, and we're talking about the council and the advisory committees and the SSC and fishermen and whatnot.

RICHARD APPELDOORN: Well, we're speaking for the SSC.

DOUG GREGORY: I want to reiterate kind of what Walter -- This is not something that we have to lobby for. This is going to be implemented, and I don't see any council or SSC opposing this. Plus, the whole measure of using rates instead of weights and pounds, falls right into the recreational lobby industry's request to try to get some flexibility, and so this provides flexibility to us, to the national recreational industry, and this is going to be implemented, and so we don't have to bend over backwards pushing it. Thank you.

VANCE VICENTE: I agree, Doug, and that's why I said, if we were to include such a sentence justifying a background historical statement, then I would reword it that it as it was originally proposed, and that's my point.

KEVIN MCCARTHY: Given what Doug has said, is there any reason to go into -- To go beyond a single statement of endorsement? We don't -- Without all the background stuff, without any of that, and, I mean, we think we sum it up right there, with the last phrase of the first sentence, "given that all stock within the U.S. Caribbean would benefit." Done. Get rid of everything else, and it's one line that we endorse it.

WALTER KEITHLY: That's what I would go with. I would have a tough time, or a difficult time, supporting anything beyond that, in fact.

RICHARD APPELDOORN: It's 4:00. If this will move us along, go ahead and delete all of that, except the last sentence. Delete the whole thing down to "nevertheless". Then, following comments by Walter and some, we could expand this to that "We anticipate there will be operational difficulties to overcome in their application and expect a period of testing before they become operational, or before they can be implemented on a routine basis."

LIAJAY RIVERA: I am lost. Which line are you talking about?

RICHARD APPELDOORN: At the end of "application". Then "We

expect a period of testing before such methods can be routinely applied." Does that serve, Walter, your concerns and others?

WALTER KEITHLY: Yes, Mr. Chairman. I am happy with that paragraph now.

RICHARD APPELDOORN: Okay. Second paragraph. I am not sure that I expressed well this idea of the staff, and we could just leave it to limitations within the SSC, I mean the Center, or their funding or whatever, if anybody has a better way of saying that.

JASON COPE: It gets the point across.

RICHARD APPELDOORN: Yes, and the meaning is, if they really want to implement this, they better get the staff and funding levels up, or it's going to be a long process.

JASON COPE: Yes.

KEVIN MCCARTHY: I fully endorse what you're saying. I just need to get you on the phone with Clay.

RICHARD APPELDOORN: We just say this to Miguel, and Miguel has to do that.

KEVIN MCCARTHY: Right.

GRACIELA GARCIA-MOLINER: You have Jocelyn's hand raised.

RICHARD APPELDOORN: Go ahead, Jocelyn, and where do you click to raise your hand?

JOCELYN D'AMBROSIO: I'm sorry, and that was from earlier, and so, under the reactions icon, there is an option to raise your hand, but, yes, that was from earlier.

RICHARD APPELDOORN: Where is it? Under options for what?

JOCELYN D'AMBROSIO: Reactions, and so the chat, and then mine is to the right of chat, and it says, "reactions". Then, when you click that, there is a number of reactions that one could have, including raising the hand.

RICHARD APPELDOORN: Okay. I don't have that, but I'm not in full screen, and so maybe that's the difference. Thank you. The sentence on additional benefit, is that okay, and do people want to cut or expand it?

JASON COPE: Good point. I am still -- I still have a worry with that last sentence in the first paragraph, where it says, "operational difficulties and a period of testing", and all of that is true, absolutely. What I think is lacking here though is the fact that what is the -- What is the alternative?

I think there's like a rightful burden of proof on how to apply these methods, and that should never be glossed over, but it also should be recognized that, for a long time, you really couldn't do much of anything, and so I feel like there needs to be a balance of the fact, of an urgency, like we need to really consider these methods, and you need to test them, and you need to come up with the right reference points, and you've got to do it right, but, also, there are going to be some difficulties, and there is going to be the need of testing, and that isn't a good reason to not do them and just not do anything.

I think the urgency here is we want a flexibility and an openness to try new things and do that properly, but not at the expense of just saying, well, we're just not going to do anything, because it might be too hard, or take too much work or something, because there is no good alternative.

TODD GEDAMKE: Jason, I fully agree, and, after not being in this conversation for three-plus years, the same voices that are opposing are similar to the ones that said we don't trust the landings, and this allows us to get away from that, and I think we need to really stress the fact that this is huge, and this is exactly where we need to be, and the hesitation here -- There is no hesitation, and there should be no hesitation, because this has nothing to do with decisions that are going to be absolutely made, but it just allows us more tools.

Those that did not trust the landings, that said I don't trust the landings, and average them all over twenty-seven years, do all these things with the landings, the point here is that now the laws surrounding our ability to make decisions removes that from the process, and that's what we're gaining here. The fact that we were handcuffed to using landings, that the same voices that are opposing this language were opposing the use of the landings, is the same exact thing.

We're at a point now where there is going to be difficulties with application, and of course, but this is not about that. This is us saying we want the extra tools to be able to do a better job at our job, and that's it.

RICHARD APPELDOORN: We could either delete the sentence or we could have this pointing to the fact that the SSC needs to -- The Science Center needs the resources to be able to move ahead.

JASON COPE: What I'm hearing is that there is a -- When employing these things, we need to be thoughtful, and they need to be tested, and it needs to be done properly, and that is an important point, and I think that's very appropriate for the SSC to be raising that issue. I just didn't want the other side of the teeter-totter to be empty, and the fact is exactly what Todd said, that we now have the opportunity to even do these things, to explore those issues, to confront the difficulties in implementing there, whereas, before, we really just didn't, and so that just needs to be part of this discussion, and that's part of --

Like you said, you can move this to -- It's going to be on someone's shoulders to do that testing and so forth, right, and so maybe that comment goes more with the resources needed for the Science Center and whomever is going to do it, to do that, but, somewhere, and I think that's what we lost in chopping out that whole first part of that paragraph, was this sort of building wave of we know we need to do these things, but we've been handcuffed, and now we're not. Now we can at least consider these things.

RICHARD APPELDOORN: My purpose, in this last sentence, was to make the council aware that, while this is a really great thing, it's not going to change things overnight, is kind of what I was trying to do with that sentence.

JASON COPE: That's good. We need that sort of element in here, and I wonder if you could just -- That very first sentence, "Given that all stocks within the U.S. Caribbean would benefit" and just tagging on to that, "something that has long been recognized", or something like that, and it doesn't have to be three sentences, but just some element of the fact that the recognition that these methods can be very useful has been there, and it didn't come --

RICHARD APPELDOORN: After "benefit", we could have "a point that has long been recognized".

JASON COPE: Yes, something that simple, because then at least that says, oh -- That's kind of like, oh, great, we can consider these things now, and then there's the, well, this isn't a panacea, and this isn't obvious how we do it, in every case, and there's going to be some difficulties with that promise of

enhance flexibility, and I think that presents it a little bit more balanced, without too much fanfare.

RICHARD APPELDOORN: Okay.

JASON COPE: A consideration for that last paragraph might be the point that, while it would be nice to eventually get to number and weight-based OFLs, you would ideally like to get there, and you want to work towards that, and it's going to take some time, and so it's important that we have these -- That we support these data collection systems and these monitoring programs and the capacity to do these sorts of things and build towards the normal approach of OFLs.

This is one of the real sticky legal points that we've been running into, was that, oh, this is just an out, and now you can just do things in these simple methods and not have to worry about that, or, even if you could set weight-based OFLs, or number-based OFLs, now you can just bypass that, in lieu of rates, because you don't like catch limits, and that's also something that this is not supposed to be encouraging.

This is supposed to be we can't set those weight and number-based ones, but we need to do something, and we have the ideas, and here's what we could do, but we're working, hopefully, towards building towards normal OFLs.

For consideration for folks, you could add a sentence, at the end there, that says -- Let me read this. Basically, while weight and number-based OFLs are the ideal, improvements in data collection and application of data-limited methods -- Weight and number-based OFLs are the ideal, improvements in data collection and application of data-limited methods create the bridge, ultimately, to monitoring catches, or something like that, and that's not really well worded, but it's something to start with, and I think that's it. It just acknowledges that the intent is to really get into fully fulfilled MSA and not have to go the (h)(2) route, but you've got to do something, in the meantime, and we totally can.

I don't really like how I suggested ending that sentence, and so that needs some heavy work, but I think the gist of it is there, and that would be it.

Maybe, instead of "data-limited methods", maybe, more explicitly, "improvements in data collection and application of (h)(2) flexibilities" -- I really don't like the way I'm ending this sentence, and so it's bothering me. "Improvements in data

collection and application of (h)(2) flexibilities" --

RICHARD APPELDOORN: "Create the bridge, ultimately, to achieve that goal."

JASON COPE: Yes, and that's way better said than what I was hacking around.

RICHARD APPELDOORN: So you're deleting, at the end, "monitoring catches" and replacing it with "achieve that goal".

JASON COPE: Is that a fair statement? Does that seem like a decent way to kind of wrap this up?

RICHARD APPELDOORN: Well, I like it. If we're all happy, somebody has to move that we accept this. It should probably not be Jason.

JASON COPE: Yes, and I won't do it.

RICHARD APPELDOORN: Michelle is saying, at the very beginning of line four at the top, it's "enhanced".

LIAJAY RIVERA: Thank you, Michelle.

RICHARD APPELDOORN: Then somebody has to make a motion or something, and I can't do that.

JORGE GARCIA-SAIS: **Richard, move to accept the motion.**

RICHARD APPELDOORN: Is there a second?

VANCE VICENTE: Second.

RICHARD APPELDOORN: **Any opposition?**

WALTER KEITHLY: I will abstain.

RICHARD APPELDOORN: **Anybody against? Hearing none, the motion passes.** Then, very quickly, let's move on to the text that Michelle drafted.

At this point, I am going to drop out of chairing this. As I said, Michelle and I will note vote on any of these things, and we can ask questions, and we can help formulate text, if it's not clear on some point, but so, Doug, if you will, could you chair this part?

GRACIELA GARCIA-MOLINER: Who did you ask, Richard?

RICHARD APPELDOORN: Doug Gregory.

DOUG GREGORY: Okay.

JORGE GARCIA-SAIS: Richard, I have a question regarding the -- Well, whoever is the chair now.

RICHARD APPELDOORN: Reni, you were wanting to make a comment before, and so go ahead.

JORGE GARCIA-SAIS: I did, yes. First, I was a little bit uncomfortable with the comparison between Abrir la Sierra and the MCD. The amount of coral habitat at the MCD is proportionally higher than in this area of Abrir la Sierra that joins with, merges with, Tourmaline, and, actually, there is very different habitats, which I believe that those two things -- Even though they are spawning aggregation sites for red hind, the habitats surrounding that area is very different. There is much more coral habitat in the MCD compared to the west coast Puerto Rico, near the shelf edge.

The other thing is that we monitored densities of red hind in 2011 and then back again in 2018 and 2019, and, for red hind in particular, we surveyed an area in the vicinity of 24,000 square meters, and we found 175 fish, for an average that ranged between habitats, three different habitats, from 0.6 to 0.8 fishes per square meter, which is below the maximum that Michelle was finding in the spawning aggregations, and that is -- That would have been expected, but the main point is that we didn't see any significant differences between 2011 and 2018 and 2019, and so, basically, in a time span of about nine years, essentially no differences in the densities of red hind were found, and the point is that the densities being low -- There hasn't been a significant increment in the densities of red hind outside of the spawning season in this area of Abrir la Sierra.

The other point that I want to bring up is that we've dove in Tourmaline for the last ten years, both for DNER shallow-reef monitoring and mesophotic monitoring programs, and we have never seen an aggregation, spawning aggregation, of red hind at Tourmaline Bank, never, and so, in fact, red hind in Tourmaline are very, very lower densities than Abrir la Sierra, and so the point, the main point, is that I think that we need to support any effort that might bring new alternatives, new possibilities, for the enhancement of the red hind populations, because, essentially, what has been done has not worked to diminish the

densities of red hind, but neither has been effective in increasing the densities of the natural populations of red hind in this area.

During our monitoring effort in 2018 and 2019, it was right after Hurricane Maria and Winter Storm Riley, which was exceptionally high wave action in this zone, and, actually, the only habitat where we saw an increment, a substantial increment, in the densities of red hind was actually at the regolith habitat, and it's a habitat in the range of 140 to 145 feet, and so, essentially, what I am trying to say is that I do endorse any kind of -- I think that the data that Michelle brought was very clear, in terms of the start of that season and then on that last March spawning activity, and I believe that we should make every effort to support that, but I would be -- I have my reservations regarding what we should say about the red hind spawning aggregations in Tourmaline, because, frankly, I have not seen -- I have not seen any kind of aggregation activities in Tourmaline in the last ten years. Thanks.

DOUG GREGORY: Thank you, Reni. That was very good, and I have a question about the last sentence under the rationale for the first item. It says the December full moon is not forming an FSA if before the 15th, but remain after the first, and I don't understand that last phrase of "but remain after March 1st". Could somebody explain that, or maybe insert a word or two or delete?

GRACIELA GARCIA-MOLINER: Michelle, are you there? You can actually discuss this. Richard, are you there? I just heard a loud noise, and so I don't know if people are still online.

RICHARD APPELDOORN: Well, it's Michelle's wording. I think it's supposed to say that -- It's really supposed to say that an FSA does not form if the December full moon -- I think it just says an FSA does not form before the 15th of December, but the aggregations can extend beyond March 1st.

LIAJAY RIVERA: You have Michelle in the chat.

DOUG GREGORY: I think I understand.

RICHARD APPELDOORN: It should be "if the full moon occurs before the 15th".

DOUG GREGORY: The December full moon is not forming an FSA if the full moon is before the 15th, and it causes them to remain.

RICHARD APPELDOORN: No, it doesn't cause. What she's saying is that -- You know, the recommendation is to shift it by fifteen days, and it's because the data show that an FSA is not forming before December 15th, regardless of when the moon occurs, but we are getting aggregations after March 1st.

MICHELLE SCHARER: We haven't seen the formation of the aggregation before December 15th, and so it's the aggregation that is not forming before the 15th of December.

DOUG GREGORY: Okay, and so we could take out the full moon part.

MICHELLE SCHARER: Right.

RICHARD APPELDOORN: Yes, and you could just say an FSA does not form before the 15th.

MICHELLE SCHARER: Correct.

RICHARD APPELDOORN: Before December 15th.

DOUG GREGORY: Put "December" before the "15th".

MICHELLE SCHARER: Yes, before December 15th.

RICHARD APPELDOORN: But FSAs remain after March 1st, or can remain. It's not every one, but it's most of them.

DOUG GREGORY: That helps me. Does anyone want to make a motion about this Item Number 1?

JORGE GARCIA-SAIS: I will move the motion, Doug.

DOUG GREGORY: Okay.

WALTER KEITHLY: I will second it, actually.

DOUG GREGORY: Is there any opposition to the motion, which I will read, and it's to recommend an amendment for the Puerto Rico IBFMP to have closed seasons for red hind FSAs December 15th to the 15th of March in the EEZ and in Abrir la Sierra and Tourmaline MPAs?

RICHARD APPELDOORN: I will just add that it should be "have the closed season", or "have a closed season", after "have". Then, after "FSAs", it will be "from 15 December in the EEZ".

DOUG GREGORY: I'm sorry. I wasn't trying to be so precise.

RICHARD APPELDOORN: Well, I have a question, because this -- The regulations now suggest there is a closure at Abrir la Sierra and Tourmaline, and also Bajo de Sico, and so Bajo de Sico is not being mentioned here.

GRACIELA GARCIA-MOLINER: Because that begins in October, and, at some point, I need to make a comment, also.

RICHARD APPELDOORN: Yes, okay, and it still ends on March 1st, but this is extending the closure to all of the EEZ.

GRACIELA GARCIA-MOLINER: Right.

TODD GEDAMKE: I would like to ask a question too on this.

RICHARD APPELDOORN: Which is not the case now.

DOUG GREGORY: My understanding is our intention is not to expand the area closed, but to expand the seasonal closure in the current closed areas.

JORGE GARCIA-SAIS: Bajo de Sico is part of the EEZ, and it's also a seasonally-closed area, and so I think what Richard's point is -- I am sort of like I would either restrict the motion to Abrir la Sierra or include the three closed areas, including Bajo de Sico, but, as far as I am concerned, the main, and perhaps only, fish aggregation site for red hind, at present, operational at present, is probably Abrir la Sierra, and I am not sure if Tourmaline or Bajo de Sico have recorded spawning aggregations, recent spawning aggregations, for red hind, but I may be wrong, and I may not be up-to-date with what is happening, in terms of the fishing aggregations in these recent years for Bajo de Sico, but, as far as I know, there has been no spawning aggregation of red hind in Tourmaline in the recent years, but you might want to just include closed areas within the EEZ, and that would make it a more simplistic, general approach. I don't know why include Tourmaline and not Bajo de Sico, frankly.

GRACIELA GARCIA-MOLINER: If I may, in terms of regulations, there is a difference between shifting the seasonal closure, which is what you're doing here, and extending the seasonal closure, which we would be doing in the Bajo de Sico area.

JOCELYN D'AMBROSIO: On the Bajo closure, it goes from October 1 to March 31, and so it would go from December 15 to March 15.

JORGE GARCIA-SAIS: Okay, and so that takes care of that.

JOCELYN D'AMBROSIO: But I would agree, and I had thought the purpose was to change just the timing, but not the area, as I believe it was Doug had said, and the areas off of Puerto Rico are both Tourmaline and Abrir la Sierra, but perhaps, if you think it's appropriate, you could recommend that something is done to look into the -- I'm sorry, but I forget which one you said that you haven't seen spawning there, but those are the current protections for red hind spawning off of Puerto Rico, and they exist, right now, from December 1 through February 28.

DOUG GREGORY: Michelle, would you be comfortable if we take out the phrase "in the EEZ", since that would be implied, and that's the only thing the Caribbean Council can manage.

MICHELLE SCHARER: Sure. No problem.

DOUG GREGORY: Take out the word "and". Is that okay with Reni and Walter? Are you all more comfortable with it now?

WALTER KEITHLY: I'm okay with it.

DOUG GREGORY: Sarah says wait. She says there's a closure in the EEZ west of 67, 10 that goes with red hind. Okay, and so, Sarah, or I guess you can't speak up, if you're chatting, and, Sarah, how would you recommend changing the motion? Would we put back in what we just took out and put "in the EEZ west of 67, 10"? Thank you, Richard. This is the last time I will so readily agree with you.

TODD GEDAMKE: Doug, can I make your life more difficult? I just would like to ask, I guess Michelle or Richard, and I have raised this back when this was first proposed, but this is a tiny spot, spawning aggregation, and it so much relates to our charge as an SSC, and are we looking at a stock population?

Can someone give me sort of an idea how important this area is to the stock, which is what our charge is? I think that we've discussed red hind, and we all love red hind, and we all love the acoustic work, and I think it's great, great work, but our charge, as the SSC, is for the stock and for looking at the whole thing, and I think the spatial -- This is federal, and the spatial component is a very -- We want to talk about that, but how does this relate to the stock?

I don't think we've had discussion really of that, and can

anyone talk, or speak, to what this means in terms of reduction of mortality, because the numbers that I see, if we extend this, for the whole island of Puerto Rico, you're looking at maybe a thousand pounds of landings, for all of Puerto Rico, in terms of the stock, and so, if this is a critical habitat for the success of the stock, and I don't think we've seen any evidence for that, then, yes, I'm onboard, but I don't understand how this small area, without -- Reni made a very good point that the MCD is just a totally different ballgame, and he's right, and this is another spot.

How do we know that this is a -- This is clearly where Michelle and you have done your work, but how does that relate to Puerto Rico as a whole?

DOUG GREGORY: Todd, hold onto that, and let me get this motion, and so I think, where it says, "in the EEZ", after "EEZ", add the words "west of 67 degrees, 10 minutes west longitude". That's according to our General Counsel. That's the area in the EEZ that is closed to red hind. Can we add that to the motion? Then we can discuss the pros and cons of the motion.

JORGE GARCIA-SAIS: Doug, let me give you my opinion regarding Todd's comment. What I believe -- Thirty or forty years ago, there is pretty good evidence that red hind was aggregating to spawn at Abrir la Sierra, at Tourmaline, and at Bajo de Sico. In the last twenty years, from what I have heard, and during the last ten years that I have been working in -- Well, a little bit more than that of working in the area, what is now believed is that red hind is aggregating to spawn only at Abrir la Sierra.

What that suggests is that the populations of red hind have reduced to such a point that the only aggregation activities have been concentrated at Abrir la Sierra, and so that means that, essentially, the Abrir la Sierra, since it is right at the center of everything, and apparently -- What I believe is that the remaining populations from Bajo de Sico, and perhaps Abrir la Sierra and Boya Quadro, which is south of Abrir la Sierra, are moving towards Abrir la Sierra as the last actively effective reproducing population of red hind.

The common sense tells me that, yes, it is a very small area, but it's attracting fishes from that corner of the west coast of Puerto Rico, and so any effort to protect that remaining reproductively-active population might be significant, in terms of the persistence of the spawning aggregation of the red hind to aggregate to spawn, and so I believe that Abrir la Sierra is perhaps the last active reproducing population on that west

coast, and so, if we lose it for reducing, ever again, the stocks of the red hind in that area, we might just lose altogether the reproduction activity of the species on the west coast.

DOUG GREGORY: Okay. Let's get back to the motion.

SARAH STEPHENSON: I think what you're trying to do is modify the seasonal closures as they are now in our regulations, and so there's kind of two. There is one that is going to modify the seasonal closure west of that 67 degrees, and then there's another one that is going to modify the seasonal closures for the red hind spawning aggregation areas, which are listed as Lang Bank in St. Croix, which you're not worrying about right now, Tourmaline Bank, and Abrir la Sierra.

If you want to modify the ones specific to Puerto Rico, I have put text down in the chat for a suggested motion, and you want to modify the seasonal closures for fishing for or possession of red hind in federal waters west of 67 degrees, 10 minutes west longitude and for the Tourmaline and Abrir la Sierra banks red hind spawning aggregation areas, and you could say what you want to close it to, which is the December 15 to March 15 each year. Can you see that in the chat, everyone?

DOUG GREGORY: Let's try to --

RICHARD APPELDOORN: Liajay, if you see that in the chat, you should just be able to copy-and-paste it.

LIAJAY RIVERA: There you go. Delete this first sentence?

DOUG GREGORY: Yes.

RICHARD APPELDOORN: You need to specify that it's for the Puerto Rico island-based management plan.

LIAJAY RIVERA: Where would that go in the sentence?

SARAH STEPHENSON: You could just say -- So delete "have a closed season", starting right there, and so leave the first "Amendment for the Puerto Rico", and it's not the island-based FMP, but it's the Puerto Rico FMP, to -- Then delete the rest and drop in "modify the seasonal closures", blah, blah, blah.

DOUG GREGORY: Thank you. Reni and Walter, and I guess anybody else, are you comfortable with that change? Is it more specific and appropriate?

WALTER KEITHLY: Yes, and I think Sarah covered it quite well. What we are attempting to do is just shift the dates of the current closures, due to the fact that it appears that either they were misspecified, when originally proposed, or there has been an actual shift in when red hind aggregate, and so I'm happy with it.

DOUG GREGORY: Okay. Any discussion on this motion? We have the motion on the floor.

RICHARD APPELDOORN: I have a follow-up to Reni's comments. I am probably not quite as pessimistic as he is, but I am probably not far away. If we look at the study that was done, led by Edgardo Ojeda talking to fishermen about where potential spawning aggregations are, or were, there used to be one right off of la Parguera, and that's gone, and there apparently was one off of Guanica, and we've never been able to document anything there.

There might still be some aggregations in an area on the south coast, further west and off of Cabo Rojo, and those really haven't been looked at. However, the glider studies that were done with hydrophones went all the way up the west coast, and there were only -- It did not go to Tourmaline, however, and Buoy 4 had calling behavior consistent with the existence of spawning, and Abrir la Sierra did, and there is some activity, or was some activity, and we haven't been looking at that, I think, in a couple of years, but at Bajo de Sico.

I know Bajo de Sico was one of the areas that, when Yvonne Sadovy was doing her work, was identified as also a spawning aggregation site.

The aggregations are bigger than that fall area that we were looking at, and we were looking at the core of that area, but the closures are a nautical mile wide, and so they cover substantially more ground, and there is spawning that goes on, and, as I said, we've documented that acoustically for the extent of that for Abrir la Sierra, and it pretty much falls within the full extent of that square nautical mile. As I said, Buoy 4 is not closed, and I'm not sure where it falls relative to the 67 degree, 10 minute line, but that's another area that seems to be less abundant, in terms of calling activity, than Abrir la Sierra.

We did, and this is now maybe six years old, or more, have recordings at Tourmaline that were consistent with spawning

activity, although, as Reni said, we've never been able to actually document the location of that. Where we were able to document an aggregation was further inshore, and this would be in Puerto Rican waters right off Mayaguez, and we don't know the size of that, and it was something that fishermen told us about, and we went in and listened to it, and there was certainly lots of activity going on, but most of the areas for spawning for red hind in the west are on that western platform edge or in Mona, and the information we have for Mona is that Mona is pretty much on its own.

Nothing documented along the north coast, that we know of, until you get out to the eastern side of Puerto Rico, and, at least from Guanica to the west, there is very limited activity now, and so a lot of the aggregations that were there are gone, and so just reinforcing Reni's statement, and it may be worse than I am thinking, and he is completely correct, and so these are the last spawning aggregations for red hind.

From what we know of distributions and how red hind have responded with the closure of the aggregation at the MCD, it's fully expected that these populations are supporting -- These spawning aggregations are supporting the red hind populations on the platform, and so it's like this or no red hind, and it could be that bad.

DOUG GREGORY: Any other comments on this Motion 1?

TODD GEDAMKE: I will just summarize the logic, Doug. The logic is that, thirty to forty years ago, fishers told us that there is these aggregations in these few sites, and both Reni and -- That's where that information came from. Since that time, and this is our second logic, is that we have been unable to find the aggregation sites, and the conclusion is these are the last spawning aggregations.

I am -- Listen, as I said the first time, I am totally supportive, and I think we, as an SSC, have to have logic and not gut feeling, and not finding evidence is not evidence. Going out and saying we have been unable to doesn't mean anything. The fact that it hasn't increased in the last ten years could also -- If the tone was different, the fact that it hasn't changed over the last ten years -- There was comments in the letter that says that climate change may be causing problems, and, I mean, these are not -- They can be dynamic, and so, I mean, I just want -- For the logic there, and I will leave it at that.

I would like to recommend, Richard, and I just requested our charge, as an SSC, and I requested that formally from Miguel and Graciela and Richard, because I think this is a question of scale, and we should be really -- I mean, saying -- Richard, your statement was just that these are the last spawning aggregations of red hind. I think that, as a scientist --

RICHARD APPELDOORN: For the west coast.

TODD GEDAMKE: So is our issue that -- If we wiped out every single red hind in that area, every single one of them, would that affect the stock, and that is a question of -- This is a fundamental premise of an SSC and of our charge, is that that could be a local extirpation, but it has no effect on the genetic makeup of the population, and that becomes a different issue.

The stock includes the MCD, and the stock -- You said it might be feeding from that other area, and I agree, but there is no shortage of red hind along the east coast, the south, in the landings, and so you were talking about an area that, if we wiped out every single one out from that area, which I am not advocating, and you all know me well enough to know that's not what I am saying, but my point is that are we worried about a stock? Is that our charge, as an SSC, or are we worried about a local extirpation?

Is there proof that this is a blended -- That this is a stock, or are we talking about one area that people have studied that we know is not changing, and I will leave my comments at that, and, Richard, I really am -- Graciela, I think we need -- I would really like what is our charge, what are we supposed to be doing as an SSC, because this is exactly a scale issue, which I think is critical for us to be able to make decisions.

DOUG GREGORY: Philosophically, I agree with you, and what would be nice would be a stock assessment. I am relatively new to the SSC, and I have not seen a stock assessment, or any attempted efforts, in the past, and I was questioning, this morning, about similar things, but we're talking about a fifteen-day shift, which is minor, at this point.

I think Item Number 2 that we're going to discuss later is the most important item of this. We need to monitor this, and we need to get more information, but, given that this is only a fifteen-day shift, I'm kind of comfortable with it, particularly knowing that it's going to go before the advisory committees and the council and be moderated, if needed, and so it seems like a

minor request at this point, but I agree with all the things that you raised.

WALTER KEITHLY: I agree with Doug on this. Again, as I mentioned, fifteen minutes ago or so, we have had this closure in the past, and either the time of spawning aggregations have changed or they were wrong on the dates when they first instituted a closure, spawning aggregation closure. They had a purpose for the closures to begin with, and all we're doing is saying, okay, let's shift them fifteen days, and I don't see what the major issue with that would be.

TODD GEDAMKE: Doug, I agree with the minor aspect, and that's also part of my point, is that, with the landings that we have, we're talking about a totally minor -- It's just a question of -- Walter, you referred to the original, and so, because it's on the books as a closure, the same evidence existed then, which was -- Anyway, I am done. Thank you for considering my comments.

DOUG GREGORY: Any other comments? I do not encourage them. Let's vote this way. I think we have two people that are going to abstain, and so I will ask for abstentions first.

RICHARD APPELDOORN: I am abstaining.

TODD GEDAMKE: I will abstain too, Doug.

MICHELLE SCHARER: I am abstaining as well.

DOUG GREGORY: Is anyone that has not abstained against the motion, and I don't know how many people are left. We do need a count, and so we've got zero people against. What does that leave, as far as the unanimous vote?

GRACIELA GARCIA-MOLINER: It's you, Reni, Vance, Jason, Kevin, Tarsila --

RICHARD APPELDOORN: Tarsila and J.J. aren't here, and I think we're nine.

GRACIELA GARCIA-MOLINER: No, and she logged in just now, or a little bit earlier. If you don't hear from anyone else, then you have --

DOUG GREGORY: **For the last time, anybody against? The motion passes.** Now to Item Number 2. Before we have a motion, does anybody have any suggested changes? The way I look at motions

is kind of like trying to develop a consensus statement. If anybody has strong feelings that something needs to be changed, they should speak up and recommend a change and see if anybody opposes it.

RICHARD APPELDOORN: I would like to know whether this is specific to red hind or a more broad statement.

MICHELLE SCHARER: I would say it's more broad, and what we can do, actually, is limited.

DOUG GREGORY: I don't hear any suggested changes. My understanding is that, currently, the monitoring is done on a catch-as-catch-can. When we can get out there, we do it, because we know it's important, and we're looking for more moral support or financial support.

RICHARD APPELDOORN: Just a background, and catch-as-catch-can was really based on either MARFIN or Sea Grant or Coral Reef Institute funding, or the council, when we were doing Bajo de Sico for Nassau, and it's whoever has a grant and we're passing through that area, and we try to put the meters down and get divers, like when we're going to someplace else, or there, if we actually had money to do that, and so that's been myself and Michelle, mostly Michelle, and Rick Nemeth.

It's really catch-as-catch-can, and we've had some nice support from the SEAMAP program, in allowing us to use their hydrophones, but it's the effort of three individuals, really, to push this, from a financial point of view.

DOUG GREGORY: Thank you, and I didn't mean to be demeaning with that term.

RICHARD APPELDOORN: No, and I'm just saying that it really is catch-as-catch-can, and, the years that we don't have the funding, it really gets down to like, okay, we got out there once, and we were able to deploy the meter and pick it up again, and so --

DOUG GREGORY: What's interesting to me is marine protected areas are being touted, around the world, as the saviors of our oceans, and fish spawning aggregations -- There is an international organization to support and help fish -- Encourage fish spawning aggregation MPAs, and it's a no-brainer that there should be ongoing monitoring and participation in an area that has obvious aggregations that could benefit the stock overall, and that could have tremendous implications.

I will be negative. If these spawning aggregation sites don't help the stock, that raises a big issue, and, if the assumption is they do, and it's logical that they do, but, elsewhere, in continental shelf areas, where we don't have obvious spawning aggregations, it's more nebulous, and so it's very important, in areas like Puerto Rico and the Virgin Islands, to monitor these things and to get some definitive science. Thank you.

TODD GEDAMKE: Guys, I'm really sorry, but it's well after 5:00, and I've got to take care of the child while we get dinner going, and so I'm sorry, but I've got to jump right now. Thank you, all, and it's been good chatting with you all again, and we'll talk soon.

DOUG GREGORY: Okay. Are there any more discussions about this option? Todd, thank you, and we are running late. Do we have a motion to support Item Number 2?

VANCE VICENTE: Yes.

DOUG GREGORY: Motion from Vance. Do we have a second?

JASON COPE: I will second it.

DOUG GREGORY: All right. Any more discussion?

WALTER KEITHLY: I will probably abstain, and the reason for it being that we're constantly bombarding the council with requests, or suggestions, that they increase funding, or continue funding, for different projects, and, while I agree that there are some benefits to this, I look at it from the economic perspective, and something may have to be given up for continued funding of this project, and, until I know a little bit more about what project may have to be given up for this project, I won't be supporting it.

DOUG GREGORY: Any other comments?

RICHARD APPELDOORN: I will make one, and it's not relevant to this, per se, because this is Puerto Rico, but an assessment of the red hind populations, particularly in the spawning aggregation areas, in St. Thomas has been a constant demand by the council members from the Virgin Islands.

They have the closure, and they want to know what the response has been to that, and so this is just basically the same kind of argument on the west coast. Walter is absolutely right that

there are many choices that need to be made as to where research money goes.

DOUG GREGORY: Any other comments?

SARAH STEPHENSON: The motion is not species specific, but the rationale is just for red hind, and do you want to make them consistent?

DOUG GREGORY: I would ask Michelle. Do you want to change the motion to be specific to red hind or change the rationale to be more broad to other species? I know, in your report, you mention other species, but this seems to be focused on red hind.

MICHELLE SCHARER: I think we can focus this on red hind, because the next one talks about groupers.

DOUG GREGORY: Okay. Support the implementation of continued long-term FSA monitoring to determine changes in the spawning stock populations of red hind off western Puerto Rico. Is that okay with Vance and Jason?

VANCE VICENTE: Yes.

JASON COPE: Yes.

DOUG GREGORY: Okay. Other than Walter, who wants to abstain?

MICHELLE SCHARER: Michelle Scharer.

RICHARD APPELDOORN: Rich Appeldoorn.

DOUG GREGORY: Is anyone against this motion that has not abstained? Hearing no opposition, the motion passes unanimously.

Actually, the next one, Item 3, and I should have read these, and I'm sorry. Establish a mechanism to revise or update the closed season dates for groupers in the region. The rationale is that the spawning seasons should coincide with closed seasons, as much as possible. To me, this one is more complicated.

VANCE VICENTE: To me too, because the rationale doesn't make much sense. I mean, the rationale should be because there are significant environmental variations occurring, such as an increase in storm frequency and intensity and changes in the physical and chemical properties of the water column, such as

pH, and climatic changes. I mean, you want to establish a mechanism to revise and update because there are significant changes occurring, and then, as a second sentence, the spawning season should coincide with closed seasons, but that should be there, but it's not -- I don't think that's the rationale.

RICHARD APPELDOORN: Well, I really should be the closed season should coincide with the spawning season, and so we've got the cause and effect reversed, but Michelle showed, or at least mentioned, information about several of the species who have significant spawning going on outside their closed season, and this included Nassau grouper and yellowfin grouper. Nassau grouper is a closed species, but there are, obviously, risks in fishing in an aggregation area, and so they would still be at risk.

SARAH STEPHENSON: Doug, can I ask a quick question on this one?

DOUG GREGORY: Yes.

SARAH STEPHENSON: Is this referring specifically to the February 1 through April 30 closure for fishing for or possession of red, black, tiger, yellowfin, and yellowedge grouper? That's the only one I see that is specific to grouper, and so is that the seasonal closure that this is referring to?

DOUG GREGORY: You would have to ask Michelle.

RICHARD APPELDOORN: She typed in "correct".

DOUG GREGORY: She chatted that's correct.

SARAH STEPHENSON: Okay. If that's the case, I am going to write, in the chat, just a little bit more of that specific language, so that we know which one we're referring to.

DOUG GREGORY: Okay. I mean, I am uncomfortable with the predictions about season changes ten years in advance, but, if there was a mechanism, or a way, to monitor this and say, this year, we're having a late start to the spawning season, and we need to extend the closed season another month, that would be like an emergency measure, and that would be very difficult to implement, I believe, and so that's my concern with this particular motion, is I don't understand --

RICHARD APPELDOORN: I think we're looking at, as we saw with red hind, the timing of the aggregations is highly predictable, and so we can say, in confidence, what might be the future

impact. We don't have as long-term of a record for some of these other species, but we do have quite a number of years now where I think we can say with confidence, for some of them, when they're going to spawn and when they're not going to spawn, and I think that's what you want to align. If you have the information that says this is when this species spawns at that location, maybe we should put the closed season in alignment with that.

GRACIELA GARCIA-MOLINER: If I may --

DOUG GREGORY: If we could put in Sarah's comments. It just makes things more explicit.

SARAH STEPHENSON: I wasn't sure if this one was going to be specific to Puerto Rico or for Puerto Rico and the USVI.

MICHELLE SCHARER: We have data for both.

RICHARD APPELDOORN: I don't know about anybody else, but I didn't get that.

MICHELLE SCHARER: We have data for both Puerto Rico and the USVI.

RICHARD APPELDOORN: Michelle, this is for the U.S. Caribbean, correct?

MICHELLE SCHARER: Correct.

SARAH STEPHENSON: So then we might just need to put an "as applicable", only because, for instance, yellowedge grouper is not going to be managed anymore in St. Croix, but that's a minor note. Liajay, it's a little bit duplicative, and so establish a mechanism to revise/update -- You have "to revise/update" twice.

Then you would want to say, "in federal waters of the U.S. Caribbean, as applicable", and then delete all the way to "to coincide", and so delete the "off Puerto" and the stuff in the parentheses. I'm sorry, but I also forgot -- Just for the record, the dates of that closure currently is February 1 through April 30, just for the record.

RICHARD APPELDOORN: That could go after the word "closure" on the first line.

MICHELLE SCHARER: Jocelyn put a question in the chat of why we're not including snappers, and the data we have only works

for groupers right now, and we haven't been able to associate any snapper with acoustic signals that we could record, and so that's why we stuck to groupers.

DOUG GREGORY: That seems reasonable, and I wonder if, instead of saying "establish a mechanism", something more gentle, like "consider establishing a mechanism", and maybe there is not a mechanism, but we want it evaluated, and maybe consider establishing, and is that okay?

LIAJAY RIVERA: Consider establishing or evaluating? I couldn't hear well.

DOUG GREGORY: Consider establishing a mechanism or consider evaluating mechanisms.

RICHARD APPELDOORN: Leave it like it is.

DOUG GREGORY: Okay. Now, does anybody want to make this as a motion?

RICHARD APPELDOORN: I want to reiterate that the rationale be reversed. Closed seasons should coincide with spawning seasons. You can't change the spawning season, but you can change the closed season.

LIAJAY RIVERA: Okay, and so closed seasons should coincide with spawning seasons.

DOUG GREGORY: Correct.

KEVIN MCCARTHY: I guess I'm wondering if we're clear on what we've actually written here. I completely agree with the change that's being made right now, by the way, but consider establishing a mechanism to revise or update the seasonal closure, and that reads like a management action, right, and, Doug, I think you mentioned earlier that, well, that would be an emergency rule, and so what are we actually trying to say here, because they already have a management mechanism, and so we're not talking about management, I don't think, and we're talking about some way to monitor this situation, and that is not clear to me, from the way this first bit is written. Maybe I'm off the mark.

DOUG GREGORY: No, you're not. Given the study we saw earlier today about projections of spawning seasons for ten years in the future, that could be a way for the biologists to estimate what the spawning season is going to be in the following year, and

that may not necessitate an emergency action.

KEVIN MCCARTHY: Right, but I guess it's still not clear that we're asking for some science, and it also could be interpreted as that we're asking for a management action, but what we're really saying is establish some sort of scientific basis, or some trigger, that would then -- That we would then recommend a change in the season, in the closed season, and is that not correct? I don't know how to word that, but I think that's what we're trying to say, and this doesn't say that, or it's so general that it doesn't -- You wouldn't necessarily take that away from the way this is written.

DOUG GREGORY: If the council accepted this, I would see certain scientific advice within a certain timeframe could result in a change in management, or it could be even more general, in that, as we accumulate more information about the impacts of climate change, or other factors, as I think Vance listed earlier, on the spawning aggregations, that the scientists could recommend, for the following year, or couple of years, that the season be changed or something else, that the area be expanded or reduced. You're right that the management process is adaptive anyway, and I think the intent of this is to do something more definitive.

KEVIN MCCARTHY: Right, and so you -- I guess I just -- This is such a general statement, and, if everybody is fine with it, given the hour, I am too, but it's not clear, for me, what we're asking for here, whether we're asking for some development of some kind of marker that is measured by a scientist or if we're asking for some ongoing mechanism from management, and I just don't -- The way it's written, it's unclear to me, but I think what we're -- Well, I don't know what we're asking for, but this phrase does not help me resolve that question.

MICHELLE SCHARER: I think part of it is we did not have a lot of information on these rare species when the seasonal closure was established, and I'm not sure what the process is where we revisit these closed seasons with recent information that has become available, and so that was the type of mechanism that I was thinking about.

KEVIN MCCARTHY: Okay. I just want to make sure that we're clear in what we're proposing here, and I don't want to -- If everybody understands what we're saying, and it's just me being pigheaded or something, and I don't want to sidetrack us.

GRACIELA GARCIA-MOLINER: I mean, the SSC can request that the already established seasonal closure be revised, if there is new

information that has come to light, or recommend that priority be given to the research that is needed to reassess these seasonal closures, or this seasonal closure, and so it's really science, what you're requesting.

KEVIN MCCARTHY: That's how I was interpreting things, but that's not what I get, necessarily, when I read this, but, again, I don't want to get wrapped around the axle on this thing, if people are ready to move on.

DOUG GREGORY: Well, nobody has made a motion, and so, with no motion, it does not move forward.

MICHELLE SCHARER: Here's a question, and is there a process, like every five years, every ten years, every fifty years, that the closed seasons are revised? Is there something that there already exists a way to revisit after twenty or fifty years, or is it something that has to be requested?

DOUG GREGORY: Well, that's a good request.

RICHARD APPELDOORN: There is no set review process, in terms of every whatever, other than recommendations be made relative to SEDAR evaluations, which would not necessarily cover this issue.

DOUG GREGORY: But what you've done here, Michelle, is appropriate and the best way, moving forward, because, if you establish a certain timeframe, then we have these efforts that have to go forward, regardless of what's going on, but apparently the way it's working now is the system reacts to new information, when it becomes available, and maybe that is the best way to go forward.

MICHELLE SCHARER: Well, that was the intent. There is new information for some of the species within that group.

RICHARD APPELDOORN: Well, it could just be consider revising or updating the seasonal closures and not worry about a mechanism. If you said something like "consider establishing a timeframe to revise and update", that splits it from the question of whether you want to actually have the closed season coincide with the spawning aggregations.

DOUG GREGORY: Well, I don't see any enthusiasm for this motion at this time, and it's raised some interesting thoughts, and I would -- Given that I am from Florida, I will take my guidance from those of you that live in the Caribbean.

GRACIELA GARCIA-MOLINER: If the SSC knows already, because Michelle has told you, that there is new information coming up, and so just ask the council to request that the seasonal closure for these groupers be evaluated.

DOUG GREGORY: That's better.

GRACIELA GARCIA-MOLINER: So the SSC requests that a seasonal closure for these groupers be reevaluated or updated or --

LIAJAY RIVERA: So request to --

GRACIELA GARCIA-MOLINER: Request to evaluate the seasonal closures.

DOUG GREGORY: Where have you been all day?

GRACIELA GARCIA-MOLINER: You've been doing very well, and so I've been quiet. Evaluate the seasonal closures for -- Then for groupers, seasonal closures for red hind, and then take the date to the end of the sentence. Take out the closures, because it's one seasonal closure for all those groupers, and so just take out the "s". There. Is that better? Then the council will have to request --

SARAH STEPHENSON: This seems backwards, to me. Shouldn't the council request that you, as the science body, look into this, and then you make a recommendation to them based on the science? You could tweak it maybe somehow, and I don't know, but it seems backwards.

DOUG GREGORY: Well, all the SSC can do is make requests to the council, and so I think a little wordsmithing will straighten this out.

GRACIELA GARCIA-MOLINER: Because you were just tasked with part of the issue, which had to do with the red hind, right, and so now you're saying there is additional information for all these, and can we go ahead and look at it, and the council can request, from the Science Center, data on these species, et cetera, and so it starts the movement of doing something, and so the SSC requests, but, on the other hand, you can table it and think about it.

MICHELLE SCHARER: I would say at least that the council should be made aware that there is new information, and they don't really read those papers, and maybe don't know that we have local, new information regarding the spawning of these species.

DOUG GREGORY: Well, we could say that the SSC requests the council to ask NMFS to evaluate, and that comes directly to the SSC. I mean, NMFS will do the work, and the SSC won't do the work. I don't know about the territories, but the council could ask NMFS, and NMFS would go to the territories and get their information.

RICHARD APPELDOORN: I would replace "NMFS" with "Southeast Fisheries Science Center".

DOUG GREGORY: That's good. We could put Kevin's name in there.

RICHARD APPELDOORN: Especially the Caribbean Branch.

KEVIN MCCARTHY: Let's not go crazy there, guys. We're just getting our feet wet.

RICHARD APPELDOORN: Especially the head of the Caribbean Branch.

DOUG GREGORY: Okay, and Jocelyn just sent a chat to be sure that it coincides with --

JOCELYN D'AMBROSIO: That was just a comment, because it says to evaluate the seasonal closure to coincide with, and so I was wondering if there's sort of now missing words, and if we should say to evaluate the seasonal closure and whether it coincides with, or to ensure it coincides with, and I'm just wondering how it --

DOUG GREGORY: To ensure it coincides with. Great.

RICHARD APPELDOORN: Well, that's a lot of work on a motion that hasn't been made yet.

DOUG GREGORY: We're developing a consensus statement.

RICHARD APPELDOORN: That works too, if you can get consensus.

JORGE GARCIA-SAIS: Doug, I am going to move for the motion.

DOUG GREGORY: Jorge. Seconded by -- Where is our economist or our Alaskan fellow?

GRACIELA GARCIA-MOLINER: Let's see who you have left. You, Reni, Jason, Kevin, Michelle, and Richard. I think Walter is not --

DOUG GREGORY: But I think Richard and Michelle are going to abstain.

WALTER KEITHLY: I am here.

GRACIELA GARCIA-MOLINER: Okay.

RICHARD APPELDOORN: That's seven, and we still have a quorum.

DOUG GREGORY: I think it would be difficult for Kevin to second it. It's like asking yourself to do more work. Do we have a second for this motion?

RICHARD APPELDOORN: If it's not going to forward because we don't have that kind of full consensus, I can report to the council that we considered this issue and just did not make a recommendation on it, but that at least would make it in the record that we are aware, and therefore they are aware, of the issue.

GRACIELA GARCIA-MOLINER: So do you want to make a statement by consensus that says that you are aware that there are issues with this seasonal closure?

JASON COPE: I guess my microphone has been broken for who knows how long, and I am just talking to myself, but I was just going to say that I would second this and see if anyone is opposed to it.

DOUG GREGORY: Okay. Thank you. Okay. Abstentions would be Richard and Michelle.

RICHARD APPELDOORN: Correct.

DOUG GREGORY: I don't necessarily agree with this approach, these abstentions and the reason for all of that, but that has been up for debate ever since I've been with the SSC, for years and years. Okay. Anyone against the motion? **Any opposition?**

WALTER KEITHLY: Just a point before we do that, and then we make -- Shouldn't that be "as yellowedge grouper", or did I miss something somewhere?

DOUG GREGORY: Yes.

WALTER KEITHLY: In other words, we want to look at those species "or yellowedge grouper", and it seems like it should be

"and yellowedge grouper".

DOUG GREGORY: Correct. Thank you.

WALTER KEITHLY: You're welcome.

DOUG GREGORY: So there is no opposition? I will ask again. **Any opposition? So the motion passes unanimously.** I assume we still have a quorum.

RICHARD APPELDOORN: Yes, we do.

DOUG GREGORY: Now I will pass the baton back to Dr. Appeldoorn.

RICHARD APPELDOORN: Okay. You know, it's almost 6:00, and I would like to stop here. There was some things that maybe we could have addressed relative to the electronic monitoring issue. If it's sufficient with the members of the committee, I can just relate to the council that we heard the presentation and that we liked what was going on, and it shows a lot of promise, and please continue. Does that sound more or less okay to everybody?

JASON COPE: It sounds good to me, Rich.

RICHARD APPELDOORN: So there would not be a recommendation, but it would just a sense of the committee, if you will.

JORGE GARCIA-SAIS: That's good with me, Richard. Good with me.

KEVIN MCCARTHY: Is the council providing some financial support for that project?

GRACIELA GARCIA-MOLINER: At this time, I don't think so. That came through NOAA and NGO funding to the DNER. We have been involved in, you know, helping out with the information that we need, and we are talking to ShellCatch and to the two local governments, in terms of what are the next steps and how to make it into the NOAA database.

KEVIN MCCARTHY: Okay, and so we're not recommending any financial cost to the council then.

GRACIELA GARCIA-MOLINER: I don't think so, because, I mean, this would be the kind of thing that the implementation of the ET would benefit from having this work ongoing and the cameras, et cetera, that they want to have, and other efforts, but that would come through those RFPs.

KEVIN MCCARTHY: Right, and so I think saying that we think it's great doesn't oblige the council to do anything that costs them money at this point.

GRACIELA GARCIA-MOLINER: The plan is revised every February, and so with Jessica Stephen and that group, and we'll be talking about what would be the priorities of the council, in terms of data monitoring and technologies to be applied in the area, and we'll be talking to the Science Center and the Regional Office, so that we're all on the same page.

KEVIN MCCARTHY: Thank you.

RICHARD APPELDOORN: Any other comments? I am not hearing. Is there a motion to adjourn? Walter.

WALTER KEITHLY: Mr. Chairman, I do have one comment. At the next meeting, preferably an in-person meeting, could we have a presentation on where the ecosystem model that we spent two years developing -- Where that stands now and how it's being used in the management process, and I was going to ask that that be handled under Other Business today, but time got out of hand, and so I really think we could spend some time looking at some of these issues again.

We seem to do a lot of jumping from one issue to another, and we sometimes lose track of where we're at on things, and so if we could have a presentation on that, and, again, we have it on record as requesting a presentation for the data collection, the revised method that Todd has been working on, to have a presentation on that at the next meeting too, and at a previous meeting we made that motion, and so thank you. I will make a motion to adjourn, based on that.

RICHARD APPELDOORN: Any opposition? Not hearing any, and so I will note the request for the next meeting, to have that ecosystem review given to us, and they have also been delayed a lot because of the pandemic stuff as well, but we'll see where they are in that, and so, with that, we're adjourned, and I thank everybody.

(Whereupon, the meeting recessed on July 14, 2021.)

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