CARIBBEAN FISHERY MANAGEMENT COUNCIL
SCIENTIFIC AND STATISTICAL COMMITTEE MEETING
CFMC Headquarters
San Juan, Puerto Rico

JUNE 19-20, 2013

The Scientific and Statistical Committee of the Caribbean Fishery Management Council convened at the CFMC Headquarters, San Juan, Puerto Rico, Wednesday morning, June 19, 2013, and was called to order at 9:00 o'clock a.m. by Chairman Barbara Kojis.

CALL TO ORDER AND ROLL CALL

BARBARA KOJIS: Good morning, everyone. This is June 19 and we are commencing the SSC meeting, Scientific and Statistical Meeting for the Caribbean Fisheries Management Council. It's being held in the CFMC Conference Room on June 19 and the start time is twenty-five past nine. I would like to start off with a roll call, starting over here, and just go around the room, please.

RICHARD APPELDOORN: Rich Appeldoorn, SSC.

GRACIELA GARCIA-MOLINER: Graciela Garcia-Moliner, council staff.

BILL ARNOLD: Bill Arnold, National Marine Fisheries Service.

WALTER KEITHLY: Walter Keithly, Louisiana State University.

TODD GEDAMKE: Todd Gedamke.

MICHAEL SISSENWINE: Mike Sissenwine, Woods Hole Oceanographic Institution.

JORGE GARCIA-SAIS: Reni Garcia, SSC.

MEAGHAN BRYAN: Meaghan Bryan, Southeast Fisheries Science Center.

JULIE NEER: Julie Neer, SEDAR.

IRIS OLIVERAS: Iris Oliveras, council staff.

BARBARA KOJIS: Barbara Kojis, SSC Chair. Welcome, everybody. We have a fair amount of things to discuss today and tomorrow. We are commencing with a discussion of the paper that was

produced on the queen and silk snapper and I would just like to get some background information on the purpose of our discussion from Graciela on what we're doing with respect to this new assessment of queen and silk snapper.

TODD GEDAMKE: Jim Berkson just dropped a note asking if he wanted to be on the roll call.

BARBARA KOJIS: Yes, please, Jim.

JIM BERKSON: Good morning, everyone. Jim Berkson, NMFS Southeast Fisheries Science Center.

BARBARA KOJIS: Is anyone else on the telephone conference or Go to Meeting?

GRACIELA GARCIA-MOLINER: They should be able to hear us at the Regional Office. They will see the screen and they will hear the discussion.

BARBARA KOJIS: But they can't -- Jim is the only one that is able to communicate with us?

GRACIELA GARCIA-MOLINER: Yes and you have Miguel Lugo and Brittany at SERO.

ADOPTION OF AGENDA

BARBARA KOJIS: Okay. Graciela, can you go over a little bit what the purpose of this initial agenda topic is? Well, first of all, let's just go over the agenda. I suppose we had better approve the agenda, adoption of the agenda. Does anybody have anything to add to the agenda or anything that they want to -- Changes that they want to make?

GRACIELA GARCIA-MOLINER: I have an official item to the agenda. This afternoon, Randy Parks will be here to talk about the -- They will go over the reef conservation grants and so anyone from the SSC who wants to stay around and talk to them, they are welcome to do so.

BARBARA KOJIS: But that's not part of the official meeting?

GRACIELA GARCIA-MOLINER: No.

BARBARA KOJIS: Okay. Jim, did you have anything you wanted to add?

JIM BERKSON: No, I don't.

BARBARA KOJIS: Okay. Let's just -- By consensus, let's agree that we're going to adopt the agenda as is. Everybody is agreeing the agenda will be as is. Graciela, could you just review a little bit of what we're doing?

GRACIELA GARCIA-MOLINER: The annual catch limits for the species under management are based on average landings. You have a copy of the Federal Register with the final ACLs as they were established and in 2013, it is now that some of the ACLs have been exceeded and so if they are exceeded, they are a number of accountability measures.

There is one accountability measure that is stricter and that accountability measure is that the fishing season is shortened by a certain amount and so the fishing for Snapper Unit 2 will come to an end and you also have a copy of the Federal Register notice that says the date it will close. That is September 21, 2013.

Snapper Unit 2 is the queen snapper, the silk snapper -- The species that were overfished and undergoing overfishing, because -- For the Virgin Islands, they are just reported as snappers.

Come September 21, the fishing season will be over for queen snapper and cardinal snapper. Those are the two species that make up Snapper Unit 2. The reason for the overrun was that the ACL was set for 145,916 pounds per year and it was reported, based on the average for 2010 and 2011, over 300,000 pounds. Basically, it's almost a 100 percent increase from the landings.

There have been a number of issues dealing with the queen snappers specifically and that will be the opening or the relaxation of the regulations in Puerto Rico, so that anyone -- People didn't have to submit the IRS information and they would just write notary public letters saying that they were commercial fishermen and this is one of the things that was found by the DNER.

People who were not commercial fishermen were submitting commercial landings data and that's one of the points. The second issue is that there were, at the same time that the council had been talking about annual catch limits, we were also looking at limited entry for the deepwater snappers.

There was a lot of information coming in and there were people that wanted to participate and make sure that they had

participation in that fishery.

Most of the public comments that were received when this was announced had to do with the fact that people seem to think that the queen snapper didn't have any problems and it was an issue with the landings, the way they were reported, but nevertheless, because the information that came from the Southeast Fisheries Science Center and the Region, it states that we have almost 300,000 pounds of landings, on average, for the very recent data. The ACL was exceeded and the AMs were published and the final rule on that is out.

RICHARD APPELDOORN: What was the ACL?

GRACIELA GARCIA-MOLINER: It's 145,916 pounds.

MICHAEL SISSENWINE: So it's almost double. It's more than double.

BILL ARNOLD: They overran by about 90 percent.

JORGE GARCIA-SAIS: What was the final catch?

GRACIELA GARCIA-MOLINER: The ACL was 145,916.

JORGE GARCIA-SAIS: What was the catch?

BILL ARNOLD: The catch was 277,979.

GRACIELA GARCIA-MOLINER: In addition to that, the SEDAR-26 had looked at the use of a length model to determine if there was any problem with the stocks at the time and that information was brought to the council.

There was then a revision of the SEDAR methodology. The review of the SEDAR-26 was by the Southeast Fisheries Science Center and that's what you're going to hear today and to make recommendations on two things.

One, in terms of using the model for other species, so that we will just direct our efforts to do the assessments, quote, unquote, following that directive and, number two, if there is any indication that the Snapper Unit 2 could hold a higher commercial landings, if the SSC thinks that the council should take action regarding the ACL.

We are very late in the process, because we've already published the final rule for September 21. Probably even if the SSC

believes that there was no problem, but you already spoke to that, with the ACL, then to recommend anything to the council regarding that, trying to prevent the AMs from being triggered.

The main reason that you're here is just to look at the reanalysis of the queen snapper information and recommend to the council if you should follow that path for the other species.

MICHAEL SISSENWINE: Could I ask a question about the accountability measures? The accountability measure shortens the season.

GRACIELA GARCIA-MOLINER: That's correct.

MICHAEL SISSENWINE: Is there also a reduction from the ACL to account for the overage?

GRACIELA GARCIA-MOLINER: No, it just shortens the season and then come January 1, 2014, the season opens again.

RICHARD APPELDOORN: It closes when?

GRACIELA GARCIA-MOLINER: September 21.

JORGE GARCIA-SAIS: And it reopens, Graciela?

GRACIELA GARCIA-MOLINER: January 1 of the next year, 2014. There is no payback on the landings. Now, the issue is going to be that if you already have 145,000 pounds as an ACL and people are reporting almost 300,000 pounds, the ACLs probably need to be revised. These are some of the things that are on the table right now and that's going to be analyses of the information and that presentation is important.

BARBARA KOJIS: Okay. Then are queen snapper considered undergoing overfishing or underfished in the original?

MEAGHAN BRYAN: I'm going to review that.

BARBARA KOJIS: You're going to review all of that?

MEAGHAN BRYAN: Yes, I'll review those, the main stuff about SEDAR-26.

BARBARA KOJIS: If you're going to review that, then that's fine. That's great. I just want to make sure everybody is on the same page and understands what the situation is with respect to what the focus of our discussion should be and in terms of

what the status is with things, because I know we had a discussion regarding the fact that there's all these fishermen reporting catch now that didn't report before, but there is also a -- The data is standardized and that's taken into account by -- It should have been taken into account when Puerto Rico made their determination of how much the catch was.

They should have been looking at how many commercial fishers there were and how much reporting is being done compared to previous years, so they have a --

GRACIELA GARCIA-MOLINER: There are a number of issues with the Puerto Rico dataset and the recent meeting, just a week-and-a-half ago or something like that, we got into the number of fishermen that are submitting commercial landings, but that's a -- We don't have a good handle on that yet.

BARBARA KOJIS: You don't have a good handle. Okay. Any questions for Graciela?

GRACIELA GARCIA-MOLINER: The thing is that with the snappers, when the council took action in terms of establishing the ACLs, it had to do with -- It went along with all the species that were overfished and undergoing overfishing.

The snappers at that time -- It was groupers, snappers, parrotfish, and queen conch. That's why it's -- The buffer at the time for the ACL was much larger than was used for the other species that were not overfished or undergoing overfishing and so there is a 15 percent buffer for those that were dealt with in 2010 and only a 10 percent buffer for the others.

TODD GEDAMKE: The difference between those two categories though -- You just stressed that these were treated as undergoing overfishing. In the end, if you did a difference, you would have been talking a difference of about 3,000 pounds. You're talking insignificant differences between the way those buffers were set up.

RICHARD APPELDOORN: What was the numbers, 10 percent?

GRACIELA GARCIA-MOLINER: 15 and 10 percent.

BARBARA KOJIS: 15 for species undergoing overfishing and overfished and 10 percent for those that weren't.

GRACIELA GARCIA-MOLINER: The way that we're setting this up, I am going to transfer the presentation to Meaghan and she'll be

showing everyone, including Jim, who is going to be looking at the screen, and she will have the power now.

BARBARA KOJIS: Okay, good.

PRESENTATION OF REANALYSIS OF SEDAR-26 DATA

MEAGHAN BRYAN: You all should have received a report, and I don't know when, that summarizes the approach that I used and the results and basically what I did was just an extension of the analysis from SEDAR-26.

I didn't reanalyze anything in terms of what we did with the mean length estimate. I just took the results that were generated during that SEDAR process and then applied them to the yield per recruit and spawner per recruit analysis that I did.

What I thought I would do first is just review what we did for SEDAR-26, before moving on to what I did, and summarize some of the main conclusions and the results and the methods from that SEDAR process.

As you know, during SEDAR-26 we looked at three species, but the two that I was told we were concerned with for this meeting were queen snapper and silk snapper. What we did was we assessed each of these species separately by island platforms and gear types and the main gear types that target queen snapper and silk snapper are hook and line gear types.

During the SEDAR-26 process, we reviewed all of the data available in the Caribbean, and so MRFSS and the commercial landings, but what turned out to be the most consistent, in terms of species-specific information for these species and Puerto Rico, across Puerto Rico, St. Thomas, St. John, and St. Croix was from the Trip Interview Program, or TIP.

This data collection program is a port sampling program and it was designed by the Southeast Fisheries Science Center to supplement the data collection that we don't necessarily get from the commercial landings and so information about lengths, species composition of catch. Those kinds of things are collected by the TIP program.

The data that was of main interest to us were the annual length data, because this was the data that we were going to be able to apply to the mean length estimator that I will talk about briefly in a moment.

Just to give you a sense of the length frequency data that's available from TIP for these species by island and gear types, you can see there are some observations from other gear types, but I think some of these might be erroneous or just incidental catch.

Mainly, queen snapper is targeted using the hook and line gear types. This figure just shows the length frequency data aggregated in five-year blocks, due to fairly low sample size in some of the years, but this gives you an idea of what the length frequency of the species looks like over time, between 1983 and 2011.

MICHAEL SISSENWINE: What is the red bar?

MEAGHAN BRYAN: Sorry. The red bar is what -- It basically shows the mode of the distribution and that's what we used to pick the length at full vulnerability for the analysis.

MICHAEL SISSENWINE: That's what I would have thought, except for the lower left. The red doesn't look like the mode.

MEAGHAN BRYAN: It represents the bin with the highest frequency and so in most cases, that's the mode. I will talk about that a little bit more in a bit, about how we chose the length at full recruitment. This is just the length frequency distribution for queen snapper in St. Croix. Again, hook and line is the main gear type.

You will notice between 1999 and 2002 that there were barely any samples collected for queen snapper in St. Croix and I don't know if that was due to a decline in sampling efforts in St. Croix or if that's just because they were just not intercepting trips that were catching queen snapper.

BARBARA KOJIS: That would have been because of not as many samples being taken.

MEAGHAN BRYAN: Funding? Okay.

BARBARA KOJIS: Yes, funding was a very serious issue back then.

MEAGHAN BRYAN: I am also looking at silk as well and, again, hook and line, you can see the length frequency data for silk snapper caught in St. Croix.

I am not showing the length frequency data from Puerto Rico and I didn't reconsider that analysis for this meeting, because

during SEDAR-26, we talked about how there was some shift in management towards a larger size limit. I can't remember what year it was and maybe 2004. That was a violation of the assumption that selectivity was constant over time and methods and so I didn't reevaluate that analysis.

That's the data that we used or that was available for us that was species specific, so that we could focus on queen snapper and silk snapper separately, or outside of the snapper complex for the USVI.

What we did was we used the Gedamke and Hoenig mean length estimator. This is an extension of the Beverton-Holt mean length mortality estimator and as we discussed in SEDAR-26, this method is computationally attractive for data-limited situations, because it has minimal data inputs.

One, you need length frequency data to get your mean length information and to determine length at full recruitment, if you don't have other information about selectivity. Also, it relies on life history parameters, mainly the von Bertalannfy growth parameters, the von Bertalannfy growth coefficient, and the asymptotic length.

This method provides estimates of total mortality, which can then be used to derive fishing mortality if you have some -- Either an empirical estimate of natural mortality or if you assume some sort of life history invariant relationship between natural mortality and your growth parameters.

Another facet of this method that's attractive, as opposed to the Beverton-Holt mean length estimator, is that it doesn't assume that the population is at equilibrium and so it can estimate temporal changes in total mortality, which can be useful when you're trying to consider how is mortality -- You want to see how mortality has changed over time and what is that relative change and does that give you any information about the sustainability of the fishing pressure on the species that you're focusing on.

We did an extensive review of the life history information for queen snapper and silk snapper during the SEDAR-26 review process and the main uncertainty in the assessment was the life history parameters.

There was very little published information about the age and growth relationship for these species. I think there were two for queen snapper that we found and so to account for having

very limited knowledge about the life history or the age and growth relationship for these species, we conducted a sensitivity analysis over a range of the input parameters and so those growth parameters.

This is not showing up very well and I can't seem to use my mouse, but this just shows the estimates, the absolute estimates, of total mortality across the range of each of the three input parameters.

The top panel shows that length at full recruitment. The middle panel shows the von Bertalannfy growth coefficient and that bottom panel shows the asymptotic length and on the Y-axis, you see the absolute estimates of total mortality in the current time period and so that either means that over the entire time series if there was no change detected in total mortality or the most recent time period if a change in total mortality was detected.

BILL ARNOLD: I'm sorry, Meaghan, but what was the middle table?

MEAGHAN BRYAN: That's the von Bertalannfy growth coefficient and so, as you can see, that has a strong influence on the total mortality estimates, mainly the absolute total mortality estimates, the von Bertalannfy growth coefficient.

You can see that for larger values von Bertalannfy growth coefficient total mortality -- Your total mortality estimates end up being much higher than for lower values of that von Bertalannfy growth coefficient. This is just an example of what the sensitivity results looked like.

TODD GEDAMKE: I just think that it's important here, and you're probably going to stress this again, that the take-home message that I see from this, as we've gone into it, is look at the range of Ks, the range of L infinities, the range of Lc, that we felt the need to explore.

We didn't basically set it, but the literature did not pin us down on to specific values that we were running sensitivities off of base case values. We were more or less doing a real shotgun-type approach at looking at this. There's a huge range and then the other one too is if you look at K, the value of K really does affect the total mortality estimate in a pretty substantial way.

BARBARA KOJIS: I just have a question of Graciela related to this. Didn't the Puerto Rico lab do work on age and growth for

deepwater snapper?

MEAGHAN BRYAN: I did come across a report and I think it provided some information about maturity, but they were not able to age those fish that they had. I think they had -- I don't know if they had the --

GRACIELA GARCIA-MOLINER: They had the otoliths.

MEAGHAN BRYAN: They had the otoliths, but I don't know if they able to actually read the otoliths, for some reason.

GRACIELA GARCIA-MOLINER: The good news is that we did send people to be trained on reading otoliths and processing them. They do have a collection of the otoliths for the queen and the silk. They just sent me the budget for the materials that they need and so hopefully, within the very near future, we should have at least age for the queen and the silk.

MEAGHAN BRYAN: Just to move on to the general conclusions, as many of you are already aware, because you were here for the review, I'm sure, last -- I don't know if it was last year or two years ago for the assessment, but, as we said earlier, that for all the fisheries that we considered, the hook and line fishery in St. Croix or Puerto Rico for queen snapper and the hook and line fishery in St. Croix for silk snapper, the analysis didn't provide any evidence to suggest that queen snapper or silk snapper were experiencing overfishing.

MICHAEL SISSENWINE: That statement is true over the range of sensitivities you're saying?

MEAGHAN BRYAN: Yes and so what we did is we looked at -- We did compare fishing mortality estimates that were derived from the total mortality estimates and natural mortality and compared that to estimates of natural mortality to make some conclusions or try to make conclusions about whether or not these fisheries were experiencing overfishing.

In general, yes, over the sensitivities, we didn't find that there was evidence to suggest that. I will talk about the issue of queen and Puerto Rico.

TODD GEDAMKE: A couple of pieces in there. Over the whole range of sensitivities, we ended up with total mortality estimates that I think were bounded out of the three plus, in a lot of cases.

If you follow that through, you would end up with a determination of overfishing on some of those sensitivities and so although I agree that over the range of sensitivities that you did, the final conclusion was that if you looked at individual cases, you definitely wouldn't have come up with it.

The other thing is I don't know how many hours it took for us to come up with the language for those five words, "no evidence to suggest overfishing", as opposed to "overfishing is not occurring".

It's a simple way of wording it, but the point being is that there was nothing we found that really strongly suggested that overfishing was occurring and the other key piece to this was if you looked at the size structure of the population in comparison to the size at maturity, you ended up with the size at maturity being at the very low end of the size structure being caught.

With that, we felt, basic population dynamics principles 101, we were probably in a decent place with the harvest size structure in relationship to the size at maturity and so there was a couple of pieces of information which led us to that statement.

MICHAEL SISSENWINE: I interpret that statement as the equivalent -- The statement of the original overfishing versus no evidence to suggest overfishing implies, to me, that the people who chose this one view the power of the test was fairly low.

TODD GEDAMKE: Yes.

MEAGHAN BRYAN: Yes. There was no quantitative --

TODD GEDAMKE: That's why I felt it was worth restating, so that it was not misinterpreted.

MEAGHAN BRYAN: Right. Thank you. I will just show this plot so you can see the size structure zoomed in and overlaid on top of each other and it was fairly stable over time and so that was one piece of the evidence.

Silk snapper, again, there was no evidence to suggest that the fishery was experiencing overfishing, but as you will remember from a previous slide, there was a gap in the sampling due to, as Barbara said, funding issues and so any temporal changes that we detected in total mortality -- We didn't, actually. They were not specifically supported and the reason why is probably because of that low sample size. It obscured any relationship

between change in size and change in mortality.

Then, again, that figure, you can see, from 1999 to 2002, there was thirty-one total samples in that five-year period of time and so -- You still had some of those larger individuals that you're seeing earlier in the time series in that time block of 1999 to 2002. That kind of recedes in 2003 to 2011, but we did not detect any temporal changes in mortality and so we couldn't investigate or evaluate the relative change in total mortality between time periods.

Just to complete the review of SEDAR-26, for queen snapper, the hook and line fishery in Puerto Rico, again, there was no evidence to suggest overfishing, but temporal changes in total mortality were detected and there was an increase in total mortality over that time period, but the proportional change across all of the sensitivities that we did were between about 55 percent and 85 percent.

We were kind of in a unique situation with this particular fishery, because apparently the fishery started in the early 1980s, when this dataset begins, and so to make the statement that fishing mortality is likely less than the FMSY, we needed to assume that the first year of data collection represents the start of the fishery and in turn, the initial estimate of total mortality is equal to natural mortality.

If you assume that FMSY is approximately equal to natural mortality, your ratio between your current fishing mortality and FMSY is less than one and so that would indicate that the fishery is not experiencing overfishing. That was the logic behind that conclusion for the queen snapper hook and line fishery in Puerto Rico. Those were the main conclusions from that analysis.

TODD GEDAMKE: Just two clarifications. I think Meaghan just said it and I will just restate them, because I think they're important for further discussion on here. The proportional change in this case -- This was an approach we sort of developed or looked at during the analysis, because we didn't really trust the values for the growth parameter.

By looking at proportional change, our growth parameter actually cancels out and so we ended up looking at that as an alternative way of trying to look at the relative change in mortality over the time period.

The other thing I really want to stress here is what Meaghan

said regarding fishing mortality is less than FMSY. For the queen snapper, we had a fishery, based on all anecdotal accounts and all data sources, that it did not exist at the beginning of the time series.

It was relatively easy for us in this case to look at this species and say, well, let's just assume that at the beginning part of this time series that there was little to no fishing mortality occurring.

From that, and Meaghan just said this, but from that, we can then look at our early estimates of total mortality representing just natural mortality. In this case, we were able to make an assumption, based on all the information in front of us, and come up with an empirical estimate for M.

As this process continues and this type of method becomes applied, getting to that empirical estimate of M becomes very difficult and in this case, it was just a unique situation that allowed us to be pretty confident in assuming that early estimates were equal to M.

RICHARD APPELDOORN: A question. When you say the early period, are you talking about that block of time or actually the first years in that block of time?

TODD GEDAMKE: I don't remember the exact years right now, but I think you had at least a ten-year period where there was no records of queen snapper in the early part.

RICHARD APPELDOORN: I am talking about the length frequency distribution.

TODD GEDAMKE: I'm talking time and so the earliest years in the time series.

RICHARD APPELDOORN: But that earliest block of time that was shown on the graph?

TODD GEDAMKE: Yes.

RICHARD APPELDOORN: Okay, because the big decline comes between that first year and the second year.

BARBARA KOJIS: The second block of years.

RICHARD APPELDOORN: The second block of time.

BARBARA KOJIS: Rich and Todd, if there were no queen snapper caught, how could you get values for length? Where were you getting those from?

MICHAEL SISSENWINE: There must have been a few caught.

TODD GEDAMKE: Flip to silk.

RICHARD APPELDOORN: I think it was silk. Maybe that was what I was looking at. Yes, that's the one I was looking at. Maybe I just haven't --

TODD GEDAMKE: You were just looking at the scale.

RICHARD APPELDOORN: You don't see it that much.

MEAGHAN BRYAN: Yes, there's fewer.

RICHARD APPELDOORN: The scales are different and so that accounts for the fact that there's definite sampling effort going on. I think it's okay. I just had the silk and queen confused.

MICHAEL SISSENWINE: The conclusion, based on what you said, would be that not only is overfishing not occurring, but it has never occurred in the time series.

TODD GEDAMKE: That was where we were. It's a developing fishery.

MEAGHAN BRYAN: The review of SEDAR-26, before I move on, are there any other questions?

MICHAEL SISSENWINE: This is being reported, status report and managed, on the basis of it being overfished.

MEAGHAN BRYAN: It's Snapper Unit 2 and is that based mainly on cardinal snapper or was it --

GRACIELA GARCIA-MOLINER: The queen and the cardinal. At that time, it was based on the average landings of queen snapper.

MEAGHAN BRYAN: But prior to this assessment, how was it determined that that Snapper Unit 2 was overfished?

TODD GEDAMKE: You want to open that can of worms?

MEAGHAN BRYAN: Maybe not, but --

TODD GEDAMKE: Expert judgment was what was originally done with this.

GRACIELA GARCIA-MOLINER: During the development of the ACLs, based on the average catch and the certain number of parameters that were used and that list.

TODD GEDAMKE: You bring up a good point. There is that list. In the process of looking at all the Caribbean species, we went with the data-poor average landing approach, which has been applied in many different places.

Then from there, this was one of the first single species that we reevaluated or did a full attempt at assessment following this. What was done with the broad sweep of species was average landings and some reduction to get to your ACL.

This is the first one we've looked at in an attempt to reevaluate and actually come up with a quantitative estimate. In this case, our final conclusion was that there's no reason to suggest that overfishing is occurring, but there's also not enough information available to say that the ACL should be two times greater than the average landings. There was no reason to add any additional cautionary approach to the current ACL.

MICHAEL SISSENWINE: In practice, in the data-poor situations, it would seem there is very little difference between whether the thing is classified as overfished or not. Overfishing makes a difference, but since there isn't a rebuilding plan with F rebuild calculated based on some sort of projections, in practice it doesn't make much difference whether it's overfished or not. It may show up on a list somewhere, but the actual averages are pretty much going to be the same.

JORGE GARCIA-SAIS: Is that actual catch based on an expansion factors for accounting for recreational fishermen and stuff?

MEAGHAN BRYAN: The ACL?

JORGE GARCIA-SAIS: No, the total catch for which we are saying that the annual catch limit has been overridden or exceeded. Is that based on some expansion factor?

RICHARD APPELDOORN: Yes, obviously.

JORGE GARCIA-SAIS: It is?

RICHARD APPELDOORN: Yes.

JORGE GARCIA-SAIS: For which do we have any real check on that?

GRACIELA GARCIA-MOLINER: That's what the -- The DNER provides the information to the Southeast Fisheries Science Center and between the two, they go over the expansion factors as they are going to apply to the reported commercial landings and they have been reviewing the expansion factors also in real time.

MEAGHAN BRYAN: If I'm remembering the figure correctly, the overage is based on 2010 and 2011 and the expansion factor has minimal effect on the landings in Puerto Rico. I think it's almost one and so you're not expanding the landings by much at all and so essentially it's saying whatever they've observed or self reported is what is going into that ACL, essentially.

JORGE GARCIA-SAIS: Is there any way you can tell me what was the expansion factor applied to the landing data?

TODD GEDAMKE: Meaghan's statement I think I can say is correct. The expansion factors are regionally-based in Puerto Rico and in this case, most of the landings are occurring from the southwest corner of the island and in that region, there is very high reporting rates and so the expansion factor has little impact.

If I may make a suggestion regarding expansion factors, because this, Reni, I know is something that bothers you every single time we talk about landings.

JORGE GARCIA-SAIS: I know, because it's an abstract thing, you know.

TODD GEDAMKE: I understand and we end up spending hours and hours discussing expansion factors and I think I would be happy to say that, once again, expansion factors need to be looked and evaluated and let's move on on that, because the expansion factors are not really relevant to this discussion.

JORGE GARCIA-SAIS: Well, that's what I wanted to know.

GRACIELA GARCIA-MOLINER: The information that you're looking at, the ACLs that were exceeded, are for Puerto Rico commercial side. There is information on the recreational harvest of these species, but the ACL was not exceeded on that sector, which is one of the reasons why the DNER is looking so closely at this, because they believe that many recreational fishers were reporting as commercial. That's an issue that they have to deal

with and clarify before we can do anything else. We are working on that.

TODD GEDAMKE: It needs to be addressed for every species in the region in Puerto Rico. The question needs to -- I don't know the last time the conversion factors were reevaluated, but I believe, at least from the last SSC meetings I was at, we spent a good bit of time making recommendations that this needs to be reevaluated and I think Steve Turner had sent some information down. Once again, when we look at any ACL, those same questions are going to arise.

JORGE GARCIA-SAIS: Yes, but with particular reference to these species, it's that I still remember, because I participated in the SEDAR analyses as well, and these species, we actually concluded that we don't have any evidence that it was undergoing overfishing and that we had applied an extra cautionary -- Like a cushion and I think it was 15 percent over the average annual catch for scientific reasons, just to look at how the fishery was behaving.

I had very strong reservations all through, because of the considerations that we were going to impose, severe annual catch limits to the coral reef fishery resources, which we wanted to protect as a high priority.

We have to give the fishermen some kind of alternative fishery, for which queen conch was something that was one of the most promising, because it was an emergent fishery. Number two, the habitat of the queen snapper is a very large habitat, which includes not only the resources of the Puerto Rico habitat, but actually the close Caribbean islands, because, as we saw in several presentations, there is a ridge between Puerto Rico and the Dominican Republic which we believe includes a very wide range of benthic habitat for that species.

It's not very restricted in terms of habitat and all those considerations, plus the uncertainties of the previous history of the fishery itself, gave us some -- At least gave me some indication that we should consider queen snapper fisheries as an alternative for a -- A fishery to be considered as a developing fishery, for which we didn't have to be so conservative and give that as an option for fishermen to consider it, the reduction in effort on the coral reef fisheries.

That is why now it's hitting us back and I am trying myself here, in a situation where I say I should have not let go my initial considerations regarding the fisheries for these species

in particular, and that's why now all I have left is the consideration of, okay, what about the expansion factors?

Are we now going to close down or restrict the fisheries based on data that we are just -- It's just an assumption. It's just an abstract. It's an expansion that may or may not be.

GRACIELA GARCIA-MOLINER: At the time of the council considering limited entry or some sort of program like that for the deepwater snappers, there was a report to the council of about 40 percent underreporting, for example, and so some efforts have been made to address the issue of non-reporting and misreporting, et cetera.

There was, in 2010, also a change in the data forms, so that the reporting will be more specific. That one specifically needs to be evaluated, because that started in 2010 and we were just talking now that we don't have the 2012 landings data for Puerto Rico yet, at least not the final versions.

There are quite a number of issues with the data, but, again, that's the data that we have available. The DNER has been requesting or has been discussing actually going through their own records to look in more detail at the information that they have, to make sure that they have the people who are commercial fishers submitting as commercial fishers and be able to get rid of anyone else who had not been in the fishery before and they just came in when the DNER opened the doors for almost anyone to come in. Those are the issues that are under consideration, but we can't offer anything else except that.

BARBARA KOJIS: Meaghan, can you continue?

MEAGHAN BRYAN: Yes. So none of the analyses suggested overfishing and because of the method that we used, we couldn't determine whether or not these were considered overfished. Everything was based on -- Our analysis was focusing on that determination of overfishing.

BARBARA KOJIS: Let's take a coffee break now.

(Whereupon, a brief recess was taken.)

BARBARA KOJIS: I would like to call the meeting to order again. We are going to restart the meeting. We had a power outage and the start time is 11:15 and, Meaghan, could you continue?

MEAGHAN BRYAN: We had just reviewed the SEDAR-26 process and

assessment and now, moving on to this extended analysis. Essentially, the Science Center was asked to address this issue of reevaluating whether these fisheries were experiencing overfishing and was there a method that was appropriate to determine that or a more quantitative and robust, I guess, estimate of FMSY or some sort of proxy, rather than just using natural mortality as a proxy for FMSY.

To address this, I have conducted a yield per recruit analysis and spawner per recruit analysis to derive these fishing mortality reference points that are sometimes suggested to act as proxies for FMSY.

I derived Fmax, which is just the maximum of the yield per recruit curve; F 0.1, which just represents the slope of the yield per recruit curve that's 10 percent of the stock at the origin; and then F 30 percent, which is the F that allows the survival of 30 percent of the spawning biomass per recruit.

MIKE SISSENWINE: Can I ask on that, is your F 30 percent definition shorthand for 30 percent spawning biomass per recruit?

MEAGHAN BRYAN: Yes. Those are the three reference points that I derived and then the other goal of this analysis was to compare these mortality reference points to the current fishing mortality estimates that we derived or estimated during the SEDAR-26 sensitivity analyses and reevaluate overfishing status for these species.

Then, beyond this per recruit analysis, and it's something I'll present a little bit later, is getting at this point of okay, can we -- If this information -- If you determine that this information is useful for determining overfishing status, can we use this, these reference points, in combination with the current fishing mortality estimates to then develop a harvest control rule based solely on fishing mortality, since we don't have abundance estimates, which usually you have a harvest control rule that considers fishing mortality and abundance.

Can we develop a harvest control rule just using fishing mortality and I've started investigating a potential harvest control rule that could potentially be used, but I haven't thoroughly tested this yet. I think probably another step would be to do further simulation testing, but we can get to that later.

This is just to show you an example. The blue line shows the

yield per recruit curve and this is just an example. The blue line shows the yield per recruit curve and the red line shows the depletion in spawning biomass and then F 0.1 is represented by that dashed line and in this situation, Fmax and F 30 percent ended up being the same, as represented by that dotted line. This is just an example for you to see what these could potentially look like in relation to one another.

MIKE SISSENWINE: Where is M on that?

MEAGHAN BRYAN: M? This is just an example and it doesn't -- I didn't come up with an M for this example. Getting back to that second goal to derive fishing mortality estimates, I needed to derive estimates of natural mortality and to do that, I used three different approaches and they're all based on some sort of life history and variance, the Pauly method, which is a function of the growth parameters as well as temperature.

For queen snapper, I found one paper by Lesser et al. that reported that queen snapper, the temperature at the depths at which queen snapper are found, can be anywhere between fifteen and twenty degrees and so I chose seventeen degrees as a happy medium and knowing that queen snapper are commonly found a bit shallower than queen snapper, I used that information and used nineteen degrees Celsius.

I also looked at the Ralston method, which is just a linear regression equation, and Jensen's life history and variance relationship for M and so there's three different ways and they were all based on these growth parameters, because we didn't have particularly reliable estimates of maximum age and so I constrained the analysis to consider these three mortality equations.

Just to give you an idea of what the age schedule on the model assumptions looked like, there's a few different lines and so just to orient you to the screen, the blue line represents the survivorship of queen snapper and so it basically is just showing you the proportion of a particular age group surviving to the next age group and that's that blue line, which is just an exponential declining function of age.

Vulnerability and maturity seem to be knife edge at the age of full recruitment and this varied depending upon the sensitivities, but in this example, this assumes that they become or they recruit to the fishery or mature at age two and then it also assumes that weight follows the von Bertalannfy growth relationship.

To carry out the yield per recruit and the spawning biomass per recruit analysis, I used the Botsford incidence functions and basically, what this allows -- These account for the effects of natural mortality and fishing mortality over the lifetime of the species of interest through that survivorship Lx parameter.

Vulnerable biomass is just a function of survivorship, weighted age, and vulnerability at age and then yield per recruit was calculated as the exploitation rate or the product of the exploitation rate and that vulnerable biomass and spawning biomass per recruit was also calculated as the function of the survivorship, the weighted age, and the maturity at age.

Those are the components of the analysis. Because I was applying this approach to the majority of the sensitivity -- The results from the sensitivity runs, there were hundreds of yield per recruit curves that were derived and so I'm just showing this as an example, because it's a fairly good example of the shape of the yield per recruit curves that resulted.

You can see -- Normally, I think when people think of yield per recruit curves, they think of this curve that peaks and then declines fairly rapidly. Not rapidly, but it declines as fishing mortality increases.

Here, it does decline a bit, but it's more asymptotic than what I think people think of a typical yield per recruit curve and so in this case, the F 30 percent -- I should have shown the spawning biomass per recruit on this figure too, but what was happening in the majority of runs is that F 30 percent was just so much larger than your Fmax and F 0.1 and Fmax is often -- It has been shown to often be greater than what FMSY would be. If that holds true, the F 30 percent may be greater than FMSY. I looked at, again, the queen snapper.

MICHAEL SISSENWINE: Can we go back to that one? It looks very much, in that example, like FMSY is about M. It's about the same value as M, 0.43.

MEAGHAN BRYAN: Yes.

MICHAEL SISSENWINE: Is that a common outcome from these many iterations?

MEAGHAN BRYAN: I would have to go back and look at that, but that's a good question.

MICHAEL SISSENWINE: It wouldn't surprise me if it was.

RICHARD APPELDOORN: How can you get an F 30 way out there?

MEAGHAN BRYAN: This sometimes happens when your age at recruitment to the fishery is greater than your age at maturity, but in this case, they're assumed to be the same and often when you have higher natural mortality, you also can sometimes get this kind of pattern. My interpretation of this --

RICHARD APPELDOORN: That should tell you that something is seriously wrong somewhere.

MEAGHAN BRYAN: I think in terms of productivity --

RICHARD APPELDOORN: You did this for a wide variety of parameters because of the uncertainty in those and is that a common feature?

MEAGHAN BRYAN: Yes, that is a common feature and I was associating it to high natural mortality rates and productivity.

BILL ARNOLD: Meaghan, which of those mortality rates would you consider to be the best guideline for sustaining the fishery?

MEAGHAN BRYAN: I think what you need to --

TODD GEDAMKE: We're still questioning how some of them are derived, Bill. Do you want the answer immediately?

BILL ARNOLD: Yes.

MEAGHAN BRYAN: I don't know and maybe there is -- That is the equation that I used to derive the spawning biomass per recruit, where that survivorship is a function of the natural mortality and the fishing mortality. Maybe the Fs are -- No, the F is really high.

RICHARD APPELDOORN: What is V? In the first equation, VT?

MEAGHAN BRYAN: That is vulnerability at age and W is weighted age and that LXT is the survivorship at age.

RICHARD APPELDOORN: Spawning biomass per recruit is basically following the same procedure as the yield per recruit.

MIKE SISSENWINE: Except that it doesn't have V in it.

RICHARD APPELDOORN: Slightly different formulations, but the concepts are basically the same. You're just putting the weight structure on that biomass.

TODD GEDAMKE: What's the yield per recruit curve? I'm not sure what I'm asking, but was the F 30 calculated from that equation or was it picked off of this curve? I'm just wondering if --

MEAGHAN BRYAN: It was picked off of this curve and so it could be --

TODD GEDAMKE: Is it possible you picked off the right-hand side of the curve as opposed to the same solution down closer to F 0.1?

MEAGHAN BRYAN: I would have to look at my code. If that's what I did --

MICHAEL SISSENWINE: If it's picked off a yield curve or off of spawning biomass per recruit curve. Do we have the spawning biomass per recruit curve that goes with this run?

RICHARD APPELDOORN: That's what she said she should have done.

MEAGHAN BRYAN: I should have put that on here and I realize that I didn't put that on here, but I have a spreadsheet that I could do that quickly.

BARBARA KOJIS: You could do that at lunch.

MICHAEL SISSENWINE: I don't even need to see it, as long as you can confirm that the spreadsheet says that F is that high.

MEAGHAN BRYAN: Yes, I will have to go back and look at that.

MICHAEL SISSENWINE: Because it really doesn't make sense that it's that high.

MEAGHAN BRYAN: It could have been an error in my code, because it was automated and said, okay, when it gets to -- It's going off the spawner per recruit and so it's going to go down to 30 percent and so it shouldn't be --

TODD GEDAMKE: Did you have a single solution?

MEAGHAN BRYAN: Yes, a single solution. I need to look into that.

MICHAEL SISSENWINE: If you go back to the equation for spawning per recruit, I'm still trying to understand why it doesn't have vulnerability in it.

MEAGHAN BRYAN: Survivorship is accounted for in the natural mortality and in the fishing mortality.

MICHAEL SISSENWINE: It's embedded in the survivorship.

RICHARD APPELDOORN: Anything that's mature is going to be fully vulnerable.

MICHAEL SISSENWINE: So Lx is this survivorship.

MEAGHAN BRYAN: Yes. When I first ran these analyses, it definitely was high and I noticed that it was high, but it seemed to be pretty common throughout the majority of the runs and when I was trying to justify why it would be so high, I was thinking that maybe it had something to do with the natural mortality rates, because you do find that higher natural mortality rates end up leading to more asymptotic -- That's yield per recruit.

MICHAEL SISSENWINE: But I mean the spawning per recruit has to be a ratio.

MEAGHAN BRYAN: Yes, it is.

RICHARD APPELDOORN: But what you have there, as I'm looking at it --

MICHAEL SISSENWINE: Isn't a ratio.

MEAGHAN BRYAN: This is the spawning biomass per recruit and then I have the ratio of this divided by the spawning biomass per recruit in an unfished. That's how I calculated that. That's how I got the F 30 percent.

RICHARD APPELDOORN: But how did you get per recruit?

MEAGHAN BRYAN: These are equations are basically --

RICHARD APPELDOORN: The first one is vulnerable biomass per recruit.

MEAGHAN BRYAN: Per recruit, yes. Sorry. I should have said per recruit on that one and I just didn't put that in there.

RICHARD APPELDOORN: So yes, somehow they should come up with something similar.

MEAGHAN BRYAN: I do think the vulnerable biomass does follow, but when you -- The yield per recruit, you have the exploitation times that vulnerable biomass and it's going to give you more. It's not going to give you that declining trend in biomass, because you're looking at yield.

RICHARD APPELDOORN: Yes, but the whole point of having spawning biomass per recruit is because yield per recruit doesn't --

MEAGHAN BRYAN: Account for biomass.

RICHARD APPELDOORN: Well, it doesn't account for any kind of reproduction at all and so it should be more conservative.

MEAGHAN BRYAN: Not always, but yes. I mean if you have a really productive species, that spawning biomass per recruit might not drop off. It might --

TODD GEDAMKE: If everyone else is okay with it, Meaghan, I would recommend continuing on and take a look at your F 30 during lunch and then we can go from there.

BILL ARNOLD: I just want to ask a question about that plot real quick. Your current mortality is below every one of your measures and what does that tell you about the status and potential for this fishery?

MEAGHAN BRYAN: This is one iteration and it's just saying that if you were going to use a --

BILL ARNOLD: That's what the example part is all about?

MEAGHAN BRYAN: Yes. Moving on to the synthesis of all of the model iterations, I calculated the yield per recruit and the spawning biomass per recruit for every iteration of that sensitivity analysis and so this histogram shows you the frequency of the runs that resulted in your current fishing mortality -- The ratio of your current fishing mortality rate to your F 0.1 in this particular figure.

A value greater than one is interpreted as overfishing and below one is not experiencing overfishing and so the red line is showing the cumulative probability or the cumulative percent of each of these outcomes and so for this particular reference point ratio, there is a 60 percent chance that queen snapper in

Puerto Rico is not experiencing, but on the flip side, there's a 40 percent chance that it is.

Given the growth parameters, the growth parameters that were used, natural mortality was derived using the von Bertalannfy growth parameter and the assumptions that were being made about maturity and vulnerability and so this reference point would indicate that there is some probability of queen snapper in Puerto Rico experiencing overfishing, but this varied depending upon which reference point you used or you were looking at.

RICHARD APPELDOORN: I am more concerned about the parameters that would end from your assumptions about mortality and the growth parameters. Your K values, for example, went from 0.1 to 0.7 or something like that.

MEAGHAN BRYAN: Correct.

RICHARD APPELDOORN: I doubt the high end of that and so if it was just like the lower end and K was like 0.2 or 0.3, somewhere in there, how would this change? We would have more or less? There would be less production, right?

MEAGHAN BRYAN: There would be less production and I think --

RICHARD APPELDOORN: So you would be increasing the chance of overfishing?

MEAGHAN BRYAN: You would be increasing the chance of overfishing, yes.

MICHAEL SISSENWINE: What is the median value on that?

MEAGHAN BRYAN: I do not know that off the top of my head.

RICHARD APPELDOORN: You mean the 50 percent point?

MEAGHAN BRYAN: 50 percent, yes. So it would be -- 50 percent would be about 0.75.

TODD GEDAMKE: Richard, you brought up a point which I will probably bring up numerous, numerous times during our discussions here and that is you're more concerned about the derivations of M from K. If you think about what Meaghan has done here in developing the benchmarks, in addition to developing the estimates of total mortality, they all hinge on single values of growth parameters or life history and variance.

If I had a white board here, I would throw a magic marker up and start with K and L infinity and draw that to your Z and then take that to your estimate of M and then take that M to your estimate of your benchmark and you're going to have a web of estimates that are all tied together based on your life history parameters.

RICHARD APPELDOORN: But the life history parameters don't vary randomly, although if this is going this way, this one is probably going that way and that one is probably going that way and that should drive this thing.

TODD GEDAMKE: Yes and you bring up a good point too, because one of the things is that K and L infinity are generally inversely correlated and the analysis that was done here, those are straight up -- Did you do that?

MEAGHAN BRYAN: Yes, I subset the -- I should have said that and I forget to mention that, but I subset the sensitivity results so that the parameters were negatively correlated.

TODD GEDAMKE: But don't lose sight of the fact that virtually everything we're looking at here is based on some life history invariant relationship or rule of thumb.

RICHARD APPELDOORN: Right and so actually one question I have is that you had taken that first part of the early fishery to calculate total mortality as an estimate of M and how did that compare to the ones derived from the growth parameters or is it still -- I mean it's still somewhat related to it, because you obviously are using the growth to get --

TODD GEDAMKE: I don't have the numbers off the top of my head, but it's a good question.

BARBARA KOJIS: Are these numbers that could be picked up at lunch?

MEAGHAN BRYAN: I just need to make sure that I understand. You're asking how did -- Both estimates of mortality, the first time period and the second time period, are functions of the growth parameters.

RICHARD APPELDOORN: Yes, I understand that, but they're also a function of the shape of the frequency distribution, as opposed to the other formulas, which are just plugged in and based on large-scale associations that are not connected to actual data for this species. If they were similar, that would give us some

confidence that we're actually in the ballpark.

MEAGHAN BRYAN: The rest of the slides are going to basically be the same type of figure, but with different reference points. This is for Fmax for queen snapper in Puerto Rico. There was a much lower probability of overfishing when you're looking at Fmax. It's like 15 percent and F 30 percent, again, because it was --

RICHARD APPELDOORN: Wait, why are these changing?

MEAGHAN BRYAN: Because I'm showing you the different reference points or benchmarks.

RICHARD APPELDOORN: Fmax versus F current?

MEAGHAN BRYAN: Yes and so your F current from the sensitivity runs compared to the Fmax and F 30 percent that were derived from the per recruit analyses. Again, none of the ratios go --

RICHARD APPELDOORN: What was the previous one?

MEAGHAN BRYAN: It's about a 15 percent chance if you use Fmax. Then 100 percent of the ratios when you're using F 30 percent are below and that's because F 30 percent was just so high in almost every case, compared to the F current. That's just queen snapper in Puerto Rico and do we want to move on to St. Croix?

BARBARA KOJIS: Yes.

MEAGHAN BRYAN: Okay. In St. Croix, there's, based, again, on the fishing mortality estimates from the sensitivity results and the growth parameters and the assumptions, there's a much a higher chance, when you compare this fishery to Puerto Rico, of it experiencing overfishing when you are considering the F 0.1 reference point. It's almost an 85 percent chance, given this probability curve.

Then, again, your chances are lowered as you look at different benchmarks. Fmax, there's a 30 percent chance and F 30 percent, again, all of the current fishing mortality estimates were less than that F 30 percent estimate.

Then silk snapper, the patterns are fairly similar. F 0.1 leads to a higher percent chance of overfishing and in this case, for silk snapper in St. Croix, there's a 55 percent chance, but then if you use Fmax, there's a 7 or 8 percent chance and F 30 percent, again, all of the current fishing mortality estimates

are falling below and are less than that F 30 percent.

RICHARD APPELDOORN: What was the F 0.1 level?

MEAGHAN BRYAN: Fifty-something percent. The interpretation of overfishing status varied among the reference points, obviously, and I already made this point, but I guess it's moot until I look at the F 30 percent results again, but the majority of the yield per recruit curves were asymptotic.

They were asymptotic in the resulting spawning biomass per recruit. It's kind of a leveled off as well across a wide range of fishing mortality rates, leading to really high F 30 percent estimates.

MICHAEL SISSENWINE: That statement --

MEAGHAN BRYAN: It doesn't make sense.

MICHAEL SISSENWINE: No, because asymptotic means Fmax is undefined. It's infinite.

MEAGHAN BRYAN: Maybe I shouldn't say they're asymptotic. They're relatively flat. Sorry.

MICHAEL SISSENWINE: By the way, that's why F 0.1 was invented, because for -- stocks in the North Atlantic, they're usually asymptotic and Fmax wasn't defined and so they came up with some quick way to come up with a reference point.

RICHARD APPELDOORN: Was it that or was it also because of what version of yield per recruit you're using?

MICHAEL SISSENWINE: That could also be true and then he partnered up with his economist friend at FAO and they described it as being an economically beneficial fishing concept.

RICHARD APPELDOORN: I'm sure it is.

MEAGHAN BRYAN: I was asked to derive these benchmarks and there is three possibilities that can be considered. Is it better to use these than natural mortality as a proxy? I think that's something that the SSC has to decide.

TODD GEDAMKE: I want to make sure that we all understand, I guess, the methodology behind what you've done, which I think you'll take a look at the F 30 and we'll revisit this after lunch and take a look, but what strikes me is that during the

SEDAR review workshop, we did some working sessions where we came up with pretty similar patterns for I guess the histograms of the sensitivity results, comparing F current to just a -- proxy and so I don't see much difference in terms of what we came up with using the slightly different rules of thumb than what you've got here.

MEAGHAN BRYAN: I don't think those were in the report.

TODD GEDAMKE: No, but we spent -- They're not in the final report, because -- This was asked because the reviewers, during that meeting, we spent at least half a day or three-quarters of a day and the reviewers' take on it was that we were making too many assumptions and too many relationships tied to life history parameters and also they didn't trust the work that I did very quickly in the middle of the night between the two meetings.

It's reassuring to me at least to see it, with a little more care taken to it, that you've come up with similar patterns, but I still have the same reservations with everything being tied to uncertain parameters.

MEAGHAN BRYAN: Right.

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

MEAGAN BRYAN: 0.4264 in this example yield per recruit. It's pretty close to F 0.1. It's not quite 0.5 and I would have to look and see what the range of M to F 0.1 was.

As a second component of what I did was derive these reference points and then use them to see if we could use the information to provide advice about ACLs or adjust the ACLs using some of this information in developing a harvest control rule.

Normally you have some relationship between your fishing mortality ratios to your biomass ratios and this is just an example, but you might fish at a level of fishing mortality that might be close to or a little bit less than FMSY when biomass is equal to or above fishing mortality or slightly lower than BMSY, when you consider natural mortality in there.

Then you start to ramp down your fishing mortality as biomass declines, but we don't have an abundance estimate, based on the data available right now, for assessment. At the Science Center, we were thinking about ways of using these fishing mortality reference points in the current estimates of fishing

mortality to come up with a harvest control rule that could be used, potentially, to adjust ACLs when they're being exceeded or when they're not being met for some reason.

I have a spreadsheet that I can walk through it. I don't know if it's appropriate to go through all of this right now or if this is something you want to do after lunch.

BARBARA KOJIS: It's almost lunch. How long will it take you?

MEAGHAN BRYAN: I don't know. I could walk through the --

BARBARA KOJIS: A long time?

MEAGHAN BRYAN: I don't know if it will take a long time, but people might have questions and want to walk through it more and I don't know. I guess it depends on --

GRACIELA GARCIA-MOLINER: Lunch around here is very close. It's just between the two buildings, there is a Japanese restaurant, a pizza place and a deli or something or other and then the old cafeteria in the old building. You're going to remain within the area if you want to go have lunch and come back.

BARBARA KOJIS: It's nearby and maybe if we want to keep this together and maybe we want to discuss a little bit more about what you're going to look at during lunchtime regarding the questions that everybody had. Why don't we take lunch now and then come back here at one o'clock. That gives us an hour and ten minutes. If that's okay with everybody, why don't we do that and adjourn the meeting temporarily, adjourn for lunch.

(Whereupon, the meeting recessed for lunch on June 19, 2013.)

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June 19, 2013

WEDNESDAY AFTERNOON SESSION

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The Scientific and Statistical Committee of the Caribbean Fishery Management Council reconvened at the CFMC Headquarters, San Juan, Puerto Rico, Wednesday afternoon, June 19, 2013, and was called to order at 1:00 o'clock p.m. by Chairman Barbara Kojis.

BARBARA KOJIS: Let's reconvene the meeting. Everyone is here except for Reni right now and I'm sure he will be showing up shortly. Meaghan, do you want to start?

MEAGHAN BRYAN: Sure. While we took a break, I investigated the F 30 percent and it was a case of my code doing what I was telling it instead of what I wanted it to do. This is only for -- I only had time to redo this for queen snapper in Puerto Rico, but instead of now having 100 percent of the F ratios being below one, now there's a 10 percent chance of overfishing when comparing the current fishing mortality estimates to F 30 percent.

RICHARD APPELDOORN: There was a leap there. What happened with the F 30?

MEAGHAN BRYAN: What was happening was it was always choosing the -- It was choosing like the highest F pretty much every single time and so now -- It was a conditional statement on how it was choosing F 30 percent in my code and so now I have rectified that. It was just always choosing the last one instead of choosing the one associated with SPR 30 percent.

RICHARD APPELDOORN: So it was just a code thing.

MEAGHAN BRYAN: It was, unfortunately, something that -- I don't know and I thought I had double checked a lot of this stuff and unfortunately, in this case, it was choosing the wrong thing, but I figured that out and so just ignore that 60 percent. That's just a remnant from a different figure.

MICHAEL SISSENWINE: What was the number again? It's what percentage?

MEAGHAN BRYAN: So now there's about a 10 percent probability of overfishing.

MICHAEL SISSENWINE: Overfishing at F 30 percent.

MEAGHAN BRYAN: F 30 percent, yes.

RICHARD APPELDOORN: Up from the 1.

MEAGHAN BRYAN: Yes, up from the 1. Sorry. This is misleading. That was just for a different graph I was making.

RICHARD APPELDOORN: This is Puerto Rico or St. Croix?

MEAGHAN BRYAN: This is Puerto Rico. I also looked at the relationship between natural mortality and F 0.1 and this is for queen snapper in Puerto Rico as well and that's the relationship. There's a positive correlation.

MICHAEL SISSENWINE: It's pretty close to the slope of one, which is probably also now true for F 30 percent. It all makes sense. That's the way it's supposed to be.

RICHARD APPELDOORN: Which ones define this variable here?

MEAGHAN BRYAN: This is the natural mortality that was used, that was derived, and then this is the F 0.1.

RICHARD APPELDOORN: That came from that?

MEAGHAN BRYAN: Yes, which natural mortality is coming from K.

RICHARD APPELDOORN: Generally, the lower the natural mortality, the lower the F current.

MEAGHAN BRYAN: I just need to update the report then to make those corrections and so I'll do that.

BARBARA KOJIS: You will make the corrections for both St. Croix and Puerto Rico.

MEAGHAN BRYAN: Yes, I will make the corrections for St. Croix and Puerto Rico. Before we broke for lunch or when we were about to break for lunch, I mentioned that at the Science Center we've been trying to determine whether or not we could now use these F reference points to then create or develop a harvest control rule based on fishing mortality alone and use that maybe as an adjustment factor for the ACLs.

I will show the spreadsheet, which I think will make more sense, but currently, the ACLs are derived from the observed landings, again, given the lack of the abundance estimate.

If we can assume that that ACL is equal to the OFL, essentially, and OFL is equal to FMSY times some average abundance and that our current observed -- The catch for a time period is equal to that fishing mortality rate for that time period, again times some average N, you can then solve those equations for FMSY and fishing mortality rate.

It's essentially just the inverse of the F ratio that we used to determine overfishing and we're proposing that a potential

method for adjusting ACLs would be to adjust them by this FMSY over the fishing current mortality ratio.

WALTER KEITHLY: Can you go back for a second? OFL is equal to FMSY times N as an average of landings, yet FMSY is equal to OFL times N --

RICHARD APPELDOORN: That's just --

MEAGHAN BRYAN: I meant to divide that. Sorry.

MICHAEL SISSENWINE: So your adjustment would be when FMSY is greater than F current.

MEAGHAN BRYAN: Yes, you could adjust it be --

MICHAEL SISSENWINE: It would be a -- You would increase?

MEAGHAN BRYAN: Hold on. Let me open up the --

MICHAEL SISSENWINE: This would only apply to this descending slope. You can't, by law, increase it and so it would only be applicable when it's less than one.

MEAGHAN BRYAN: Right. I will walk through this. If your F reference point, whatever it might be, say it's F 0.1, if that results in a ratio greater than one, you're not overfishing and so yes --

MICHAEL SISSENWINE: So you would multiply by one.

MEAGHAN BRYAN: You would multiply by one, because you can't increase the --

MICHAEL SISSENWINE: By law you can't.

MEAGHAN BRYAN: Okay, by law. I didn't realize that. If the ratio is less than one, then you could apply that to decrease the ACL. There's a couple of steps that would need to be taken before anything like this obviously could be implemented.

First, we would need to specify the ACL start year and end year and I wasn't sure what was used for queen snapper in Puerto Rico or in St. Croix, the years exactly, and I only have the landings from 1999 to 2011 that I got from a presentation that Bonnie gave to the council and so those are the only landings I had.

BILL ARNOLD: 1999 to 2005.

MEAGHAN BRYAN: 1999 to 2005, okay. In this example, there is two harvest control rules that you could potentially use. One, you just have a scaler, an overfishing scaler, that the SSC comes up with or if it's not overfishing, multiply it by one, or you can use this ratio between the F reference point and F current.

This would need to be updated, so that when it's greater than one, that would also equal one. In terms of one or the other, one would be more static, in terms of how much it's reduced from year to year if it's needed, whereas the other one would be based on the current estimates of fishing mortality.

TODD GEDAMKE: Can you just extend on your statement of not exceeding, by law?

MICHAEL SISSENWINE: The Magnuson Act says thou shall not overfish and overfish is basically defined as --

TODD GEDAMKE: Okay. You're saying the ratio is one.

MICHAEL SISSENWINE: Yes and if the ratio is greater than one, it means --

RICHARD APPELDOORN: You're overfishing.

MICHAEL SISSENWINE: If you multiply it times OFL, then you're overfishing, under the law.

TODD GEDAMKE: That makes sense.

MICHAEL SISSENWINE: The law says that you have to correct overfishing immediately and it's no longer a phase-in.

MEAGHAN BRYAN: In this example, I just picked out a few model iterations from the sensitivity results and the corresponding F 0.1, Fmax, and F 30 percent, which now needs to be updated for each, and calculated that ratio to determine whether or not overfishing was happening based on that ratio and then applied the two different control rules.

Basically, you can either use these model iterations -- One way to do it would be to use the model iterations and determine an average adjusted ACL and use this as a proxy of an OFL and then from there, an ABC can be developed using some sort of acceptable risk of overfishing provided by the council or the SSC.

One way I looked at this was just to look at the cumulative frequency and this is messy, because it's just so few iterations, but say it an acceptable risk of overfishing was about 30 percent and you would be somewhere between 143,000 and 148,000 pounds for your ABC.

This is just an example of some of the control rules that could be explored and, again, this is something that hasn't been fully tested at this point in terms of long-term effects and would this lead to recovery, if needed.

I do have a projection example where I just simulated an age structured population and calculated and got the F 30 percent, F 0.1, and Fmax. I carried out the yield per recruit analysis and made the adjustments based on the ratio of your F reference point to F current to how catch would change over time in the future and the corresponding abundance.

For this example, it does seem like you have declining catch or declining biomass and then when you start implementing this adjusted ACL, you do have some recovery, but this is just one example.

MICHAEL SISSENWINE: Is the adjustment in this using the ratio directly or is there a coefficient applied here?

MEAGHAN BRYAN: It's just using the ratio directly.

MICHAEL SISSENWINE: So if you're overfished, you take the current ACL and you multiply it by whatever that ratio is?

MEAGHAN BRYAN: By whatever that ratio is and so it would reduce the --

MICHAEL SISSENWINE: But isn't that the same as a harvest control rule with a constant F at FMSY, because it says that -- I mean roughly, given that the non-linear relationship between F and catch is real, but aside from that, it's basically a constant FMSY control rule, because let's say you get 100,000 from catch, 100,000 pounds or a million pounds, and your ratio is 0.5. You're going to reduce the catch by 50 percent, which presumably reduces the F to FMSY.

MEAGHAN BRYAN: Yes, you would hope, yes.

MICHAEL SISSENWINE: Except for the non-linearity in the catch equation and all that, but at relatively low Fs, that's not very

important anyway and so it's effectively a -- It's striving towards a constant FMSY strategy, which isn't a bad thing. Now, if you applied some sort of multiplier that said you reduced even faster than the ratio --

MEAGHAN BRYAN: Which is something I wanted to look into.

MICHAEL SISSENWINE: Then you get a stronger control rule to bring this stock back to whatever the desired level is.

RICHARD APPELDOORN: So what's the difference between that and instead of closing off whatever percent overrun, you close off the season that overrun plus some percent --

MICHAEL SISSENWINE: It's an extra.

MEAGHAN BRYAN: Yes, it's an extra.

RICHARD APPELDOORN: It's sort of the same thing. The difference would be how it's implemented and how the fishery would respond to it.

MEAGHAN BRYAN: Right and what I would like to do is actually do a management strategy evaluation to see how this actually performs in terms with uncertainty. Like this is -- There's no uncertainty in what I did here and so it would be good to see implementation error.

They exceed the ACL and what does that mean over time or if they're not exceeding it or maybe they're not meeting their ACL and how does the population respond and that uncertainty in the implementation error.

RICHARD APPELDOORN: If you know you're going to cut the ACL by a certain amount, the fishermen, without any other control, are going to go after that as fast as possible, leading to even more overfishing if you don't catch it in time.

MICHAEL SISSENWINE: That's part of the problem, is that --

RICHARD APPELDOORN: Unless you have monthly quotas or something like that.

MICHAEL SISSENWINE: I was really pointing out more in the context of you started your presentation motivated by a harvest control rule, where F was dependent on biomass. I think the way you've implemented this simulation and if you use the ratio directly, F is relatively insensitive to biomass.

MEAGHAN BRYAN: I was just using that as an example.

MICHAEL SISSENWINE: I know, but it's not that -- It doesn't actually act in the way we typically envision a harvest control rule.

MEAGHAN BRYAN: Exactly.

MICHAEL SISSENWINE: It still may be perfectly reasonable.

MEAGHAN BRYAN: Yes, this was just more of a -- As you said, it's more of a function of catch.

MICHAEL SISSENWINE: It's more if you did a constant F strategy.

MEAGHAN BRYAN: That's all I have for this at this point, these benchmarks and how it could be implemented to change ACLs, if needed, but these aren't -- This isn't the only harvest control rule that can be explored. As an SSC, I'm sure you could come up with other rules that could be explored. These are just two potential rules to use.

MICHAEL SISSENWINE: Part of our problem with these sort of rules is that they're based on estimates of mortality rate that are essentially the whole time series, whereas the rules would be applied if you had more current estimates and not estimates that are a result of analyzing fifteen or twenty or thirty years of data.

What you end up doing is basing your current stuff on what actually happens in the catch, which isn't actually an estimate of what the mortality rate is. That's sort of a legacy of your estimation from the assessment. It's presuming the assessment correct and not only is the assessment correct, but that you were correct to assume that some recent average catch corresponding to the F over the entire time period.

TODD GEDAMKE: I totally agree with your last point. I think the first part of that, your current fishing mortality rate is derived from the most recent time block.

MICHAEL SISSENWINE: Okay. Which is how many years?

TODD GEDAMKE: Five years? It depends on sample sizes and so your current Z is estimated for the most recent years and your M is estimated from those life history invariant relationships and so you have two sort of leaps of faith on that, that your M is

being estimated correctly and that your original average catch somewhat corresponds to an appropriate level. I think that really summarizes those three points and in some way summarizes kind of my overall impression of what you've done.

MEAGHAN BRYAN: Exactly. That's a very good summary and thank you.

RICHARD APPELDOORN: The data that went into this went up to 2010?

MEAGHAN BRYAN: For the assessment? It was 2009. I don't think we had 2010.

MICHAEL SISSENWINE: The recent estimate of F relative to FMSY is something like 2004 through 2009 or something like that, a five-year block.

MEAGHAN BRYAN: Yes.

MICHAEL SISSENWINE: We're then applying it to management procedures that have accountability measures on a one-year resolution, right? Even though the ACL applies for three years, you're treating it as if -- Well, the accountability applies every individual year.

BILL ARNOLD: The ACL doesn't apply, but the landings that are compared to the ACL are averaged over three years. The ACL is just a single standing number until it's changed.

MICHAEL SISSENWINE: In 2013, the accountability is applied based on the overage from 2012, 2011, and 2010?

BILL ARNOLD: 2010 and 2011. Those are the only data we had. It's a 2010 and 2011 average, compared against the ACL. That outcome is applied in the 2013 fishing year.

MEAGHAN BRYAN: The other point I should make too is that these F ratios are being developed for the queen snapper data, where the ACL is being developed for queen snapper and cardinal and so it's two species.

BILL ARNOLD: Yes.

MEAGHAN BRYAN: I guess that you can assume that cardinal responds similarly to fishing as queen and that's essentially what we've done.

MICHAEL SISSENWINE: The actual catch that actually -- The estimated catch that's going to come up in 2012 is a function of stock size, fishing effort, and estimation error and random variation. It's almost hard to envision that if you did a full management strategy evaluation that the outcome would be anything but a bunch of random outcomes. There's so little information.

BILL ARNOLD: It looks like cardinal is about 5 percent of the queen.

MEAGHAN BRYAN: 5 percent of the catch.

BILL ARNOLD: That's all there in Snapper Unit 2 is queen and cardinal/wenchman, because --

GRACIELA GARCIA-MOLINER: For a number of years, the misnomer --

MEAGHAN BRYAN: I thought that was all corrected now.

BILL ARNOLD: Yes, but it wasn't corrected going back. Whether it would make any difference or not, I have no idea. They just called them wenchman and this has always been a little confusing to me.

GRACIELA GARCIA-MOLINER: They are two species and the wrong name was applied to the deepwater one and the deepwater one was really not in the FMU and so now they are both in the FMU and they are corresponding units in Snapper Units 1 and 2, but still, there is a little bit of a difference in the depth that they are harvested and so most likely everything that was reported with the queen snapper really was cardinal.

BARBARA KOJIS: But it's easy to identify the two species and now people are using correct names?

GRACIELA GARCIA-MOLINER: It's not easy to identify the two species if you are harvesting them continuously, but since the harvesters of queen snapper are very targeted fishermen, most likely they are harvesting the cardinal snapper, because not usually do you see queen snapper mixed in with the silk snapper. Silk snapper fishermen mostly harvest silk snapper.

BARBARA KOJIS: Okay. I guess we go back to the questions that we looked at originally.

GRACIELA GARCIA-MOLINER: The thing is there a difference of feet in depth between the silk and the queen snapper and so if

you are going to target queen, you're not really going to waste your time and the size and the amount of harvest that they do and so the 5 percent is about --

JORGE GARCIA-SAIS: You can get juvenile queen snapper while fishing for adult silk snapper, because the juveniles tend to go up a little bit, to the 600 feet or so.

GRACIELA GARCIA-MOLINER: I think that would be a good thing -- That can be pulled out of the TIP data, for example. To find how much of the silk are harvested with the queen. All of that information is either in the length distribution interviews that they do and in the landings data.

SSC DISCUSSION OF QUEEN AND CARDINAL SNAPPER

BARBARA KOJIS: The questions then that the council would like us to answer, one of them is does the SSC think that queen and cardinal snapper are still undergoing overfishing or are overfished? Is that right?

GRACIELA GARCIA-MOLINER: To review that analysis that's been done and to make a recommendation to the council.

BARBARA KOJIS: A recommendation regarding?

GRACIELA GARCIA-MOLINER: The -- of the fishery, per se, and the methodology and the application of the methodology to other species.

RICHARD APPELDOORN: I have some questions, because this seemed to originate from a change in what's being reported. When was this rule passed that opened up the fishery to other people?

GRACIELA GARCIA-MOLINER: I don't know exactly, but --

RICHARD APPELDOORN: How about the year?

GRACIELA GARCIA-MOLINER: It must have been 2011 or 2012. Most likely it was 2012, because that's when the political change took place.

RICHARD APPELDOORN: Right and so that's after the problem that we're looking at now.

GRACIELA GARCIA-MOLINER: Unless I am mistaking the dates, but that's why I say, I could call right now and find out.

RICHARD APPELDOORN: The overage is on 2011?

BILL ARNOLD: 2010 and 2011 and 2010 was the big year. It looks like 330,000, I think.

RICHARD APPELDOORN: You would have to be way off and I don't think you are. You mentioned that in the interviewing for the limited entry exploration that this may have spurred people to probably actually report what they're -- Maybe even over report what they were catching, to try to get a bigger share. When were you doing that? When did that take place?

WALTER KEITHLY: That, I have one reference from July of 2010. I don't know if that was my first meeting or what, but it was roughly beginning in 2010. We started holding a series of workshops or a couple of workshops. I held a couple with Miguel with fishermen, introducing them to the concept of a catch share program or an IFQ.

Since that initial allocation depends on -- It generally depends on historical landings by the individual fishermen, which really gives them the incentive, potentially, to report more accurately or, as you just said, over report their landings, especially if they didn't know the dates that would be used for that initial allocation.

If they thought that 2010 and 2011 might be the years that would be included in the initial allocations, there's a very large incentive to potentially change their reporting system.

RICHARD APPELDOORN: It sounds to me like this is -- It's a reporting system problem more than anything else, but you wouldn't know that without going back to the individual records and seeing --

WALTER KEITHLY: I think what needs to be done is look at the traditional fishermen in the group, those that have an established set of landings covering back to 2001 or 2002, and see if some of those had big jumps also in 2010. I think that's what you're going to find. That's my hypothesis and, again, until somebody does some work, we won't be able to tell for certain though.

RICHARD APPELDOORN: What I think I'm seeing here is that we have two things, what's the status of the fishery and then what was the real catch rate at the time that we were setting the ACLs based on what was being recorded as the catch rate.

From the analyses, we might say, okay, there's not strong evidence that overfishing is going on, but that doesn't mean necessarily that there's room to expand that, because that expansion may just be a reporting issue and not -- We would get a more accurate estimate of what the actual catch really might be if people are now reporting better.

It's sort of you can't really answer that question without going through the kind of detailed look at the data that you're talking about.

I, for one, based on what we saw in the presentations, would be somewhat leery about raising the ACL if we're actually thinking about -- If there's actually more being harvested and is that okay.

We were talking about like a 61 percent chance that things are not, but a 40 percent chance that they are being overfished and so we're getting towards that level about where we -- If we're talking about what's the buffers that we're having in the system, we're sort of about there and the question is what's the real level of fishing that's going into that effect, the real biomass removal.

JULIE NEER: It will be interesting to see what comes out of the now species-specific report, because when we were doing the data scoping last year, several fishermen said that because of these new ACLs, they think it's going to shorten their season and so then they started underreporting their landings, species specifically, to make sure that they get to fish for the whole year, because we were showing them the preliminary data for the current year and it was quite low and then they were like, well, that's why and so we tried to explain to them, when you do that, that's not going to help you either, because looking at the curves when it comes to the assessment, suddenly the landings are dropping off and is that because the fishery is in trouble or because you're not writing it down. We tried to get it across to them that you should write down what you catch.

There are several fishermen in the USVI that made comments that they started sort of underreporting their species-specific landings because they didn't know what that was going to mean with ACLs and they were afraid they were going to get shut down.

BARBARA KOJIS: That sounds like the USVI, especially St. Croix, because they --

BILL ARNOLD: It's what they're doing.

JULIE NEER: It is what they're doing and this is not necessarily what --

MICHAEL SISSENWINE: So where does this leave us? We have an assessment and we have some additional work that looks at common reference levels for overfishing and generally concludes that overfishing was not occurring in the most recent years for which there is some information about F, which is a five-year period about five years ago.

Therefore, the catch that occurred during that period was probably reasonably close to an OFL catch and a reasonably acceptable ACL and all that sort of stuff. We're not certain that that is what the catch was. We have a reported catch and if it's the true catch, then all of that sort of holds.

We have a stock that is relatively short lived. We basically are showing most of these things are gone by age six. I think that's what the survival ratio showed, which means most of the animals that were alive during the period for which there was an assessment are dead now and so we're now hypothesizing about the size of the stock based on virtually no information from the assessment and we're comparing it to a catch that we estimated about five years ago that may or may not have been right catch and we're comparing it to a catch today where there's reason to believe that the nature of the errors in the catch have changed.

I don't know whether this stuff is better or worse, but it's different and so my conclusion, based on all of that, is the outcome from the most recent years of the fishery are uninformative in terms of what has happened and the best we have is an assessment that's about five years out of data, or whatever it is, in terms of the data that went into it. Not when it was done, but the data that went into it.

That said at least at that time, we probably weren't overfishing, but as Richard said, we probably weren't all that far from it, such that one wouldn't want to just say do whatever you want.

I don't think there's any information that's any basis for saying much more than that about what's happened in the last five years, other than reported catches are higher than reported catches were five years ago, but we don't know why and we don't have any real information about what the stock has done in five years.

Given that it only lives about five or six years, it's reasonable to assume that it changed substantially during that period of time.

RICHARD APPELDOORN: How are you getting the longevity?

MICHAEL SISSENWINE: I was looking at those survival rates that showed almost everything disappeared by about age six.

MEAGHAN BRYAN: This example. It did change, depending upon --

MICHAEL SISSENWINE: If that isn't representative, then my statement has to be somewhat modified, but clearly it's not a long-lived species.

MEAGHAN BRYAN: It's a function of M and so it depends on what you're using in the assessment.

RICHARD APPELDOORN: What M were you using?

MEAGHAN BRYAN: I was just giving you an -- I don't exactly know.

RICHARD APPELDOORN: This was unofficial?

MEAGHAN BRYAN: This was using the life history parameters of queen, but in terms of the sensitivity runs, this changed with changes in natural mortality.

RICHARD APPELDOORN: I was just wondering what this particular one was.

MEAGHAN BRYAN: I don't remember exactly.

MICHAEL SISSENWINE: The assessment of the five-year-old information may not be meaningless, but there's substantial scope that things could have changed for a relatively short-lived species compared to dusky shark, which I happen to be looking at on my screen for some reason.

GRACIELA GARCIA-MOLINER: I did get an official answer for your question. The fishing regulations did change in 2010, but the number of fishermen into the commercial fishery increased in 2012.

BILL ARNOLD: What might Daniel think happened in 2010 and 2011?

TODD GEDAMKE: I think this is going to be a recurring problem.

It has the same flavor as some of the other issues we've dealt with in the past, yet the steps to improve the process resulted in much more outreach and education to the fishing communities.

Our presence alone has provided them with some behavioral changes in the way they're acting or operating and the new forms that are on the ground are also going to change what's coming in the door.

I agree with Mike and Richard that the most recent years you have reporting changes. You have differences in those years versus the previous years and what that means, I am still unclear right now, but the number one thing that I think has us -- The easiest recommendation from us to come out of this is just simply that those studies that Walter -- We've all discussed before that validation of what is coming in, the validation of landings, that needs to be a solid recommendation.

I know that there are people at the Center right now that are pushing forward that idea and really, that's the number one thing on the list.

Those changes in reporting are really problematic and I have a hard time looking at what we have for -- We ended up with average catch by default in the past, because of no other options.

Now we have average catch over the past couple of years which is very different that may or may not be a result of changes in fishing practices and I'm not sure where to go with it beyond saying there's still significant uncertainty, if not more uncertainty, in what those numbers mean in relation to the actual landings.

JORGE GARCIA-SAIS: An analysis of the most recent data is nowhere possible? Can this committee request that the most recent information be made available to see if there is any other inference that we could --

GRACIELA GARCIA-MOLINER: This is it.

RICHARD APPELDOORN: No, this is --

MEAGHAN BRYAN: I didn't redo the length analysis to include all of the most recent data, no.

JORGE GARCIA-SAIS: Especially the length data.

MEAGHAN BRYAN: You still have the problems with no having well defined age and growth relationships, which are the underpinning of the analysis, really.

TODD GEDAMKE: If we think about this question, as Mike sort of phrased it and I tried to re-summarize it, you have a methodology that's looking at developing some sort of scaler. That scaler, we can discuss the pros and cons and merits and procedures that are involved in that. That's one aspect.

That scaler then has to be multiplied by something and that something is what we're looking at and discussing as reported landings right now, which we know have problems.

If we keep those two somewhat separate, I think it might guide the discussion, at least a little bit, and I don't think anyone here would say that they're totally confident that what is in there as landings is directly related to it, to the actual landings. There is significant uncertainty in that.

Then, as Meaghan was just pointing out, much of the numbers, the results that are included in the analysis she has presented, are very much tied to -- Very much, wholly, tied to the life history parameters, which we still have significant uncertainty about also.

MICHAEL SISSENWINE: Even with our uncertainty about the life history parameters, changes in what F might be relative to some reference level would probably be informed by new length frequency data and so that's useful, but if the life history parameters are changing as well in any substantial way, then the whole thing is out the window, but I guess that's true of all assessments.

TODD GEDAMKE: One of the things that I noticed in what Meaghan presented is the same issue that we ran into during the review, when we started exploring this type of approach, which is if you look at St. Croix queen, you have a 99 or 98 percent chance that overfishing is occurring, whereas Puerto Rico, you have a much, much lower chance.

In our discussions with the fishermen, apparently there's very few people fishing in St. Croix for queen snapper. We couldn't find anyone that was willing to say that there are actually people going out there and doing deep drops, yet we had what looks to be -- If you look at that histogram, that distribution, you have solid evidence that overfishing is occurring and I would say that very loosely, but you have solid evidence that

overfishing is occurring in St. Croix.

You then take a look at the Puerto Rico and you have a totally different picture, although we know there are people very substantially targeting that species in that location and so what we know, versus what was coming out of some of analyses, were in conflict with each other and we couldn't explain it.

We couldn't explain it at the review meeting and that's where we more or less stopped our approach. For all I know, it's possible that you have extremely different growth patterns on two different regions. You could have different K or you could have different L infinity. I don't know.

RICHARD APPELDOORN: You could, because St. Croix is a narrow shelf and that population probably has a lot of island input into the mixing supply, whereas going out toward Pichincha, they're basically -- There's upwelling coming through the Mona Channel, but that's not the same thing as having stuff delivered from a high island.

TODD GEDAMKE: Right and so I mean let's hope and push for step one, which is a U.S. Caribbean-derived age/growth relationship, and then those explorations into even smaller scalers, but right now, we're borrowing from Barbados or Jamaica or places that may or may not be applicable here.

Now, as I say that, Meaghan has really looked at sort of every combination of life history parameters and so I don't want to diminish the fact that that was taken into account in the analysis, but, to me, it just adds an amount of uncertainty to what we can do with those results.

RICHARD APPELDOORN: Graciela, you mentioned that the lab is gearing up to do the otolith work and do you know if queen snapper is a priority species? I know it's one of the species, but is it a priority species?

GRACIELA GARCIA-MOLINER: One thing that the SSC can do is to recommend to the council that if it's not, since we do have the collection of the otoliths already at the lab and their associated length and everything else, to set aside some money to one of the Science Centers that does aging and just send them all the otoliths or to actually contract with a fisheries research lab to do specific otolith work for the deepwater snappers. I think that that's really a missing link.

RICHARD APPELDOORN: From where we are now, I would guess you

probably need at least year, or maybe two, to do that work, depending on who is doing it.

GRACIELA GARCIA-MOLINER: Unless you contract out and then it can be done in a much shorter time.

BILL ARNOLD: The samples are in pounds, right?

GRACIELA GARCIA-MOLINER: Yes.

JULIE NEER: How old are the samples?

GRACIELA GARCIA-MOLINER: For the same period of time that the report came out in 2000 or 2002 or 2003 or 2004.

JULIE NEER: Potentially, those fish, again, are all -- If you're worried about getting updated data and having current representation of what's going on, you would want to try to get new samples.

RICHARD APPELDOORN: I am willing to accept that within some reason the rate of growth isn't changing. The data that we're looking at in terms of how fishing mortality or total mortality is changing seems to show that there was some drop early on, but it's been fairly constant since that time, which means the population structure should have been stable and so barring long-term climatic influences, the growth rates should be.

TODD GEDAMKE: We've done this discussion numerous times on the SSC and we've done this as part of SEDAR and can we just all agree that the age and growth and getting those samples done is a top priority? It's part of every meeting that we've been in.

RICHARD APPELDOORN: This is one of the more important commercial species.

BARBARA KOJIS: Any species that is going to have a SEDAR done on it, it sounds like it's a waste of time to do the SEDAR unless you have age and growth, because you've had all these SEDARs and that is one of the things and so instead of spending the money on the SEDARs, spend the money getting the fish samples and having the lab analyze them.

The other aspect of it is my understanding, because I collected otoliths that somebody analyzed for mutton snapper, is the otoliths still need to be validated. Those rings need to be validated.

There’s a number of ways of doing it, but you’ve got to have somebody with knowledge and I don’t know if the lab -- If the Puerto Rico lab, at the time of learning how to cut and count the rings, also learned how to validate and without going through the process of --

RICHARD APPELDOORN: That’s why I said two years, because if they were doing the study, they would probably have to -- If you sent them to like Panama or someplace like that, they could probably process them fairly quickly.

JULIE NEER: Validation is a long-term thing and it’s not something that’s done quickly unless -- They can’t even do a radiometric age validation on these things if they’re short-lived and so validation is like a ten or fifteen-year endeavor, essentially, but regardless of that.

BARBARA KOJIS: My understanding, from a paper that I read part of, but --

TODD GEDAMKE: Incremental analysis and you can do it in a year.

BILL ARNOLD: Assuming you have a bunch of the samples in hand. That’s what you need.

GRACIELA GARCIA-MOLINER: We know we have problems, because we’ve already started talking to the people who use aging and with the queen snapper specifically, it’s the size of the otolith and they are difficult to age. We are working towards getting a quote and everything else. We would much rather have the development of the capability to do that here.

BARBARA KOJIS: But they need to have that full capability or having somebody overseeing it and maybe somebody else does the validation, if that’s too complicated, but you really need to do that whole ball of wax and do that before we start getting into a lot of these complicated analyses and so on that are contingent on age and growth.

JORGE GARCIA-SAIS: Barbara, I think that was one of the main priorities on the research priority document that was prepared a couple of months ago and so it’s all in line. It’s just waiting to be done.

BARBARA KOJIS: Yes. Age and growth and then listing the species that we really have to have this done for, so at least those are the ones that are focused on, because the lab over there -- I remember Rick Nemeth was talking about setting up an

age and growth lab at the University of the Virgin Islands, but it's something where I think looking at that is the council and SSC saying this and then the council coming to him and saying, look, this is really important. They have a bunch of masters students that are going on and they have technical staff that could be trained.

BILL ARNOLD: I would expect when it comes to validating this deepwater stable environment species that it's going to be a little tricky, because you don't have those distinct seasonal signals. Is that reasonable, Reni? Are you getting differences in water mass characteristics over the year at 900 or 1,500 feet?

JORGE GARCIA-SAIS: Not that I would expect. That's well below the -- It's probably a very stable water mass. It might have variations, but I don't know. I don't know much about that water mass. We're talking about 1,200 feet for the queen, around there.

BARBARA KOJIS: Do they have seasonal reproduction?

BILL ARNOLD: That's what I'm thinking, because sometimes you've got two spawning events in a year and other times you have one and you have to be very careful of that and this could get tricky with deepwater species.

BARBARA KOJIS: Sometimes it's year-round, but if you've got really a peak spawning event that happens once a year or even if it's twice a year and six months apart or something like that, you might be able to still pull out information. Those rings might mean something.

BILL ARNOLD: I am sure they mean something.

BARBARA KOJIS: If they're there.

JORGE GARCIA-SAIS: Do we have any information of when the queen snapper spawns for the first time and what's the age at maturity?

BARBARA KOJIS: We must, because we've got the assumption that they're all mature when they're fully vulnerable.

TODD GEDAMKE: My recommendation is going to stand that we recommend an investigation on life history of the species. We're not going to solve it.

JORGE GARCIA-SAIS: We're going to be guessing and guessing and guessing.

TODD GEDAMKE: What's the age and growth and how do we validate? Have the age and growth done by someone that that's what they do and the maturity done by someone that that's what they do. Barbara's recommendation I think was the one most related, which is that if the SSC felt the need to recommend that age and growth relationships and/or maturity information were available for any species to go into a SEDAR process, that seems, to me, to be a process recommendation and that would be relevant to what our job is.

GRACIELA GARCIA-MOLINER: I have requested an inventory of the species for which otoliths were collected at the Fisheries Research Lab and so we should have the distribution over the period of time of whatever year it was collected and the reports on the length and maturity should be available for a couple of species. I am trying to get together what they have at the lab.

BARBARA KOJIS: They would have reported on these things.

GRACIELA GARCIA-MOLINER: They do have the reports on them, but they do the length at maturity and what month of the year they spawn and things like that, but they don't go into age and they don't go into -- They do have, probably, either the samples -- I am trying to figure out how many otoliths of what species they have available.

BARBARA KOJIS: Yes, because that's really important, because otherwise, they have to also go back and collect more, if they are going to validate. If they have collected them every month or every two months or something, so they've got seasonality. All of that is very important.

GRACIELA GARCIA-MOLINER: We have requested that.

JORGE GARCIA-SAIS: Barbara, may I ask Meaghan to explain -- This is my ignorance in this, but the survivorship information, I find it very interesting and I really don't know where the data comes from. Where do you derive that curve? How do you do that?

It's the only thing that has told me anything about the life history of that fish and I can start with that, but I don't know where the data comes from.

MEAGHAN BRYAN: It's just the fish that survive from one age to

another due to natural causes as well as fishing mortality. That's where it is coming from. That relationship is driven by natural mortality and fishing mortality.

JORGE GARCIA-SAIS: Okay, but what is the main source of the data? The catch?

MEAGHAN BRYAN: For natural mortality, that was derived using basically the von Bertalannfy growth parameter and then fishing mortality -- In terms of this yield per recruit, it was -- I looked at survivorship across a number of hypotheses of what fishing mortality would be and so that's modeled.

JORGE GARCIA-SAIS: So we don't really know. We don't really know for sure any biological inference from the fish. Just it all depends on what you put in the model.

MEAGHAN BRYAN: What your assumption is of that von Bertalannfy growth coefficient.

JORGE GARCIA-SAIS: That's terrible and I don't like it. It's the only thing we have and we have to deal with that, but what I am here always trying to justify -- Trying to justify a decision that affects people based on incomplete information and we are not even sure what is it that it is and then we come here and come out with a decision tool to shorten the fisheries of a stock and from that, a lot of people live from and I have a hard time swallowing that.

What we're saying here is that it could be overfished or it could not be and we don't know, but the ACL was exceeded and we need to do something about it and what is it that we're going to do.

TODD GEDAMKE: The question is not what we're going to do. That's all in law. The whole structure is already in place. The question now, for us, is whether we revisit the fundamental basis, the OFL and the ABC and the ACL, based on this new information.

BARBARA KOJIS: We would only do the ABC and OFL.

JORGE GARCIA-SAIS: But without the data that we're talking about, I don't see that we're going to get very far.

TODD GEDAMKE: I understand and I know your concern about shortening the season or even having that -- You weren't a big fan of having that initial buffer.

JORGE GARCIA-SAIS: You know I wasn't. I was kind of anticipating this kind of thing, you know?

TODD GEDAMKE: I think that the way the structure has been set up, that's the position that we're in. That's the way the process has been set up and especially the precautionary -- The data-poor situations, that's the way the process has moved forward.

Going the other direction now, I think that we're in a position now of having to have some scientific evidence, support, or confidence in a new approach or new confidence in our landings estimates for us to really revisit those numbers and I'm not sure I guess where to go from there.

RICHARD APPELDOORN: We've had overages for two years.

BILL ARNOLD: We had overages for two years and we took the average of those two years to determine where we were relative to the ACL, but it is true that both 2010 and 2011 were over.

RICHARD APPELDOORN: In theory, you're talking on average that we doubled the catch. If everything was constant, we were doubling the fishing mortality?

BARBARA KOJIS: Yes.

RICHARD APPELDOORN: Wouldn't that show up in the size frequency, a change of that magnitude?

TODD GEDAMKE: It should.

MICHAEL SISSENWINE: But nobody has looked at the size frequencies.

RICHARD APPELDOORN: One of our recommendations is that ought to be looked at and the other one is that the data should be looked at relative to the concerns that we have about the reporting issues. One of those two should point to where the problem is.

JORGE GARCIA-SAIS: Can we get a look at that length data? Is it available or is it non-existent?

GRACIELA GARCIA-MOLINER: The landings data for 2010 was 308,000.

RICHARD APPELDOORN: It's the length frequency data.

BARBARA KOJIS: You are looking at an ACL of 145,000.

MEAGHAN BRYAN: This is from a presentation that I pulled it from.

BARBARA KOJIS: That's based on 1999 to 2005 and every year from 2007, the ACL has been exceeded, but the AMs only apply to 2010 and 2011.

JORGE GARCIA-SAIS: Only two or three years of all that data has been below that ACL. The entire dataset is -- It's that we went too low.

TODD GEDAMKE: We have to use all of the years of information. There are people very strongly arguing to go back into the early 1980s and to use those numbers to come up with an average catch.

BARBARA KOJIS: The other aspect of it is the average catch is the ABC and the 145,000 is the ACL, which is 15 percent less than the ABC.

BILL ARNOLD: It's 1999 to 2005.

JORGE GARCIA-SAIS: For me, it's not surprising that we're exceeding the ACL and it's going to happen every single year. Come on. If it doesn't happen, it's because they are not reporting it. It's going to happen. Look at that data. It's almost -- The majority of that catch, of those landings, are above our ACL.

BILL ARNOLD: Reni, to ask a philosophical question, what alternative would you take?

JORGE GARCIA-SAIS: You know what, I would have probably averaged double and go -- Perhaps limit just at the MSY that we have.

BILL ARNOLD: Something I've brought up these meetings before in these SSC meetings is the SSC might want to provide some guidance as to the --

JORGE GARCIA-SAIS: Bill, the only thing we have was that the length frequency data show that the fishery was doing pretty good, because we are seeing big specimens in the recent catches and everything looked pretty good, but when we set the ACL so low, it was -- I mean it was completely predictable that we would have this problem and that's why I raised hell in those

earlier meetings.

BILL ARNOLD: What if our ACL turned out to be high? Would they have fished harder to meet the ACL?

JORGE GARCIA-SAIS: What was that?

BILL ARNOLD: What if instead of our ACL being low, it would have been high? Would they have fished harder to meet it?

JORGE GARCIA-SAIS: I don't think so. I don't think they are measuring that, Bill. I don't think they are going down fishing and looking at our charts. They don't give a shit about our ACLs. They are fishing when they need money and that's what they do.

They fish the average number of days that the sea is good to fish and that's what they go with. They don't go out and say we're going to exceed our ACL. There are good days of fishing and they go at it and they find new spots and they get new areas to fish and when they go out, just look at the history. The history is what you have to look at. The history tells you that, look, that 145,000, very seldom do they go below that, historically, during the last fifteen years.

I don't know what you were thinking about, that all of a sudden they were going to reduce their effort to adjust to an ACL. That's the only method of fishing they have. If you close their spawning aggregation sites or the coral reef fisheries, you have to think about -- You have to put yourself in the perspective of the fishermen that are going towards these stocks.

They are not -- If you are closing down in the shallow areas, be sure that they are going to have alternative fishing sites. They opted for offshore sites, both for mahi-mahi, pelagics, and then there's a group of fishermen on the west coast that have gone forward towards offshore waters and these other seamounts in Mona Passage and they are exploring this resource.

Don't expect in the middle of the development of the fishery for the landings to decline towards an ACL which was really unfair and unreasonable to think that on a developing fishery that the landings would decline. I don't know. It never made sense to me and then when the data came that we saw there is no evidence towards overfishing and in fact, what we are seeing is a very tendency of a very healthy fishery, developing fishery, because of the length frequency data, that's what it says.

Then we come up with an ACL that I said was very, very weak. It was very small and very reduced and very tight, very tight, tighter than -- If you look at the landings data, you will see that our ACL goes below the vast majority of those years and why would we think that now the fishery would decline toward meeting our ACL?

BILL ARNOLD: Reni, everybody can see that, but --

MICHAEL SISSENWINE: Can we -- I was probably in on the discussion, but I can't remember. Why was the ACL based on the entire time period and not the time period that corresponds to the most recent estimate of F or relative to F?

BARBARA KOJIS: The ABC is based on 1999 to 2005, correct?

BILL ARNOLD: Yes.

MICHAEL SISSENWINE: That's the period for which we determined that relative fishing mortality is not -- It's not being overfished.

BILL ARNOLD: It was stable. I think that's the description that was used. This is a time period when landings were stable and the fishery seemed to be functioning at a stable level.

TODD GEDAMKE: "Stable" was the key word.

MICHAEL SISSENWINE: Okay, but we now have an assessment that says during some time period ending in 2009, and going back about five years, overfishing was not occurring and is that correct?

MEAGHAN BRYAN: There was an increase in mortality. The model predicted an increase in mortality, but it was still below one.

MICHAEL SISSENWINE: The average catch during that period would be a minimum level of OFL during that period. I don't know whether it still works today, because I don't know what the stock has done, but if we had a period from 2004 to 2009, where overfishing was not occurring, then the average catch during that period should be a minimum estimate of OFL. I don't know what the number is or whether it helps us or not, but that's logically what I interpret from the assessment.

BARBARA KOJIS: You would be saying what information we need is when do you start in your analysis? What years did your analysis take into account?

MICHAEL SISSENWINE: I'm only interested in the last block, on which you concluded that overfishing is not occurring, which is about a five-year period ending in 2009.

BARBARA KOJIS: But we need to know what block she used.

MICHAEL SISSENWINE: Sure.

BILL ARNOLD: I would say this, you guys, just as a reminder. When we set these ACLs, we were under a pretty intense timeline, congressionally mandated. The SSC, as a leader of Caribbean fisheries management, has an opportunity to reassess and reset those ACLs. I think you have to take advantage of that opportunity.

MICHAEL SISSENWINE: That's -- right now, where we have some basis for concluding something different from what we said before. I don't know what the number is.

BILL ARNOLD: Not just for queen, but everything is going to need this sooner rather than later, especially these 2010 species, as I call them, because their most recent data, 2005, is getting pretty darned old.

The other, 2011, species, we used 1998 or 1999 data and at least it's a little newer and a little more reflective of reality, but I'm a big proponent of let's get these ACLs reconsidered, if we can.

BARBARA KOJIS: Right and this methodology, it looks like this methodology could be used to determine if species are overfished or undergoing overfishing and if they're not, then we could extend the period of time for determining OFL, the landings period of time of landings for determining OFL.

JULIE NEER: Was the ABC control rule put forward by this committee or was there not one ever put into place through the council and officially accepted in a plan through the council? Like in the Gulf and the South Atlantic, they both have an ABC control rule that was developed by their SSCs to come up with their ABC values and their recommendations, guiding principles.

That went into plan amendments and FMPs and had been passed and did that ever happen down here or no? If that has happened, then you can't just one off change things without going through an amendment. If it hasn't happened, then you have a whole lot more flexibility and I'm just wondering, from a procedural

standpoint, how this would work.

GRACIELA GARCIA-MOLINER: At the time when the ACLs were being set, we had not been looking at the length frequency information. We were just looking at the catch data.

JULIE NEER: I understand what data was used.

GRACIELA GARCIA-MOLINER: It was the ORCS methodology that was used for 2011 for Puerto Rico.

TODD GEDAMKE: This is the exact approach that we tried for three years to inform the OFL for our own process. The conclusion that we drew then was that we had -- Silk was one of the main examples that we tried working with and then we found out that management had changed and reporting had changed and therefore, we no longer trusted using a scaler based on those values.

What we're doing now is we're coming full circle back to where we started the process and trying to revisit it and what we did -- I'm not sure a full plan was drawn up and I'm not procedurally sure how that came through, but yes, the SSC deliberated for at least three or four meetings.

JULIE NEER: I know you had extensive discussions about it and that was my question, was that if it never actually -- Essentially, your default, we'll call it, ABC control rule was that if it had this overfishing label and not on the official list, but what they came out with, then it got a 15 percent reduction from average landings and if it was okay, in quotes, we'll say that it was a 10 percent reduction between OFL and ABC and your determiner of OFL was this average landings approach.

BARBARA KOJIS: The SSC didn't determine the 10 percent and the 15 percent. The SSC only provided the ABC and the ABC was still average landings.

JULIE NEER: The ABC was straight average landings and then the council, to go from ABC to ACL, did the 10 to 15 percent reductions and that was the management decision and not science?

BILL ARNOLD: That's right and so actually, how it worked was the average landings -- The MSY proxy was set as the average landings and then OFL and ABC were set equal to the MSY proxy.

JULIE NEER: Then it sounds like you guys just provided an ABC value, essentially.

BARBARA KOJIS: That's right.

JULIE NEER: Then the reductions came on the council half in terms of the ACL.

BARBARA KOJIS: That's right.

JULIE NEER: Can't the council just change their ACL? If the science doesn't change their ABC and the ACL is supposed to account for the management uncertainty between the ABC and the ACL, can't the council just change the ACL?

BILL ARNOLD: The council could get rid of those reductions and bring the ACL up to the ABC. They could do that on Monday. I don't think they're going to, but they could.

BARBARA KOJIS: The other aspect of this, is if we say that this species that was previously considered overfished or undergoing overfishing is no longer considered that, then the council can reconsider at least a little reduction, but I would say it's going to be the same as all the other species that aren't undergoing overfishing or are overfished, but that's just a minor -- Like Bill pointed out, it's maybe 3,000 pounds or something like that. That's not a major increase.

The other aspect of it is we've looked at whether or not overfishing is occurring and if we concur that there's no overfishing occurring for a certain number of years and this is more years now than we previously had, can we increase the ABC if we know what those years are?

If this goes from 1999, your analysis for overfishing -- Well, maybe you can say your previous analysis -- The analysis includes these numbers of years that there was no overfishing occurring and maybe the average catch now increases and then the ABC will go up and then the ACL will --

BILL ARNOLD: Two points I want to make and the first is in regard to what Julie was saying. The council could recommend that the reduction factors be changed. That's still going to have to go through secretarial approval and I think we would have a lot of trouble.

We might be able to argue that we could go from 15 percent to 10 percent, but setting the ACL equal to the ABC is not going to go over real well.

RICHARD APPELDOORN: Except for the fact that we actually have an assessment that seems to indicate a problem, but for most species, we don't have that.

JULIE NEER: That's exactly what was accepted for both the South Atlantic and the Gulf.

BILL ARNOLD: That ABC and ACL are equal or was the ABC reduced?

JULIE NEER: Yes, the OFL and the ABC was reduced and then ABC to ACL was --

BILL ARNOLD: I think really what it comes down to is they don't want their ACL equaling their OFL. The second thing is that "stable" word comes back into play. It wasn't just five or six years of landings, but it was five or six years of stable landings and when you look at those landings and you're kind of bouncing along averaging probably two-hundred-grand and then you hit that three-hundred-and-something-grand, you have to ask if that's stable and it would be legitimately included in that time sequence.

It's not a question for me to answer, but I think that would be a question that would have to be addressed. I am all for anything. You guys are the experts on this.

JORGE GARCIA-SAIS: When you consider that in part, that 300,000 mark could be very well associated with increased reporting.

BILL ARNOLD: It could be associated with intense overfishing as well. The question is do we know what it's associated with?

JORGE GARCIA-SAIS: That is the problem, that we don't know.

BILL ARNOLD: This fishery could handle five-hundred-thousand-grand a year for all we know. We don't really know. We may be way below what this thing could support and we could be way above what it can support.

MICHAEL SISSENWINE: That's basically why people will tell you that output controls, which are ACLs, essentially are not a useful tool to manage fisheries without a current assessment, which applies throughout the Caribbean.

BILL ARNOLD: Mike, is that applied everywhere except in Alaska, where they're getting an assessment for every species every year or maybe more, versus we get one --

MICHAEL SISSENWINE: I didn't say every year, but more frequently than five years out of date.

BILL ARNOLD: I know, but it works in Alaska because they're getting assessments all the time.

MICHAEL SISSENWINE: It probably should work in New England, because there's enough data to do it even if it's not done, but it doesn't work here. It doesn't work here.

BILL ARNOLD: Unfortunately, it's, I repeat, a congressional mandate.

MICHAEL SISSENWINE: No, it's an agency policy. It's in the National Standard 1 Guidelines. The law mentions ACL once in lower case. It doesn't have some section on ACLs the way it does on rebuilding and so forth. It's one sentence that has the words "annual catch limits" in lower case with a lot of modifiers and so forth that have been interpreted as required under all circumstances.

There's even a section in the Guidelines that talks about circumstances under which you may not do it and those are listed as salmon, for some reason, and a couple of other bizarre things, but it doesn't address the potential of doing something else where you don't have data.

BARBARA KOJIS: Mike, with your suggestion, if we go back to the landings, how do we go forward with that?

MICHAEL SISSENWINE: I still don't know what period of time the final block is under which we base our conclusion that overfishing is not occurring.

JORGE GARCIA-SAIS: You know what, there's a point there in that data that caught my attention, because it was -- It looked like an outlier and it was 79,000 pounds or so. I wonder if we actually put that number into consideration, because that would tend to reduce the average annual catch substantially and it doesn't look stable to me. Can you put up that little table you had?

BARBARA KOJIS: Do you need some time to go check this out?

MEAGHAN BRYAN: I am looking at the report from SEDAR-26 to find the years. We did have to 2011, but actually, I don't know if 2011 was complete though. This change is predicted in about 1996 and so you see there's a decline in mean length and so an

increase in total mortality. That decline starts in 1996 and it kind of levels out in 2000.

BARBARA KOJIS: So from 1999 to 2010 or 2011 is really the period of time?

MEAGHAN BRYAN: I need to find the exact years. The figure showed 2008 to 2011, but I just don't know if 2011 and 2010 were complete, in terms of the length frequencies. 2009, 2010, and 2011, we didn't have any length frequency samples and so 2008 is the last year we had length frequency samples.

MICHAEL SISSENWINE: We're concluding that from approximately 1999 to 2009 --

BARBARA KOJIS: 2008. Is that what you're saying, 2008?

MICHAEL SISSENWINE: Okay, 2008, but the fishing mortality was probably less than FMSY or there's no basis to conclude it was more. I would argue that whatever the catch was in that period is a minimum estimate of OFL.

BARBARA KOJIS: Can you just pull that out?

MICHAEL SISSENWINE: I don't know if this can be any better than what's the ACL now, but I mean that just so logically fits with the assessment.

MEAGHAN BRYAN: You want to see the average catch?

BARBARA KOJIS: Average to 2008, 1999 to 2008.

MICHAEL SISSENWINE: I said 1999 because Barbara said it and it does look like that's sort of where it --

MEAGHAN BRYAN: That decline kind of leveled out in 1999 and 2000. That's just the average.

BARBARA KOJIS: Except 1999 is kind of a weird number and so let's just do 2000. Say 1999 is an outlier and we'll do 2000 to 2008.

JULIE NEER: How did you come up with your 1999 to 2005 landings initially, like that time block? Was it for all species or did you go through species-specific?

GRACIELA GARCIA-MOLINER: It was for all species.

JULIE NEER: All species use the same and so basically if you do this, you're advocating making a change for all species, which is okay. I am just --

MICHAEL SISSENWINE: Just the species for which we have an assessment that says over some period of time --

JULIE NEER: I am okay. I am just trying to wrap my head around it.

BARBARA KOJIS: It's got 2000 to 2008 and so it's just a little bit higher. It's 188. It's a little bit more, because it's 174. This is the OFL and I think it was 175 or 174 before, wasn't it? You are adding another 10,000 or 12,000 pounds.

MICHAEL SISSENWINE: I guess you could also argue that since it's presumably a minimum estimate of OFL that maybe you don't have to reduce it by very much for a hedge against uncertainty, but it's still a problem. You still have recent catches that are well --

JORGE GARCIA-SAIS: Why would we include that 1999 data?

JULIE NEER: She took it out.

BARBARA KOJIS: That's why I asked her to just click on that, so you could see what it was for the new one.

TODD GEDAMKE: Just because I feel like I have to say it out loud, I think what we're looking at right now is what I was advocating initially, looking at using the most recent years and using the years that compare to what we would be assessing for the ACLs.

If we compare transcripts from two years ago to what I'm about to say now, you would see something very different, but I feel very strange, in some way, that because we've got an overage we're now actually going back and looking at changing the years to somehow change the fact that we've got an overage to somehow change the fact that we've got accountability measures coming in.

The fishermen that I've worked with here know that I will be straight up with them and I hate to argue any other way on this, but it feels strange to me that we're here because of an overage revisiting something that we've revisited for many, many months and many, many meetings to take away again -- I guess my only thought on this is that I would be weary of being reactive to

the process.

If there is a reason to revisit these -- I think as Mike very well said, if we're going to be using length frequency information for the most recent years, maybe a broad-based rule to take a look at those average years versus what we're going to be assessing may be most appropriate.

I have a hard time stomaching hand-picking out a single species and modifying the years for those species to accommodate the fact that we've gone over.

MICHAEL SISSENWINE: Why didn't we do it this way? We essentially, as I vaguely recall, we went to this ORCS method because we didn't have the individual assessments or something like that.

TODD GEDAMKE: I could call up plots on this, but if people remember what happened was I believe 2007, if I'm right, or 2008, for almost all species in Puerto Rico, you had an average landings that looked stable and then you had this reduction.

I think there was some -- There was a change in behavior, a change in reporting, in the two years prior to what we're looking at in 2009 and do you remember that?

GRACIELA GARCIA-MOLINER: 2005 was the time when the SFA came in and there was large changes.

MICHAEL SISSENWINE: We didn't believe the recent catches.

TODD GEDAMKE: The recent catches had the same exact issue that we're looking at right now, which is now we've got people that we're surmising and coming up with ideas as to why people may be reporting more information, while three years ago we were doing the exact opposite.

There was this sudden drop in all the reported landings and so we didn't believe those few years and this was -- Once again, I think Julie made a good point. We looked at the whole complex. We looked at the whole shelf and said these are the years we're going to use and across the board, there was behavioral change and so we didn't believe, basically, those last two years.

MICHAEL SISSENWINE: So it wasn't the assessment that said overfishing wasn't occurring. It's that we didn't have any catch to associate to that.

JULIE NEER: Initially for these unassessed species, the other two councils in the Southeast did very similar approaches, where they came up with a block of time for their catch-only species and came up with an average landings approach, initially. In that respect, how each individual SSC chose the years that they used, but that word, that "stable" catch that --

MICHAEL SISSENWINE: Of course, you know if you take some period and take average landings, and you think that period was okay, and then you reduce it for all these uncertainties, then if everything is okay, you are still guaranteed to put in -- You would expect accountability measures to occur more than half the time, which violates the National Standard Guidelines which says they ought to only occur one-quarter of the time. Essentially, the system can't work.

JULIE NEER: Yes, this is an assumption that 50 percent of the time you're going to be over, basically.

MICHAEL SISSENWINE: So it's really pretty much nonsense.

JULIE NEER: In some of the other councils, and I can't remember if it's the Gulf or South Atlantic, but one of them said for these catch-only species -- They said OFL is undefined, because they weren't legally required to do it and then they came up with their ABC.

MICHAEL SISSENWINE: I think that's what we did as well, but it doesn't really help the problem.

JULIE NEER: Then the council then set ACL equal to ABC, even though the was no reduction between OFL and ABC, because we don't know what OFL is. OFL was unknown and so there was no reduction, but they were still allowed to set ABC equal to ACL, even with no reduction between OFL and ABC. It has been done. If you can get away with it here, I don't know.

WALTER KEITHLY: This does not make sense to me. The ABC is supposed to take into account the scientific uncertainty. The ACL is supposed to take into account the management uncertainty. There is an awful lot of management uncertainty in the Caribbean. Therefore, I don't see how you can possibly set ACL equal to ABC down here.

JULIE NEER: There's management uncertainty everywhere and it seems to have been kind of saying that yes, we can manage our catches exactly and we don't and we've gone over and we're having the exact same issues with the South Atlantic currently

now.

They keep going over their ACLs and the SSCs are being asked to revisit ABC values because there are suddenly overages due to these ACLs.

Just in that kind of bigger perspective, you are not the only ones who are being asked to do this and I know how you wish to address it, but it's not exclusive to the Caribbean. You have different issues down here, but this whole system of ABC and OFL and these overages are happening Southeast-wide.

MICHAEL SISSENWINE: Anyway, what I just was commenting on, in terms of using that yellow block, is only valid if we think those catches are valid and if we doubt them for 2006, 2007, and 2008, then that's a fair portion of those years.

JORGE GARCIA-SAIS: Those numbers look within the range. I don't see anything like strange. The 2010 data, that looks to me like something is unusual and out of the range. On the other -- As a maximum and not as a minimum. Something happened there, either increased reporting or there was a year of really good weather that people could go out for many days during the year, because these guys are not fishing at the shelf edge.

They are fishing way offshore. They go to all those seamounts in the Mona Passage that we don't even know much about them. They don't want to give away much information on where is it that they're fishing, but they're finding out new spots, new mountains, new seamounts, every time. Apparently there is more than we thought.

MEAGHAN BRYAN: You could just be depleting them if they're going to new areas.

JORGE GARCIA-SAIS: What?

MEAGHAN BRYAN: That could indicate that they're serially depleting the stock. Catch rates get low and so they move on to a new area and the catch is high again, but they're you're overfishing --

MICHAEL SISSENWINE: Then that means the length-based assessment isn't valid.

MEAGHAN BRYAN: We actually did talk about this spatial expansion, now that I remember.

TODD GEDAMKE: For queen, it wasn't a big issue, just because of the location and the narrowness of the shelf in that area and the range of the vessels that are working. For queen, it's not a problem, but --

BARBARA KOJIS: What do you mean by the narrowness of the shelf?

RICHARD APPELDOORN: For queen it's a problem. It was brought up.

BARBARA KOJIS: It's not a narrow shelf. It goes way out.

RICHARD APPELDOORN: It's not a narrow shelf. For St. Croix, it's a narrow shelf, but not for Puerto Rico. It goes way out.

JORGE GARCIA-SAIS: The submarine habitat goes all the way to the Dominican Republic. There's a ridge that connects and that is probably within the habitat of the fish and then there's a consideration that the fish grows fast.

If that survivorship curve is right on the money, the inference we have is that it's a fast-growing fish that probably reaches maturity in a couple of years. It's like the mahi-mahi.

MEAGHAN BRYAN: I think that makes the argument for getting better age and growth relationships.

JORGE GARCIA-SAIS: Data, of course. Every time we meet here or anywhere, that's something that comes about, that we need more information on age and growth or whatever.

GRACIELA GARCIA-MOLINER: The other issue with the queen snapper was also that the species had not been part of the reported landings until 1985 or 1987 or something like that. Before that, comparing to silk and other snappers and the series begins in --

BARBARA KOJIS: Why does it begin then? Is that when the fishery started or that's when the reporting started?

GRACIELA GARCIA-MOLINER: The fishermen who are fishing for queen snapper now began fishing at that time. There were a number of fishermen that were fishing for queen snapper.

JORGE GARCIA-SAIS: There's something about the mentality of the fishermen that doesn't work just the way you describe it. They move to other places because this place was depleted, but they are trying to gain a pretty wide range of fishing spots and they

go from one place to another because they don't want to deplete their stocks. How about that?

RICHARD APPELDOORN: It doesn't make a difference. It's still an expansion of the range over which the fishery is operating and it would have the same effect on the analysis.

JORGE GARCIA-SAIS: I understand it's a big range. The fishing range is quite big.

MICHAEL SISSENWINE: Under the most optimistic situation, from a scientific point of view, we have an assessment that has a representative set of length frequencies. What we know about the demographics is realistic or what we use in the assessment for demographics is realistic and those catches are valid, in which case we have a reasonable estimate of what would have been OFL during the period that ended in about 2008.

That's sort of the best you could hope for out of the stuff we have and further then, we wouldn't really know anything about what's happening now, because the life span of the species is such that the population that existed in 2008 would have been largely replaced by now and it could be bigger or smaller.

We don't know what has happened to fishing effort and we don't know whether there's been a change in catch and so about all we can say is that the ACL that's in place now might be a little bit conservative compared to what it could have been in 2000 through 2008. I don't think we can say much more than that.

That's the best case. If we don't believe the catches in that period and we don't believe the length frequencies, then we don't really know anything. I would suggest we probably report it based on the best case. We acknowledge that it's uncertain, but that under the best of circumstances, what we know is sort of what a reasonable, possibly somewhat conservative, ABC would have been during the period of about five to ten years ago.

JULIE NEER: Then you would recommend?

MICHAEL SISSENWINE: I would recommend not using ACLs to manage the fishery.

JULIE NEER: Are you still indicating that you think they should change the years that were used for your ABC determination from the 1999 to 2005, which is currently on the books?

MICHAEL SISSENWINE: If we believe the catch under the best case

scenario I described, meaning we believe those catch numbers, which apparently we didn't when this was done, and we think the assessment is a reasonably valid assessment of the -- The conclusion that overfishing was not occurring is reasonably valid, then yes, it is logical that you would use that theory, but it doesn't change the situation very much, I don't think. I can't see how you can milk anything more out of this stuff.

JORGE GARCIA-SAIS: One thing I am almost sure, and I'm going to say it and I don't care, is what we're going to milk out, if we give the shortage to the fishermen, is that we are going to misinformation on the reporting side. The fishermen are going to keep fishing and they are not going to report.

MICHAEL SISSENWINE: That's another reason that ACL management doesn't make any sense. You have no enforcement of the reporting, to speak of.

BILL ARNOLD: As long as you're using their data to control them, they're going to manipulate their data so you control the way they wish to be controlled.

JORGE GARCIA-SAIS: This is the way they live.

BILL ARNOLD: This is all three islands, which is what they're doing.

JORGE GARCIA-SAIS: It is not for fun. They live out of this stuff and these are the most cooperative of the entire group of fishermen. These guys are the ones that want to make it happen with us.

RICHARD APPELDOORN: Not anymore. We will kill that.

JORGE GARCIA-SAIS: They want to provide the information and those are the only ones that want to do it.

BARBARA KOJIS: Okay. I think that Mike has summarized fairly well what we can do with respect to this. Is there any other comments or consensus? Do we want to at least increase the ACL based on -- Not the ACL, but the ABC, based on the increase by adding these three extra years and eliminating 1999 and presenting this to the council as the new ABC, based on the fact that this is a period of time that's been analyzed, which we concur that overfishing hasn't occurred, concur with the analysis that overfishing hasn't occurred?

MICHAEL SISSENWINE: Wasn't occurring.

RICHARD APPELDOORN: Wasn't 2009 in that dataset or no?

MICHAEL SISSENWINE: Apparently there's no length frequencies.

WALTER KEITHLY: Like Todd, I'm a little concerned about taking one species simply because landings have increased significantly for whatever reason, whether it's reporting, statistics, or actual landings have increased and exceeded the ACL and therefore, we go back and change the ACL.

BARBARA KOJIS: We're supposed to be looking at this in terms of are we going to be able to use this methodology for all the other species as well.

WALTER KEITHLY: I don't think we're at the stage yet where we can say that. Until we hit that stage, I would prefer to leave the ACL where it is.

MEAGHAN BRYAN: Are you talking about the mean length estimator or --

TODD GEDAMKE: Consistency between the years used and mean length estimator and the years used to come up with average catch. I think that's the most solid argument that I've heard to take a look at revisiting any of this, in terms of year sequence, but it's not going to change that much.

BARBARA KOJIS: No and the other aspect of it is it could change more if you go back to 2010 and 2011, for example, and do the analysis for lengths on all those years. Then it would change more, but if -- It indicated that overfishing wasn't occurring based on the estimation, right?

MICHAEL SISSENWINE: Yes, we could include more years in the catch average, but I think at some point you have to start to question whether the resolution of your conclusion that overfishing is not occurring is meaningful.

If you have an analysis period that starts to be ten or twelve years and then you're making a conclusion, you're still saying it's the same in every one of those years and there's no reason to think that's true and it becomes less likely to be true when you start to see big changes in catch.

BARBARA KOJIS: But you can analyze the more recent years or do some other analysis there.

MICHAEL SISSENWINE: Yes and I would think you would want to be analyzing blocks that are some reasonable length of period and not just adding years on, but dropping years off from the other end in five-year blocks or whatever it is, whatever is the minimum number of years, based on some sort of analysis of a methodology that's robust.

TODD GEDAMKE: Let me throw out something here, too.

RICHARD APPELDOORN: It's supposed to be five years, right?

MEAGHAN BRYAN: Yes, but 2009, 2010, and 2011 didn't have data.

RICHARD APPELDOORN: So it's only based on 2007 and 2008?

MEAGHAN BRYAN: The change?

RICHARD APPELDOORN: The last block of time that you're getting.

MEAGHAN BRYAN: It was from 2000 to 2008. That's where that change leveled off.

RICHARD APPELDOORN: That's the last block of time?

MEAGHAN BRYAN: Yes.

RICHARD APPELDOORN: Or you're just saying where that level occurred?

MEAGHAN BRYAN: Yes, where the leveling occurred.

JULIE NEER: The five-year increments of length frequency was just a way to present changes over time.

MICHAEL SISSENWINE: So there are no blocks of time where there's an average and it's an annual estimate?

JULIE NEER: Yes, an annual estimate.

TODD GEDAMKE: In this case, when I look at this, I look at 2000 as your stable point in there and then 2006 is where the change occurred and your stock size is going to respond over that four-year period and be stable, in this analysis, at a new equilibrium in about 2000.

I've got these plots from queen and silk that we used during all of our early discussions and if you look at landings -- I just have a plot of the queen snapper landings and the years used to

average queen and silk and the only point that I was going to show --

RICHARD APPELDOORN: What was the number you came up with? Was it 188 something?

MEAGHAN BRYAN: That's just the average landings from 2000 to 2008.

RICHARD APPELDOORN: And it was 188 what?

MEAGHAN BRYAN: It was 188,539.9.

RICHARD APPELDOORN: We could just call it 188,540.

GRACIELA GARCIA-MOLINER: The 2009 is that we don't have TIP data for that year for the queen snapper.

JIM BERKSON: Can I jump in for a second? I am about to have to leave, unfortunately. I am going to be teaching this afternoon. I have got my summer program students in town and then tomorrow we're going to head down to St. Pete to give a presentation to the NMFS Regional Office down there and so it's a busy time.

It's much tougher for me to follow this and follow the discussion and everything looking at it from my desk via webinar, as I'm sure you all can understand, compared to actually being in the room and discussing this with you all and that's why I haven't said a lot up until now.

The way I'm viewing this at this point is that I am not seeing a lot of difference in the scientific information for when we looked at this previously. What strikes me about everything we're looking at is the large amount of uncertainty in all of the pieces of information that go into this, whether you're talking about the life history information, the catch information, which is always troublesome.

Every step of this has uncertainty and I always think about the precautionary principle and the basic concept of the more uncertain you are about the status of your resource, the more conservative your management has to be.

I think that largely supports the methods we've used in the past. Now, I think what has changed recently is how the management and the impact of the management has changed rather than how the science has changed and you all can correct me if I'm wrong about that, but what our job is, I think, is to be

looking at the scientific information and talking about the implications of the science and not reacting to the management in itself.

If I am reading this correctly, and I may not be, but if I'm reading this correctly, I'm not quite sure that this would cause us to make dramatic changes from what we've said in the past, since the science hasn't changed that much. I would be real curious to get your take on that.

TODD GEDAMKE: I think I tried echoing and not as eloquently, but I agree with you.

MICHAEL SISSENWINE: I guess the added science is the results that look at various types of overfishing reference points and then reinforce, again, the conclusion that overfishing is not likely to be occurring, but that doesn't change the big picture very much.

I don't think anything we're saying changes it very much. It might be an alternative choice of the period of years used to come up with an OFL estimate and that's no more or less the right way to go than somebody's judgment about whether the catch data is reliable.

Apparently the last time through this, the judgment was it wasn't and if that's still the judgment and there's no reason to think otherwise, then so be it.

JIM BERKSON: I would be real interested in seeing more sensitivities related to the yield per recruit analyses, given the uncertainty associated with those parameters.

MEAGHAN BRYAN: The yield per recruit analyses were done across that uncertainty in the input parameters.

JIM BERKSON: They were?

MEAGHAN BRYAN: Yes.

JULIE NEER: Bill, I have a question. You said initially this group, queen and cardinal, that they are in Snapper Unit 2, which was listed as undergoing overfishing on your information when you guys classified these.

BILL ARNOLD: We grouped them with the species that were listed as undergoing overfishing.

JULIE NEER: Thank you. That's what I was trying to say. Given that, but then when this assessment came out -- Essentially, the assessment, when SEDAR-26 came out, it said we don't believe this is undergoing overfishing.

The SSC concurred with that assessment a year ago and so why -- Since the SSC a year ago basically said we sort of agree that it's probably not undergoing overfishing, why has this not already been switched from the 15 percent buffer to the 10 percent buffer?

I know you don't work for the council and I'm just asking, because it sounded like that's sort of one of the ways, without changing the years, would be to switching this buffer from the overfishing class to the not overfishing class. That would change it from a 15 percent buffer to a 10 percent buffer, giving the fishermen more fish. Why hasn't the council done that or are they waiting for additional information from this body to say they should go do that? I'm just trying to --

BILL ARNOLD: This topic of adjusting the reductions has not been brought up, but it may not be as simple as just saying we now classify these as not undergoing overfishing and so we reduce the buffer from 15 percent to 10 percent, because there are other arguments that could be brought into play, like we're not doing it because it's not undergoing overfishing, but we're doing it because these are bigger fisheries with more uncertainty involved, et cetera, et cetera.

There are a lot of arguments you could bring into play to say why not all things are equal. For example, we are placing 25 percent reductions on surgeonfish and angelfish because of their ecological importance and so it's not always just this is what we feel is appropriate for undergoing overfishing versus non-undergoing overfishing species.

Even with parrotfish on St. Croix, we threw in an extra roughly 5 percent, because of their ecological importance above and beyond. It's not just a matter of saying these guys are now just like squirrelfish and they should be treated the same.

JULIE NEER: Okay. I just was wondering, because it seemed like the council does have some flexibility to make that, to at least have that discussion.

BILL ARNOLD: They have flexibility, absolutely.

JULIE NEER: They just have not had that discussion?

BILL ARNOLD: They have not had that discussion and in the host of discussions that the council needs to have, you would have to ask yourself, is that near the top of the list? Some of the discussions are even more important.

JULIE NEER: I absolutely agree. I am just trying to understand why it seems like the SSC is being asked to reconsider what they did in the hopes to essentially get -- My take on it, personally, is that the council is asking the SSC to revisit what they did before, even the assessment they already looked at once and approved, essentially, in hopes of getting potentially a larger ABC, which, in theory, they could potentially get on their own by reclassifying it and having the discussions on their own.

Basically, there's two options available to the council, potentially, that they could take. The SSC could increase the ABC and the council doesn't have to change their buffer at all or potentially the council could discuss changing their buffer based on the SSC's new classification of these species.

BILL ARNOLD: Yes.

JULIE NEER: That's what I was just trying to wrap my head around and I'm sure there's all these other things and it's not as simple as yes, we'll just do it.

MICHAEL SISSENWINE: Given the magnitude of the problem, the 5 percent isn't what is needed. It's an order of magnitude bigger issue. Following up on Berkson's concern, I guess I would stand by the sort of summary I tried to describe before, but, again, it was all contingent on that we believed the catch data and if it's the will of the SSC, we could then say we don't have anything -- The reason we didn't use this approach previously, one of the main reasons, was we didn't believe the catch data during that period or there were various reasons to have doubt in it and nothing has changed in that regard and therefore, we don't recommend any change in ABC.

By the way, even if we did, it wouldn't be very big anyway and so it's -- Just as an aside, it wouldn't be a very big change anyway. That's one way of both capturing sort of the most informative scenario, but also still, given Todd's comment and Jim's, still coming down in the same place and saying we don't we have a basis by which we want to change our recommendation on an ABC.

I am fine with either one of those outcomes. I don't think either one of them is going to make much difference in terms of what the council and the agency actually have to deal with in terms of this problem.

RICHARD APPELDOORN: Can we just throw the problem to them? In other words, we can say there's an option here, if you wanted to do it, and that says from 2000 on, we don't seem to have a problem with this probability and therefore, if we use the data that that assessment was based on, this is what you would get as your ABC. Whether they want to change it or not --

BARBARA KOJIS: We're responsible.

JULIE NEER: You're responsible for ABC.

MICHAEL SISSENWINE: I think we should be making the judgment of whether we believe the catch data or not.

RICHARD APPELDOORN: What's the difference? It's the only data we have.

JULIE NEER: Changing your initial ABC from the 1999 to 2005 years.

RICHARD APPELDOORN: We have a scientific basis for doing that.

MICHAEL SISSENWINE: Only if we believe the data. Only if we think that 2006, 2007, and 2008 are representative.

RICHARD APPELDOORN: No, the reason for doing that is because we have this curve that drops down in 2000 and flattens out, but we're saying based on --

TODD GEDAMKE: Look up there and this is the key point of this. In all the average landings discussions, if you don't have the scientific information, some stability in your landings is reflective that maybe the population size is not changing or the fishing is not changing.

It's sort of a requirement, in some way, of using this average landings approach and so this is the time period that was chosen for silk and queen. It was zeros in the first four years. It was a developing fishery and it reached this plateau and in the most recent six or seven years, it's all over the place.

RICHARD APPELDOORN: Well, we have that one point that's -- The really high point is under the green line.

TODD GEDAMKE: Yes, that's 2003 in here and then it's 2005. This whole period here starts getting -- You're doing double from this catch, over 2.3 times higher. As you extend into here, you're going to get much more variability and I'm not arguing for it or against it. That was just an initial argument.

The reason I sent this to Meaghan too was we're looking at queen because we've got an overage and so we're going to say, okay, let's do this change of adding another couple of years in there.

You have the exact opposite trend in landings in silk and so when you start doing the same tweaking in there, just because it seems to me that we're here because the numbers exceeded what's on the books and if we're going to do the same thing for here, we're going to do the same thing for silk.

If anyone is looking at the end product rather than the mechanism to get there, the result is going to be the inverse for silk as it is for queen, if we use the same logic in applying the analysis period.

MICHAEL SISSENWINE: That's the reason I described the system as reverse feedback, because, in essence, it says we let silk go extinct, but if things are getting better on queen, we crank down on the fishermen. That's the way the system works.

GRACIELA GARCIA-MOLINER: In 2005, there was a seasonal closure implemented for silk and not for queen and that's when you also start seeing the changes in the queen. There is that case.

TODD GEDAMKE: That's why we didn't use the analysis for silk. I am just trying to broaden it out from a specific number or a specific species and go, okay, here's the procedure and here's what we're looking at. I like the logic between making consistency between the analysis period and your average landings period.

As a broad brush stroke, you also have to be careful though that you don't have these steep increases or these steep decreases occurring at that time. Theoretically, with enough samples, that mean length estimate will be predicting where that is going, but you have to have large enough sample sizes in those recent years to have any sort of trajectory and changes in mean length and get a reasonable estimate of total mortality, because it hasn't reached a new equilibrium.

RICHARD APPELDOORN: Can you put your other one back up?

JULIE NEER: Todd, just so I'm correct, the reason you would have those two spikes is because you guys said we're doing 1999 to 2005 for all species, when you guys came up with your year segment for -- You didn't go through species-by-species and it was --

TODD GEDAMKE: It was those designated as undergoing and overfished, which is the green line, which is our first cut at everything, and this was everything else and this was just a discussion of by using this, I and the Center had strong concerns that you had just extreme residuals that were in different directions for different species.

RICHARD APPELDOORN: Your green line is not the average, but that's just showing the years?

TODD GEDAMKE: Yes, just the years.

BILL ARNOLD: There were reasons for each end of that spectrum. The 1998 was a hurricane year and we chose not to use it. 2006 was the beginning of the SFA application and so we chose not to go beyond that. That's why we picked that time period.

RICHARD APPELDOORN: One could argue that we're seeing the same degree of variability now as we were during the time period, because we had two really highs and four lows. It comes back, as we said, to what do you believe.

BILL ARNOLD: There's room for belief in science.

BARBARA KOJIS: That's just through 2010 data. That doesn't include 2011 and 2012, which is way up there as well. One is around 220,000 and the other is above 300,000.

BILL ARNOLD: 2010 and 2011. We don't have 2012 yet.

RICHARD APPELDOORN: Let me throw out the theoretical question here. Since we have more higher catches later on, if that is showing an impact in the response to the length structure, so we can say that F might be changing one way or the other, does that get us any closer to actually setting an ABC?

TODD GEDAMKE: The beauty of queen snapper is that --

RICHARD APPELDOORN: If we double this and we say we double fishing mortality, does that say that what is at least the

relative changes in catch are in fact reflective of mortality and therefore, we can use that data to set something?

TODD GEDAMKE: If you believe that reporting behavior hasn't changed, I guess, if I'm understanding that question right. The beauty with queen, or the nice thing about queen, was there was no fishery for it and so you're starting from a zero point and then increasing or ramping your fishing mortality up.

By an increase in the most recent years, you're dealing with increases in fishing mortality that are probably going to -- I am hypothesizing, but they're going to really require relatively large sample sizes just to get the resolution of increases at those higher Fs. I could be wrong, because it's detecting the early reductions, due to you're going to pull your largest, biggest fish out quicker and you're going to be able to detect that, but as we get into smaller and smaller shifts in a truncated size structure, you're going to probably going to have to have larger sample sizes.

Picking up those changes in the length structure as the fishing intensity increases require more sampling and may be more difficult to detect, but theoretically, yes.

RICHARD APPELDOORN: Generally speaking, the more difficult it is to show a change in F, the more it indicates that you have a problem?

TODD GEDAMKE: No. I think you're asking whether changes in the length structure are going to reflect the changes that we're observing in the landings.

RICHARD APPELDOORN: If this is a true reflection of fishing effort.

TODD GEDAMKE: Right, but I think once you get up into these higher levels with a reduction in population size, we may have a harder time detecting it without larger sample sizes. I'm not sure it's going to be reflected as much as we would like to see it and that would make it cleaner and as easy. I don't know if that makes sense.

JULIE NEER: You mean as opposed to the clear trend that you saw in 1999.

TODD GEDAMKE: Right. We had a very clear drop and you can see it in the landings and you can see it and boom, you're done. That clearly was a change and the length model worked very well

detecting that.

You had a drop in those early mean lengths down in there and to get out of that cluster at the bottom, I'm not sure you would be talking about continued reductions. At this point, I don't know what this goes up to, but if this continues down to here, you're going to have a second change and a second drop, but mostly what I think we're seeing there is an increase in those highly variable numbers occurring right in here, in 2000.

BARBARA KOJIS: We should have TIP data for 2009, 2010, and 2011, shouldn't we?

MEAGHAN BRYAN: There are no samples, at least when we were putting this together.

GRACIELA GARCIA-MOLINER: The samples are at the Southeast Fisheries Science Center. That's why I am asking to check for the -- If there have been samples that have not been sent to the Science Center.

MEAGHAN BRYAN: I need to find this, but I am pretty sure it was zero.

JULIE NEER: It was zero, but whether there was --

MEAGHAN BRYAN: At that point, if there was any question about whether or not there were lengths for -- It would be 2011 and not 2010 and 2009. I have 2008 is the last year that there were any length samples from TIP in Puerto Rico for queen snapper.

BARBARA KOJIS: That's based on the work that you did a couple of years ago, right?

TODD GEDAMKE: I don't remember.

JULIE NEER: The assessment was done in 2009.

BARBARA KOJIS: So you wouldn't expect it then, but --

JULIE NEER: The assessment was done in 2010 and 2011. We finished in 2011.

GRACIELA GARCIA-MOLINER: The issue is that there might be samples sitting somewhere that have not been uploaded. There were dramatic changes in the number of people that left the lab and things like that and so there might be data that have never been scoped and I'm taking notes to find out, because I'm

surprised that there are no TIP data for queen snapper and it's an easy target.

BARBARA KOJIS: That looks like it's -- Those are crucial years, because the last year that you've got data for indicates a drop in the size of the fish and so you need to see whether that drop continues or that's just associated with one off year with sampling or what have you.

GRACIELA GARCIA-MOLINER: Especially because those were the years of the catch shares and everything else and we had sampled that fishery over the time and so that's one of the reasons --

TODD GEDAMKE: I know that there was reductions in people and then there was a backlog in entering. When we were doing the assessment, there was nothing there and I don't know if it's happened to have changed in the last year.

GRACIELA GARCIA-MOLINER: No, there are less people there.

JULIE NEER: There was also that issue of the guys who were going close to this house and he wasn't going -- I remember the discussion where the sample was only -- They didn't have any east coast samplers and they only had west coast samplers or vice versa and so they weren't getting any --

TODD GEDAMKE: It was silk. I was able to detect when someone got fired in that organization in Puerto Rico in the data, because so many samples dropped out.

BARBARA KOJIS: But at the same time, they're getting funding to do this.

GRACIELA GARCIA-MOLINER: That has been dramatically reduced.

BARBARA KOJIS: The funding to do this has been dramatically reduced? Why?

GRACIELA GARCIA-MOLINER: The local government picked up a lot of the people's salaries for the Fisheries Lab and that amount that comes in from NMFS has been decreasing over the years.

BARBARA KOJIS: Okay, because I know the amount from NMFS increased in the Virgin Islands.

GRACIELA GARCIA-MOLINER: And you have no people to do the work.

BARBARA KOJIS: Because it had been stable for years, but in

essence, it had decreased, because, of course, salaries have gone up and everything else and after ten years of the same funding, you can't employ people -- Where you could employ two or three people on the amount, you only could employ and so it was like crazy, but we ended up with more funding for it and then you got state and federal and you've got IJ that was used for this.

I don't know if -- Puerto Rico is bigger and so you may not have. The other aspect of it might be -- I guess you need the fishermen reporting, but I was just thinking maybe all you need is the TIP samples.

GRACIELA GARCIA-MOLINER: One of the issues that has been discussed is that we need that kind of information and so there is this break in the information that has been collected and it's hugely important that that be brought up to the council. I am surprised that that break came at that time.

One of the recommendations that you've made at the beginning of the meeting to look into the reporting issues and the information on the history of the fishermen that have been involved in these fisheries, et cetera, I don't know if you are making that by consensus, but those are in my notes. I think something like this that changes so dramatically, data collection for the length frequency data, is not acceptable.

BARBARA KOJIS: I suppose one of the other things that we addressed is whether this methodology would be useful for other species, for utilizing with other species, to use the same technique for adjusting our recommendation for OFL and ABC.

JULIE NEER: So you are adjusting this one to use the new years? Is that what the group decided? I didn't get this decision yet.

BARBARA KOJIS: No, we haven't, really. Why don't we discuss that then? Is there a consensus on what we should do?

GRACIELA GARCIA-MOLINER: You have a continuation on this topic for tomorrow.

MICHAEL SISSENWINE: I think the decision is one of two things. First, I thought we had a consensus about sort of a description of where we are in the analysis and what we know and what we don't know and if one believes the catch data, then the logic is to use the catch data that fits with the model analysis, but we can either say and that's what we recommend or we can say there were doubts about the catch data when this was done in whatever

date that -- Whatever SSC meeting it was and there's no reason -- We have nothing to change our concerns on that and therefore, we don't recommend a change in ABC.

The footnote is, in either case, it's not going to change things by very much and I can move with either one of those. I don't have a strong feeling like Jim indicated that he would rather not change and I think I heard that from Todd. It's fine with me and either one of those inclusions I think is equally defensible. Since it doesn't matter that much, I won't get too concerned either way.

JULIE NEER: If you don't give the council a clear direction, they're going to come back and ask you to clarify that you need to change it or --

MICHAEL SISSENWINE: No, I think we should say whether we do or we don't. Personally, I can move with either one, because I don't have any strong judgment about it. It's partially because my strong judgment is the quality of the catch data is it sucks, but it really doesn't matter, since we're using it to make judgments using equally sucky catch data. The whole thing is really a bunch of hand waving, in the end of the day.

BARBARA KOJIS: Is the 2006 to 2008 catch data any different in terms of its reliability than the 1999 to 2005? That's really almost what you're saying and if you're saying we did come up with an ABC based on average catch in these particular years, adding these three more years --

MICHAEL SISSENWINE: We concluded a couple of years ago that 2006, 2007, and 2008 were less reliable than prior to that, for some reason, and we can either stand by that or not and that's sort of the bottom line.

BARBARA KOJIS: That's true.

MICHAEL SISSENWINE: I guess it appears that maybe it's three members that have said they would prefer to stand by what we concluded a couple of years ago.

TODD GEDAMKE: Mike got me staring at the ceiling, because I really like the idea of having it consistent. I like the idea of doing that. Yet, at the same time, I am wavering on changing things without any really new, solid information. That's a logical piece that if I trusted the information in both time periods, I think I would feel much stronger about it, but I'm not sure I am wholly -- I don't feel extremely strong about it

either way.

If I were to have to go one way or the other, I would say let's just keep it the way it is and make the statement that it doesn't really change anything if we modify them, but it should be carefully looked at, a corresponding mean length analysis with the landings, and strong recommendations to revisit the landings and get some sort of validation.

RICHARD APPELDOORN: I would add, based on the analysis that Meaghan presented today that showed the range of wherever you might be based on the sole range of variability in the parameters, that the analysis that was originally done shows, while there isn't strong evidence for overfishing, there is still a reasonable probability that overfishing might be occurring.

Therefore, where we set the ABC is probably about where we want to be, being somewhat cautious, and that if these new catches are really real, that would be an argument to be very concerned about them.

MICHAEL SISSENWINE: Or an argument that the stock has increased substantially, either one of which, to me, is equally plausible.

RICHARD APPELDOORN: Right and so that falls out and there's three recommendations that kind of leads to. Look at the length frequency for the most recent years and we need to check on what the catch records are really reflecting as to the way that we had talked about before, and we need a recommendation that the otolith data, which already exists, or otoliths that already exist, could be given some priority to be processed.

BARBARA KOJIS: Any other comments? Is this our consensus then? Would you just look through those three things, Richard?

RICHARD APPELDOORN: The recommendations?

BARBARA KOJIS: Yes.

RICHARD APPELDOORN: About what needs to be done?

BARBARA KOJIS: Yes.

RICHARD APPELDOORN: We need to relook at the assessment with the most recent length frequency information, we need to assess the recorded data to see if we're really looking at a reporting problem or a catch problem, and we need to recommend that

priority be given to analyzing the existing otoliths so that we can get clearer confidence on the life history parameters.

JULIE NEER: So, given that one of your recommendations was to basically redo this assessment again, is this a higher priority for you guys versus getting additional -- Moving forward with new species? That's always the tradeoff.

MICHAEL SISSENWINE: Addressing you in the context of your SEDAR hat?

JULIE NEER: Yes, that's the SEDAR hat.

MICHAEL SISSENWINE: One of the issues has always been does it take a SEDAR for every update and, of course, the intent is that the SEDAR does benchmarks and then there be updates and I have gone through this discussion with Clay and he said, yes, that's the intent, but every time we try to do that, somebody says there's something wrong with the methodology and we end up with a benchmark. What if we say there isn't anything wrong with the benchmark and do an update?

JULIE NEER: This is a perfect example of a case to do an update and that's fine, but it's still a slot on the schedule. It's still a person who will not be available to do a benchmark for another species.

TODD GEDAMKE: I was just going to say that adding two years of information in a clean, data-rich fishery is no problem. Adding two years of information in these fisheries and quality control and so on is just very time consuming.

Don't underestimate saying you know what, we just want you to add those two years of information. I think that first go-around to add those will probably end up taking a week of someone's time just doing a revisit on that.

MICHAEL SISSENWINE: But it's still not a SEDAR.

RICHARD APPELDOORN: That's still not a SEDAR.

JULIE NEER: But it's still a person and a slot.

TODD GEDAMKE: I am just saying getting that loaded up and cleaned up and even running is going to be a week and all in all, it's going to end up being a month of somebody's time, just to do some plots.

JULIE NEER: Currently, when it comes to assigning slots and the way that it's currently working in terms of it's one analyst is essentially one -- It's mostly one project. If they're assigned to do this, then what's they're going to do and so that's why I am just asking in terms of priorities.

When you guys make your priorities to the council, is this a higher priority versus -- We're doing red hind this year, but perhaps whatever is on the schedule for next year, is this a higher priority than that? I don't know if you've had those discussions or when you're going to have those discussions, but it's just something to think in your brain.

I don't think you should change this recommendation, but just in the bigger picture, keep that in kind of your mind, because a lot of times the council gets the SSC wants this, this, this, this, and this and they never prioritize it and it makes it difficult.

MICHAEL SISSENWINE: To be fair, there's no way this SSC can answer that question unless there are dedicated resources on a council-by-council, SSC-by-SSC basis, which there are not. It can't be a question answered by any single council in the Southeast or any single SSC, because the resources are not dedicated.

JULIE NEER: Within your species, which species in the Caribbean do you want to see assessed next? That's what I'm talking about in terms of your recommendations.

BILL ARNOLD: The discussion for the next SEDAR was it's now scheduled for red hind and white grunt, right?

JULIE NEER: We are doing red hind.

BILL ARNOLD: Just red hind and so the idea was, the discussion was, instead of doing white grunt, you do a data review or whatever review of this potentially new method that the Science Center had come up with.

Now, this is a Bonnie and Roy discussion and that's what they have said, is we take white grunt out of the circuit and we put this reevaluation in there and so is that --

JULIE NEER: This just happened for queen already.

BILL ARNOLD: I am talking about for everything. The idea was we come to this SSC meeting and we review the new method with

respect to queen, but then we go to that SEDAR meeting and review it with respect to this being a new approach for doing assessments of Caribbean species.

JULIE NEER: Currently, anything regarding this reevaluation data-poor whatever thing, none of the details have been communicated to us at all at any level. We don't know if it's happening or if that's happening, how it's being done or who is even running it. The only thing with SEDAR is red hind is on and white grunt is off.

There are discussions of that and we have heard discussion of this data-poor thing and we also heard we're swapping white grunt to do this and we've also heard we're still talking lobster next year and red hind doesn't even start until October of this year and so there's no way this data-poor workshop thing is happening this year, even though Bonnie said it was going to happen in 2013.

To the council, it's not going to happen in 2013. It's probably going to be 2014 and so we're still working out all of those details.

MICHAEL SISSENWINE: This is proving my point that we can't legitimately be asked to give you priorities.

JULIE NEER: The thought is that it will come to the SSC asking you guys which species you would like to see handled during that approach, but it has not happened yet.

GRACIELA GARCIA-MOLINER: But do we have to send to the SSC an inventory of the otoliths available and the information that they're collecting on the different species and the priorities for the people who are actually doing that work, because they have the money to do it? It's not fair to ask the SSC to talk about any species in particular and so the inventory is being made.

The local government will provide, hopefully, a list of the species that they have in their priority list for whatever. We will try to convince them to make sure that they collect otoliths at the same time that they're doing everything else and so as soon as we have that, then we can send it to you guys.

JULIE NEER: Yes, as we move forward.

GRACIELA GARCIA-MOLINER: Along with the inventory from the Science Center regarding the TIP data. How many individuals per

species do we have available? That will be like an update on the data workshop that we had before, but not until we have all those pieces together.

JULIE NEER: Right and then it will come to you guys and that's what I'm saying, is that's when your priorities of what you would like to see done when.

RICHARD APPELDOORN: So there's a package here. If we just want to look at the length frequencies and see what is happening, we plug them into the same analysis that was done before and we're not changing methodologies or anything like that. That's a much simpler process, albeit it's going to be somebody's time for a month or more, whatever it is, but it's not a full-blown -- We're not asking for that.

There is the other side of this, however, that says if the otoliths get processed, maybe at that point we need to relook at it or is it just the same process and we just refine that with the life history parameters that are based on the analysis and go forward? I don't know where you cross the line and say this now requires a whole new thing.

TODD GEDAMKE: Plugging in the new life history parameters introduce change to your input parameters, but what I'm hearing here, and I think we're skirting somewhat the question, which is the methodology.

RICHARD APPELDOORN: I am happy with the methodology.

TODD GEDAMKE: Given a K and an L infinity, Richard, you're happy with using the various life history invariants to come up with --

RICHARD APPELDOORN: I think that's what we have to work with in that case and I'm happy with it.

TODD GEDAMKE: That's what I threw out early on too and I just want to make sure everyone is clear with that, because when you look at an image that shows a distribution, that's the summary slide that's going to be put in front of the council and we're the ones that are responsible for making sure that methodology for getting that slide up there is valid and any caveats that are necessary are included. I just think that we should have at least some discussion.

MEAGHAN BRYAN: Are you referring to the F to F reference points?

TODD GEDAMKE: Yes, the reference points.

MEAGHAN BRYAN: A decision would need to be made which reference point seems to be more appropriate. I presented three.

TODD GEDAMKE: I don't think we're picking it. I think right now it's just the -- Picking which reference point, which of those three, is fine, but to get there, to even get -- How do you get M?

All of the steps to get to that final plot on that and so choosing which one is most appropriate is going to probably be done on a species-specific basis, looking at the results, but the overall approach, and I think Bill said it, we should be able to cookie-cutter this out and bang it out one after the other and if that process starts, it's not going to stop.

I think it's important for us to just weigh in on whether anyone has any serious concerns throughout it or any suggestions for improvement or caveats that need to be thought of. I didn't put it forward initially, because I wasn't going to be the one to stand behind some of those ratios that are all interconnected to K.

I don't know what bias an M estimate from K is versus, again, to the FMSY estimate. I haven't read anything that would give me some indication as to how using three different life history invariant relationships ends up producing the final product.

MEAGHAN BRYAN: They're all pretty similar in terms of natural mortality.

RICHARD APPELDOORN: In terms of priority, I am not sure if the way we are discussing it here is the way you're thinking about it. I think what's a priority is going to come back to the council, because they're going to look at this from a problem of what do we do about it and is it real or not.

We're going to say, okay, we're not really changing our assessment about what's going on and if they want to have -- If this is a real problem for them and they think this new assessment will help, they're going to make it a priority.

It's a management concern about which one do they want to deal with and not a scientific concern, to me. At least that's how I'm viewing it. Our recommendations about this is what you need to do is this is what you need to do if you want to update this.

If it's really not that much of a problem for you, let's work on something else.

JULIE NEER: I think that's an excellent way to put it, is these are the things we would like to see for us to address this. I think that's the best way to put that to the council and just get these new pieces of information.

BARBARA KOJIS: The other thing that we need to look at maybe is why we didn't include the 2006 to 2008 data in the original and what was our rationale for doing that.

I think that it could have had to do with the way that the expansion factors were changing, the way they calculated those, but I would like to see that with respect to -- So that we just go over that again, because it was true for all the data, I believe, that we just used 1999 to 2005 and so the purpose of this, in part, at least from the Southeast Fisheries Science Center rationale, was to see if we couldn't use this methodology and if we approve it, to some way modify the way we were calculating ABC or the number of years or whatever.

GRACIELA GARCIA-MOLINER: In 2005, when we have such an already changing management, that really stopped anyone from looking for it. You do have that information and the idea is to see if from the length information, away from the landings data or impacted by the seasonal closures, et cetera, you still get information that can give you an indication of the stock status.

We do have 2006, 2007, and 2008. I am going to check on the 2009, 2010, and 2011, at least for the queen, but you do have that TIP data.

BILL ARNOLD: Also, it's not exactly apples to apples, but we used 2006, 2007, and 2008 in Puerto Rico and 2009 for the 2011 species. I guess we got over it.

GRACIELA GARCIA-MOLINER: That's not exactly -- They were not impacted by any of the big regulations that came into place in 2005 directly.

BARBARA KOJIS: But the queen snapper wasn't affected, was it?

GRACIELA GARCIA-MOLINER: It was with the 2010 species that were undergoing overfishing.

BARBARA KOJIS: It was put in with those, but the seasonal closures and stuff like that didn't affect queen snapper and

that was one of the reasons for that snapper group. Maybe the data still going through 2008 would be not applicable. The problems that we saw in the data wouldn't be applicable to the queen and cardinal snapper.

I would just like to go and see if we can pull out what we said on that with respect to that, because if the way those expansion factors were calculated was the reason, then that really hasn't changed.

TODD GEDAMKE: What's the objective of revisiting that?

BARBARA KOJIS: We haven't come to a conclusion of whether we're going to change our ABC recommendation.

JULIE NEER: I thought the group said that they were changing it.

BARBARA KOJIS: A number of people have said that, but I don't think we've set a consensus yet on that, because the other thing is if you're not changing it, because you're not convinced what's the rationale for not changing it, you're not convinced that the data is valid data, and I think the comment was 2006 to 2008 data, we had omitted it in the past and so why are we including it now?

The other aspect of it is that would then apply to all these other species, if that's what we did with all these other species.

RICHARD APPELDOORN: The rationale is that currently it says we think mortality, the size structure, has been stable during that time period for this species and not for every other thing. There's no basis for changing anything else.

BARBARA KOJIS: No, I realize that. I realize that, but in the future, how will we use this? If we say that this particular technique could be used for other species and so on, then how do we use it to, in some way, shape, or form, to inform the whole system, which is like informing OFL or ABC.

RICHARD APPELDOORN: That's what assessments are supposed to do.

BARBARA KOJIS: That's right and we had a recommendation here that Mike made. He said he could go either way, that we use this because overfishing was not occurring or there's no evidence of overfishing between the period of time that we looked at from 2000 to 2008. One of the recommendations was

possibly to look at and include the 2000 to 2008 landings data in developing the new ABC.

RICHARD APPELDOORN: But we're not making that recommendation.

BARBARA KOJIS: Okay and is that going -- In essence, when we do the analysis for other species, that would be the same recommendation? What's the reason for not making that recommendation?

RICHARD APPELDOORN: Uncertainty in what the catch levels actually are and it doesn't really change things that much. Until we deal with the uncertainty in the catch levels, it doesn't really make sense to mess with everything else.

If we have some assessment that says some of our assumptions before were wrong and there's room to expand, then that's what the assessment says. If it says the opposite, it says the opposite, but we still have that problem that Mike was talking about as far as feedback, where that shelf was -- Exactly what he was talking about relative to the queen.

MICHAEL SISSENWINE: That's just built into the way we're trying to use this sort of data to manage in the way that we're trying to manage.

BARBARA KOJIS: This is really not -- While this can indicate whether a species is undergoing overfishing or not, it's really not useful information -- We can't use the information to modify ABC.

RICHARD APPELDOORN: Not without some confidence in the catch report.

BARBARA KOJIS: That confidence will only come with validation of the landings, probably only from the validation of the landings data or some sort of validation.

RICHARD APPELDOORN: The only thing we can really kind of try to assess is whether the behavior for reporting has changed. Is that correct? If we don't see anything that suggests the reporting behavior has changed, then we have to start arguing whether this is real.

JULIE NEER: If you get life history information, then your confidence might be higher in the conclusions that come out of the assessment such as this, because you won't have that range. Then you may feel more comfortable about changing your ABCs as

well if you have more confidence in the --

RICHARD APPELDOORN: Or more comfortable about not changing them.

JULIE NEER: Or not changing them. You will have more comfort in whatever your decision is and so I don't think you can necessarily say that this is not necessarily useful for making your changes, because I think you guys have been -- You were happy with trying to move forward with this for other species, but in this case, you're not going to make a change to your ABC recommendations at this point or are you saying we shouldn't bother to do this for anything?

TODD GEDAMKE: Which question are we addressing right now?

JULIE NEER: Barbara just said, so this method is not useful for having us change our ABC and so I want clarification of what exactly you guys are recommending.

TODD GEDAMKE: For queen?

JULIE NEER: No, for the methodology. It sounds like you're not recommending a change for queen, but then Barbara said so this methodology is not useful for making a change to our recommendations and so do you just mean for queen or do you mean the methodology in general?

TODD GEDAMKE: I think the methodology, in this case, is the best thing you are going to do with the information that's available, period. I don't think there's anything else out there. I think that we have milked this as much as we possibly can.

If I am in the manager seat and I am looking at every life history invariant relationship being used and rules of thumb being used, I am going to see that as potentially very risk prone and I'm going to make conservative calls on where I go with the fishery and I'm going to make very strong recommendations about better data being collected and better information to be collected.

I just don't want that step to get missed in our recommendations up to the council, because I think that there is just -- Doing this in a quantitative or semi-quantitative way, that's what we need to do, but it turns into a risk, in my mind, as you pass this stuff forward and I have a hard time figuring out how to present the information in a way that really captures the first

paragraph of the methodology, which says we assume -- Then it goes blank. I think it's the best thing in town, the best game in town.

BARBARA KOJIS: My concern is, because I've been to the council meetings and I know Bonnie anticipates that there could be a possibility that we might be able to change, using this methodology, to increase the ABC so that the queen snapper fishery does not have to close on September 21.

That's where I am coming from with respect to this and I'm not saying that we need to do that, make the changes and stuff, but I'm just saying that if we're not doing it -- If we don't do it for this species in this particular case and we have these concerns about the landings data, we need to present all of these concerns in all of this, but it also indicates to me that this would not be -- You would not be able to use this, at this stage anyway, with the information that's available, probably for most of the other species, to modify ABC for those as well, because the landings data for the other species is probably not in any better shape than the landings data for the queen snapper. We would be not any more confident of that, that landings data, and so that's what --

JORGE GARCIA-SAIS: Barbara, it doesn't matter what we do. There is no way of stopping the fishery from closing, because the overage is way above whatever other consideration that we can fix considering other sets of years.

WALTER KEITHLY: That is not true.

JORGE GARCIA-SAIS: No? What about the 300,000 pounds? What do you do with that?

WALTER KEITHLY: It states right here that the AM is triggered unless NMFS Southeast Fisheries Science Center, in consultation with the council and its Scientific and Statistical Committee, determines that the overage occurred because data collection and monitoring improved, rather than because catches actually increased.

We've been talking about that and I don't know if we want to call it a data improvement, but we've been talking all day about potential problems with the catch data the last couple of years and if anything, I think we ought to simply make a recommendation to the council that the use of caution before putting any addition restrictions on the catch, for the reasons that we've been talking about, that they thought they might put

in an IFQ program in 2010 and because the fishermen may have increased their reported landings that changed from the recreational and put them in the commercial sector and so forth.

JORGE GARCIA-SAIS: We use that before we use anything else then. We always use that statement to cancel any action.

WALTER KEITHLY: Not always. In this case, I think there's a valid reason for doing so. I am totally opposed to doing this, but I -- I know that any time you start talking about implementing an IFQ that there becomes a strong incentive for fishermen in the program to change their reporting system, given that their initial share usually is based on their individual historical landings.

I think that's, at least to some extent, what happened. I am confident that landings did not increase by 90 percent, or relatively confident, in a one-year period. The only reason I think that could have happened is if the recession, that I know Puerto Rico had earlier, ending dramatically in 2010 and tourism came back in, thereby increasing the demand for some of these snapper species.

If there's a significant increase in demand very rapidly, then I could see increased catches and I'm not sure about a 90 percent increase in the catch, but overall, I think most of the evidence leads to the fact that there's some change in the reporting system.

JORGE GARCIA-SAIS: There would be a -- The fact is that it went up and then it went down again and what happened? Did they change again the philosophy of reporting from one year to the other? It's hard to swallow that.

BILL ARNOLD: Yes, Reni, that's what they've done. It's not just the IFQ program and it's not just Puerto Rico. Ever since -- My understanding is ever since the SFA came along, these fishermen have been gauging their landings, one way or the other, trying to predict and manipulate outcomes and they're still doing it.

JORGE GARCIA-SAIS: And it changed between 2010 and 2011? They changed between 2009 and 2010 and then they changed their minds again and said, okay, we're going back to the non-reporting.

BILL ARNOLD: IFQ mean more and ACLs mean less.

TODD GEDAMKE: Where are we going with this?

BARBARA KOJIS: That's another recommendation, I would assume, to the council, and so we need to --

MICHAEL SISSENWINE: There are two different things that are being discussed here then. One is does this assessment tell us anything different from what we knew before and so on and I think we've already thrashed that around and you could interpret it -- You could either say, okay, let's revisit our ACL or ABC or not and it doesn't make much difference.

The other issue though is should we say something that would essentially let the fishery off the hook by invoking this clause that the catch data has changed and that is what you just read, Walter.

WALTER KEITHLY: I did not say let the fishery off the hook. I think an additional analysis should be conducted before the council takes action.

MICHAEL SISSENWINE: I'm going to come to the same conclusion, because what you just read said that the impetus to lead that decision comes from the Southeast Fisheries Science Center in consultation with us, with us commenting or verifying or whatever. I am waiting to hear whether the Center believes that this provision should take effect and therefore --

BILL ARNOLD: They already did that.

MICHAEL SISSENWINE: What did they say?

BILL ARNOLD: They applied to two of the overage fisheries, but not to these.

MICHAEL SISSENWINE: So they didn't believe it applied to --

BILL ARNOLD: They made the determination that this was not due to changes in reporting.

MICHAEL SISSENWINE: So why would we believe any differently?

BILL ARNOLD: I believe it's going to be an uphill battle to convince them that you've changed your minds.

RICHARD APPELDOORN: We haven't changed our minds.

JORGE GARCIA-SAIS: It's not a pattern. It's just up and down and up and down and are they getting together to say this year

there’s no reporting and next year, there’s reporting and next year, we will not be reporting again. Either you see a pattern of behavior or you don’t and it’s pretty obvious.

BILL ARNOLD: The thing in that regard, Reni, is that the pattern you see in queen snapper off the west coast of Puerto Rico is not much different from the patterns you see for all of these fisheries on all of these islands, for whatever reason.

You could invoke this for everything and say it’s not just due to the Science Center’s determination as to whether the reporting has changed or not, but it’s now due to any oddities in the landings patterns that could be invoked and if you go that route, which isn’t what this meant at all, then you apply it to all of them and we don’t apply AMs to anything.

JORGE GARCIA-SAIS: Well then why believe any data at all?

BILL ARNOLD: In the 2011, you didn’t.

JORGE GARCIA-SAIS: I am referring to the period we selected to determine the ACL and the ABC.

BILL ARNOLD: In your 2011 decision, you decided not to leave data out, except for 1984 to 1987 in Puerto Rico. Otherwise, you pretty much included everything, everything that we could legitimately include in setting ACLs was included for the 2011 species, partially because, as Graciela said, the 2005 SFA impacts did not directly apply to those 2011 species.

Nevertheless, the argument was, the one that drove Jorge off of this SSC, was use all the data and in 2011, basically we used all the data. You can come back and say, look, we’re going to use all the data and we’re going to apply the ORCS and we’re going to do exactly what we did in 2011 and you can reassess everything based upon the most recent status of ORCS and come in with 1.5 or whatever you want and change this whole thing in a matter of tomorrow, if you wanted to.

BARBARA KOJIS: If you had a rationale for doing that.

BILL ARNOLD: You could use your 2011 rationale and just say here’s our 2011 rationale and boom, right on top of 2010 species, because it’s all laid out.

JORGE GARCIA-SAIS: Bill, could you predict what would happen in 2012 based on that, on your knowledge of the fishermen reporting or not reporting? Could you anticipate what would be in 2012?

BILL ARNOLD: You mean the landings in 2012?

JORGE GARCIA-SAIS: Yes and would it be up or would it be down?

BILL ARNOLD: That's got nothing to do with --

JORGE GARCIA-SAIS: We don't even know what's going on.

BARBARA KOJIS: Why don't we take a little break? We're getting close to the end anyway, but let's take a little break.

(Whereupon, a brief recess was taken.)

BARBARA KOJIS: The meeting is reconvening again at about 4:20. Iris gave this to me to remind everybody that tomorrow the meeting here starts at 8:30 and so don't forget. Walter, do you want to continue with your discussion with respect to the reporting?

WALTER KEITHLY: I am really done with my discussion.

BARBARA KOJIS: Does anyone want to make a comment? Walter was discussing the caveat in the Federal Register regarding implementing accountability measures or not implementing accountability measures if fishermen are increasing their reporting.

RICHARD APPELDOORN: I have a question. I understood what Walter's point was and I don't know whether you were making that as a recommendation for our report or as just a statement that that's --

WALTER KEITHLY: I did not make it as a recommendation, but I just think that's a direction that the SSC may move in now.

RICHARD APPELDOORN: You're putting it out for us to consider.

WALTER KEITHLY: Yes.

BARBARA KOJIS: Meaghan, could you put the years again for landings data, that little table, up on the screen?

MEAGHAN BRYAN: Yes, but I just need to get the control.

BARBARA KOJIS: Those are the landings data and the accountability measures will take effect based on the 2010 and 2011 average landings, correct? Those average landings were

2010 was considerably higher, by over a hundred-thousand pounds, than the 2009 and 2011 landings. Walter, would you just like to repeat why you thought that might have happened?

WALTER KEITHLY: I think everybody knows now, but I will repeat it one last time. In 2010, the council considered an IFQ program for deepwater snapper and I suspect -- It's my opinion that because of that, fishermen did a better job of reporting in 2010, or possibly even overreported, in an attempt to increase their individual initial shares for the allocation.

TODD GEDAMKE: The statement about increased landings due to reporting, I fought long and hard to have that included in the development of this amendment, because the idea of having ACLs and accountability measures in this environment, when at the same time concurrently we had an improved data reporting schedule, I just saw two entirely different incentives going on at the same time.

Walter, I am really glad you brought that back up, because that, in some way, would be the essence of our discussion if the Center had collected information or the local territorial agents had collected information at the start of this amendment process to spur this, but I think at the very, very least, the -- Bill, you mentioned that the Center had reviewed the reporting behavior on queen and silk.

BILL ARNOLD: For all of those that exceeded and not silk, but those units that exceeded their ACLs.

TODD GEDAMKE: I wasn't involved in that and I don't know what was done, but I think that that's just a strong recommendation or I have a strong feeling that that needs to be reiterated, that that process of not only landings validation, but that it be a continuing process, because, right now, if you get more feet on the ground taking a look at behavioral changes, it's going to be very hard to say that in 2014 that behavioral reporting was very different than in 2007, when a different data collection program was in place.

GRACIELA GARCIA-MOLINER: In terms of the revision of the commercial landings form, one of the things that was not done was to follow the history of the people that were involved. For example, in many of the fisheries, there had been a request by the DNER specifically to look at certain questions that they had regarding the number of people that were new to the fishery, the changes in the commercial fishing licenses and things like that. That aspect of the commercial landings was not addressed.

MEAGHAN BRYAN: I think there were confidentiality issues that couldn't be presented.

GRACIELA GARCIA-MOLINER: But these identifiers are identifiers and they have a number to see and you don't have to see the name of the person or anything, but, again, going back to the local government, we have something that could be done at the local level as well as the Science Center, because once -- If you don't disclose the name of the people and if it's more than five pounds, more than one trip, there are certain rules for displaying the information.

You can see that in 2008, there were a hundred fishermen surrendering statistics for queen snapper and in 2010, there were 3,000 and there's something wrong. That kind of information was not addressed at the time.

RICHARD APPELDOORN: Two points. One is the increase in fishermen in Puerto Rico, because of the change of the regulation there, is going to have some impacts for 2013. This is something that's going to come up again and having a good baseline now to be able to assess what happened then is important.

However, this is a problem for 2010, because 2010 was the first year that this thing was in effect, but if you look at the numbers, everything from 2000 on would have been over the ACL.

BARBARA KOJIS: Well, not quite.

RICHARD APPELDOORN: Almost. The ACL was one-forty-something, wasn't it?

BARBARA KOJIS: Yes, but there was 135,000 and there was 138,000.

RICHARD APPELDOORN: I said from 2007 on.

BARBARA KOJIS: Okay, 2007. Sorry.

RICHARD APPELDOORN: My point is it's not just a 2010 problem, but the magnitude of 2010 certainly could be explained by that.

BARBARA KOJIS: I would also concur with you. It's not just a 2010 problem, but 2010 is the main problem, because it's higher, at least 70,000 --

RICHARD APPELDOORN: Yes, it's forcing a severe closure of the fishery.

BARBARA KOJIS: Yes and it's 70,000 pounds higher than any other year, 60,000 pounds higher than any other year, and it's almost like 2010 should be eliminated from the calculation of the overage, because it just seems erroneous.

TODD GEDAMKE: But eliminating something because it seems erroneous I think is --

BARBARA KOJIS: It's not just seems it, but there's a rationale for it, in terms of what Walter said about IFQ.

GRACIELA GARCIA-MOLINER: The other issue that was not addressed at the time was to look at the outliers. For example, apparently there were quite a number of trips that had over 10,000 pounds reported or something like that, which is not the normal behavior for the years. There are a number of questions that were raised.

BARBARA KOJIS: I thought that was taken into account and those were eliminated by the Southeast Fisheries Science Center.

BILL ARNOLD: I think those were taken out to determine what that average would be. There was a 9,000 pounder in there that I think was identified. I don't think there was anything beyond that. I think it was that one extreme one. There was maybe a 3,500 pound and a couple of 2,000's or something like that, which were all -- As Genio would say, 500 pounds is a big trip, a big trip, for queen snapper.

These guys were reporting several over that, but I think only the 9,000-pound trip was extracted, if it was, and I don't remember exactly how that was handled.

GRACIELA GARCIA-MOLINER: There is 2,000 pounds per week over a very long period of time and that adds up to a modest amount and so there are still issues that need to be -- This one, for example, of extra poundage per trip and things like that is not in my recent memory that it was addressed, but I can look it up.

JORGE GARCIA-SAIS: Graciela, when they get to the fish market, don't they weigh the entire -- There is a record of the entire weight for which they are being paid for?

GRACIELA GARCIA-MOLINER: Yes and that's what they report or not report or --

JORGE GARCIA-SAIS: So why would the owner of the fish market overestimate the landings? That's going to cause for him to artificially --

GRACIELA GARCIA-MOLINER: It's not from the fish market. It's in our annual reported landings. If you sell me the fish, I will give you a receipt for the amount that I paid, but you are responsible for submitting the landings data to the DNER. If you want to put 100,000 pounds, that's your business.

JORGE GARCIA-SAIS: Okay and so then what happened in 2011? Did they get tired of it? Why the difference of over 100,000 pounds between 2010 and 2011? If that was a behavior or a pattern that they wanted to establish, why change it from one year to the next?

RICHARD APPELDOORN: In this case, it's because they just realized they went over the ACL and their fishery is going to be cut. They realized the impact of over reporting.

JORGE GARCIA-SAIS: They are still over the edge, substantially, and if that would be true, I would go back to the 140.

BARBARA KOJIS: They don't know. They don't know what other people are reporting and then they're also probably looking at this IFQ and if they report too low or they may have accurately reported in 2011, because then they said, well, we've got the IFQs and we've got the ACLs and we can't over report like we did in 2010 and we're just making suppositions about this.

Some of it could be looked at if you looked at the data and you looked at long-term fishermen and looked at individual fishers. Did they all of a sudden report a lot of fish in 2010 and was there any reason to report in 2010 a lot of fish, because suddenly there were a lot of fish out there and they could catch a lot?

JORGE GARCIA-SAIS: Or the weather was good and they could go out.

BARBARA KOJIS: Was there any evidence from the -- I believe that DNER gets at least some of the information from the people who are buying fish, right, from the -- Because they're using that to validate for the expansion factors.

GRACIELA GARCIA-MOLINER: Yes, but most of everything that gets reported is on an individual report. There are very few places

where they report through the fishing associations.

BARBARA KOJIS: I'm not talking about reporting through the fishing association, but even just going to the fishing association to get information about receipts. Do the fishing associations have to report how much fish they bought or anything?

GRACIELA GARCIA-MOLINER: Except for the tuna dealers and that kind of thing, but in this case, no.

JORGE GARCIA-SAIS: When was that data available for fishermen, to fishermen, the fact that they had fished 330,000 pounds?

GRACIELA GARCIA-MOLINER: This year.

JORGE GARCIA-SAIS: This year? So it wasn't possible for them to use 2011, because they already had known that they had gone over the ACL.

GRACIELA GARCIA-MOLINER: The council started hearing about the increase in the landings in 2012, but at that time, we were still talking about --

JORGE GARCIA-SAIS: I am referring to the 2011 number that went down 130,000 pounds, almost the equivalent of our ACL. Why would they do it to go down if they didn't know that they had gone over the ACL the year before?

TODD GEDAMKE: Once again, we can make stories up to explain all of these things and so I'm trying to come up with a one-sentence recommendation from us that may be helpful. Just basically, I think that reporting behavior and validation of landings needs to be studied and tracked over time to be able to adequately evaluate the difference between actual overages and changes in reporting.

Something along those lines to come out of the SSC that just says let's -- We could guess at this forever and ever and ever, but we need to make it strong that we've recognized the fact that changes in reporting could be causing some of this and that we really recommend that the Southeast Center and -- This is where the Center looks towards the Puerto Rican and territorial fisheries.

This is the expansion factors and this is in their hands. The Center always takes that information from them and so this is going to be something that they're going to have to work

together to get this information jointly.

Just as a recommendation, and we'll pass some of this back and forth later and then we can review this altogether tomorrow, but I think that's the best way. Joining this altogether and closing it out, let's come up with a recommendation. I think we all agree.

JORGE GARCIA-SAIS: I don't think anybody in this room has any doubt that we have a problem with the reporting. I am just trying to figure out what is it that we know.

BARBARA KOJIS: The other aspect of it may be to use the queen snapper as an example with the 2000 to 2011 data. That peak in 2010 is --

TODD GEDAMKE: Queen is on the table right now. The next meeting, it's going to be another species and the next meeting, it's going to be another species and so let's look at -- We've got big-picture issues that need to be addressed across the board and so a protocol and a procedure for being able to look at this and evaluate whether behavior has changed or not.

It needs to be put in place sooner rather than later, because comparisons to the information collected now very well are going to be very difficult to compare back to ten years ago, when all we have is a single expansion factor and not a regional expansion factor.

MICHAEL SISSENWINE: I have no problem with what you just said, but do we have any basis to know whether changes in catch -- Changes in catch from one year to the next, like a 90 percent increase, are more likely to be a result of a reporting difference, a true change in fishing mortality, or a stock size difference?

I would actually argue that in most cases it would be hard to generate 90 percent more fishing mortality from one year to the next, I guess particularly if there's some technology involved in fishing and it's not just a matter of more people flocking out there to go fishing.

It's quite easy to envision stock size changes by that amount and it's probably quite easy to envision reporting problems by that amount. Of course, the reason the system is in place is out of concern about the fishing mortality actually changing by that amount and so we're trying to control something, a signal, fishing mortality, that our information has noise in it,

measurement of catch and actual changes in stock size that probably are larger than the signal, which, again, goes to the problem of using this methodology to manage the fishery.

If one is going to talk about needing some protocol to deal with this reporting problem, I think -- Maybe it's not included in the Federal Register, but equally, we ought to be pointing out that there needs to be a methodology that would address the possibility that these overages or underages, which are equally as big a concern, reflect actual changes in stock dynamics, which, of course, means that -- At one extreme, it means a full stock assessment and a SEDAR. At another extreme, it at least means looking at some indicators, length frequencies or something.

TODD GEDAMKE: Let me just add one other thing. I am looking at the transcript list and expansion factors are the other one that are in there, because we have the reported amount listing, the plan that the expansion factors are being provided and they are also being generated regionally.

They can have a significant impact on the expanded landings and so a recalculation of those expansion factors annually could result in significant changes to what are expanded landings and not reported landings. What we're looking at is expanded landings.

RICHARD APPELDOORN: We don't have any indicator of the variability associated with those expansion factors.

BILL ARNOLD: By the way, just to cheer you guys up, and I forget this and it's kind of important, but the 2010 expansion factors were not calculated. They simply used the 2009 expansion factors and applied them in 2010.

JORGE GARCIA-SAIS: That was my first concern this morning to start with, but I would like to know if we have the data on effort, in terms of number of trips. By now, we should have that. If we don't have number of trips per year, we are off. We don't know where we are and at least some indication of effort, because the weather might be an important variable in this, good weather. It's not every day you can go out to look for deepwater snappers and so the number of good days in the year might be an important variable in understanding all of this.

WALTER KEITHLY: Again, it's not effort that's the worry. If you had a constant catch and more effort, you could have

increased catch and possibly overfishing. The critical value is whether catch per unit of effort is actually increasing. If catch per unit of effort is actually increasing, that's going to be more difficult.

JORGE GARCIA-SAIS: But we don't have anything. At least if we had effort, at least we would have something to go with and try to understand this sudden peak in these peaks that are overages.

GRACIELA GARCIA-MOLINER: This is trips for days when fishing was reported.

JORGE GARCIA-SAIS: Correct, that kind of thing or whatever. Give me something, whatever.

MEAGHAN BRYAN: Here is the number of trips by coast in Puerto Rico.

BARBARA KOJIS: Carlos just brought this up and he said Daniel Matos stated that the government of Puerto Rico gave fishers a grace period to submit CCRs, their catch reports, in order to maintain their active license and this could have showed increase in landings. What that may have meant was that --

RICHARD APPELDOORN: That's extension in 2009?

BARBARA KOJIS: After so many days, I think forty-five days after the month they were supposed to report, the time and date they were supposed to report, previously Daniel Matos would not accept the reports and the government said no, you need to accept those reports.

There were a lot of reports coming in and so, in other words, fishermen before were fishing and didn't turn in reports, because they were too late in turning them in.

TODD GEDAMKE: That argues against that when you have flat reported landings in there. There is no reported trip change due to any of the things that we've been discussing if this is what the data are based on and if those number of trips are there, if we fall back to what Mike was just summarizing, how could you end up with a 100,000 pound increase?

You either have stock size dramatically increasing, doubling or -- There's a whole slew of reasons that it could potentially -- It could be just one of those good years, but you would have to almost double landings for every trip per fisherman in that year or you have potentially an expansion problem that's in there.

That, to me, is somewhat reassuring at least, because many of the things we've talked about are that, well, maybe you just have a whole lot more people reporting and a whole lot more trips.

JORGE GARCIA-SAIS: This doesn't make any sense at all.

RICHARD APPELDOORN: Is this expanded trips or is this --

TODD GEDAMKE: Number of reported trips and I'm just reading the axis and so that would be the number of pieces of paper that came in with numbers on them.

BILL ARNOLD: I don't think this will be a big revelation, but if you have 50 percent of your fishers reporting in 2009 and they report 50,000 pounds of landings and then you have 100 percent of your fishers reporting in 2010 and they have 50,000 pounds of landings, but you use the 2009 expansion, that will look like 100,000 pounds of landings, when, in reality, it was really 50,000 pounds.

As Todd agreed, what we really need to be looking at are the reported landings, to see what those changes are, and I thought the Science Center did that as part of their analysis of is this due to changes in reporting or is it due to these screwy expansion factors, but the rule does not say if we have screwy expansion factors, then we don't have to apply accountability measures.

It says if there has been an increase in reporting, we don't have to apply the accountability measures and in Bonnie's analysis that she presented at that December council meeting, we looked at the expansion factors and she said this is a mess and this 2009 to 2010 carryover may have had a significant impact on that 2010 burst, but we don't -- We can't address that within the regulations.

BARBARA KOJIS: The other thing is they could have been just misreporting in 2010, like Walter said.

BILL ARNOLD: It could be a combination of factors.

BARBARA KOJIS: They just reported a lot more fish for every trip than they did in the past, because they've got fewer trips in 2010 than 2009.

BILL ARNOLD: Again, as Todd pointed out, it could be all kinds

of things and it could be a combination of things and we can make up any story we want.

TODD GEDAMKE: Just in case we don't forget this, because I've stared at this forever, is look at this drop from here. We're not expanding them at all from here and so that's 100,000 pounds of fish.

If you go to the next year, you're at 180,000 pounds of fish, with the same exact number of fish being landed. That's how that expansion factor from one year to the next is going to affect the expanded landings.

If this is true and there are magnitudes of change that are 30 or 40 percent in there and you carry over one year here, that we missed a signal that is 30 percent higher or 30 percent lower, if what Bill is saying, the carryover was not applicable, you may have that spike up in here and that's going to take that expanded landings exactly down to the same realm that we were in before.

BILL ARNOLD: Yes.

MICHAEL SISSENWINE: I don't know if they're overfished here, but look at the north, where you're talking about factors of one year to the next it's a factor of ten.

RICHARD APPELDOORN: Or even the south.

TODD GEDAMKE: If you get one guy that comes in with a few hundred pounds of fish in the north and then you take the whole entire stock and add another 10,000 pounds, but the time you --

BARBARA KOJIS: He didn't report his couple hundred pounds of fish and so now it gets --

TODD GEDAMKE: It's supposed to take that into account.

BARBARA KOJIS: Yes, that's right.

TODD GEDAMKE: Just any of those jumps and your expansion factors are all over the board like that and it's cause for concern and we've revisited this.

BARBARA KOJIS: It depends upon the sample size. If you rely on this expansion factor is based on a couple of samples and you happen to run across this guy that landed a couple hundred pounds and didn't report it, then your expansion factor may

increase the amount of landings for that region tremendously.

BILL ARNOLD: One of the good points about expansion factors has been that it's based upon a referenced number of fishers. That's the number of licensed fishers and so if you have a thousand licensed fishermen and you get reports from 800 of them, then you have 0.8 expansion factor for failure to report.

I don't know how they do the underreporting and stuff, because they assume that those 200 fishermen did fish, but they just didn't report. The problem is that those fishermen may not have reported, and this was something we had to -- I forget what year it was, but when the gas prices went up.

I think the gas prices reduced the number of fishermen who were actually fishing, because they couldn't afford it. That was interpreted as them not reporting and so they really weren't out there fishing and they really weren't out there catching fish, but the landings were adjusted accordingly and they went up artificially and, like I said, I don't remember if it was 2008 or 2009 or somewhere in there, whatever it was.

JORGE GARCIA-SAIS: Bill, all of us know that that is not a problem, because it's not the fishermen, the commercial fishermen, the licensed commercial fishermen, that are not reporting. It's the recreational people, fishermen, that are participating massively now in this fishery which are not reporting.

BILL ARNOLD: So if you add fishermen and you use a false expansion factor, then you simply magnify the effect of those -- They are commercial fishermen now, but this additional group of fishermen that have suddenly burst into the fishery. They may catch 50,000 pounds more, but then you multiply that by a doubling or whatever it may be.

RICHARD APPELDOORN: Looking at the individual catch rates will show that. If the catch rates per trip of what these people are reporting aren't going up and then the total catch goes way up, it's got to be the expansion factor that does that.

BILL ARNOLD: But as we discussed earlier, the data are probably available to make these analyses, but nobody has done them, to really get into this dataset and try to figure out what's going on in-depth.

BARBARA KOJIS: Is there anything else you need, Todd, before --

JORGE GARCIA-SAIS: I think Todd's line is very good, Barbara.

BARBARA KOJIS: I think what you said was good. You had a good line and just do a little explanation about what the discussion was and --

JORGE GARCIA-SAIS: It also underlies the real reality here that these numbers -- No one really believes pretty much anything seriously about these numbers.

BILL ARNOLD: Best available data.

JORGE GARCIA-SAIS: But with the caveat that we don't believe it.

BILL ARNOLD: There is no believing in science, just like there's no religion.

BARBARA KOJIS: Any other final comment or anything like that? It's almost five o'clock. Does everybody concur that we've pretty much covered all aspects of this analysis, the assessment and what we can do with it, and we can go on tomorrow to look at what Todd has written up and see if we concur with what Todd says about our discussion today about the overfishing status of queen snapper, as well as all the other aspects of this.

Then we can go on to the SEDAR-30 analysis. Does that sound like -- Nobody else has anything else that they need to bring up at this stage? Okay. Tomorrow then, we will -- Todd, if you could have this ready and if Mike could just help him. If you could please help Todd in any way he needs help. I don't think he probably needs much help with respect to this and then tomorrow we will take a look at this.

TODD GEDAMKE: I am just going to make about three or four summary statements with a couple of sentences clarifying.

BARBARA KOJIS: We can elaborate tomorrow or what have you.

TODD GEDAMKE: I would rather do that than me wordsmith and so I will get the gist.

BARBARA KOJIS: Get the gist of what we've concluded up there and then we'll go over that and then if everybody can be prepared with our kind of review of the SEDAR-30 and that's queen trigger and blue tang and, Meaghan, you're going to be making a presentation on that as well. Then we will see everybody tomorrow and thank you very much for all your input

and it's at 8:30 tomorrow.

(Whereupon, the meeting recessed on June 19, 2013.)

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June 20, 2013

THURSDAY MORNING SESSION

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The Scientific and Statistical Committee of the Caribbean Fishery Management Council reconvened at the CFMC Headquarters, San Juan, Puerto Rico, Thursday morning, June 20, 2013, and was called to order at 8:45 o'clock a.m. by Chairman Barbara Kojis.

BARBARA KOJIS: Good morning, everybody. Thank you very much for coming here and we're close to on time. The meeting is starting about quarter to nine and this is the 20th of June and we're starting the SSC meeting. I would like to go around the room and have everybody do a kind of roll call and we'll start with Meaghan, please.

MEAGHAN BRYAN: Meaghan Bryan, Southeast Fisheries Science Center.

RICHARD APPELDOORN: Rich Appeldoorn, SSC.

GRACIELA GARCIA-MOLINER: Graciela Garcia-Moliner, council staff.

BILL ARNOLD: Bill Arnold, National Marine Fisheries Service.

WALTER KEITHLY: Walter Keithly, SSC.

TODD GEDAMKE: Todd Gedamke, SSC.

MICHAEL SISSENWINE: Mike Sissenwine, SSC.

CARLOS FARCHETTE: Carlos Farchette, Caribbean Council.

JORGE GARCIA-SAIS: Reni Garcia, SSC.

JULIE NEER: Julie Neer, SEDAR.

BARBARA KOJIS: Barbara Kojis, SSC Chair. What we're going to be doing today is to, first of all, go over the report that Todd

has put together about the discussion that we had yesterday and then we'll be reviewing the SEDAR-30, which is the queen trigger and blue tang SEDAR. Todd, this is your report that's up on the screen right now?

TODD GEDAMKE: It is a report. What I tried to do is kind of run through, as briefly as I could, what Meaghan presented, a couple of things that we pointed out during the discussion, and then some summary statements towards the end and so do you want me to just read through it?

BARBARA KOJIS: Yes, please.

TODD GEDAMKE: Meagan Bryan presented a summary of the queen and silk snapper SEDAR-26 results and described a newly-developed approach to use PYR-based reference points to evaluate stock status and so the approach can generally be described as total mortality was estimated using the Gedamke-Hoenig approach with sensitivities to input parameters.

Natural mortality was not available from empirical studies and so it was derived from life history invariant relationships and Fcurrent was estimated by subtracting M from the most recent Z, Fcurrent, when compared to M, YPR, and MSY reference points as ratios. If the ratio exceeded one, overfishing was indicated and so all the sensitivity runs were presented as a histogram in a cumulative probability of overfishing, an example of how the ratios can be used to develop a harvest control rule as presented.

We noted that estimates of the current F were derived from a specific time period that, at least in the case of queen snapper, is not consistent with the years used to calculate average catch and the available evidence indicates that overfishing probably has not occurred through 2008 and queen snapper were probably not overfished.

Current status of the stock was unknown, since the most recent length frequency data included in the assessment was 2008. A true harvest control rule is not possible, as no reliable estimates of biomass exist and the approach presented is approximately a constant F scenario.

I think we discussed this a lot. Adjusting the current ACL by any ratio assumes the existing average catch derived ACL is appropriate. Then I tried to just do some points along the major discussions we had.

The SSC recognized the uncertainty in methodology due to uncertainty in life history parameters and, once again, our recommendation is that regional age growth studies be conducted for queen snapper. Otoliths are already in storage and should be analyzed as soon as possible.

We can modify the wording on any of this. The age growth studies, I think we've repeated that over and over. I just wanted to really highlight the fact that we discussed that there are actually otoliths in place and at least maybe we could make a push for that one.

The SSC recommends the most recent length data be included in the mean length analysis aspect of the approach and ideally, if ratios were used to modify OFLs, then the time period for average landings should correspond to the time period for the mean length analysis. However, this does presume that the landings data is reliable.

The SSC looked at years used to calculate average catch and found that slightly different time series had little effect on the value for average catch, which corresponds to the OFL and maybe we should put "for queen" in there.

The SSC spent most of the first day discussing expanding landings data and extremely high variability that has been observed in recent years. A number of members believed that high fluctuations are not a reflection of reality. The SSC strongly recommends that the expansion factors be evaluated again and that reported landings alone be evaluated.

The SSC's concern is that reporting for queen snapper has changed and reporting behavior is driving the recent overages. The implications of this are that fishers could have harvested more in the past and the current OFL is too low or, alternatively, that the current harvest rates are higher than expected and the status is unknown.

It was also noted that according to the Federal Register, that the SSC needs to determine if overages are due to increased landings or improved reporting. Apparently the SEFSC concluded the former, but the SSC understands that the individual representative fishers or even tracking number of reporting fishers over the most recent time period hasn't been presented.

Our recommendation is that reporting behavior and validation of landings needs to be studied and tracked over time to be able to adequately evaluate the differences between overages and changes

in reporting.

Our overall summary statement is both the SEDAR-26 results and the information presented from the new methodology suggests that overfishing is not occurring, although the assessment is too uncertain to be confident and there isn't much room for further development of the fishery.

Rich Appeldoorn reminded us that the new analysis does show some probability of overfishing is occurring. The SSC is concerned about the reliability in expanded catch and uncertainty in the life history estimates. The SSC concluded at this time there was no scientific basis for modifying the ABC.

BILL ARNOLD: Todd, could you send that to me, please, or is it not final enough?

TODD GEDAMKE: It's not final enough. I just read what I wrote and the rest of these members deserve to chop it up and revise it.

RICHARD APPELDOORN: Why am I the only one who is identified there?

TODD GEDAMKE: I did have a couple of other ones. Mike pulled a few out and as I was reading that, I thought that we should probably pull your --

MICHAEL SISSENWINE: I don't think we ought to identify individuals, unless they personally --

JULIE NEER: Todd pointed out earlier that you should add "queen" when you're talking about changing the years had little effect.

BARBARA KOJIS: And should we just put, instead of "some probability", "the range of probabilities" that overfishing is occurring?

RICHARD APPELDOORN: No, I think it's correct the way it is.

BARBARA KOJIS: I think it ranged from 5 to 55 percent.

TODD GEDAMKE: I would prefer not to include specific numbers in there, because once it ends up in writing and gets put forward, that one piece that they grab --

JULIE NEER: Meaghan, you needed to review the 30 percent ones,

too.

BARBARA KOJIS: Could we just go back to the beginning and --

TODD GEDAMKE: The whole first summary section, I'm not sure that we want to include the approach can generally be described as -- I just thought for us that it would be good to have --

BARBARA KOJIS: I think it's good to have that in there.

TODD GEDAMKE: It's included for completeness, the summary of the method.

BARBARA KOJIS: Any other comments on this?

TODD GEDAMKE: Along those lines, there's a plot of silk also and I think we did have limited amounts of discussion as to the approach overall. I think we wanted to include a statement in there that the approach is -- Vetting the approach a little bit more or adding just a statement saying that we believe the approach can be valuable and with life history information and a natural mortality estimate, we may be able to actually -- I think it's kind of hinted at in here, but not explicitly stated.

BARBARA KOJIS: That's under the recommendations, right?

JORGE GARCIA-SAIS: Barbara, is the conclusion or opinion of the SSC that overfishing is not occurring compatible with that recommendation that accountability measures are not taken?

BARBARA KOJIS: Can you say that again, please?

JORGE GARCIA-SAIS: For things like closure of the fisheries and things like that. Does one thing have to do with the other?

RICHARD APPELDOORN: Only if the data coincide temporally, which they don't here. Just because the data here is up to 2008, the overage is from 2010 or 2011.

BARBARA KOJIS: Any other changes for this page or comments? Could you go to the next page then?

GRACIELA GARCIA-MOLINER: We have Maria and Miguel on the Go to Meeting and so if you can speak up so that they can hear you better.

JORGE GARCIA-SAIS: What would be the source of the most recent mean length data? TIP data?

BARBARA KOJIS: Yes.

BILL ARNOLD: As a recommendation that regional age growth studies be conducted, is there any timeframe associated with that or is this just a -- Do you guys want to state a timeframe?

JULIE NEER: As soon as possible.

BILL ARNOLD: I agree, but that's not what it says.

BARBARA KOJIS: Yes, it is.

TODD GEDAMKE: It's the last four words.

BILL ARNOLD: Sorry. It's all comprehension.

BARBARA KOJIS: Could you explain just the first sentence up there, adjusting the current ACL ratio assumes --

TODD GEDAMKE: As I read that, I thought that could be cleaned up a little bit. I think that just was trying to capture discussions when we were looking at the ratios. We were basically saying that you could end up with a ratio that's 0.7 and you take that 0.7 and reducing your average landings down to 70 percent of what was the average was of those two years, yet that whole process assumes that the average landings are reliable for you to get an OFL from.

The ratio is a benchmark-based ratio and that will assume that you're basically taking your average landings down from a value that makes sense and we don't have much confidence in the level of landings to be able to make that statement. We can reword or revise that, but I think that was kind of where our discussion went to when we started looking at how to apply the ratio.

BARBARA KOJIS: Maybe it's just changing "as appropriate" to something more specific.

TODD GEDAMKE: Where Meaghan just corrected too, I am basically saying the same. Those two things are trying to get at the same point.

BARBARA KOJIS: It's more like it's accurate instead of appropriate or based on data which we're confident of.

TODD GEDAMKE: The point there is -- We have an OFL MSY proxy and an OFL to get to the ACL and so we're basing this on an MSY

principle and for us to reduce that down by a ratio, we're assuming that what's in place already is appropriate, given the theory behind it. I am not married to the word "appropriate".

MICHAEL SISSENWINE: Are you talking about reducing it down by a ratio with this harvest control rule? I can't see the paragraph above that, which I presume refers to the harvest control rule.

BARBARA KOJIS: Any more comments? The SSC is concerned where that green line is --

BILL ARNOLD: We have that recommendation that expansion factors be evaluated again. We know that those 2010 expansion factors were never developed and they were just carried over from 2009. Graciela, do you know if anything could be done about that to develop 2010-specific expansion factors?

GRACIELA GARCIA-MOLINER: They should be able to do something about it, because that's the year where they changed the forms and they were working on factors. I think that they should be able to.

BILL ARNOLD: They've got all the information.

GRACIELA GARCIA-MOLINER: Even if it's just number of fishermen for that year, something that will give them an idea of how big the change was from 2009 to 2010. The information is in the database and so I would think yes. Why wasn't it done? That, I don't know.

BARBARA KOJIS: I can't remember.

GRACIELA GARCIA-MOLINER: 2010 was the year when they were rewriting the regulations and everything else and so there was probably a lot of --

BARBARA KOJIS: They may not have collected the information that they normally used for the expansion factors, because my understanding was they collect information on fishermen and whether fishermen are reporting their catches and observations in the field and how accurate the reports are. They see how much a fisherman has landed and then they go back to the report and check the report, to see how accurate it is. That's what I thought they were doing.

JORGE GARCIA-SAIS: For me, those last two bullets of the page are kind of contradictory. In the first one, it's mostly saying that reporting has changed and so those numbers are kind of

dubious and then on the next one, it says that apparently the Southeast Fisheries Science Center concluded it was the former and in other words, the overage is actually a reflection of a real increase in landings. I have trouble matching the two of them.

RICHARD APPELDOORN: These two?

JORGE GARCIA-SAIS: It's the last one that ends on the next page. The first one says that we have concluded that reporting has changed and so implying that, those overages are actually resulting from a change in reporting, but then, on the next bullet, it says that the Southeast Fisheries Science Center concluded that it was the former and in other words, due to increased landings, because the other thing would be the latter, right?

MICHAEL SISSENWINE: Isn't that what we were told yesterday, that that was the opinion of the Southeast Center?

BARBARA KOJIS: Yes, it was.

MICHAEL SISSENWINE: That's why it says that. It doesn't mean that that's our opinion.

BARBARA KOJIS: The individual representative fishers doesn't seem to go anywhere. Individual representative fishers hasn't been presented? I think you're referring to --

TODD GEDAMKE: Understands that tracking number of reporting fishers or individual representative fishers over the recent time period -- Just take "individual representative fishers" out and put it after "number of reporting fishers". We can take out the "or even".

BARBARA KOJIS: Just tracking the reporting of individual representative fishers. One of the things we were recommending is tracking the individual fishers and the reporting of the individual fishers to see if there was changes.

TODD GEDAMKE: If you put "fishers" to the end of that sentence and put that "fishers" back in.

MEAGHAN BRYAN: The number of reporting fishers? That's what you want?

TODD GEDAMKE: Yes. The SSC understands that tracking the number of reporting fishers or individual representative fishers

over the recent time period. Those are the two pieces that we discussed.

BARBARA KOJIS: Yes.

JULIE NEER: It sounded to me like you guys thought that the new analysis, the looking at the possible benchmark ratios, was useful for your discussions and something that you would like to continue to see done. I think it's encompassed in there, but I was just making sure that that was the new analysis that Meaghan presented yesterday as something that you guys would like to see done for the assessment done this year as well.

BARBARA KOJIS: Comment? Do people concur?

BILL ARNOLD: Could you repeat that?

JULIE NEER: I was just saying that it sounded like for what was written up above that the new analysis that Meaghan presented, the ratios for possible use for benchmarks to indicate overfishing probabilities -- You guys thought that was useful in part of your discussions of determining whether overfishing was occurring and that you would like to have that additional step added to the length-based method that was used in SEDAR-26 and if you would like to see it for red hind this year to help you in your discussions on what to do.

BARBARA KOJIS: Comment? Anybody?

JULIE NEER: I think it said that in there, but I just wanted to clarify.

BILL ARNOLD: Where it says, in the first sentence in that top bullet, that the overage is due to the increased landings or improved reporting, it doesn't really say improved reporting. It says data collection and monitoring improved and that is a big difference, because there is no behavioral component in that.

Data collection and monitoring improves when you take angelfish and add them to a fishing report that you didn't used to have them on and so now they're reporting angelfish landings, but that's not improved reporting. That's better monitoring and tracking. That is a specific instance of data collection and monitoring having improved.

BARBARA KOJIS: That's what it says in the Federal Register.

BILL ARNOLD: That's what it says in the Federal Register, yes.

MEAGHAN BRYAN: So you want that to say "or improved data collection"?

BILL ARNOLD: It should say "data collection and monitoring improved" and you can put that in quotes.

WALTER KEITHLY: You see to neglect the very next part of the sentence and it's "rather than because the catch has actually increased". You're basically saying that you have no basis for thinking that catch has increased, or very little basis, because changes in reporting behavior -- Potential changes in reporting behavior by fishermen.

BARBARA KOJIS: So include that other part?

BILL ARNOLD: You can, but that's what -- Overages are due to increased landings and I thought that covered it.

BARBARA KOJIS: I would include the whole thing.

MEAGHAN BRYAN: "Or improved reporting", do you want that back in?

BARBARA KOJIS: Yes, leave that in and then add --

BILL ARNOLD: Rather than because catches actually increased.

BARBARA KOJIS: At the end of "data collection and monitoring improved" and it's within that quote.

BILL ARNOLD: Rather than because catches actually increased.

MICHAEL SISSENWINE: You probably need to get rid of the "Southeast Center needs to determine if" and then you go to the quote. You don't need the "overages are due to increased landings". That's redundant.

RICHARD APPELDOORN: Right.

MEAGHAN BRYAN: Get rid of this part?

MICHAEL SISSENWINE: No. "Notes the Southeast Center needs to determine if" and then delete the "overages are due to increased landings or". It needs to determine if data collection and monitoring improved rather than --

RICHARD APPELDOORN: You need the “overage”, because that refers to the “rather than”. If overages are due to --

MEAGHAN BRYAN: There is a delay and I’m sorry. I am typing.

BILL ARNOLD: You might want to say overages result from rather than, just to make it read better.

MICHAEL SISSENWINE: Then I would change the next sentence to say “Apparently the Southeast Center concluded catches actually increased”. You could say “the Southeast Center concluded the latter”, but we might as well be more specific that catches actually increased.

BILL ARNOLD: I wouldn’t say that. I would get rid of the “apparently” and I would say the Southeast Fisheries Science Center concluded that the overage was not due to improved data collection and monitoring, because they didn’t actually say what it was due to. They said what it wasn’t due to.

MICHAEL SISSENWINE: That’s why the word “apparently” was used, because apparently that’s --

BILL ARNOLD: I wouldn’t be saying apparently. They gave a very clear presentation at the council meeting saying this is what we concluded and we conclude that this is not due to increased better monitoring and reporting.

MEAGHAN BRYAN: So that should be changed?

JORGE GARCIA-SAIS: Bill, why did they conclude that? Why did they conclude that?

TODD GEDAMKE: I think why they concluded it, at this point, is they summarized that it was done and let’s just come up with a statement on it now, because we did a good bit of this yesterday, as to why they concluded it. We don’t know.

JORGE GARCIA-SAIS: Really I’m asking because if they considered that their data is good, what can we do? Can we say that we don’t agree with them?

BILL ARNOLD: I tried to explain that and that’s the angelfish example. In the angelfish example, a tangible action was taken to improve data reporting. We added angelfish to the form and so that improved reporting. There was no tangible action taken in the case of Snapper Unit 2 to improve reporting.

The reports were the same and ostensibly the folks out in the field were doing the same thing. Maybe they weren't, but this is what the Science Center, as I understand it, as it was explained, looked at and there was nothing saying we have made conscientious, tangible efforts to improve reporting in the Snapper Unit 2 fishery. Like I said, there is no behavioral component included in that.

MICHAEL SISSENWINE: It responded exactly to the text rather than the spirit of what was being asked.

BILL ARNOLD: Yes, no spirit.

MICHAEL SISSENWINE: Then somehow we're supposed to fix the mess. The spirit of what was being asked was clearly should you implement accountability measures because these catches that are reported represent the problem in terms of overfishing and I think everyone would agree that we have no reason to believe that's the case. Maybe it is, but we just don't know.

It would have been easy to respond and say in the spirit of what was being asked, these overages probably are not an indication that we need accountability measures, but that isn't the way it was applied. It was applied strictly with were there improvements.

BILL ARNOLD: We had an influx of -- One explanation for this is we had an influx of new fishers into the commercial fishery, but they're all licensed fishers. They are real, live commercial fishers and if you had an influx into the shrimp fishery in the Gulf of Mexico of a thousand commercial fishers, that doesn't mean you raise the ACL to allow these guys to fish.

You have still got a level of fishing that is allowable and if you double the number of fishermen, each fisherman gets half as much catch or you blow through the ACL, even no matter how much we think these guys are -- This doesn't deal with the bogus concept of reporting, but it deals with the influx of --

MICHAEL SISSENWINE: So if we believe that that influx of fishermen actually were out there fishing and what they were reporting was real catch --

BILL ARNOLD: Puerto Rico licensed them as commercial fishers, but they reported 9,000 pounds and clearly nobody was bringing back 9,000 pounds of queen snapper.

MICHAEL SISSENWINE: So in the spirit of what was intended here

--

BILL ARNOLD: The Science Center addressed that, too.

BARBARA KOJIS: They eliminated 9,000 out.

BILL ARNOLD: They said we can take 9,000 out and maybe we can take 2,000 out, but what about 700 and what about 800? What about all these reports that also -- Really, if you take the 9,000 out and a couple of 2,500s, it's not going to bring it down that much. It might bring it down 20,000 pounds.

JORGE GARCIA-SAIS: What Genio told me last night was that the maximum catch per trip was in the order of 150 pounds and very seldom did anybody have, in the last twenty years, have more than 200 pounds in one trip a day.

BILL ARNOLD: I asked him. I said, Genio, what would be a spectacularly good landing for a day?

JORGE GARCIA-SAIS: 200 pounds.

BILL ARNOLD: He said the upper limit was 500 pounds and I can't even imagine doing that, but we'll be conservative and say 500 pounds.

GRACIELA GARCIA-MOLINER: But you've addressed the tracking of the reporting, because that's what would really have told you whether there is a problem with the reporting or not. When you track fishermen over time, even if you have -- When they come into the fishery, the DNER gives them a beginners license and nobody expects a beginning to be in the 200-pound or 500-pound limit. That kind of thing, that kind of review of the data that's coming in, hasn't been done.

BILL ARNOLD: Is that what that recommendation is about, because that's what I thought it was about, is a recommendation that reporting behavior and validation of landings needs to be studied and tracked over time.

MICHAEL SISSENWINE: In any case, to complete where we were, the sentence that starts "Apparently" should be replaced, I guess, by something that says the Southeast Center concluded that data collection and monitoring had not improved.

TODD GEDAMKE: Let's use the words and --

MICHAEL SISSENWINE: That's what I just read. Those are

presumably the words.

MEAGHAN BRYAN: I am taking out all of this and adding what?

MICHAEL SISSENWINE: The data collection and monitoring had not improved. That doesn't mean that we actually believe the results.

BILL ARNOLD: This Science Center report is available on the council website under its December 2012 meeting presentations.

MICHAEL SISSENWINE: Is that an accurate statement?

TODD GEDAMKE: Is it going to change what we want to do here? I think "apparently" takes out -- Bill summarized what was done and so we have a report based on what was done and we know where that stands. I think the "apparently" at the start of the sentence -- We didn't fully review the process, but it's our understanding that this is what occurred.

Concluded that data collection and monitoring had not improved, because the statement in the Federal Register is determine the overage occurred because data collection and monitoring improved rather than because catches actually increased. It is somewhat semantics, but Mike was trying to get the catches in there, in the wording.

I think it might be stronger if we used the same language and so the SSC concluded that data collection and monitoring had not improved and the inverse of this is and that catches actually increased. You can't have one without the other.

MICHAEL SISSENWINE: Apparently you can, because they didn't say they believe catches had increased.

BILL ARNOLD: If you put "there was no evidence that data" -- It's clear and we would know if there was an improvement in data collection and monitoring, because those are, like I said, actions that are taken.

TODD GEDAMKE: I disagree with you, Bill, in the spirit of what that is. I understand you're looking at a piece of a form and a new this and a new that. I've modified the expansion factors and I've changed the way we look at it and I've changed the landings and so you're not just counting the fish, but you're looking at the process of how you get to expanded landings.

MICHAEL SISSENWINE: I would even go beyond that in that the

spirit of it wasn't necessarily about improvements or not. It was is there a reason to think that these overages occurred because something changed in the way we're reporting catches and it's not a reflection of something bad happening in the fishery.

If you take the argument that maybe something bad did happen in the fishery, because you've got all these new licensed commercial fishermen, then it's a fair enough outcome.

BARBARA KOJIS: We are discussing this quite a bit and do we want to include a sentence relating to the spirit of the comment in the Federal Register, the comment about data collection and monitoring and improved, rather than -- Improved rather than because catches actually increased? Do we want to talk about that?

MICHAEL SISSENWINE: I think that's a broader issue, the whole idea of having an ACL and accountability measures when you have unreliable catch data. It's the problem, really.

BILL ARNOLD: They were aware, when they made this conclusion, that the 2010 expansion factors were a carryover from 2009.

MICHAEL SISSENWINE: So that's another reason it's not an improvement. If anything, it's a deprovement or a deterioration, but the Federal Register notice doesn't allow that you would somehow not invoke the accountability measures because the data got worse, but only if it gets better.

This was apparently crafted to be as narrow and as restrictive as possible, which, again, is going with don't give anyone a way out of accountability measures and, in effect, that's the way it plays out.

BILL ARNOLD: It was written by me and it was not written in a vacuum and it had to go through GC and everybody else.

MICHAEL SISSENWINE: Yes, but it's very narrow and constraining and it doesn't allow for a lot of wiggle room and presumably that's intentional, because lots of people feel that if they leave wiggle room, there's a lot of abuse.

BILL ARNOLD: That's right.

BARBARA KOJIS: We could go on and on discussing all of this. Obviously there's issues and the problem goes back to unreliable catch data and this has been brought up at the council meeting and it was brought up by the issues, especially with respect to

queen snapper and the closure for the fishermen and everything else.

We can make recommendations, and I think we have here, regarding this, but the Southeast Fisheries Science Center, I guess, and the Southeast Regional Office have to see how much they feel like they've got leeway in what they do.

Do we want to be anything more specific, even though it's a small potential change in the ACL, about no evidence of overfishing and therefore, the 15 percent reduction could be changed to a 10 percent reduction, because this is not a species that there's any evidence of overfishing or that it's overfished or we can't say that because we don't have data to 2011, size data for 2011, and the analysis hasn't been done to current levels?

MICHAEL SISSENWINE: We could have a bullet in there somewhere that says the SSC recalls that the ACL -- I am thinking out loud here or speaking while I'm thinking, but the ACL was based on an adjustment to average catch by a coefficient of 0.85, based on the understanding that the stock was overfished.

A coefficient of 0.9 was routinely applied to stocks that were not overfished and in retrospect, the latter coefficient might have been more appropriate or something to that nature. I'm just pointing that out. Something along those lines it seems to me would be informative to have in the report. It would probably be before the summary, a bullet point before the summary.

BARBARA KOJIS: The summary was at the end.

MICHAEL SISSENWINE: I would start it with "The SSC recalls that -- Was it the ACL or the ABC?

BARBARA KOJIS: The ACL.

MICHAEL SISSENWINE: That the ACL was based on average catch during a reference period multiplied by a coefficient of -- Multiplied by 0.85.

BARBARA KOJIS: During a reference period.

MICHAEL SISSENWINE: Because the stock was considered overfished.

JULIE NEER: Overfished or undergoing overfishing?

BILL ARNOLD: Undergoing overfishing.

MICHAEL SISSENWINE: Was considered to be undergoing overfishing.

RICHARD APPELDOORN: Is this true? Because the analysis that was done at that time did not indicate that --

BARBARA KOJIS: All the snappers were put into either overfished or undergoing overfishing status, because of -- That was based on Puerto Rico's concern about deepwater snapper.

MICHAEL SISSENWINE: Then maybe we shouldn't say it that way and so it should be a full stop after "0.85" and then we would say that --

BARBARA KOJIS: But they didn't say that. This is correct as far as all the documentation goes. The basis for it was limited. There were species that were undergoing overfishing and this was just expert opinion. It wasn't --

RICHARD APPELDOORN: The ACL was set before the analysis was completed.

BARBARA KOJIS: That's right.

RICHARD APPELDOORN: Then that's fine.

MICHAEL SISSENWINE: Then we would want to say a coefficient of 0.9 was used for stocks for which overfishing was not occurring. In light of our current assessment, the latter coefficient might have been more appropriate or something like that.

JULIE NEER: How about latter coefficient and then, in parentheses, 0.9, so no one gets confused and then it's clear.

BARBARA KOJIS: Any comment or changes on that one? Okay. Any other comments or changes? Is everybody --

MICHAEL SISSENWINE: I don't know whether this should be reflected in the report, but I mean the way this whole thing is set up -- Let's say all the information, catch data, was spot on and it was perfect.

The way this whole framework is formulated, one would expect accountability measures to be invoked more than 50 percent of the time and so the fact that we have accountability measures

and everybody is in a furor, in saying it must be because the data is wrong, they don't understand that even if the data were prefect, they would have accountability measures more than half the time.

BILL ARNOLD: Actually, the surprising thing is that we didn't have to apply more accountability measures and that there weren't more overages. We had like fourteen or sixteen stocks or something like that and only five of them were -- I realize that that's a lot, but why didn't we have eight or why didn't we have nine or ten?

MICHAEL SISSENWINE: We may have twelve next year.

RICHARD APPELDOORN: It's a 50/50 chance.

MICHAEL SISSENWINE: That's right and so we've set up a system where they are expected to, more often than not, have to apply accountability measures and so why is everybody trying to get us to solve the problem for something that is designed for this to occur most of the time?

WALTER KEITHLY: Assuming if things were stationary you would, yes.

MICHAEL SISSENWINE: If it's not, then it's even probably worse. If everything -- If all the information was perfect and nothing usual was happening other than just normal random variations --

BARBARA KOJIS: That's right, but with this one, because of the severity, I think that's what really triggered the --

BILL ARNOLD: Where it really came from, in Roy's mind, was you've got -- Since we established this, a SEDAR assessment was conducted and that SEDAR assessment indicated that this species was not undergoing overfishing. This was a conclusion in the SEDAR.

Roy asked, okay, could you take that data any farther and establish a new ABC for this species? That's really what it boiled down to and that's why this group is discussing this or that's my understanding.

MICHAEL SISSENWINE: That's fair enough and our conclusion is it's not undergoing overfishing and you might have gotten a little different answer if you associated the catch data with the period, the reference period.

You might get a little different answer if you used 0.9 instead of 0.85 and we've given the opening, so that if the council wants to pursue those things, they might, but it's not -- The differences are relatively small compared to the problem.

JORGE GARCIA-SAIS: I think that the queen snapper catch is going to be very close to 200,000 pounds, very close. If we cut it any measure below that, I think overages are going to keep occurring and that's just my opinion.

One important measure that would take that would take us very close to that 200,000-pound mark is to delete one of the data points which I think is like an outlier, which is the 1999 value, which is the 79,000 pounds. It's completely out of like the range and what I believe is like the normal range that that fishery is being --

BARBARA KOJIS: We did that. We looked at it and we added up to 2008.

JORGE GARCIA-SAIS: It came to 185,000, which is close to what I believe should be a good number to work with and in my opinion, that would be a good starting point and I'm not going to say anything else.

BILL ARNOLD: I have two suggestions. The one I made to Genio and this is a local issue. This has to be dealt with -- If they really want to readdress that 2010 huge landings, they have to do that on a local level and that's what I talked about yesterday.

Puerto Rico would have to go into their data and determine what the allocation of these landings are amongst the various groups of fishermen and then Puerto Rico would have to make a determination as to what they feel their legitimate commercial and recreational landings are and if they want to deal with it and then they would have to submit those reallocated landings to the Southeast Fisheries Science Center for their inclusion in analysis.

Really, the feds can't do this. We can't just take Puerto Rico's data and say we're going to -- Maybe we can, but I don't think we can take the Puerto Rico data and say we are just going to unilaterally reevaluate these data and reclassify them and that's what we talked about yesterday when we said go through the reports.

BARBARA KOJIS: One of the things that we could do with this

technique, it seems to me, is that you can go back and if you can get TIP data for 2010 and 2011 and then you go back and do a reanalysis and find out -- If it still doesn't look like overfishing is occurring, then the SSC could go back and say, okay, let's look at the ABC and make a recommendation and then that ABC may be around 220,000 pounds, because the problem is, Reni, even if you say 200,000 pounds for the ACL would be appropriate, there's only 188,000 pounds for the ABC there and then you're reducing it now by 10 percent.

You would still have an ACL, based on what we calculated before, of about 165,000 pounds. You really need to be up higher than that if you really think 200,000 pounds is what they're, on average, catching that's a good -- You really need to have a basis for it.

JORGE GARCIA-SAIS: I just gave you a starting point.

BARBARA KOJIS: I realize, but I think you need to look at that whole period of time and you could go back from what we were making comments about before. If there's no overfishing occurring for that whole period and we've got TIP data, then you can go and recalculate the ACL and use more recent years even.

JORGE GARCIA-SAIS: I agree that that would be a good second step.

JULIE NEER: As long as the SSC believes that those landings are accurate. It still comes back to the landings issue.

BILL ARNOLD: I agree with that, Barbara. That's the federal component of this. That's the SSC's component, is resetting the ABC.

BARBARA KOJIS: We made recommendations, I believe, in there. Didn't we make recommendations that we redo this analysis based on the more recent years and extend? That would allow then possible reevaluation of the ABC by the SSC and increase it.

JORGE GARCIA-SAIS: Those two are pretty good steps. If you take the more recent data, that perhaps would be part of the consideration of deleting that 1999 data and then you move forward a year or whatever, but then you step right into the wall of the 2010 data, which I agree with you that Puerto Rico needs to deal with that, but they probably will not.

Knowing how these things are -- This political party is not going to try to clean up what the other one did, but still,

those two considerations are worthwhile considering and taking into account.

BILL ARNOLD: The other thing I would suggest is that a recommendation be included that Puerto Rico establish 2010 specific expansion factors. Maybe they can or cannot do that, but the SSC should recommend that they do that, to the best of their abilities, because I think this carrying over of the 2009 expansion factors and the 2010 --

TODD GEDAMKE: We've already got that in there.

BILL ARNOLD: You have expansion factors in there specifically?

JULIE NEER: Yes, it's in there.

BARBARA KOJIS: I think that we've pretty much covered everything here, maybe three times over. Is there any final --

RICHARD APPELDOORN: There's a typo in the summary or not a typo, but it's missing a word. The third line of the summary, it should be "too uncertain to be confident".

BILL ARNOLD: Meaghan, where it says "the Federal Register notes", it should say "Federal Register notice".

BARBARA KOJIS: Todd, do you want to make those corrections or do you want me to just go through and do that? Why don't you just do the final on that? Okay. Why don't we take a ten-minute break and then we'll start the SEDAR-30 review and Meaghan will be giving a presentation for that.

(Whereupon, a brief recess was taken.)

BARBARA KOJIS: Let's resume the meeting. Meaghan is going to give us a presentation on the SEDAR-30 and this was an assessment of the blue tang and the queen triggerfish in the U.S. Caribbean and so, Meaghan, please.

REVIEW OF SEDAR-30

MEAGHAN BRYAN: Like Barbara said, SEDAR-30 focused on blue tang and queen triggerfish in Puerto Rico and the USVI and similar to most SEDARs, the goals were to try to determine stock status for blue tang and queen triggerfish, but as you will find out, the data limitations precluded us from getting abundance estimates and so we conducted mean length analyses to evaluate stock status in terms of mortality, very similar to what we did -- We

did the same exact thing we did during SEDAR-26 and a lot of the issues or all of the issues that we had with data and that we have been discussing over the last day or so apply here, to SEDAR-30.

What I'm going to do is just briefly go over the data sources that we reviewed, so you can see what they look like, and then I will go into the results and the conclusions and then talk about some of the comments from the review, the desktop review.

The data sources that we reviewed during the data workshop/assessment workshop for SEDAR-30, we looked at the Marine Recreational Fisheries Statistics Survey, which is carried out in Puerto Rico. This is not a sampling program that's conducted in the USVI at this point and so the data that's available only pertains to Puerto Rico.

We looked at commercial landings by island platform and gear types and we reviewed the Trip Interview Program, which was the main source of information for the analysis, and we reviewed the life history information from published literature, because no one brought anything to the table in terms of recent analysis for life history for these species.

We did not use the MRFSS data for this assessment for a few reasons. For blue tang, there were only five intercepted trips that retained or indicated discarding of blue tang and there were two length measurements and so we couldn't use this data.

Queen triggerfish, there were less than twenty intercepted trips per year that indicated that they retained or discarded queen triggerfish and over the time period of 2000 to 2011, there were sixty length measurements and so the data that's contained in the MRFSS database for blue tang and queen triggerfish at this point are not useful for assessment and so they were not used.

The commercial landings, they also were not used for the assessment. In the USVI, the commercial landings start in 1974 and from 1974 to 1995, catch was recorded as snapper grouper or finfish and so I guess these species were contained in the finfish category.

Starting in 1997, or maybe 1996, the fishers were required to report species to species groups and so blue tang belongs to the surgeonfishes group and queen triggerfish obviously belongs to the triggerfish group.

Unlike the USVI, the commercial data is species-specific in

Puerto Rico, but there obviously are known problems with underreporting and so expansion factors were applied and, again, these were not used for assessment, mainly because we do not know which species they are catching in the USVI, but I guess starting in July of 2011, fishers were required to report to species and so at some point in the future, that data will likely be useful for assessment, but at this moment, we can't use it.

Just to give you an idea of what the landings look like, the top panel shows the surgeonfish landings for St. Thomas and the bottom panel shows the landings for St. Croix. In St. Thomas, the predominant fishery is the pot and trap fishery, which is the red line. That's the main gear type that catches surgeonfishes. There were some other gear types that did catch surgeonfishes, but they make up a very small proportion and that black line is the total catch.

You can see that over time there was a slight increase, from about 2000 to 2004, and then it starts to decline until 2011 and there seems to be a steep decline in landings of surgeonfishes between 2010 and 2011.

BARBARA KOJIS: 2011 was complete data, wasn't it, and not just six months?

MEAGHAN BRYAN: I am almost positive that this is showing complete data. I'm not 100 percent sure, but I am pretty sure that these were complete data.

BILL ARNOLD: The fact that St. Croix didn't drop similarly would suggest to me that this is complete data.

MEAGHAN BRYAN: I am pretty sure it was, yes. St. Croix surgeonfishes are caught by other gear types besides pots and traps, but the red line represents the trap fishery. The purple line represents the net fishery and the green line represents the diver-based fishery.

One thing I want to point out about these landings is you'll see a really rapid decline in landings associated with the net fishery. There was a net ban that was put in place in 2006 and so you're seeing a shift from landings associated with the net fishery going into the diving-based fishery and so that explains that decline and that increase that you're seeing in those two fisheries.

BARBARA KOJIS: Just to explain, in 2006, I think the regulation

was approved, but the implementation took until like 2008, because there was controversy about it.

MEAGHAN BRYAN: I am sure, yes. Those are the landings for the surgeonfishes in the USVI. Triggerfish landings, a similar pattern for triggerfish in St. Thomas and St. John. They have an increase from 2000 to 2003 and then a declining trend starting in 2003 to 2011.

The landings are predominantly associated with the trap fishery and then landings for triggerfish in St. Croix are predominantly caught by the diving-based fishery, starting in about 2005, where you see an increase. You can see that the time series for the triggerfish landings abruptly stops for the net fishery in 2007.

It does seem that that was a shifting of effort from the net fishery to the diving fishery, which explains that increase in landings. It explains the increase in landings for the diving-based fishery, but overall, the total landings of triggerfish is variable, but fairly consistent between about 25,000 pounds and 40,000 pounds over the time series.

TODD GEDAMKE: Meaghan, can you just flip back to the last two, just flip back to the tang?

MEAGHAN BRYAN: Sure. Those are the landings for surgeonfishes and triggerfish in the USVI. Moving on to Puerto Rico, surgeonfishes are just not really targeted in Puerto Rico and so that explains this funky looking graph and I won't explain that anymore.

Here are the landings for the queen trigger, the commercial landings for queen triggerfish in Puerto Rico. It's much more variable than what you're seeing in the USVI, but that is, I think, explained by the expansion factors, for the most part. That red line represents the trap fishery.

The orange line represents the hook and line fishery and green is the diving fishery and purple is the net fishery and so the predominant fishery capturing queen triggerfish is the trap fishery.

You see from 1983 until about 1986 that there's a steep decline in triggerfish landings and then it kind of levels out until about 2002. There's another increase in 2004 or 2005 and then another decline until about 2006 and then it levels off between 2006 and 2011. It's highly variable landings.

BARBARA KOJIS: Is there any reason for that 1983 to 1986 decline?

MEAGHAN BRYAN: I am trying to remember. I would have to look, but I think --

TODD GEDAMKE: If I may, I think that's when boats were fishing elsewhere and landing --

RICHARD APPELDOORN: Well, but they wouldn't be going after triggerfish though.

TODD GEDAMKE: It's just the same pattern we had for a couple other species.

RICHARD APPELDOORN: It's the same pattern for the entire fishery. Actually, most of the decline is even sooner than that.

BARBARA KOJIS: Do you think that's a real decline?

RICHARD APPELDOORN: Yes. Whether there is foreign input into that decline or lots of foreign input into that decline, I don't know, but --

TODD GEDAMKE: What year did the average catch go back to? What year did we start, Bill?

BILL ARNOLD: We started in 1988.

TODD GEDAMKE: Because of that decline.

BILL ARNOLD: Yes.

TODD GEDAMKE: That was the testimony from locals on that, was that that was the period when people were bringing landings back from other regions.

BILL ARNOLD: In general.

TODD GEDAMKE: In general and so prior to 1987 or 1988. That was the discussion there and that's where we ended up chopping those years out, because there was some question as to fishing outside.

BILL ARNOLD: But it was also that they had no confidence in the expansion -- This was pre-Daniel Matos. We couldn't get Daniel

in there and he couldn't explain what was going on in those 1988 years and so we said, okay, we just won't use them.

JORGE GARCIA-SAIS: What about that spike in 2005? Is that the same for other species as well? I don't remember that.

TODD GEDAMKE: That's when the regional expansion factors were put in place, around that time, and that big dip in 2006 and 2007 is basically across most stocks in Puerto Rico and that's why we ended up -- For the average landings series, that's where we chopped it off, at the 2005, because there was a lot of people that really questioned that spike and that decline.

BILL ARNOLD: Here's how I understood the 2005 thing. I think that may have been when the gas prices went up or something and so you had --

RICHARD APPELDOORN: No, that was later.

BILL ARNOLD: There was something that -- I thought there was something about that expansion factor that they adjusted it because fishermen reporting was way down.

RICHARD APPELDOORN: That was because of the new tax requirement.

BILL ARNOLD: That may have been it, because they assumed that the fishermen weren't reporting and it's likely that the fishermen were reporting and or actually that the fishermen weren't fishing and so they applied an expansion factor that assumed those fishermen were fishing and weren't reporting, when in reality, they really weren't fishing as much. You've got a low expansion factor and you divide by that and it jacked that peak up.

MEAGHAN BRYAN: Even though we do have species-specific landings in Puerto Rico, this issue of the expansion factors, as we've been discussing, precludes us from using it for analysis at this point.

I think validation of the expansion factors will be important for us to be able to use these types of landings for assessment purposes in the future. Those are the landings and are there any other questions before moving on to the main dataset that we used for analysis?

Okay. The Trip Interview Program provided the most consistent species-specific information over time for these two species

across the U.S. Caribbean. This table just summarizes the number of samples, the number of years sampled, and the average number of samples per year for blue tang by island platform and gear type.

The lines that are in bold, those were the fisheries that had enough samples to be used for analysis and so you can see that in St. Thomas and St. John the pot and trap fishery caught a total of almost 3,000 samples over the twenty-one years that we have data and, on average, there was about 142 length samples per year.

Then St. Croix, the number of samples for blue tang is much larger than what you're seeing in St. Thomas. It's over 30,000 samples over twenty-nine years and so those were the two fisheries that we focused on for this analysis. That's the main fishery for that area for these shallow-water species.

For queen triggerfish, again, the species is mainly caught by the pot and trap fisheries across the islands and we looked at these fisheries and applied the data from these fisheries for analysis and so in Puerto Rico, there were a total of 4,917 samples over twenty-eight years and in St. Thomas/St. John, we had over 7,000 samples and in St. Croix, we had a little over 8,000 samples.

We used the length frequency data from the TIP database for the pot and trap fisheries for both species across the islands, except in Puerto Rico we did not do an analysis for blue tang, because that species is not caught in Puerto Rico.

To analyze the length frequency data, we used, again, the Gedamke-Hoenig mean length estimator to obtain estimates of total mortality to evaluate how mortality has changed over time.

We also used these total mortality estimates to derive fishing mortality estimates as well and we did that by deriving natural mortality from various natural mortality estimators that I will explain a bit later.

For this mean length analysis, the model inputs total mortality as a function of the von Bertalannfy growth parameters as well as mean length and so model inputs include the mean lengths from the TIP database, the von Bertalannfy growth parameters from the published literature, and we also used the length frequency data to determine the length at full vulnerability, which also influences total mortality.

We looked at the length frequency data to determine a range or the length at full vulnerability for each of the species. Mean length was then calculated for fish larger than that length at full vulnerability and applied to the mean length estimator.

Just to give you an idea of what the length frequency data looks like, I binned this in five-year bins, just for ease of presentation. I can flip to the report if you want to see the annual length frequency histograms, but you can see here that the length frequency for blue tang has been fairly consistent over time or that peak has been fairly consistent and so the length at full vulnerability for blue tang, at least in St. Thomas, and this is showing the length frequency for blue tang in St. Thomas, was around eighteen to twenty centimeters.

This is the length frequency data for blue tang in St. Croix. It's much more consistent length frequency over time in St. Croix than in St. Thomas. Again, that peak with the length at full vulnerability from this length frequency data was similar and it was around eighteen to twenty centimeters.

Now this is the TIP length frequency data for queen triggerfish from the pot and trap fishery in Puerto Rico and what you will notice is that between 1998 and 2007, we start to get a few more larger individuals out in the tails and if you look at this -- Please note that the Y-axis of these histograms are on different scales, but when they are on the same scale, you still notice a more predominant blip in that right side of the distribution between 1998 and 2007.

During the data workshop, there was one fisherman from Puerto Rico, but I think he was a diver. We did have a discussion about whether or not -- What this meant and if there was some sort of spatial expansion of the fishery that might explain why we're seeing larger individuals. Apparently there hasn't been an expansion of the pot and trap fishery or that was the -- That is what the fisherman indicated.

Then here's length frequency data for queen triggerfish in St. Thomas. We did have a fairly lengthy discussion with the fishermen from St. Thomas about this distribution.

You will notice that the right side of the length frequency distribution is fairly consistent over time and it stops around like -- It really falls off at like forty centimeters or between forty and forty-five centimeters.

Apparently fishermen in St. Thomas discard queen triggerfish

that are larger than I think forty-two centimeters or forty-five centimeters because they can't sell them. No one wants those larger triggerfish and one of the assumptions of the Gedamke-Hoenig method is that selectivity is knife edge at the length at full recruitment and if they're discarding -- If they're catching, but discarding, it seems that the selectivity is actually more -- Well, maybe double knife edged or dome-shaped and so this discarding practice violates the assumption of knife edge selectivity.

Here's the length frequency data for queen triggerfish in St. Croix. The distributions are fairly consistent over time, but please note in 2003 to 2007 that there are very few -- Actually, 2003 to 2011, the sampling apparently has been dramatically reduced over that time period and that may explain why we're seeing so few samples of queen triggerfish as compared to previous years from 2003 to 2011. Are there any questions about the length frequency data?

The next component that we needed to evaluate in terms of inputs was the life history information for these species and for blue tang, there were two studies. These studies did collect samples from various different areas in the Caribbean and so these are Caribbean-wide estimates, but the sample size is fairly low per island.

What was concerning about this life history information is that the range of the von Bertalannfy growth parameter was fairly wide. It was anywhere from 0.4 to a little over one and so that leads to -- We plotted the life history or the growth curves for blue tang from these studies and you can see that the growth rates are different among the different islands and we had a discussion about which ones were more appropriate to use for the USVI.

In the end, we ended up having to do a sensitivity analysis anyway and so they were pretty much all of them were considered. In this bottom panel, that shows the relationship between these points and so the points with the same color -- This is a figure that Richard Appeldoorn came up with.

The points of similar color are the two different -- Same color, but different shape are the different studies in the same locations and so there is agreement between the studies at the location, but, again, when you look across the different locations, the von Bertalannfy growth parameter is very different among the islands.

TODD GEDAMKE: What's the sample size for Los Roques?

MEAGHAN BRYAN: Los Roques is eighty-one and so the majority of sampling is a little over a hundred and so less than a hundred is -- The sample size is seventy-four to a little over a hundred for the different islands.

BILL ARNOLD: Is there any latitudinal pattern with this? It doesn't look like it, but I'm just curious.

MEAGHAN BRYAN: Lee Stocking Island is here and Belize is a little lower.

RICHARD APPELDOORN: Los Roques is the outlier.

BILL ARNOLD: Where is Los Roques?

MEAGHAN BRYAN: That's off of Venezuela and Asencion is --

RICHARD APPELDOORN: Asencion is way out.

BARBARA KOJIS: It's way out in the middle of the ocean, yes. Can you use that as -- You would think Bermuda would be quite different and the other thing is there's an L infinity or Lmax and what's the closest one to what is happening in the Virgin Islands? That may be the one that's -- Those are the ones to consider, too.

MEAGHAN BRYAN: Right, but in the end, we essentially considered all of them through the sensitivity analysis. Here are the life history parameters for queen triggerfish. There were two studies and although the asymptotic lengths were somewhat similar, the growth studies suggest different life histories in terms of growth and so the von Bertalannfy growth coefficient was 0.3 and the other was 0.14.

BARBARA KOJIS: But the 0.4 was Brazil.

MEAGHAN BRYAN: No, it's Brazil and I realize that that is not the U.S. Caribbean, or even the Caribbean, but those were the only two studies that we could find and consider.

BARBARA KOJIS: What about Jamaica?

MEAGHAN BRYAN: I should say something about Jamaica. That was not based on hard parts and so we didn't consider that.

JORGE GARCIA-SAIS: The Lmax for the Puerto Rico triggerfish is

something unreal.

MEAGHAN BRYAN: From the Bohnsack and Harper?

JORGE GARCIA-SAIS: Seventy-six centimeters and how many feet are those?

MEAGHAN BRYAN: These are millimeters.

BARBARA KOJIS: But it's still --

JORGE GARCIA-SAIS: Seventy-six centimeters, that's bigger than a cubera snapper.

BARBARA KOJIS: It's about two-and-a-half feet.

TODD GEDAMKE: Did you use 760?

MEAGHAN BRYAN: Did I use 760? No. We used --

JORGE GARCIA-SAIS: I've never seen one that big.

TODD GEDAMKE: Let's move on.

MEAGHAN BRYAN: Okay, moving on to growth curves resulting from those two studies. I plotted those to show a comparison, just to show you how different the growth rates are, even though they end in a similar asymptotic length.

BARBARA KOJIS: You would expect that, because you're talking about Brazil below the Amazon, right?

MEAGHAN BRYAN: Right, but we need to -- Given that we only had one estimate, you need to consider everything available and so we just wanted to consider it, but yes, you wouldn't expect them to represent the Caribbean.

Given the available data and the life history information, we did do some individual runs using the estimates from the published literature. First, the model was run assuming that there's no change in mortality and then increased in complexity in terms of the number of changes in mortality over time.

The models were compared using AIC to determine which were the most parsimonious and best described the change in annual mortality or lack of change.

Given the uncertainties in the life history parameters, we

conducted a sensitivity analysis to characterize those uncertainties in the mortality estimates and so it's very similar, or exactly the same, as what we did in SEDAR-26.

What I will first do is present some of the individual runs, just to give you a sense of the model selection, and then I'll go into the sensitivity results for each species or each strata and so each species and island group that was analyzed.

This table just shows the different combinations of input parameters, so the length at full vulnerability, the von Bertalannfy growth coefficient and the asymptotic length, and then the AIC results.

The first few rows represents a run where the length at full vulnerability was very close to the asymptotic length and I just threw this in here to show that an example of a convergence problem that we had with the model and so whenever the length at full vulnerability was similar to the asymptotic length, the model couldn't find or hit either the upper or lower bounds of the total mortality and so those results weren't considered to have any meaning and were disregarded.

You can see that pretty much across the -- Well, in a couple of cases, a change was detected in total mortality and this varied and I will show this in the sensitivity results, but the year of change did vary, but, in general, the Z in the first time period was lower than in the second time period and so there was some indication that there was an increase in total mortality in those instances when a change was detected.

This is just one of the iterations that we looked at and this shows the -- The blue line is the line that is best fit. The bubbles represent the mean lengths and the bubble size represents the number of samples or the -- Yes, the number of samples per year.

You can see that in this case the model predicted that total mortality changed right after that first year, in 1983, and leveled off in about 1995 and so the first estimate of total mortality was 0.9 and then there was a decline in mean length that was detected and that was associated with an increase of total mortality of 0.4.

Just to give you a sense of some of the sensitivity results, this just summarizes -- The table to the left summarizes the number of changes in total mortality that were detected and the number of sensitivity runs that either did not detect a change

or detected one change or two changes.

It was pretty evenly split in terms of detecting a change in total mortality or not and when there was one change in total mortality detected, almost every year was chosen by a couple or several of the sensitivity runs, but in 2001, that has the highest frequency of sensitivity runs. Yes, the highest number of sensitivity runs predicted a change in 2001.

RICHARD APPELDOORN: Was that the case of the graph you showed before?

MEAGHAN BRYAN: No, this one actually showed 1983. I can pull up one that shows in 2001, but I think what it was doing is predicting a change after -- Yes, it's less of an increase in 2001. It was responding to those two bubbles that are apart from that cluster that starts in 2005.

RICHARD APPELDOORN: It went through there and then came down?

MEAGHAN BRYAN: Yes, it went through there and came down. We did look at proportional change for those sensitivity runs that did detect a change and this just gives you an idea of the percent change in total mortality.

Some of these are astronomical because -- Those cases hit the bounds and so you should ignore those, but in all cases, these sensitivity runs, the estimates of Z were not hitting those bounds and so there is still a fairly considerable increase for some of these parameter combinations.

What was happening is that they were -- The model was predicting a very low total mortality in the first time period and a very high total mortality in the second period and so that explains why there was such a high proportional change or percent change, in this case.

We did derive fishing mortality from the total mortality estimates and so we used a couple of different natural mortality estimators.

We used the Pauly estimator, the Ralston estimator, and the Jensen estimator that consider just the von Bertalannfy growth parameters, but we also looked at a few estimators that considered maximum age, because we did have some estimates, even though most of the published literature that we looked at it was the reported max age that they read and so we don't know the true maximum age for blue tang, but we used that to see how the

natural mortality estimates changed or were different if you used maximum age.

Generally, natural mortality was a little lower when you used the maximum age than when you just relied solely on the von Bertalannfy growth parameters.

What I am showing here is just a summary of that ratio between the fishing mortality and the natural mortality, where we're using natural mortality as an FMSY proxy. You can see that in a lot of cases we have this very high frequency of fishing mortalities that were very close or equal to zero, because natural mortality was so much higher than the total mortality estimate.

Essentially, you can interpret that as there was no perceived fishing mortality on the population, but then when you -- This is just showing that even though a lot of -- A high frequency of the iterations are below a ratio of one, there are some that are greater than one, because of using natural mortality estimators that were based on age.

There was variability in the interpretation of what fishing mortality was and what that means in terms of overfishing, depending on the natural mortality estimator that you were showing.

I presented that information in a table in the report and I just thought that maybe this would be a better way to think about it or present it here, just to give you an idea of how variable the interpretation of this ratio is, depending upon the natural mortality estimators. Are there any questions about this before I go on to the next?

We did the same exact things for blue tang in St. Croix. This is just some of the individual runs that we did when exploring how the growth parameters influenced our estimates of total mortality.

Again, we did have some convergence problems, in cases where the length at full vulnerability was similar to the asymptotic length, but really, we didn't have -- Just moving on to the sensitivity results, that top table shows the frequency of sensitivity runs that predicted a particular number of changes in total mortality and it was fairly even between no change or one or two changes.

This bottom panel to the left shows the number of changes in

total mortality that were predicted in the first year of change and you can see that, in general, the model was predicting a total mortality changing in 1983, which was the first year that we had some data.

Then this right panel shows the number of changes in total mortality that were predicted or the year that -- The predicted year for the second change in total mortality if there was support for two or three changes in total mortality and it was anywhere between 1985, 1989, and then in 1996 or 1999, but, in general -- The model wasn't converging on a particular second year of change for total mortality when two or three changes were predicted.

Now this is just showing -- This table is just showing the percent change in total mortality when for the model runs that predicted a change in total mortality and so you can see that, in general, when a change was predicted, it was over 100 percent from the first time period to the second time period across the various life history parameters and the length at full vulnerability that was considered.

This just shows the plot comparing the fishing mortality and the natural mortality to try to get a handle on the overfishing and, again, this is -- These were applied to the sensitivity results and three or six different natural mortality estimators that were either dependent on the growth parameters or maximum age.

You can see that the highest number of these ratios is below one, but there are some -- Some of the sensitivity runs did lead to F ratios, or the ratio between current fishing mortality and natural mortality, that were above one, but, again, it was variable and it was really dependent on which natural mortality estimator was used, where the natural mortality estimators that were based on maximum age generally led to a higher ratio between F and natural mortality.

That was the analysis for blue tang for St. Thomas and St. Croix. Are there any questions before moving on to queen triggerfish? Okay.

This table is just showing individual runs using the von Bertalannfy growth parameter estimates from the study that had data from Puerto Rico and the USVI, but the top three rows are Puerto Rico and the center lines are St. Thomas and then the last three rows are St. Croix.

For this one individual run in Puerto Rico, there was a change

predicted in 1990 and I will show a figure here soon, but it does predict that total mortality declined and that is associated with that time period where we started seeing larger individuals in the length frequency data.

In St. Thomas, and I'll show for the sensitivity analysis, across the board no change was detected in total mortality and then in St. Croix, generally there was a change in mortality detected and it was always an increase in total mortality that was detected.

This is the model fit to the queen triggerfish length frequency data from Puerto Rico and this was this individual run that I just showed in the table and you can see that there is an increasing trend in mean length. The model is predicting it to start in 1990, but it seems like it starts to increase a little bit later, but it's responding to that increase here and so it's predicting that total mortality is declining.

We did do a sensitivity analysis for queen triggerfish and, in general, the model predicts either one or two changes in total mortality. When one change was predicted, the majority of sensitivity runs predicted a change in 1999, which I just showed, and that there was -- That was the second year of change.

The first year of change, if there was one change predicted, it was anywhere between 1986 and 1991. If two changes were predicted, the first year of change was anywhere from 1990 to 1993. There is some variability about when that change happened, but it's around 1990, generally.

This table just shows the different parameter combinations used for the sensitivity analysis and the percent change in total mortality and you can see that in the majority of sensitivity runs that predicted a change in total mortality that there was anywhere between 75 and almost 100 percent change in total mortality and this was a decline in total mortality, because of that increase in mean length.

Again, we derived fishing mortality from the natural mortality estimates and, in general, there is very few sensitivity runs that indicated that fishing mortality was above the natural mortality.

As I mentioned before when we were looking at that table, in general, there was no detection of change in St. Thomas and if you remember the length frequency distributions, they were very

stable over time.

JORGE GARCIA-SAIS: Meaghan, did you detect a significant increase in triggerfish at USVI compared to Puerto Rico, because I was trying to recall --

MEAGHAN BRYAN: An increase in what?

JORGE GARCIA-SAIS: Differences in size from St. Thomas, like there you're talking about -- Is that thirty-seven?

MEAGHAN BRYAN: Do you want me to go back to length frequency?

JORGE GARCIA-SAIS: I don't know if the one in Puerto Rico will show it.

MEAGHAN BRYAN: Let me look.

JORGE GARCIA-SAIS: It's just out of curiosity, because I think that the lengths are kind of different.

MEAGHAN BRYAN: From Puerto Rico, in the beginning, from 1983 to about 1997, the range is between eighteen centimeters to about forty-three, with a few larger individuals out there in the tails. Then you start seeing a few more of these larger individuals, sixty-centimeter queen triggers, starting in 1998.

Then in St. Thomas, the lower range is similar, around like eighteen or so centimeters, but, again, supposedly the fishers did indicate that they discard the larger ones and so you never see those larger ones in the data and so they might exist.

There is a few out here in 2003 and in 2007, you can see a few that are larger than that forty-five-centimeter length when they start to discard, but, in general, you don't see those larger fish in the length frequency data, because of that discarding.

TODD GEDAMKE: The discarding of the larger individuals is going to lead to overestimates of L, because of an assumption of constant mortality above Lc.

RICHARD APPELDOORN: It would lead to an overestimate of Z and it could lead to an underestimate of F over Z, because that's what we're concerned about. We've got these estimates of F over Z that basically keep saying there's virtually no fishery and we're getting an underestimate of F over Z because we're overestimating Z.

TODD GEDAMKE: I was going to ask the -- You also were suggesting virtually no fishery and is that -- You've got those zero values and those seem like they're anomalies, based on valid, bounded runs or combinations. Was there any way of filtering those out?

MEAGHAN BRYAN: I probably should have. Yes, I created that figure last night, but I did look at the -- We did look at the data and I have it, but there were a number -- When you looked at the results, there were still a number that were not at that bound, that were just very low estimates, low estimates of Z, or total mortality, but when you compared it to the derivation of F from mortality, the derived value of natural mortality, it was so high. The estimates of natural mortality were really high compared to Z in the majority of the cases for queen triggerfish.

TODD GEDAMKE: The bounding alone on so many of those runs would suggest to me a misspecification of parameters, input parameters, but that's the same life history problem that we've been faced with before.

MEAGHAN BRYAN: Right and I think too with the two -- You usually think of a negative correlation between the asymptotic length and the growth parameter and you can't tell what should be the higher bound for the asymptotic length, because that relationship wasn't obvious from those two studies. The L infinity was really similar with very different growth coefficients.

MICHAEL SISSENWINE: That's an issue, as to whether all of those frequencies or the histogram down at zero is real or not. Even beyond that, I do think the issue that -- Because of the discarding of large fish and therefore, the overestimation of Z, it creates a problem in terms of confidence in the signal, the F over Z.

TODD GEDAMKE: Unless I'm flipping this around in my head though, that will lead to an increased estimate of F.

MICHAEL SISSENWINE: Your estimate of M comes from -- It's input.

TODD GEDAMKE: It's input and so it's coming from your K and so your Z is going to be derived by this --

MICHAEL SISSENWINE: You're getting an overestimate of F.

TODD GEDAMKE: Yes, which is not being I guess reflected in that histogram. Let me ask you a question.

RICHARD APPELDOORN: We'll have to change the ratio anyway and so we're overestimating Z, which then will lead to an overestimate of F and the ratio is not really changing.

MICHAEL SISSENWINE: We have a bias resulting in an overestimation of our probability of overfishing. My concern at first was just the opposite, but since the M is input, we're going to overestimate the probability of overfishing, which seems strange, because these results seem to show the probability is very low. That must mean it's really, really low.

JORGE GARCIA-SAIS: It's pretty much intuitive, because queen triggerfish is a prized fish in the USVI. They call it the ole wife and they actually target it very much and not so much in Puerto Rico. It's like a second-class fish, but in the USVI, as far as I know, it's a prized fish.

BARBARA KOJIS: But it's prized within a certain size range and even though it's bycatch, bycatch mortality, I believe from the bycatch studies that were done, they indicated that mortality of that was pretty low, from what their observations were when they first released it anyway. If they're releasing large fish, they're probably fairly protected from predation on the way down as well.

RICHARD APPELDOORN: The question was do any fish survive the gauntlet to get to that size and at the analysis itself, the fishermen were showing pictures of giant, I mean really giant, fish that were -- Clearly there's a spawning stock out there.

JORGE GARCIA-SAIS: Yes, but not as giant as the seventy-six centimeters for Puerto Rico. That's a yard. It must weigh at least seventy pounds.

TODD GEDAMKE: I was just wondering if you had looked at any of the snapshots from the St. Croix survey for blue tang or queen trigger to groundtruth.

MEAGHAN BRYAN: Yes, I did, which is another presentation. Do you want me to --

TODD GEDAMKE: No, my question there is that I'm starting to -- I guess I'm thinking about input parameters being problematic and at least they don't have any of the behavioral -- You have a

trap and so you may have a dome-shaped selectivity on that. You may have the same sort of problem that's not behaviorally driven, but those larger individuals, or at least more of the individuals, should be present in that survey.

MEAGHAN BRYAN: I would have to look at that.

TODD GEDAMKE: I'm just saying if you did a Beverton-Holt, which more or less is what that is right there, given the snapshot from the survey, and you plug the life history parameters into that and you came out with an estimate of total mortality of 0.06, you know that your life history parameters -- It would add another suspicion to your input life history parameters.

MEAGHAN BRYAN: I agree.

TODD GEDAMKE: I don't think you can get that much out of it, but it's going to give you a little bit of insight as to whether -- I just looked at a couple of values on the first one and I thought the input parameters --

MEAGHAN BRYAN: It looks pretty problematic for this analysis.

BARBARA KOJIS: Are you going to be covering the size on the onset of reproduction, given the size of catch, as part of the discussion?

MEAGHAN BRYAN: We didn't talk about that, but we didn't come across many estimates of age at maturity, if I recall. I would have to look at the life history paper to make sure, but I don't think --

JULIE NEER: I don't think there was much discussion at all on that.

MEAGHAN BRYAN: No, we didn't talk about the age at maturity at all.

BARBARA KOJIS: I read the life history paper and it was not very comprehensive it seemed, in terms of -- Now, maybe the literature is not out there, but I know Robertson looked at size at maturity or I believe they looked at size at maturity.

MEAGHAN BRYAN: I think that was more age and growth for that paper. The person that did the life history, she really delved in. She spent a while trying to find studies that had life history for these species, because after SEDAR-26, we realized that we needed to get an early start and really try to find

something and she was having a hard time finding any published literature on the life history of these species.

GRACIELA GARCIA-MOLINER: Of course, after the fact, there is going to be someone who is going to be doing a study on I believe age of queen trigger.

MEAGHAN BRYAN: Really? I am across a MARFIN proposal. Was it funded?

GRACIELA GARCIA-MOLINER: I have a note in my office saying that I have to call someone regarding that research.

BARBARA KOJIS: I just looked at FishBase for blue tang and it came up with thirteen centimeters.

MEAGHAN BRYAN: Yes and I mean we always start with FishBase to get an idea of what's out there and if we can't find the literature, then we don't report FishBase. We don't consider FishBase as parameter estimates, just because we can't verify.

JULIE NEER: It was the same with the other report and for queen trigger, she cited one paper from 1975 regarding reproduction and it basically just said that they had ripe gonads in Jamaica during all months except April and June, but no size information and then blue tang, she cited I think three different studies from 1988, 1975, and 1984, but the only thing she talked about was when spawning was suggested to occur, but there was no size information associated from the studies she found.

BARBARA KOJIS: I think that was probably Munro and I would like to look at that and see, because they usually have size at onset of reproduction in that, but they may not have.

RICHARD APPELDOORN: Not if all the fish were large enough to be mature. If all the fish were large enough to begin with, you wouldn't catch the onset.

GRACIELA GARCIA-MOLINER: There is an older collection of papers on the exploration around Jamaica.

JULIE NEER: That was the paper cited from 1975. That was the Jamaica paper from 1975.

BARBARA KOJIS: Was that Munro?

MEAGHAN BRYAN: Aiken.

BARBARA KOJIS: Aiken became Munro though. They did that whole thing and gave good summaries of at least some species for Jamaica. My understanding from surgeonfish is that they grow rapidly and start reproducing very young, at maybe seven month for some species anyway, and then reach their maximum maturity at maybe four years or something like that and then stay about the same size the rest of their --

MEAGHAN BRYAN: They reach their asymptotic length very quickly and over a wide range of ages and I guess I didn't mention that, but we did talk about that issue at the workshop and how that may -- How a length-based estimator for blue tang might not be as appropriate as if we had catch to age information. That might be more appropriate to use in an assessment for blue tang. I should have mentioned that earlier.

Just moving on to St. Croix, this is just the individual run using the parameter estimate from the Caribbean study, where a change in total mortality was predicted in 1985 and total mortality was predicted to increase.

You can see from this that the sample size kind of peters out a bit after 1990 or so. It's variable anyway over time in the later years in St. Croix.

TODD GEDAMKE: Meaghan, just a gut response on this. I'm looking at that and you've got a 0.7 to 1.0 and you've got a drop of one-centimeter driving that. I was actually reading the first as 0.07 and so it's not changing that much.

BARBARA KOJIS: It's not changing that much, but it's quite different from St. Thomas. The lengths on St. Thomas were thirty-seven and so --

MEAGHAN BRYAN: Yes, they're smaller, on average.

TODD GEDAMKE: Is the Lc the same?

MEAGHAN BRYAN: This is twenty-eight centimeters and I think on St. Thomas it was thirty-four.

TODD GEDAMKE: There's your difference right there. The difference is the Lc selection and so it's selectivity of the years.

JULIE NEER: St. Croix fishermen are taking smaller fish. They don't get the sizes that -- They get much smaller fish than St. Thomas fishermen and that's why they don't discard, because they

don’t get the big ones that they need to discard, whereas just the St. Thomas guys get the big ones and the Puerto Rico guys have a market for the large fish so that they don’t have to discard.

BARBARA KOJIS: One of the reasons probably for that is that the St. Thomas fishermen have a much larger shelf area and it’s a deeper area and they’re fishing the shelf edge and the shelf edge area, possibly because it hasn’t been fished as much, just because of the depth and so on, they probably have larger fish out there and that’s what you’re catching, whereas on St. Croix, the shelf edge is only about eighty feet deep and so they’re out there fishing that whole area and generally the smaller fish tend to be in the shallower water, probably ninety feet, possibly because that’s where the highest fishing pressure is.

RICHARD APPELDOORN: You’re saying that the smaller size in queen triggerfish is St. Croix is because of higher fishing pressure?

BARBARA KOJIS: It’s possible, across the whole shelf.

MEAGHAN BRYAN: They’re starting off in St. Croix, at the beginning of the time series, with smaller queen triggerfish than in St. Thomas and so, given that we don’t know what the fishery was like, they could have been fished -- Their size had been fished down prior to what we actually are observing, as compared to St. Thomas.

TODD GEDAMKE: The way I heard what you said was that in St. Thomas, they’re not getting the small fish.

MEAGHAN BRYAN: In St. Croix they’re not getting the big ones.

RICHARD APPELDOORN: Is the selectivity actually different with markets and that St. Croix actually wants a smaller sized fish and so their selectivity on the large size is different?

MEAGHAN BRYAN: The fishermen from St. Croix -- I think he said they keep whatever.

JULIE NEER: They keep everything.

MEAGHAN BRYAN: They didn’t indicate that they were highly selective in terms of size for queen triggerfish, whereas St. Thomas, they just talked about that upper bound and maybe there’s a lower size, but I don’t know. They didn’t mention anything like that.

BARBARA KOJIS: It could be habitat differences and it could be fishing pressure differences, because certainly habitat is -- Maybe the big queen triggerfish in St. Croix are down at depths of 200 feet or 150 feet and they're not being fished.

MEAGHAN BRYAN: Which actually means that there's like a de facto marine protected area.

GRACIELA GARCIA-MOLINER: I have a question for Reni. Do you see any queen triggers in Lang Bank during your dives?

JORGE GARCIA-SAIS: In Lang Bank, not many, because queen trigger -- Where we find queen triggerfish to be a common member of the community there is in the regolith reefs and in Lang Bank, although we thought that we were going to find regolith reef there, we did not.

We actually -- The main habitats we found in Lang Bank were coral reefs, very well developed full coral reefs, and colonized pavement habitats of different kind of slopes, but we have not yet found any regolith reef habitats, for which queen triggerfish is one of the top predators, to say it like that. We did not find a lot of queen triggerfish in Lang Bank, we did not. I recall that we have seen some, but not as abundant and as common as when you reach a regolith reef habitat.

BARBARA KOJIS: In St. Thomas, there is extensive regolith reef habitat found at a hundred feet or 120 feet.

JORGE GARCIA-SAIS: They are extensive?

BARBARA KOJIS: Yes.

JORGE GARCIA-SAIS: Then they are there. That's where they are.

BARBARA KOJIS: Hundreds if not thousands of acres of regolith reef habitat.

MEAGHAN BRYAN: They don't generally fish that deep in St. Croix is what you're saying?

BARBARA KOJIS: No, because it's off the shelf edge and they may go off the shelf, but it wouldn't have been -- In St. Thomas, you've got a more gradual shelf area that goes down and goes fairly rapidly to eighty or ninety feet and then certainly around a hundred feet, you've got regolith habitat and there is an area that Fish and Wildlife has as a place where you can put

ships and stuff like that under for artificial reef area.

It's permitted and we dive that area and dive the ships and they're all see in regolith habitat and that's an area of a couple hundred acres and I imagine that that -- I have seen that sort of habitat when I have dived elsewhere and so I imagine that that probably extends -- It's an extensive area around St. Thomas. If Reni is right that that's a preferred habitat for queen triggerfish, that may be why you end up with a larger size.

MEAGHAN BRYAN: Then you have dome-shaped selectivity then and because they're not -- It drops off and those larger, older fish are not being fished and that's what you're saying?

BARBARA KOJIS: Possibly. I don't think there's probably much regolith habitat on the St. Croix shelf edge. It slopes down some and regolith kind of likes a flattened area and I don't know how much of that is available.

JORGE GARCIA-SAIS: One of the main problems with the triggerfish, which I actually talk about this in my fishery independent survey report, is that those things are attracted to divers. As soon as you hit the bottom, they come immediately, three or four of them.

BARBARA KOJIS: Queen triggers.

JORGE GARCIA-SAIS: They come to you and it's very hard to make an assessment of their real densities and so I talk about this in the report.

BARBARA KOJIS: It's a curious fish.

JORGE GARCIA-SAIS: They feed upon disturbances in the bottom and so as soon as somebody hits the bottom, they immediately come.

MEAGHAN BRYAN: Just to proceed with getting through this, the majority of sensitivity results did predict a change in total mortality for queen triggerfish in St. Croix and, in general, that change was predicted to be in 1985 or 1986 and so very early in the time series.

The bottom of this table got cut off, but this is just showing you the percent change in total mortality, given the parameter combinations that were used and the percent change increased between like say 40 to 80 percent and, in general, again, it's

sometime in the early 1980s.

Then this is just the comparison of the resulting fishing mortality estimates from the total mortality estimates and natural mortality and so, in general, it does seem like, given the natural mortality estimators that were considered, this figure is aggregated across all of the uncertainty in life history and our uncertainty of natural mortality, because all of the natural mortality estimators are aggregated into this histogram.

In terms of probability of potentially overfishing, it is higher in St. Croix for queen triggerfish than in St. Thomas, but, again, it varied depending upon the life history parameters and, in turn, your natural mortality estimators and what they were relying on.

In the end, we walked away with not having a clear description of whether or not blue tang or queen triggerfish were experiencing overfishing across the platforms.

BARBARA KOJIS: Was triggerfish the one where you had Brazil and then Puerto Rico and the Virgin Islands?

MEAGHAN BRYAN: Yes.

BARBARA KOJIS: Did you do this just for the Puerto Rico and Virgin Islands?

MEAGHAN BRYAN: This is the sensitivity and so it's a wide range.

BARBARA KOJIS: I realize it's all of it, but I'm looking at this and I'm going -- If you look at F 0.1 for F over M, and you go up with 1, then you've got about a 60 percent chance of overfishing, right?

MEAGHAN BRYAN: Yes.

BARBARA KOJIS: That's leading to a fairly high probability of overfishing, more than 50 percent, but is that based on the fact that -- How would the Brazil -- Where would the Brazil parameters come into that as far as the sensitivity? Would they be on the zero to one?

MEAGHAN BRYAN: Let me go back, because I want to see which one had the higher estimate of K. Brazil had a low estimate of K and so it would have a lower M, natural mortality, associated

with it and so it would have a higher F.

0.3, that's going to have a higher K and a higher M and so when you subtract that M from the total mortality, you're going to have a lower F and so in terms of that ratio, that Brazil estimate would be a combination of -- Would it have a higher ratio then too? Yes, it would have a higher ratio. Whereas if you only used the estimates from the U.S. Caribbean, it would have a lower ratio, yes.

BARBARA KOJIS: You do all the sensitivities and you come up with something like this, but I would think that you would put a graph together just using the most logical data, the PR and USVI data, and see what you would come up with.

MEAGHAN BRYAN: You would get one estimate of F and M then.

BARBARA KOJIS: Yes, right.

JULIE NEER: It's just one point.

MEAGHAN BRYAN: What are you asking to compare it to?

BARBARA KOJIS: I am just comparing it to what percentage of possibly the majority of the percentage, cumulative percentage, of all the fishing here is based on the Brazil data and so we're looking at this and what decision would an SSC make regarding overfishing of queen trigger on St. Croix, based on this graph and the information that knowing that this graph is based on Brazil and Virgin Islands data? Maybe I am going off into a tangent here, but --

MEAGHAN BRYAN: The range, the sensitivity range, was developed from the U.S. Caribbean, but it ends up incorporating Brazil because we had to look over a wide range, because we don't have a clearly defined relationship. Were there any other questions about any of this? Okay. Just some general conclusions were that --

RICHARD APPELDOORN: Since I had to go out, was there a similar graph for St. Thomas and St. John or we just decided because that was selection that --

MEAGHAN BRYAN: There it is. It's a really low chance. The main conclusions from the assessment workshop for blue tang -- We didn't do an analysis for Puerto Rico and so there is nothing to conclude.

In St. Thomas/St. John, the results from the mean length estimator suggests that total mortality may have increased, but the year of change and magnitude of change was variable among the sensitivity runs and there was some uncertainty about whether fishing mortality was actually higher than natural mortality, given the range of life history parameters that we used in the natural mortality estimators, but annual length frequency data have been relatively stable over the time series and so we couldn't make a clear conclusion about whether or not overfishing was occurring.

In St. Croix, the results suggest that total mortality may have increased in 1983, again, but the results were highly variable depending on the input parameters. There was just, in general, uncertainty for all of the analyses. There was uncertainty about whether fishing mortality was actually higher than what we were using as our proxy at the workshop for FMSY, which was natural mortality. Again, the length frequency data was very stable over the time period that we looked at.

MICHAEL SISSENWINE: On the graph you showed, how could you expect to be more certain about overfishing not occurring in St. Croix?

MEAGHAN BRYAN: For blue tang?

MICHAEL SISSENWINE: Was it the one that showed there was very low probability? Maybe I'm in the wrong graph. It's not absolutely certain, but how could you expect to be any more conclusive?

MEAGHAN BRYAN: I don't know. I think that statement was being made just because there was so much uncertainty about the life history parameters and everything that we did was reliant on every derivation of every parameter that we were considering was based on that von Bertalannfy growth parameter, the decision for what the input for the von Bertalannfy growth parameter was or coefficient.

MICHAEL SISSENWINE: But isn't that reflected in this range of outcomes?

MEAGHAN BRYAN: Yes, that's true.

MICHAEL SISSENWINE: That's the sensitivity for those inputs.

MEAGHAN BRYAN: Yes, that's true. I think that also the uncertainty comes from if you were to look at -- Yes, this does

incorporate the uncertainties to the natural mortality estimators, but if you look at the individual natural mortality estimators, one -- If you use natural mortality estimators reliant on maximum age, rather than the von Bertalannfy growth parameters, you get a different story than what you would if you only relied on life history invariant relationships for natural mortality.

MICHAEL SISSENWINE: This is also the one where we said because of the discarding the large fish --

MEAGHAN BRYAN: No, that's queen triggerfish, but for blue tang, the growth relationship to -- It erodes at a very early age, given the life span or expected life span, and so there was concern that the length data doesn't adequately reflect changes in mortality or mortality of the species and that it would be better to use age-based methods, but we just don't have any catch at age information for blue tang.

I think we already talked about these final conclusions and then the main conclusions for queen triggerfish -- The results from the length analysis suggest that total mortality declined some time in 1998 or 1999, which was associated with an increase in mean length.

I meant to take this out, because this is something that was a discussion point at the assessment workshop, but given the discussions with the fishermen, we don't think that there's expansion into relatively unfished areas and so this increase in mean length is what they do to a reduction in mortality rather than expansion to fishing areas that have been relatively unfished, but it would be nice to have detailed spatial catch data to verify this, but we just don't have that.

In St. Thomas, we didn't predict a change in total mortality and there were issues with our assumption of selectivity being versus knife edge versus maybe double knife edge, given the selectivity patterns from the fishermen. It makes it difficult to interpret the absolute mortality estimates.

As we discussed earlier, as Todd brought up, because there were bounding -- A lot of those sensitivity results did run into bounds and maybe the life history parameters are not considered reflective of queen triggerfish. The life history parameters that we used for the analysis might not reflect the life history of queen triggerfish.

BARBARA KOJIS: You may want to make sure that when you put that

up, if this is going to be a presentation someplace else, that you separate out St. Croix from that industry representatives, because that just applies to St. Thomas and St. John.

MEAGHAN BRYAN: You're right.

JORGE GARCIA-SAIS: Meaghan, have you considered what's the maximum reported size of queen trigger for the Caribbean, the USVI?

MEAGHAN BRYAN: What's the asymptotic length?

JORGE GARCIA-SAIS: Yes, because at forty-five centimeters, that size fish in the water, someone should -- My opinion is that forty-five centimeters must be pretty close to the maximum size of the fish. If they throw fishes out larger than forty-five centimeters, they are throwing just the huge ones. Forty-five centimeters is an adult fish, certainly. It must be way above its size at first reproduction to start with and it's probably a pretty large fish. It's not a gigantic one, but it's large.

MEAGHAN BRYAN: The length frequency data from TIP, if you remember what I showed for Puerto Rico, there were fish that were sixty centimeters, sixty-two centimeters. Do you think those are all outliers? The fishermen said that they've seen them.

JORGE GARCIA-SAIS: I have never seen a sixty-centimeter triggerfish in the water. I have seen thousands of them and it's like --

GRACIELA GARCIA-MOLINER: But you also have a variation in the depths that you're fishing, that you're sizing fish.

JORGE GARCIA-SAIS: Yes, but you don't see many triggerfish below 165 feet. It's not like --

MEAGHAN BRYAN: They did share those photos. I remember looking at the photos and they were showing -- Granted, it was hard to tell, but --

JORGE GARCIA-SAIS: A forty-five centimeter -- My point is I don't know what's the biggest triggerfish ever caught, but my point is that a forty-five-centimeter triggerfish, it's a large adult fish for that species.

RICHARD APPELDOORN: The selection is occurring actually below forty, because by forty, you've pretty much eliminated --

There’s a few that get a little larger, but --

MEAGHAN BRYAN: The length at full vulnerability for St. Thomas was I think thirty-four centimeters and then in St. Croix, it was like twenty-eight and twenty-nine in --

BARBARA KOJIS: Those were both in traps.

MEAGHAN BRYAN: Yes, they were all traps and in Puerto Rico, it was about twenty-nine centimeters.

JORGE GARCIA-SAIS: Are we talking fork length?

MEAGHAN BRYAN: Yes.

JORGE GARCIA-SAIS: This is about a sixty-centimeter triggerfish and this is huge. This fish must weigh at least fifteen to twenty pounds and that’s not even talk about the --

TODD GEDAMKE: Reni, what’s your concern?

JORGE GARCIA-SAIS: My concern is that the lack of individuals larger than forty-five centimeters be in some way limiting the analysis and one of the conclusions is that because those larger fish are thrown away that it’s difficult to conclude about the mortality estimates for the population.

My point is that there shouldn’t be that many that are being thrown away, because I don’t consider that you will find, in the habitat that has been fished for years and years and years, many triggerfish above forty-five centimeters.

BARBARA KOJIS: So you’re saying it’s not so much of an issue?

JORGE GARCIA-SAIS: It’s not so much of an issue.

MEAGHAN BRYAN: The fishermen indicated that they were throwing them back all the time and that their selectivity pattern was different than what is assumed in the model. We did talk about this for a while and they might be valid as they stand, but there is some uncertainty, given that violation of the assumption of knife edge selectivity.

GRACIELA GARCIA-MOLINER: Again, in St. Thomas, it’s a different kind of habitat. It would be really nice and you can suggest that someone just go out there with them or that they check how many they throw overboard over a period of time.

BARBARA KOJIS: They should be reporting their bycatch.

GRACIELA GARCIA-MOLINER: They should be reporting their bycatch, that's true, but we haven't looked at the bycatch that they report, have we?

MEAGHAN BRYAN: It would be nice to see the St. Thomas Fishermen's Association trap data to see, because they're using the same gear as the fishermen that were there and --

JULIE NEER: They were surprised we didn't have the data.

MEAGHAN BRYAN: So that is the analysis for blue tang and queen triggerfish.

TODD GEDAMKE: I will just make a comment. In the summary slide you have before for each one, you said they're relatively stable -- When I started looking at this report, that was the first thing I noticed, is you don't have much of a signal in terms of mean lengths.

You don't really -- Your driving force in those increases or decreases -- A couple of them were constant or at least you were getting the same signal for percent increase or decrease across the board, but I wouldn't put that much weight onto those, due to the limited signal you have in the data.

From that, what you're really looking at is more or less absolute estimates that are going to be directly linked to your uncertain life history parameters and, as you indicated, getting absolute values is going to be just really hard.

Just looking at the initial plots, before I even saw your write-up on there, I knew you were going to have a really hard time getting anything out of it and getting anything conclusive on it.

RICHARD APPELDOORN: You're just saying the power is low because the data are limited?

TODD GEDAMKE: I don't have the sample sizes in my head right now. Blue tang are --

RICHARD APPELDOORN: Fairly limited is not sample size alone. It is other things.

TODD GEDAMKE: Information content for change and like 32,000 fish in St. Croix for blue tang is a huge amount of fish.

RICHARD APPELDOORN: Right, but if they're not growing --

TODD GEDAMKE: Right. You've got to determine potential deterministic growth and you've got this really narrow range in there and getting a signal out of that is really hard. Anyway, in the first part, looking at, you're really beating your head against the wall on this one.

MICHAEL SISSENWINE: The length frequencies are stable and they don't change over time. If that's true, of course, it means that the evidence is that Z hasn't changed over time. That's not an unimportant outcome.

RICHARD APPELDOORN: No, but that's not necessarily an accurate outcome, because if --

MICHAEL SISSENWINE: If the length frequencies are a valid sample of the population.

RICHARD APPELDOORN: If the length isn't changing as they age, you're not going to be able to get the --

BARBARA KOJIS: You're talking about blue tang, just blue tang.

RICHARD APPELDOORN: This is what we were talking about.

TODD GEDAMKE: Blue tang is problematic for potential growth patterns and also size range and so that may not be the -- Pinpointing, I agree, that it's not a trivial conclusion and we hung our hat on that for a number of things, but pinpointing where that is in relation to whether it's a high Z value or a low Z value and where you started the time series is in relation to virgin, that's really hard.

I will go one farther on St. Croix and I'm going to, of course, push something I am involved in, but we did the trap survey on St. Croix and your top three species were queen trigger and what was the other one? White grunt.

MEAGHAN BRYAN: I see where you're going.

TODD GEDAMKE: Where I'm going with this is just simply from a -- If you go out and you go fishing, your must abundant signal of species that you're getting in St. Croix is -- These are the top two of the three on the whole island and yes, snapshot during one point in time is potentially --

RICHARD APPELDOORN: Was blue tang in that top?

TODD GEDAMKE: White grunt was the top, queen trigger, and then blue tang.

BARBARA KOJIS: Blue tang has an issue associated with its deterministic --

JULIE NEER: -- data to TIP data at the workshop, because I remember that --

TODD GEDAMKE: You have got to go into interpretive mode on this and what other sources do you have? In terms of catch per unit effort, given September/October fishing in there, your greatest abundance signal that came out of that is in queen trigger and blue tang and white grunt.

Would I hang my hat on saying that's fantastic and don't worry about these guys? I'm not sure, but I'm just making sure everyone else is aware those were the top three.

BARBARA KOJIS: The top three species that you caught, yes.

TODD GEDAMKE: I think what Meaghan is trying to dig up is the length structure from the survey.

JULIE NEER: Yes, because she showed this, the comparison of the length structure from Todd's survey.

BARBARA KOJIS: Is that survey available, the report from that?

MEAGHAN BRYAN: A technical memo has been published of the exploratory data analysis for the St. Croix trap study.

BARBARA KOJIS: Is it available?

MEAGHAN BRYAN: Yes, it is. I can send it to you and there's definitely analyses in the works, which you could talk to Todd about, but hopefully by the end of year, if time permits, there will be more analysis done on this dataset to see what kind of information could come out of it.

TODD GEDAMKE: My departure has left the process with less working bodies and it ended up with more work on Meaghan's plate.

MEAGHAN BRYAN: This figure shows the a comparison of the TIP data from 2010 on the left, the length frequency data, to the

St. Croix trap survey for that one -- I think it was September and October of 2010.

JULIE NEER: The point is that they're not drastically different.

MEAGHAN BRYAN: No, they're not drastically different.

TODD GEDAMKE: It's different bin sizes and it messed me up.

MEAGHAN BRYAN: I thought I put them in the same. It's just the starting point I think is what's throwing you.

BARBARA KOJIS: What was the mesh size of the traps that you used? Was it two-inch or one-and-a-half inch?

TODD GEDAMKE: It's in the report.

BARBARA KOJIS: I know on St. Croix there's a lot of fishermen that were using, in the past at least, 1.5-inch square mesh.

TODD GEDAMKE: I think we went with a bigger one, if I remember correctly.

JULIE NEER: Meaghan, you don't have a presentation of the CIE?

MEAGHAN BRYAN: I don't, but we can discuss them.

JULIE NEER: I don't know how many want to. I didn't think you had a presentation on it.

TODD GEDAMKE: I am just looking at comparing the two and making sure they're not drastically different and then the descending limb is the key.

The trap survey, you've got a much smoother step-down from those bins and so in the TIP, you've got a big jump at your 200 bin, which if you take that directly over to total mortality, you're going to end up with a greater mortality in your TIP data than the trap survey data and I don't know if that's the case or not.

The mean length was -- It's not going to mean anything until you do an analysis on that, but my gut would tell me that the TIP is going to have a higher mortality than the trap.

MEAGHAN BRYAN: This is not very pretty, but this is a comparison of the TIP data to the trap survey and it does look like the trap survey caught more smaller queen trigger than what

TIP in 2000 from St. Croix.

TODD GEDAMKE: Just for your own interpretive knowledge on that, we used squid for logistic reasons. There are not a ton of people in St. Croix that are using squid and so we may have been baiting in some of the smaller fish that weren't being baited in by their standard rawhide or the weeklong habitat soaks.

You may have some of your more mobile juvenile stages or smaller stages of the fish that are running in and getting attracted by the scent and so that may be driving the smaller individuals.

MEAGHAN BRYAN: I think it's hard to interpret what that descending limb is for 2010.

JULIE NEER: I think this is one of the slides that brought up the initial discussion of how --

BARBARA KOJIS: This is St. Croix.

JULIE NEER: I am sorry. I was confused.

MEAGHAN BRYAN: I didn't make slides of the reviewer comments, but I can summarize them. There was two of the reviews that suggesting extending this to use a yield per recruit analysis, similar to what I did for queen and silk.

One reviewer basically was like -- In his mind, given the data limitations in the Caribbean, there needs to be more of a reevaluation, programmatically, in terms of what's the angle of the assessments and what are the approaches that are needed to get to that end goal and what are the data -- What data are needed to be able to adequately assess these Caribbean species to get to the endpoint, whatever that might be in terms of a benchmark ACL.

Rather than continuing on with discovering these issues for every species, there needs to be a reevaluation before further assessments are done for species that are characterized by these data limitations. I don't think that's a new idea and it's been discussed by many of us, but that was the main commenter of the one reviewer.

Two other reviewers did suggest delving into the literature and trying to find life history parameters of species, similar species, and developing a prior, some sort of prior, for the life history parameters and characterize the uncertainty that way and develop a sensitivity range from a wider range of

species, but similar species, rather than developing the range based on one estimate from the Caribbean and investigating some percentage above or below. That was a suggestion for future assessments.

Then the application of the yield per recruit, one reviewer was more cautious, saying that given the uncertainty in the life history and the age at maturity, your yield per recruit analysis is dependent on that and so it needs to be explored further, but you could do a yield per recruit and one reviewer suggested that that be done and develop reference points to evaluate whether overfishing is occurring for these species, specifically queen triggerfish.

JULIE NEER: They were all in pretty good agreement that there wasn't a whole lot more that could have been done with blue tang, given all the things that you guys have all talked about here.

MEAGHAN BRYAN: One of the reviewers characterized this as more take a look at what's going on in the Caribbean and formulate your steps based on where you want to go and the other one was like just model your way out of it, if you can.

I decided not to apply the yield per recruit approach for this, because I wanted to discuss the uncertainties in the life history and see if that was appropriate and if you thought that was appropriate at this point.

JULIE NEER: I don't know if you guys got the CIE reports, if they were passed along to you.

BARBARA KOJIS: They were.

JORGE GARCIA-SAIS: Meaghan, do you have TIP data for Puerto Rico for queen trigger?

MEAGHAN BRYAN: Yes. Do you want to see them? Do you want to see the annual?

JORGE GARCIA-SAIS: The one similar to this one.

MEAGHAN BRYAN: For queen trigger?

JORGE GARCIA-SAIS: Yes.

MICHAEL SISSENWINE: What is our term of reference on this? We've reviewed the presentation and what are we supposed to do?

RICHARD APPELDOORN: Review and give our blessing or not.

BARBARA KOJIS: I think it was in the agenda.

MEAGHAN BRYAN: I have a presentation that kind of walks through the terms of reference.

JULIE NEER: No, their charge and what they choose to do now and not what you --

MICHAEL SISSENWINE: Are we supposed to endorse the reviewers or not? This has been peer reviewed.

RICHARD APPELDOORN: That was my understanding and I read the agenda stuff and it wasn't actually all that clear as to what we were supposed to do.

BARBARA KOJIS: There was an explanation of the role of the SSC, taken from SEDAR-30, the queen triggerfish, description of the SEDAR process. The completed assessment, including the reports of all three workshops and all supporting documentation, is then forwarded to the council SSC for certification as appropriate for management and development of specific management recommendations. That was pulled out of there and Julie might be able to expand on that.

MICHAEL SISSENWINE: There are two parts of that. One is do we have anything to add to the SEDAR process? That is, do we want to make some further suggestions that the reviewers didn't already make or something like that. The second was are we being expected to make some management recommendations based on this at this meeting?

JULIE NEER: If you can.

MICHAEL SISSENWINE: Those are two very different things.

JULIE NEER: Normally what happens is this. Normally you get an assessment -- Up in the Gulf and the South Atlantic, you get the assessment report and you get the report and you get a presentation.

The SSCs then have discussions amongst themselves and they can decide whether they are happy with the assessment they have in front of them or whether they would like to see additional runs or additional sensitivities or stuff like that done.

If they are happy with what they have, then they usually have a discussion of whether they certify it. The South Atlantic is by consensus and in the Gulf, it's by votes. It's whether this provides scientific advice that's useful for management and that's step one.

Then step two becomes we have this assessment and what's our ABC? Can we use this to help develop or change or modify our ABC, in your case? Is it going to make you want to change what you had before?

If you want additional sensitivities run, usually then it has to come back at the next SSC meeting with the new runs and then you say now we're happy and now we'll make our ABC determinations, if you want to change them.

Basically, it's whether you think this -- Is there anything more they could have done, that Meaghan could have done, that you would like to see done? That's the first question and the second question is, if not, is this useful for you and do you want to change your ABC recommendations, since you already have them currently on the books?

GRACIELA GARCIA-MOLINER: Also, in terms of the advice to the council and from the council up to NMFS, et cetera, what kind of additional information -- Where should they be looking to add information to this process so that we can improve? I keep writing down age and growth and I added all the other species that we looked at.

MEAGHAN BRYAN: Also, in that respect, you have to think about what kind of assessments do you want and what data will be important for that assessment.

JULIE NEER: That one reviewer pointed out if the SSC as a whole thinks -- Meaghan did the best that she could, but it's still not all that helpful for you guys in perhaps changing the way your ABCs are given now and do you think it's wise that we continue to trundle down this track of doing this over and over and over again if it's not going to be of use to you or do you think we should step back programmatically and try and figure something else out?

There are SEDARs on the schedule for this coming year and the next year and the following year and I don't think anyone wants to do them if you don't find them useful, but if you say we should stop --

GRACIELA GARCIA-MOLINER: For example, we still are missing fishery-independent surveys for this area. There are a couple of old reports that can be pulled out from NOAA and so I've been thinking about the deeper water surveys that would kind of fit around the islands.

There is additional things that can be done. If the fishermen are truncating the catch, it's because they don't have a way to sell them or something and is there any suggestions from the social and cultural aspect that we need to look at and does that apply to many other species and things like that.

BARBARA KOJIS: It's obvious that most of these analyses are really thwarted by not having age and growth information that people are confident of that will apply locally and that has to be one of the big focuses.

GRACIELA GARCIA-MOLINER: We can just say in the number of individuals that you have in your TIP data and the data that you need to add age and growth to that.

BARBARA KOJIS: Age and growth and then making sure that you have adequate TIP samples and that they're randomly done and taking as much as possible. It may be that those are very important things, but let's -- Maybe we should take a break. It's twelve o'clock and maybe we should take a break. Mike is heading off at three o'clock and so I would like to have a fast lunch. How fast do you think you can get lunch done? Do you need an hour?

WALTER KEITHLY: Two hours.

BARBARA KOJIS: Two hours? Can you be back by one o'clock then? Two hours should be enough to pretty much, I would think, go and review this and come up with conclusions.

MICHAEL SISSENWINE: The conclusions about this I guess probably we can come up with, but what we recommend in management -- You mentioned how it would be handled in the South Atlantic or the Gulf. In the Northeast, the result of a SARC, which is the equivalent, would go to something called a plan development team, who would then come up with ideas about what should be done and then bring those to the SSC, asking whether we think they're based on sound science.

JULIE NEER: Yes, that's the management options part. We have that in the South Atlantic and the Gulf too, but it's whether you guys think you can use this to -- Is this what you want to

do to modify your ABC schedule?

MICHAEL SISSENWINE: Most ABCs are based on an ABC control rule, which is management responsibility and not an SSC.

BARBARA KOJIS: Yes, it is the SSC.

JULIE NEER: Yes, the SSC develops the ABC control rule and the management certifies it.

MICHAEL SISSENWINE: There is an ABC control rule. Who originates it is totally the prerogative of whatever the -- If in fact the council was asking the SSC for advice on ABC control rules, that would be a -- That's a legitimate request, but that's not what is on our agenda.

GRACIELA GARCIA-MOLINER: The information that comes out of here and the recommendations, we are working on an island-specific FMP and, for example, the big difference between the blue tang and the queen trigger among the islands and things like that, that would be brought up to the IPT to talk about and see how that fits and then go back to the council to see how that fits into the island-specific FMPs. In that sense, we are taking that step.

JULIE NEER: It's the same thing.

MICHAEL SISSENWINE: What is the current control rule for ABC for these species?

JULIE NEER: That's what I asked yesterday and the council apparently doesn't have one.

MICHAEL SISSENWINE: So that's the point. We recommend an ABC within the framework of the ABC control rule and, again, it would be fair enough for the council to ask the SSC to be part of a process that developed ABC control rules, but that isn't what was on our agenda.

MEAGHAN BRYAN: But that's kind of what we were presenting yesterday to consider.

MICHAEL SISSENWINE: No, that's a harvest control rule.

MEAGHAN BRYAN: Yes, we're missing an ABC control rule. That's true. I am sorry.

MICHAEL SISSENWINE: That's a useful process and it's part of

it, but it’s not all of it.

JULIE NEER: You have an ABC control rule now, which essentially is --

MICHAEL SISSENWINE: What is it?

JULIE NEER: Essentially, ex facto, your control rule is you have an MSY proxy, which is your average landings. Your OFL equals your ABC, which both equal your MSY proxy. That is what the council has used to come up with -- That is, by default, currently your ABC control rule and then the council then, at their stage, would then come up with their ACLs as done by whatever percentage based on --

MICHAEL SISSENWINE: So our control rule is average landings and we haven’t been presented anything that says anything different about average landings and so we have no basis for saying any different.

JULIE NEER: That’s exactly the kind of advice that --

MICHAEL SISSENWINE: In that context then, what difference did the assessment make?

JULIE NEER: That’s the next question, which is the broader question of whether these are a worthwhile process for the Science Center to continue to go down the path here to continue to organize and you to consider the reviewing.

MICHAEL SISSENWINE: I don’t think they’re worthwhile if the process is bound by using management based on some three or four-year-old estimate of what catch might have been that nobody believes.

They would be extremely useful if in fact there was some management that fit the available knowledge of whether it’s overfished or not or do we have an ABC control rule that’s geared towards coming up with a catch level, because that’s what the management plan has to have a catch level to specify an ACL.

I guess the relevance of these assessments is if they show things are overfished, then the catch level ought to be lower than some average. If they’re not, then it should be at or maybe higher if it showed that it’s nowhere near overfished. An ABC control rule would basically say not only that you use average catch, but how you would use it.

JULIE NEER: I would agree that the ABC control rule that's currently what seems to be in place here in the Caribbean is perhaps not --

MICHAEL SISSENWINE: It could use this sort of information, but it doesn't and so maybe that's what our recommendation is, is knowing whether the stock is overfished or not is obviously priority information and that's what this sort of assessment is giving us at least some information about, even if it isn't --

MEAGHAN BRYAN: It's not giving abundance information. It's overfishing.

MICHAEL SISSENWINE: I'm sorry. Overfishing. The wrong jargon. In the F context, which that should be a foundation of a fishery management plan.

JULIE NEER: I think comments like what you've just said --

MICHAEL SISSENWINE: We ought to have an ABC control rule that basically builds off of that knowledge and then these assessments become very valuable.

JULIE NEER: I think comments about those sort of things are important to pass up to the council.

BARBARA KOJIS: Let's go to lunch and we can discuss this afterwards.

(Whereupon, the meeting recessed for lunch on June 20, 2013.)

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June 20, 2013

THURSDAY AFTERNOON SESSION

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The Scientific and Statistical Committee of the Caribbean Fishery Management Council reconvened at the CFMC Headquarters, San Juan, Puerto Rico, Thursday afternoon, June 20, 2013, and was called to order at 1:00 o'clock p.m. by Chairman Barbara Kojis.

BARBARA KOJIS: Good afternoon, everybody. I would like to reconvene the SSC meeting for the afternoon. Thanks, Meaghan, for giving us a summary of what was happening with the SEDAR-30.

I believe we have discussed the types of advice that the CFMC would like to get from the SSC, which includes certify if the report provides scientific advice that is useful for management and probably outline what sort of advice that is.

Is there anything in the report that is useful for changing the ABC? Then is there any additional information that will be required in the further assessment of the -- Information in further assessment for these two species that is needed -- Any further information that might be needed or useful for further assessment of these species that could improve the process. I think those are the three areas that we really need to discuss.

I guess we could start with the certification, if there's scientific advice available in this report that's useful for management.

RICHARD APPELDOORN: Do we need to make a statement that we endorse the analyses that were done and think that that was a valid process as a first step before whatever we say about management?

BARBARA KOJIS: Certainly.

RICHARD APPELDOORN: I would certainly support that, but I am biased. I was part of the -- Well, I wasn't part of the actual assessment. I was part of the review.

BARBARA KOJIS: I think, Richard, would you like Graciela to type these up? I asked Richard to put a little report together on this and he was just so amenable to doing that, but if you would like, Richard, we could have Graciela type these up as we go.

RICHARD APPELDOORN: Why not, but I will also take notes and I will make sure that they coincide.

BARBARA KOJIS: That would be great.

RICHARD APPELDOORN: Do we have agreement then that we endorse the process and the results or however you would phrase that?

BARBARA KOJIS: Would somebody like to come up with the wording?

MICHAEL SISSENWINE: I actually think that's it, that the SSC endorses the SEDAR-30 process and results.

BARBARA KOJIS: The SSC endorses the process and results for the

SEDAR-30.

RICHARD APPELDOORN: The second question is are they appropriate for management?

MICHAEL SISSENWINE: I think we ought to say that the results directly address the status determination for the stock in the context of fishing mortality directly and indirectly biomass, because it hasn't been overfished. It has not been undergoing overfishing and presumably it's not overfished, which should be the fundamental consideration in the design of fisheries management.

BARBARA KOJIS: Except for the fact that for one species, given the range of sensitivities used, 60 percent of the values were over --

MICHAEL SISSENWINE: I didn't say anything about whether the results said that overfishing was occurring or not.

RICHARD APPELDOORN: Then what was the nuance? I know you didn't say that, but I didn't catch the wording to --

MICHAEL SISSENWINE: I don't remember the exact wording, but basically that --

GRACIELA GARCIA-MOLINER: The results directly address the status determination for the stock, directly fishing mortality and indirectly biomass.

MICHAEL SISSENWINE: Maybe we could make it even shorter and say the results address the status of the stock, which is fundamental information of how much fisheries management should be based.

BARBARA KOJIS: Right. It certainly appears that this process is useful for determining status of the stocks.

MICHAEL SISSENWINE: We could make that more simple I think by just saying the results indicate the status of stocks which should be the fundamental basis for fisheries management or such information should be a fundamental basis for fisheries management.

GRACIELA GARCIA-MOLINER: I didn't get the second part.

MICHAEL SISSENWINE: The results indicates the status of stocks. Such information should be a fundamental basis for fisheries

management.

RICHARD APPELDOORN: I much prefer the word “address” instead of “indicates”, because the status is -- We’re not making a status statement here.

MICHAEL SISSENWINE: Right and the results could be inconclusive and so it may not even be --

RICHARD APPELDOORN: Which most of them were, I felt.

MICHAEL SISSENWINE: The results are just as -- I am not disagreeing with you, but I mean on an issue of status determination, the results are always inconclusive. Well, they are always inconclusive and some of these are not especially inconclusive, in my experience.

RICHARD APPELDOORN: I guess we should all feel good about that or your experience really sucks.

MICHAEL SISSENWINE: It sucks that that is my experience. Those are two different things.

RICHARD APPELDOORN: But that’s what I meant.

TODD GEDAMKE: In the first sentence, “the SSC endorses the process”, are we indicating we endorse the whole SEDAR process or are we endorsing the SEDAR process?

RICHARD APPELDOORN: To me, it’s the analytical processes that were used within SEDAR-30.

TODD GEDAMKE: Okay. We could just switch the SSC endorses the SEDAR-30 process and the results for queen triggerfish and blue tang.

BARBARA KOJIS: Just to make it clear.

TODD GEDAMKE: Julie is in the room and I don’t want to say too much, but --

JULIE NEER: I prefer clarity.

TODD GEDAMKE: I think what we’re saying is we endorse what happened in this and maybe not a blanket approval of the whole SEDAR process.

JULIE NEER: I agree that is what you’re saying.

BARBARA KOJIS: Yes.

MICHAEL SISSENWINE: Somebody has endorsed it, based on the --

RICHARD APPELDOORN: It's already been endorsed by peer review.

MICHAEL SISSENWINE: I mean but the process has also been endorsed. The SEDAR process in general has been endorsed by --

RICHARD APPELDOORN: To me, it wasn't the SEDAR process. It was the analyses that were used in SEDAR-30 is what I think I meant by endorsing.

TODD GEDAMKE: So change "process" to "analytical analyses".

RICHARD APPELDOORN: Analytical methods.

MICHAEL SISSENWINE: The SSC endorses the --

BARBARA KOJIS: Analytical methods?

RICHARD APPELDOORN: How about just methods?

MICHAEL SISSENWINE: Method used during SEDAR-30, yes. And the peer review process. I think we're also endorsing that it's a legitimate peer review done.

TODD GEDAMKE: Do we want to specifically say peer review?

MICHAEL SISSENWINE: Yes, I think that is part of what we're endorsing. We're saying the peer review is --

BARBARA KOJIS: The SSC endorses the methods used in the SEDAR-30 process --

RICHARD APPELDOORN: Then a comma and then "including peer review".

BARBARA KOJIS: Yes and including the peer review.

MICHAEL SISSENWINE: And its peer review.

BARBARA KOJIS: And its peer review, okay.

RICHARD APPELDOORN: So it's including the SEDAR-30 process and its peer review.

BARBARA KOJIS: Is that where we start mentioning the caveats regarding the results that we still need better age and growth? Do we want to go into detail with respect to that at this stage or just put that someplace else?

RICHARD APPELDOORN: I think we have to acknowledge that, because it's directly going to affect whether we feel they're appropriate for management and what other specific recommendations can be developed from it.

BARBARA KOJIS: Okay.

MICHAEL SISSENWINE: Maybe that first point ought to be broken in half and the so the first part of it is that we endorse the other methods and the peer review and the second part is that we accept the results, recognizing -- As the best available at this time, recognizing their limitations. Then we can say something about limitations. Recognizing their limitations and then you could have bullet points after that sort of listed what those limitations are.

RICHARD APPELDOORN: That's a good approach.

MICHAEL SISSENWINE: Or recognizing the following limitations.

BARBARA KOJIS: Yes, recognizing the following. That's a good way of doing it.

MICHAEL SISSENWINE: So what's our list?

TODD GEDAMKE: You're saying we want to put key limitations? Seriously?

JORGE GARCIA-SAIS: The list might be too long.

TODD GEDAMKE: Uncertainty in the growth or life history information.

BARBARA KOJIS: Lack of life history information for queen and trigger and blue tang or more specifically, what size at reproduction.

TODD GEDAMKE: Everything, lack of life history information --

BARBARA KOJIS: Then for blue tang, it's the --

RICHARD APPELDOORN: It's the lack of information content of sizes for blue tang.

BARBARA KOJIS: Then it's to explain why. It's the low information content provided by the length frequency data for blue tang, given indeterminate growth or although indeterminate growth is --

RICHARD APPELDOORN: No, it's determinate growth.

BARBARA KOJIS: Determinate, but it's more than -- I guess it is determinate growth.

RICHARD APPELDOORN: What do you call the selectivity on the right-hand side?

TODD GEDAMKE: Dome-shaped selectivity.

RICHARD APPELDOORN: Dome-shaped selectivity for queen trigger in St. Thomas and St. John.

BARBARA KOJIS: The reason for the dome-shaped selectivity is because of the discards of the large -- Owing to discards of the large fish over forty-five centimeters.

RICHARD APPELDOORN: I think it's forty. I think it starts even less than that.

JULIE NEER: Dome-shaped selectivity in itself is not bad. Because it violates the assumptions of this model, that's why dome-shaped selectivity is a problem.

TODD GEDAMKE: Strike the sentence "violation of assumptions". Following "limitations", a violation of model assumptions and then due to or -- I don't think dome-shaped has been proven and so just potential violation of the model assumptions. It just complicates the interpretation.

We didn't use the catch records, per se, in this, but the process and the results were limited what they could do, due to uncertainty in the landings. Do we want to hammer that home again? In this case, it wouldn't have made much of a difference, because the ratio is -- I don't think we could probably carry those much farther forward.

BARBARA KOJIS: Did you have any issue with the sample sizes for the length frequencies?

MEAGHAN BRYAN: You mean there's been a declining trend in sampling, I think in declining numbers in sampling in St. Croix?

I think the report is that maybe they were able to measure only 400 fish total in St. Croix, because of --

BARBARA KOJIS: Lack of staff.

RICHARD APPELDOORN: I have a question about the life history information. We did have Puerto Rico and Virgin Islands growth curves for queen trigger and how much more do you need before you say I believe those results are what we should go with?

TODD GEDAMKE: I threw up uncertainty.

RICHARD APPELDOORN: There's always uncertainty in these things.

TODD GEDAMKE: There definitely was some in the literature.

RICHARD APPELDOORN: Obviously if Brazil said the same thing, we would say, okay, let's go with --

MEAGHAN BRYAN: The study was from 1987 and someone had a concern about how the readings were done, I think.

BARBARA KOJIS: Was there validation?

MEAGHAN BRYAN: I don't think there was validation.

RICHARD APPELDOORN: This is Manooch?

MEAGHAN BRYAN: Yes, Manooch in 1987.

JULIE NEER: Validation was not a hot topic in aging in the 1980s and so there was probably not validation and there may not even be verification.

BARBARA KOJIS: What is the difference?

JULIE NEER: Validation is independent determination that the bands were laid down in some increment, normally annually. Verification is like using something within the otolith, like marginal increment analysis, to get samples from -- this band for six months and then this band.

It's verification because it documenting that they're laying down the pair of bands each year, but you're using the same thing you're counting to -- You can't validate and you have to -- Like validation externally is like OTC tetracycline injected and you get the fish back and it was at large for four years and there are four new bands.

RICHARD APPELDOORN: I thought validation was if you get different people that come up with the same counts and verification is what's the timing of that.

JULIE NEER: No, that's reader error. That's coming up with your age estimates, but that's not saying that the bands are laying down annually or at any specific time. That's just looking at your reader error.

RICHARD APPELDOORN: What's the difference between tetracycline and marginal increment analysis?

JULIE NEER: Marginal increment is within the same thing and tetracycline is the same -- You're using what you're --

RICHARD APPELDOORN: One is a better method than the other and I understand that, but I don't see what the -- That is not how I learned it, but that's okay.

BARBARA KOJIS: Things change, Richard.

RICHARD APPELDOORN: I guess.

MEAGHAN BRYAN: Going back to this paper, it wasn't otoliths actually for this paper. It was dorsal spines and that was why.

BARBARA KOJIS: People don't believe dorsal spines so much?

MEAGHAN BRYAN: I think people prefer otoliths.

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

BARBARA KOJIS: Is there anything else that we need to add or do we need to make a statement and add in the information about --

TODD GEDAMKE: Barbara's question about sample size, I don't remember what they exactly were, but the pattern generally is much more noise in lower samples in recent years and the beginning of the time series.

MEAGHAN BRYAN: For blue tang, it was actually decent throughout, but in general, yes. Like overall, the sampling program seems to have fewer samples.

RICHARD APPELDOORN: In the time period we would really like to know about.

TODD GEDAMKE: Yes, but is that something that you would think was a hindrance or a limitation for blue tang? Probably not.

MEAGHAN BRYAN: For blue tang? No, I don't think that would be a limitation.

RICHARD APPELDOORN: What about queen trigger?

MEAGHAN BRYAN: Queen trigger, I think the selectivity was a -- That violation of the selectivity assumption, but verification of actually selectivity in all of the island platforms would be good to have. If we could get some information, then we could determine if the pattern we're seeing reflects fishing mortality or is confounded by this dome-shaped selectivity. I think that was a big uncertainty for that particular analysis, but life history parameters are the main uncertainty when using this approach.

BARBARA KOJIS: Should we say that?

RICHARD APPELDOORN: Those bubble plots had a lot of variability and little bubbles here and there. If those were actually aggregate locations and we had a large sample size, this would be a very confusing picture, a much more confusing picture than this. If the large sample size actually shifted the locations -- -

TODD GEDAMKE: So it should happen based on sampling periods and that noise should come out.

BARBARA KOJIS: Do we want to say sample size and randomness of samples?

RICHARD APPELDOORN: Consistent sample sizes is what we need.

JULIE NEER: Distribution of samples over time.

RICHARD APPELDOORN: Yes, distribution of samples over time.

MEAGHAN BRYAN: That was a problem for queen triggerfish, for sure.

RICHARD APPELDOORN: Right and the other thing that bothered me about queen trigger for Puerto Rico was those two batches that had those really large fish.

BARBARA KOJIS: That needs to be consistent.

RICHARD APPELDOORN: There isn't a logical explanation for that, not on those time scales, I don't think. So it may have been a sampling -- One person was getting large fish and in those times, he was being questioned and other times not or I don't know, but does anybody find that really odd, that all of a sudden in those two blocks there are these much bigger fish?

MEAGHAN BRYAN: I guess that question is how random is the TIP sampling.

RICHARD APPELDOORN: Given that Puerto Rico didn't have a lot of data -- They're not typically targeted relative to the Virgin Islands, if I recall your initial thing.

MEAGHAN BRYAN: Actually, yes, in Puerto Rico, the queen triggerfish sampling declined. The sample numbers declined over time. You started off with a few thousand and then a thousand and it dropped down to 300 and 500 and 337.

RICHARD APPELDOORN: The big ones are out at --

MEAGHAN BRYAN: Right and they're coming out over here in the 1988 or so.

RICHARD APPELDOORN: There's no biological justification for that.

MEAGHAN BRYAN: No, it doesn't look like it.

BARBARA KOJIS: It could be different types of years.

MEAGHAN BRYAN: That's why I questioned whether or not they moved somewhere.

RICHARD APPELDOORN: That's not a biological. That's a sampling.

MEAGHAN BRYAN: I don't know and maybe that fisherman just -- He was a diver and this is looking at pots and traps and I don't know how well he knows the pot and trap fishery and so they may have moved into different areas and there are still larger fish out there, but we couldn't verify that and we don't know.

GRACIELA GARCIA-MOLINER: Those larger animals come from the pot fish or do they have diving in that sample?

MEAGHAN BRYAN: This is just pot and trap separated from everything else.

TODD GEDAMKE: What's the limitation that we're honing in on right now?

RICHARD APPELDOORN: To me, that's a quality of data issue.

BARBARA KOJIS: The quality of data has to be related to the number and random distribution of samples. Samples need to be taking place and then you have to have adequate numbers of samples, right?

MEAGHAN BRYAN: Yes, annually.

TODD GEDAMKE: The bullet above, limitation in distribution of sampling over time, needs to be consistent. That's not a limitation. That's a recommendation. What you're saying is that there's an uncertainty in the data quality due to consistent sampling, consistent and random sampling.

RICHARD APPELDOORN: That would embed that problem.

TODD GEDAMKE: Yes.

RICHARD APPELDOORN: Distribution and randomness of samples.

BARBARA KOJIS: Distribution is kind of -- Doesn't it also have to do with the number of samples over time, annual number of samples?

TODD GEDAMKE: I think distribution of catch gets at it.

BARBARA KOJIS: I did say temporal distribution. Temporal distribution could be whether you are doing monthly sampling throughout the year.

RICHARD APPELDOORN: Inconsistencies in sample size and randomness of samples, annual sample size.

BARBARA KOJIS: It could be that randomness should cover the temporal distribution, shouldn't it?

BILL ARNOLD: It should say lack of randomness.

BARBARA KOJIS: It's the sample size as well. Inconsistencies or --

TODD GEDAMKE: You could do uncertainty of data due to sampling methodology and then parentheses and say temporal distribution

and -- Don't type this and let me spit this out first. What we're talking about is the sampling strategy and the sampling limitations and so uncertainty in data due to the sampling strategy and then parentheses and annual sample sizes, distribution, and randomness or something like.

BARBARA KOJIS: So uncertainty in the data due to sampling strategy, e.g., annual sample size --

RICHARD APPELDOORN: In lieu of temporal distribution, consistency, and annual sample sizes. That works for me.

BARBARA KOJIS: Okay. Are there any other limitations? Meaghan, you could even mention things here.

GRACIELA GARCIA-MOLINER: What would make your life easier?

BILL ARNOLD: The lottery.

BARBARA KOJIS: Are you happy with this?

TODD GEDAMKE: Yes and I will just revisit what I mentioned before, but an inability to address ACL or biomass benchmarks due to a lack of reliable landings estimates or something along those lines, because although it wasn't included in there, it wasn't even attempted because of those problems. I am just throwing it out again if the group doesn't want to include it, I'm fine with that, too.

RICHARD APPELDOORN: How would you link that problem to the --

TODD GEDAMKE: We said the results for the queen triggerfish and blue tang is best available, but the limitations are the inability to address biomass-based benchmarks due to a lack --

BARBARA KOJIS: That bullet point should start with inability?

TODD GEDAMKE: Before we start adding this, do people want to include this?

BARBARA KOJIS: Put it in there and we can decide whether we want to include it.

TODD GEDAMKE: Inability to address biomass-based benchmarks due to considerable uncertainty --

BARBARA KOJIS: In the landings data. I think that drives home a point.

TODD GEDAMKE: Lack of life history information and uncertainty in landings data should be hammered home at every opportunity we can.

BARBARA KOJIS: The other part of this is certifying whether the scientific advice is useful for management and do we need to be specific about what advice is provided in this regarding overfishing status, because certainly that was the thrust of the report and for blue tang and whether their difficulty in even determining it because of the determinate life history, but there was no indication of any overfishing, but for queen trigger, wasn't it a little bit different?

RICHARD APPELDOORN: I would say you could probably say blue tang is not overfished in Puerto Rico because there was no catch data, essentially, for it, because it's just not targeted.

TODD GEDAMKE: Meaghan, without reading through the whole report, did you include summary statements that were somewhat like what Richard is saying, that the lack of landings data would suggest --

MEAGHAN BRYAN: I do not recall even considering the landing data. Is this for blue tang?

RICHARD APPELDOORN: Yes.

MEAGHAN BRYAN: I didn't make any comments about blue tang in Puerto Rico, because there was no analysis done.

RICHARD APPELDOORN: The reason there was no analysis done was because there was no data and presumably the reason there was no data was because it's not fished.

MEAGHAN BRYAN: That's fine. I did not make those comments in the report though.

JULIE NEER: The general summary statement that you did agree to in the summary report was that the status of -- Whether it's undergoing overfishing or is overfished is unknown.

TODD GEDAMKE: That's what I expected. I was just wondering whether anything went beyond that, because, like I said, the survey information in St. Croix was one of the most abundant species would suggest a lack of any finding that are going to lead to --

JORGE GARCIA-SAIS: Do they eat the blue tang there?

BARBARA KOJIS: Yes. There are limitations on how many -- It's the older people that eat it, for the most part, I think, and their older population is dying out and so they're kind of, in St. Thomas and St. John anyway, they are probably bringing back fewer blue tang.

They usually release some blue tang. They catch more blue tang than they can sell and St. Croix, I think they probably keep all of the blue tang for the pot fish. For spearfishing, they may not sometimes target it as much, because they're really going after parrotfish or snapper or grunts. You've got fewer and fewer of the elderly and the fishermen go, there's fewer people coming to buy our fish, our pot fish type of fish.

JORGE GARCIA-SAIS: There's not much meat in them.

TODD GEDAMKE: We can either add a bullet to this or we can start a -- The last one is we endorse the process and results and now we're kind of getting into conclusions, which is a limitation of the assessment was an inability to determine stock status.

We can either tie one into a bullet there or do the next piece, which is this what do we get for management advice. I think part of the assessment process is determining stock status and our management from there and so I wouldn't fight strongly to have it one way or the other, but --

BARBARA KOJIS: Maybe it belongs after that and one of the results on the status of the stocks should be information should be a fundamental basis for fisheries management and then go on to say --

RICHARD APPELDOORN: These bullets are all under what?

TODD GEDAMKE: Limitations of the assessment.

BARBARA KOJIS: Are we done with limitations then and we can go on to management advice and mention that it's sort of a limitation, but --

RICHARD APPELDOORN: I think we're done with limitations. It could be under this thing as a bullet.

BARBARA KOJIS: Because of the above limitations, the analysis was unable to determine the status of the stocks? I don't know

if somebody can word that better or clarify. To determine whether the stocks were undergoing overfishing or are overfished.

RICHARD APPELDOORN: I would prefer “limited indications of whether the stocks are” -- Or just “limited indications of the stock status”.

BARBARA KOJIS: Was unable to indicate stock status.

RICHARD APPELDOORN: I just found “unable” too strong.

BARBARA KOJIS: But that’s what, in essence -- Didn’t Meaghan say that, that they were unable to determine whether the stocks were overfished or undergoing overfishing? Isn’t that one of the conclusions of the report?

MEAGHAN BRYAN: I said it was uncertain whether they were undergoing overfishing.

BARBARA KOJIS: Uncertain.

RICHARD APPELDOORN: Uncertain in determining.

BARBARA KOJIS: Then do you want to just say stock status or undergoing overfishing?

MEAGHAN BRYAN: The analysis can’t determine if they’re overfished.

RICHARD APPELDOORN: Because we don’t have a way to get to the biomass benchmarks, which is reflecting back to the limitations that we’re talking about.

MICHAEL SISSENWINE: Indirectly, if you concluded overfishing is not occurring and it has not occurred, then you can’t be overfished and so under limited scenarios, but I don’t know that that needs to be said.

BARBARA KOJIS: Are there any other -- I don’t know if an analysis can be uncertain.

GRACIELA GARCIA-MOLINER: This is results.

RICHARD APPELDOORN: Yes, the results.

BARBARA KOJIS: Okay. Anything else that relates to the scientific advice useful for management?

MICHAEL SISSENWINE: Does this mean our conclusion is that the status is unknown for these stocks?

RICHARD APPELDOORN: No, it means it's uncertain.

MICHAEL SISSENWINE: Uncertain would be saying we're willing to take a shot at it and say this is what we believe, but it's uncertain. Unknown is that it's so uncertain we won't even put a label on it.

BARBARA KOJIS: We could go through each of the -- If blue tang is not being fished in Puerto Rico and there's no sign or indication from this analysis that --

RICHARD APPELDOORN: Are we reviewing the report or are we making that as an additional comment to the report?

BARBARA KOJIS: We can review the report, but then look also at the --

RICHARD APPELDOORN: Meaghan, in your final slides, when you were summing it up, did you say anybody was anything?

MEAGHAN BRYAN: I don't recall saying that anyone was undergoing overfishing. I just said there was uncertainty about whether fishing mortality is higher than natural mortality and I qualified that with it was -- The interpretation depended on which estimate of natural mortality you used as the proxy for FMSY, because the natural mortality estimates that were derived using the maximum age, which we had, I think maybe for each species, a few estimates, but they were basically the maximum age that the studies actually aged and so whether or not the maximum age of the fish was unknown -- Anyway, they led to higher natural mortality rates than when using the von Bertalannfy growth parameters when deriving the natural mortality. That's why I did not make any strong statements.

RICHARD APPELDOORN: The only thing that I saw that was coming out of this was St. Croix queen trigger. We did have the drop in size and we had that 60 percent probability of being overfished.

MEAGHAN BRYAN: Yes, I showed that figure.

MICHAEL SISSENWINE: Should we go through this species by platform and look at those histograms quickly and just say whether we want to come to a conclusion or just label it

unknown, systematically go through them one at a time and are we talking about the same thing here?

BARBARA KOJIS: I agree.

JULIE NEER: While Meagan is getting that, the language that got into the final summary for it was no clear status determination can be made from the assessments, as the independent reviewers differ about the appropriateness of the assessment for making such determinations. That's just for your information. The CIE, since they had varying degrees of comfort and discomfort, none of them said anything useful to help you at all.

MICHAEL SISSENWINE: I think it helps in that we're saying if we don't come up with that conclusion, we're saying we have some --

RICHARD APPELDOORN: I was jotting them down and for like blue tang in St. Thomas, 80 percent of the things were below the value of one and St. Croix is about 55 percent. I was eyeballing it, but about 55 percent were below the value of one.

In Puerto Rico, queen trigger was almost at 100 percent below one and St. Thomas was about 80 percent and so it was only St. Croix were it was 40 percent, or 60 percent overfishing.

MICHAEL SISSENWINE: If we think these analyses are unbiased -- We know they have limitations and so forth, but if they're unbiased, then we ought to be making the determination that those stocks have less than a 50 percent probability of undergoing overfishing or not undergoing overfishing.

TODD GEDAMKE: Meaghan, with these, I'm a little concerned, I guess, about these percentage values, due to the spike at zero.

RICHARD APPELDOORN: Right and the fact that for blue tang there is a question of whether you're really getting useful information from size and for queen trigger for St. Thomas, the selectivity falls below anyway.

Yes, you get those results, but the only one that seemed to have room for, to me anyway, for interpretation was queen trigger in St. Croix, because it didn't have the selectivity problem apparently that they have in St. Thomas and the blue tang, to me, is the narrow band of information wasn't broad enough.

BARBARA KOJIS: The selectivity problem in St. Thomas would push the F over M in which direction?

MICHAEL SISSENWINE: Higher and so the fact that it's below would say it's pretty damned robust that it's not going undergoing overfishing.

RICHARD APPELDOORN: If that's overestimating and 80 percent of the values are less than one already --

MICHAEL SISSENWINE: It seems quite unlikely that it's overfished or that overfishing is occurring. I think there are at least a couple of them that we could say overfishing is not occurring.

BARBARA KOJIS: For queen trigger, we would say for St. Thomas/St. John that it's not occurring and for St. Croix?

JULIE NEER: If you believe that the selectivity issue is not important.

BARBARA KOJIS: There's no selectivity issue in St. Croix.

JULIE NEER: I am saying in St. Thomas.

BARBARA KOJIS: Yes, but the selectivity issue was pushing it in the other direction.

TODD GEDAMKE: The cumulative percentage that is there is being driven by that spike. What is included in these summary histograms are bounded runs and so those are spurious results. Those are really not results and those should be excluded from any summary histogram of distribution.

MEAGHAN BRYAN: Do you want me to do that?

TODD GEDAMKE: Like that starting out at 40 percent at zero artificially puts you to the left and so I am just a little --

MEAGHAN BRYAN: I can reprocess those results.

RICHARD APPELDOORN: I've actually got a question about these graphs and I wanted to bring it up. The cumulative percent is as you go across and you're adding those frequencies?

TODD GEDAMKE: In that one there, you're starting at 50 percent and so 50 percent of all runs are in that first bin. In the first bin, and this is starting at 39 percent, that means that 39 percent of all the runs are in this first bin.

RICHARD APPELDOORN: Yes and if you look at the distribution,

that's not possible. You add all of those up and you're not even going to get 15 percent.

TODD GEDAMKE: But you can't tell, because the scale on this is 320, as opposed to what may be twenties in here or tens in here. There may five, eight, ten all the way out here. If you're bounding at five and you're bounding at zero on this, in both cases -- If there are any that are bounded at five, those need to get pulled and if any are bounded at zero -- I think I would filter at 0.01 or something or 0.02, just to remove those that were bounded.

BARBARA KOJIS: The other question is, is this giving us any information anyway, because of the determinate growth of blue tang?

TODD GEDAMKE: It's separate issues I think right now. I think when we've been discussing this, the percentage of runs -- The language "percent probability of being overfished" has been used and this is really the percent of runs that are suggesting that overfishing is -- It's semantics, in some way, but especially the way that it's summarized here, I think that it's somewhat misleading.

RICHARD APPELDOORN: Yes, I agree. Then you go to St. Croix, which had 60 percent of the runs suggesting overfishing for queen trigger and it was the second or third most abundant thing in your trap survey. Those are two different -- I am not sure we can say anything.

TODD GEDAMKE: I am hesitant to do it on these histograms. The only thing that I would be willing to discuss would be -- Not really willing to discuss, but to throw some of those other interpretative aspects of no catch in Puerto Rico, high abundance in the survey, anything like that we think is worth mentioning. I am hesitant to grab percent of these runs off these plots and draw any conclusions from that.

RICHARD APPELDOORN: If you put the limits on that you were talking about to get rid of the unbounded ones, would you feel better about that?

TODD GEDAMKE: Absolutely.

MEAGHAN BRYAN: Do you want me to do that now? I can, but I'm just not going to do it while I'm presenting.

BARBARA KOJIS: Go ahead and we can go on and do this other

stuff while you do that.

WALTER KEITHLY: Let me raise an issue that was brought up and it may not be a relevant issue, but I don't know if we can answer it, Richard, but at least one of the reviewers questioned the life parameters, the fishery parameters, and said that some of them just seemed implausible and yet, all of these life history parameters were included in the scenarios. Does anybody have a feeling on whether some of these life history parameters were implausible?

RICHARD APPELDOORN: I don't want to disturb Meaghan, but I thought that she said that yes, some of them are implausible in the totality in which they're presented, but when she was looking at the -- Actually, they were looking at a more limited set of parameters, but to do the sensitivity analysis, she worked the values around, which eventually encompassed everything we were seeing.

TODD GEDAMKE: Walter, I think what Meaghan is doing right now -- It's a judgment call on whether they're implausible or not. Analytically, when the model is bounding out, you have something where it cannot -- When it's bounding at zero, it's basically looking for spontaneous generation rather than mortality and so that's an analytical implausibility. It's not possible to have generation of life.

That's going to be kicked out right now and so some of the most obvious ones are going to be dumped by looking at these bounded cases and I think the sensitivity -- I think one of the reviewers recommended coming up with priors and getting more sophisticated with the information being fed into the distribution for these life history parameters.

Yes, I think that some of them are not likely, but I think it's really hard to pinpoint it down, but I would -- As an external reviewer, someone suggested taking comparable species, similar species, and come with priors. We could do that.

WALTER KEITHLY: I also think in terms of the probabilities that we're discussing right now that they're all dependent on which life history parameters you put into the model and if some of these are implausible, then the probabilities are probably --

RICHARD APPELDOORN: That's why we're saying there's uncertainty in the results.

TODD GEDAMKE: That whole thing is that this is a very

unsophisticated uniform prior as opposed to a well informed normal distribution prior or something for this. Basically, what Meaghan is trying to do is take the available information and run it over the whole spread uniformly. Hopefully she's got that center point.

RICHARD APPELDOORN: She was encompassing the tradeoff.

TODD GEDAMKE: I mean if you take the uniform prior, if reality is actually all the way at one end of it, you're going to shift your distribution of your model results all the way off to one side, one way or the other, and you don't know what that is until we have better information on where that sensitivity is in relation to reality.

WALTER KEITHLY: In other words, everybody feels that it cannot, apriority at this stage, subtract out some of the life history parameters.

TODD GEDAMKE: I think that was part of the data evaluation and I was not part of that.

JULIE NEER: Basically, there were the two estimates and they almost doubled in their K and for blue tang, one was 0.4 and one was 0.8. The group discussed it and said they were both valid studies and we don't know which one is more appropriate for here. They're both old and neither one of them would get us to that new record blue tang that was just collected, which is a whole other problem, which we know was real and was out there.

RICHARD APPELDOORN: I thought blue tang we had a lot of estimates for. Queen trigger is what we just had the two.

JULIE NEER: We only came to -- We had a lot of them and we only came to -- Wasn't it blue tang that we only came down to using the two that were most realistic for this region?

RICHARD APPELDOORN: No. In queen trigger, we had the Brazilian study and we had the Manooch study.

JULIE NEER: That was the 0.4 and the 0.8? The point is we talked about it, even if I'm confusing the species, and couldn't throw out or keep in any of the estimates and then we came, as a group, came up with the ranges that Meaghan is running for sensitivity. That's where they came from. I remember the discussion of that gigantic blue tang that didn't match.

TODD GEDAMKE: For blue tang, the determinate growth, is

everyone in agreement that that's going to negate the value of the ratios and is everyone on the same page there?

BARBARA KOJIS: Yes.

TODD GEDAMKE: Okay and so let's forget about blue tang and looking at any of these histograms for blue tang. We can forget that. For blue tang, the only other things we could do would be to make qualitative comments regarding landings and/or survey numbers. That will take care of blue tang across the board.

Is anyone comfortable with and would like to come up with a statement that does any qualitative summary of some of the things we've discussed? I am not sure that I feel like going that far with it.

MICHAEL SISSENWINE: I am trying to reconcile our endorsement of doing this sort of stuff and then doing these analyses and having the SEDARs and then saying but we can't conclude anything.

TODD GEDAMKE: That first endorse the process statement was where my concern was there. I mean we can in terms of steps --

BARBARA KOJIS: But the limitations are overwhelming.

TODD GEDAMKE: I think at least before lunch we discussed the statement or at least touched on the statement that it's necessary in this, which is what about the SEDAR process and do we continue to do these things as they've been done?

I tried to separate that in my head as to what we've attempted versus the ability to really provide management advice out of the results as a first step and then a second step saying should we continue to do this.

JULIE NEER: Can you do anything with the information you have in front of you right now is step one and then, once you're done with that, should we continue down this road if this is the type of stuff you're getting out of it?

TODD GEDAMKE: Although we think this is the best available and the best that could be done for this, it's the inability to provide management advice or draw strong conclusions that makes the SSC question whether this process should be --

BARBARA KOJIS: If the process should be continued until further data is available.

JULIE NEER: Right. Either further data or new methodology is developed.

RICHARD APPELDOORN: That sounded pretty good.

BARBARA KOJIS: That would solve our problem. Meaghan, do you want to show us what you've done here?

BILL ARNOLD: Barbara, there's a second component to this too and that is does the SEDAR process meet the overall goals? That's not just for each individual assessment, but for the need to assess this multitude of species in a timely manner and adjust reference points accordingly.

Even if you could get the proper data to get a blue tang assessment completed over the course of X, is the total amount of information going to be provided in a timely manner?

BARBARA KOJIS: I assume that's being provided in other locations in that manner, you know in the Gulf or where you've got more data. Here, the difficulty is the data.

BILL ARNOLD: Not completely. That's just not the case.

JULIE NEER: No, you're not getting as much as you would like, but that is not a fault of the process.

BILL ARNOLD: I'm not saying that. I am saying is this the appropriate general process for doing this and this is going to take us literally twenty years to get through -- It would take, in Puerto Rico, twenty years just to get through the snappers and groupers at two a year.

Maybe that might be a slight exaggeration, but it's not much of one and the question is, is this really the way we want to go, even if individual assessments can be done properly? That also needs to be addressed and that was sort of the idea behind being able to come into a SEDAR and do a multitude of species rather than just two individual assessments using this length-based approach.

JULIE NEER: You can do that if the length-based approach is actually going to give you guys what you need for your assessments.

BILL ARNOLD: That's the question I'm asking. Maybe this is the appropriate approach, but that's a question that needs to be

addressed.

BARBARA KOJIS: You guys are much more familiar with it. I certainly see that this is an approach that can give you information about whether overfishing is occurring and so it gives you status of the fishery, if you've got the appropriate data.

The problem is in most cases you don't have the length data for most of these species, because many of them are not that common or they may not be fished that much or whatever. They may not be target species.

I don't know if this information then can give you information, provide us information, that's more detailed than that. If you've got the catch data, then maybe you can incorporate the biomass information, but that's a long, long term proposition, probably.

I don't know. Certainly the status, one of the problems we have is what's the status of the stock to know whether even what we have as far as an ABC is reasonable and that's probably -- This looks like it could do that if you have the data for it, the life history data and the length.

It looks like it's a relatively quick thing that could be done for a lot of species in one gulp and so that, I think, is important. How much other information you can get from it, I don't know and I don't know what other information you need to have in order to get information like on actual ABCs so that you don't just have average catch, because I'm not a stock assessment person.

BILL ARNOLD: That goes back to establishing clear goals. Exactly what do we want or need out of this process to make good management decisions in a timely manner?

BARBARA KOJIS: Certainly status of the stock is an important aspect and knowing whether a stock is undergoing overfishing or not is crucial.

BILL ARNOLD: It's not just status, but it's also timely data. Using the parrotfish as an example, we spent a lot of money getting that redband assessment done and that leaves six more species of parrotfish that have to be done before we've completed that unit.

Since we manage by unit, we're really not done until we've done

all the species and if we only do one in each of the SEDARs, that's six more years. By the time we get to the end, is the original one still valid?

BARBARA KOJIS: Then the question is do you have the data and can this be put in quickly for all those other species of parrotfish, because just look for their life history information and you're looking for limited information to find out what the status is.

BILL ARNOLD: Part of the question is do you have the data, but more importantly is the recommendation that you need to get these data and this is where the funds need to be spent instead of on SEDARs.

I am not necessarily making that determination, but I'm just saying these are the kinds of decisions that I don't think we're making very clearly, how to allocate effort to achieve goals.

MICHAEL SISSENWINE: But SEDAR is an agreed process of representatives of three councils, the Center, and the Regional Office and maybe Atlantic States and --

JULIE NEER: Two commissions and HMS.

MICHAEL SISSENWINE: Those are the entities that agreed to the process and routinely the councils have complained that it doesn't deliver assessments fast enough. That's been the situation for ten years and so what are you asking us? We didn't create the process and we all know that it's not delivering assessments fast enough.

GRACIELA GARCIA-MOLINER: Then, on the other hand, it's been modified as we go along.

JULIE NEER: The Caribbean process has changed every single time for the past ten years within the framework of trying to deal with the specific issues here in these data-poor issues and the lack of help from some of the fishermen willing to participate.

The process is actually extremely flexible. The timeliness is a huge issue that all three councils are complaining about. That's not new and we agree, but the need to have to have three workshops for every single thing, you have an approved methodology, essentially, in this length-based method.

I don't see that there's anything necessarily stopping you from going -- What this data-poor workshop thing might be is if the

data is available to have the Science Center and SEDAR coordinate and do five of them next year and five of them the following year.

If that you think is a better use of your time as opposed to spending it here working on red hind or queen conch or lobster. That's why I was saying with the terms of your recommendations of time, it's still going to take someone to do it and if the SSC would rather do this sort of here's five species and spend a year whenever the Science Center has time to do it and do that and don't work on lobster. That's a recommendation that you as a group should make up to the council and the council can make that recommendation to the SEDAR Steering Committee when they set the schedule.

BILL ARNOLD: Mike asked what I'm asking and that's what I'm asking, that you make a recommendation, or at least consider making a recommendation, that alternatives at least be evaluated.

BARBARA KOJIS: The other aspect of it is you really shouldn't be doing -- It doesn't look like, from these analyses, that you should be doing any of these analyses until you have the information available and so I think they've already looked at the number of length data that's available for all these species and so they've got an idea there, but the life history aspects are something that are going to be looked at and if the life history information is not there, maybe then that should be the -- The funding and everything else should be focused on gathering the life history information.

JULIE NEER: I think Graciela is working on that now and sort of updating -- There was a data evaluation that was done for the Caribbean stocks in 2009 and Graciela is working on that now, in terms of updating that to see where we stand.

At that point, that group put together a list of the species we thought we could do this. Now, queen and silk were some of the ones -- That's how they ended up as the first species to go through this in the first place. I think the council is working on coming up with --

GRACIELA GARCIA-MOLINER: The main thing is trying to figure out if we have any life history information and if we can collect it before we do anything else. I also contacted Antonio Garcia at DNER and asked him if that information could be available for the meeting on Monday, because they have the information and so if they can bring it to the council, then we'll know where to go

next.

BARBARA KOJIS: Then the question is looking at this, because obviously, for example, if they've done parrotfish otoliths and stuff, did they verify? Do we have age and growth on these things or what do we have and then what is the basis for the age and growth? Is it spines that people obviously have concerns about or is it otoliths and have they been verified?

You might want to put together a table with respect to this for each of these species and see where we are and then pass it around to the universities and everything else and say get your masters students to do work on these species and let's get going.

JULIE NEER: I just wanted to verify what Todd had said in his summary and everyone asked if he wrote that down, but I said the SSC questions whether continuing to conduct SEDAR benchmark assessments is necessary until more data and/or approved alternative methodologies are available. I was trying to just scribble down what Todd had said and you guys can reword that entirely, but I was trying to say -- Whatever Todd said was perfect, but I didn't get it all written down in time.

TODD GEDAMKE: I was shooting from the hip and I'm not going to stand behind it right now. It might need some wordsmithing and the conversation just got hijacked into something very different and how would you like to proceed, Barbara? Should we continue with the process or go back to where we were?

BARBARA KOJIS: Let's go back. Meaghan has got a graph up here and let's look at Meaghan's graph, because then we can go back to Graciela writing things down.

MEAGHAN BRYAN: This is queen trigger in St. Thomas/St. John. There's still that spike in zeros and when you use the natural mortality estimators based on life history invariants, the von Bertalannfy growth parameters, those estimates for the natural mortality were quite high and so even if it didn't hit the bound, there were still a number of runs that led to negative, or zero, fishing mortality, but it does shift the curve and so there's like 70 percent of the runs -- 80 percent of the runs that --

TODD GEDAMKE: So there are still runs in here that have negative F?

MEAGHAN BRYAN: Yes, but I just removed those runs that hit the

bounds.

RICHARD APPELDOORN: This is queen trigger where?

MEAGHAN BRYAN: St. Thomas.

BARBARA KOJIS: This is queen trigger.

RICHARD APPELDOORN: Where we have dome-shaped selection.

MEAGHAN BRYAN: Should I move on to St. Croix?

BARBARA KOJIS: Yes.

MEAGAN BRYAN: This is St. Croix and 40 percent of the sensitivity runs have a ratio of F and natural mortality that is less than one.

BARBARA KOJIS: So a 60 percent chance of overfishing, right?

MICHAEL SISSENWINE: If we accept the M as our definition of overfishing, which is somewhat conservative, but it's not unreasonable.

MEAGHAN BRYAN: This is Puerto Rico and Puerto Rico had the increasing mean length and so almost all of the runs ended up being less than one. You still have that spike though.

BARBARA KOJIS: So definitely for Puerto Rico and St. Thomas your analysis indicates that there is no overfishing being undergone.

MICHAEL SISSENWINE: Overfishing is not occurring.

JULIE NEER: St. Thomas has the selectivity issues.

BARBARA KOJIS: But that was moving it --

MEAGHAN BRYAN: We brought up that conversation of spatial expansion in Puerto Rico, again, but we don't have any data to verify it.

BARBARA KOJIS: I can't imagine there would be much spatial expansion with respect to queen trigger after they've been fishing there for 500 years.

TODD GEDAMKE: But with GPS -- You may have 500 years, but ten years ago you had the ability for spatial expansion, or fifteen

years ago, that you never had before.

BARBARA KOJIS: With GPS? What do you mean, because you go offshore? But offshore where? Unless it's the west coast, but the shelf is --

GRACIELA GARCIA-MOLINER: The TIP should give you the region where that's coming from and you should be able to identify it.

TODD GEDAMKE: I just don't think we negate spatial expansion or movement to new areas.

BARBARA KOJIS: You've got to realize that those shelves, even in Puerto Rico, is fairly narrow. The nine nautical miles encompasses almost all of the shelf of Puerto Rico except the west coast and most of it is probably three nautical miles or two nautical miles, except for the shelf of Puerto Rico on the north and south coast and then it's only in the northeastern part that you start moving twenty miles off.

GRACIELA GARCIA-MOLINER: They went to fish over to St. Thomas for the larger size that they wanted brought over here.

RICHARD APPELDOORN: We know they're going over.

GRACIELA GARCIA-MOLINER: By identifying the area where the TIP came from, we can --

BARBARA KOJIS: They could be going to northeast and --

GRACIELA GARCIA-MOLINER: Or they found a regolith reef that no one had found before.

BARBARA KOJIS: That's far out and it's rough waters and the boats are not that big and they're not going to do it too often, but certainly there you've got 100 percent, don't you, for Puerto Rico that's -- It's 95 percent.

MICHAEL SISSENWINE: If we think these analyses are at all informative, we have to conclude that two of the stocks are not being overfished and the other one is debatable, because it's close to 50 percent F to M ratio and maybe it's a little higher, but one is a fairly conservative reference level.

MEAGHAN BRYAN: We talked about this at the assessment workshop, actually. We didn't have the sensitivity runs completed in total, but we were just comparing the natural mortality estimates with just individual and it did seem like there was

some probability of overfishing occurring, but we just didn't have a --

MICHAEL SISSENWINE: You have some of those results where the amount of overfishing would be quite severe, three or four or five or six. I guess I would say that I would report to Congress that this one overfishing is occurring, knowing that these determinations are always uncertain. If we're going to use this information to be your best --

RICHARD APPELDOORN: Yes, but in the trap study, it's one of the most common species.

MICHAEL SISSENWINE: Maybe it would be more common if it wasn't overfished.

RICHARD APPELDOORN: It's very possible.

BARBARA KOJIS: This is one where -- I don't know.

TODD GEDAMKE: Mike brought up to me, when we were tracking the dots from our vetting the methodology to us using it and now we've got two of the three that, given an acceptance of the methodology, we have two that suggest that they're not undergoing overfishing. Do we want to make a statement along those lines?

MICHAEL SISSENWINE: What's the current classification on those two? Is there any?

BARBARA KOJIS: They are not -- It just confirms that they're --

MICHAEL SISSENWINE: The report to Congress says they're not undergoing overfishing and so, okay, we're confirming that. We don't have any basis -- This evidence confirms the current status determinations for those two.

JULIE NEER: For Puerto Rico and St. John and St. Thomas.

TODD GEDAMKE: On the other hand, this shelf in St. Croix suggests that there may be a possibility that overfishing is occurring and further investigation is warranted.

MICHAEL SISSENWINE: What is the status determination on this? It's not undergoing overfishing? The council hasn't adopted -- I guess it's not up to the council to say what FMSY is and it's up to us.

This, to me, just looking at it, is a tossup, because if you want to say that FMSY equals M, then, just on a numerical basis, you would say overfishing is occurring. I guess that would be my bottom-line conclusion, if I'm going to believe these results. If somebody said no, it isn't, I wouldn't say, well, I'm certain it is. That's sort of an objective interpretation of those results.

TODD GEDAMKE: If I hadn't been involved in the trap study, I would probably look at this and solidly land where you just did or unsolidly land where you just did.

MICHAEL SISSENWINE: To me, the fact that there is a lot of something out there doesn't imply anything to me one way or another about whether overfishing is occurring. It might be more relevant to whether they're overfished or not.

BARBARA KOJIS: Graciela, can you type anything up from the statements?

GRACIELA GARCIA-MOLINER: The SSC --

MICHAEL SISSENWINE: Based on the results of SEDAR-whatever-it-was, the SSC concludes that --

BARBARA KOJIS: Queen trigger is not undergoing overfishing --

MICHAEL SISSENWINE: I would prefer to say that the current status determination of whatever the queen triggerfish -- That queen triggerfish is not undergoing overfishing.

BARBARA KOJIS: Concludes that SEDAR-30 confirms the --

MICHAEL SISSENWINE: Confirms the current status determination that queen triggerfish is not undergoing overfishing.

JULIE NEER: For all platforms?

MICHAEL SISSENWINE: Is it for all platforms?

JULIE NEER: I am asking. Was it for all platforms?

MICHAEL SISSENWINE: It was for two of the three, wasn't it?

BARBARA KOJIS: Yes.

JULIE NEER: Right and so you're only saying -- The status is for all three platforms combined, currently.

MICHAEL SISSENWINE: Okay. So it would be based on the results of SEDAR-30, the SSC concludes that the current status determination for queen triggerfish in Puerto Rico and St. Thomas --

BARBARA KOJIS: The current status determination for Puerto Rico and St. Thomas/St. John.

MICHAEL SISSENWINE: That overfishing is not occurring.

BARBARA KOJIS: For St. Thomas/St. John that queen triggerfish is not undergoing overfishing.

RICHARD APPELDOORN: Period.

JULIE NEER: I think his point was the current status on the books is not overfishing and you're agreeing with that. That's not what that statement implies.

BARBARA KOJIS: That queen triggerfish is not undergoing overfishing is confirmed or that is --

JULIE NEER: You should also make a statement about St. Croix.

RICHARD APPELDOORN: The current status determination for St. Thomas that queen triggerfish is not undergoing overfishing is what we are confirming.

MICHAEL SISSENWINE: You know probably the better way to say this, and I hate to see a bunch of retyping, but I think it's the SSC concludes that the results of SEDAR-30 are consistent with the current status determination for Puerto Rico and St. Thomas that queen triggerfish is not undergoing overfishing.

However, the results for queen triggerfish in St. Croix indicate that the stock is likely to be undergoing overfishing or overfishing is likely to be occurring. You could say simply that -- However, the results for queen triggerfish in St. Croix indicate that overfishing is likely to be occurring.

BARBARA KOJIS: We should say something about blue tang. Do you want to say something about the trap study, Todd?

RICHARD APPELDOORN: I want to change the first sentence. I think after "St. John", I would put ", which is". We made a determination and then we say what that determination is.

BARBARA KOJIS: What do we want to say about blue tang?

TODD GEDAMKE: Can I say something before we jump over? Because of the above limitations, the analysis results were uncertain in determining whether the stocks were undergoing overfishing and the SSC concludes the results are not undergoing overfishing.

MICHAEL SISSENWINE: That's true that it's uncertain, but one could then start the sentence that "Nevertheless, the SSC concludes that" -- In one case, we're saying it's uncertain, but nevertheless we're going to say something. We didn't spend two days here to come up with nothing.

BARBARA KOJIS: Do we want to put that together in one paragraph then? Okay. Where do we put blue tang in here?

RICHARD APPELDOORN: What do we want to say? This is where blue tang goes, but the question is --

BARBARA KOJIS: The other thing is because we have this sentence that because of the limitations, the analysis results were uncertain in determining whether stocks were undergoing overfishing and this was especially true for blue tang, but because of the determinate age structure.

MICHAEL SISSENWINE: We could say that the SSC concluded that the results were too uncertain for blue tang to be used for status determination. That's what we could conclude.

BARBARA KOJIS: The reason it was uncertain was because of the determinate age structure of the length-based length frequency data --

MICHAEL SISSENWINE: Isn't that already in our list of limitations?

BARBARA KOJIS: Yes.

RICHARD APPELDOORN: Can we put in something about, however, the SSC notes that blue tang does not seem to be targeted, at least in Puerto Rico, based on the lack of reported landings.

BARBARA KOJIS: Anything else for this section and conclusions? Okay.

MICHAEL SISSENWINE: I will see you all.

BARBARA KOJIS: I am going let everybody have a break. I was

just waiting for Mike to do his farewell, so we could use him as much as possible. Thanks very much, Mike. We really appreciate your input.

(Whereupon, a brief recess was taken.)

BARBARA KOJIS: We are back about maybe five past three to resume the meeting and Meaghan wants to just bring up something regarding the queen triggerfish on St. Croix and the length data.

MEAGHAN BRYAN: I just wanted to show this figure, because when you look at -- This is something that Richard touched upon earlier, that when you look at the sample size over time, we have fairly high samples early on and, in general, the sensitivity runs -- When it predicted a change, it was predicting a change to happen around -- Anywhere between 1985 and 1986 or 1984, 1984 to 1986 or so, and you see that there is a slight decline of maybe a centimeter there and then the sample size is variable and much lower later on in the time series than early in the time series.

I just didn't know if people wanted to consider this as part of that discussion of making a recommendation about whether overfishing is happening or not, because is that actually a response to the length or the change in samples? This is something that we discussed at the assessment workshop as well, which led to that uncertain conclusion, but --

JORGE GARCIA-SAIS: Meaghan, the fit of that model, does that come with an error to it, because I see so much residual error to both sides of the line.

MEAGHAN BRYAN: A reviewer did ask about diagnostics in terms of error and so far, we haven't reported any sort of residuals or anything. In SEDAR-26 we didn't and in here we didn't.

TODD GEDAMKE: We don't need to have this technical discussion right now, but I don't -- I have gone back and forth with reviewers about this and I think the error estimates that come out of the model fit are not really true error estimates on parameters.

What comes out, you can get information out of it, but I don't think it's directly -- I have fought numerous times about that determination and the sensitivities on that, instead of reporting the error determinant and there's more work that needs to be done there.

MEAGHAN BRYAN: Right and that is our weighted sensitivities, to kind of characterize uncertainty rather than getting a variance estimate.

BARBARA KOJIS: Given this then, we have made the recommendation that it looks like there might be overfishing occurring on St. Croix and does this figure increase the uncertainty in that?

TODD GEDAMKE: I was leading towards putting something a little softer in the language for St. Croix initially. I don't remember exactly what we have up there.

MEAGHAN BRYAN: I can change presenters and let me do that, but I just wanted to show you guys that.

GRACIELA GARCIA-MOLINER: Given all the problems with the data collection in St. Croix --

TODD GEDAMKE: What I do kind of like in the wording is they're consistent with the current status determination, which is that triggerfish is not undergoing overfishing. We're not really making our own statement there. We're just saying that it's consistent with the current status. What we're doing in the last sentence is basically making a statement that is different than the current status and --

BARBARA KOJIS: We have discussed this, saying that this needs further analysis or further information or something like that regarding the St. Croix situation, but we didn't put that in there.

TODD GEDAMKE: No and that's exactly what I would -- If I were to be writing this sentence, instead of "is likely might be occurring" is "queen triggerfish in St. Croix any chance that overfishing might be occurring and additional analyses or" --

RICHARD APPELDOORN: There were no additional analyses.

TODD GEDAMKE: I know and that's why I hesitated on finishing the sentence.

BARBARA KOJIS: What would be required?

TODD GEDAMKE: Additional analyses would be required to make the determination, which we don't really have.

RICHARD APPELDOORN: Which is queen trigger and so a large

number of measurements taken?

TODD GEDAMKE: That's a really good suggestion, actually, because then we could just say, however, the results for queen triggerfish indicate that overfishing might be occurring and the SSC recommends that length samples for this species in particular or additional length samples for this species be collected for further analyses.

That's going to be the quickest way to address -- Meaghan's question was emphasizing the 30 or 40 range towards the end and 300 fish in the next six months, which we could then look at that plot and say it's still falling exactly where it is or it's falling in a different place.

JULIE NEER: Todd, you wanted to change "likely" to "might be"?

BARBARA KOJIS: Yes. Could we be more specific about the length samples, because you really want an adequate number.

RICHARD APPELDOORN: Beaucoup?

TODD GEDAMKE: A significant number of length samples for this species. We don't want to put -- What is the number? That's the question we get all the time and you don't know what the number is. You won't know what the number is until you collect the samples.

RICHARD APPELDOORN: Going back to your bubble plot or your bins, how many were we getting relative to the early years, when we had those big circles?

TODD GEDAMKE: That may be a way of phrasing this, too. Is it comparable to the early part of the time series where sample sizes numbered in the hundreds or whatever?

BARBARA KOJIS: The sample size was over 500.

RICHARD APPELDOORN: In the bins it was. I don't know if it was for the individual years on the bubble plot.

BARBARA KOJIS: I think there was actually 900 in one year.

GRACIELA GARCIA-MOLINER: The origin, before 1983, does that coincide with the council's first attempt at getting --

MEAGHAN BRYAN: I think 1983 is the first year -- Well, that was the first year that I extracted from the database. I don't know

if there were samples -- I would think if there were samples before then that I would have had them.

You wanted to look at this bubble plot and so we have one fairly banner year, 927 samples, at least that are going into the mean length calculation.

RICHARD APPELDOORN: The one above it is --

MEAGHAN BRYAN: It's like three-hundred-and-something. I can go back to the --

BARBARA KOJIS: So more than 300.

RICHARD APPELDOORN: Or the ones at the bottom of the curve, which is also fairly big. I can't read that number.

MEAGHAN BRYAN: Like 300.

RICHARD APPELDOORN: Well, that's 301 that I've seen in the other one and four-hundred-something? The one that's a little smaller is the 301.

MEAGHAN BRYAN: This is -- I think it's off the graph.

GRACIELA GARCIA-MOLINER: So more than 300.

RICHARD APPELDOORN: Yes and maybe something like 500 would be better.

BARBARA KOJIS: At least 300.

MEAGHAN BRYAN: It should be random sampling.

TODD GEDAMKE: It's not.

MEAGHAN BRYAN: That's why I said it should be.

RICHARD APPELDOORN: I would like to see something that says 500 would be better, because if you say at least 300, they're going to stop it at 301.

GRACIELA GARCIA-MOLINER: At least 500?

BARBARA KOJIS: Approximately 500 maybe.

BILL ARNOLD: It's just a recommendation and I don't know why you have to say "approximately", but it's up to you guys.

GRACIELA GARCIA-MOLINER: Do you want them over a period of time or just in one month?

TODD GEDAMKE: To be comparable to the early part of the time series, which were collected over the course of a year, it probably should be over the course of a year.

JULIE NEER: And you need it for more than just one year.

TODD GEDAMKE: If you get 500 in one year, it's going to be very -- We're not looking at tracking changes over time now. We're just trying to pin the noise in the last twenty years worth of data and the model will take into account -- If you get 500 samples, it will take that into account and fit the lower sample sizes prior to that accordingly.

GRACIELA GARCIA-MOLINER: The only reason why I said it is because a couple of months, which someone dedicated to doing that, you can get the 500 samples.

TODD GEDAMKE: If I were in the manager position with the purse strings on this and saw the results and recommendations from the SSC that said, hey, this might actually be undergoing overfishing, that's what I would do.

I would send someone down to the docks for the next two weeks to measure every queen triggerfish that comes up and take a look at it and then make another decision as to what's your strategy for the whole year.

GRACIELA GARCIA-MOLINER: I just want to make sure that it's okay to do it over a period of two to four weeks rather than waiting the whole year.

TODD GEDAMKE: Ideally, you would do it over the course of a year, but lengths are so simple to get that not taking advantage of powering up a very quick evaluation -- You do 500 samples in the next month and those samples come out to be significantly lower than what's currently on the books, then you've sent someone out there consistently for the rest of that year. If they're much, much higher, you can lower your sample sizes and kind of monitor it.

BARBARA KOJIS: Do we want to say anything more specific or just say 500? Do we want to say 500 length samples for this species collected for further analysis over the course of a year and then somebody could go out quickly and do a couple of weeks of

sampling and say we don't seem to have -- We seem to have an issue and we need to do this 500 or how would you want to word it? I think clarification is important.

TODD GEDAMKE: I don't have anything more specific, but I don't like "length samples collected for further analysis". The samples themselves are not going to be analyzed. What we're getting at is the length measurements will inform additional analyses. Instead of "for further", it's just "to inform additional analyses". Do you want to do like a sampling strategy in this sentence?

BARBARA KOJIS: Yes, I would think so.

TODD GEDAMKE: It's a game of tradeoffs. When you go out and pound them out in the next month, what you're going to get is a mean length that is high sample sizes, but has the caveats of not being collected over the course of a year, but you've got something in a month.

Then you've got the other one is we don't have the personnel to do it and so let's get them out there and get fifty a month and we're going to get some information back on this in six months to a year out. It's a management call.

BARBARA KOJIS: We can leave it at that.

JORGE GARCIA-SAIS: Do you want to use the word "inform" or maybe we could "allow", allow for further analyses? It sounds strange like that.

BARBARA KOJIS: Yes, because really what you're trying to do is to determine if overfishing is occurring. It might be occurring and let's gather some more data so we can determine if it actually is occurring.

MEAGHAN BRYAN: It's to provide the information in the analysis.

BILL ARNOLD: You want a snapshot, right? That's what you're after?

TODD GEDAMKE: Well, it all depends on what you're talking about. A snapshot is one year or a snapshot is --

BILL ARNOLD: That's what I was going to ask you, is what kind of time interval would you define as a snapshot?

TODD GEDAMKE: The analysis -- What we're working on now is

annual numbers and so what we're looking at for continuing that same approach, without having to recode everything, is to do an annual and even if it's collected over a month, it's going to be taken and plugged into the model as an annual estimate. That's the way that's going to go.

It's just a question of whether you actually collect that over the whole course of the year and we really don't do a whole lot of evaluations, other than maybe visual diagnostics, on monthly samples, to see if there's patterns in monthly fishing activity.

BILL ARNOLD: This is open ended and so you might want to just say within the next year.

TODD GEDAMKE: That is very true.

BILL ARNOLD: I would say to be collected within the next year.

TODD GEDAMKE: This wording is -- 500 length samples for the species be collected and make it "recommends that approximately 500 length measurements be taken within the next year". We will just get rid of "for the species be collected".

Envision this actually working as it's supposed to and they get 500 length measurements and it gets kicked up and Meaghan can run it and fly back down and give us a presentation on the whole thing. It's simple.

BARBARA KOJIS: Okay. I think we've pretty much covered things. We can't say anything about ABC. We just can say things about overfishing and we've got recommendations up there.

GRACIELA GARCIA-MOLINER: If anyone has any specific recommendations to -- I have a number of them, but not specific to this SEDAR-30 that you've talked about.

BARBARA KOJIS: Okay. Does anybody have recommendations? Graciela, what recommendations did you write down that we had?

GRACIELA GARCIA-MOLINER: For the two-days worth of discussion, the 2010 expansion factors, the commercial landings and apply the correct factors to the years, because they were carrying 2009 over to 2010.

Age of the queen snapper, blue tang, and queen trigger if they have the information or the otoliths already collected at the lab, if possible. Find out if the TIP data for Puerto Rico for 2009 onward for the species that we talked about or any other

are available.

The inventory of otoliths and species and length sample numbers and you already covered the one about the landings and the fisher's history, et cetera. I wrote down something about look at the bycatch data for the USVI, because you said that they were reporting as bycatch and you've seen large queen triggers that were being written down.

BARBARA KOJIS: I don't know that they area.

GRACIELA GARCIA-MOLINER: So look at that. Those are the things that I have written down for you.

BARBARA KOJIS: Could you just start typing them and then we can go over them?

GRACIELA GARCIA-MOLINER: These are not specific to the SEDAR. It just had it here if you had anything specific for this process.

RICHARD APPELDOORN: I think we've already mentioned those.

JULIE NEER: Most of those were in the report.

GRACIELA GARCIA-MOLINER: Yes, but I didn't have a copy of that and so --

BARBARA KOJIS: Is there something here about -- Because the blue tang analysis has to be informed by age and growth.

GRACIELA GARCIA-MOLINER: I was thinking about these 500 length measurements and the age and growth very specifically, because if you don't have the age, that would make a big, big difference. Collecting 500 samples and they don't have the otoliths for it, for the fish already collected, to go ahead and collect them and the spines or whatever.

BARBARA KOJIS: Yes and blue tang, you have to have -- The analysis is useless unless it's an age growth, or almost useless unless it's an age growth analysis, because of the determinant growth, right?

JULIE NEER: The point is that there's multiple ages for any size and so a length-based isn't probably going to work at all, most likely for blue tang. You need age so you can -- But then you also need indices -- You need to do another method, basically. Length-based is not going to work.

GRACIELA GARCIA-MOLINER: Is there any specific recommendation for another analysis for the blue tang?

RICHARD APPELDOORN: Size and otolith analysis or some age analysis. We need an age analysis. If you're going to do that, you need it for each platform.

BARBARA KOJIS: The development of an appropriate methodology or age analysis or something like that.

MEAGHAN BRYAN: There is many age models, but you need the data to be able to do that.

RICHARD APPELDOORN: We need catch at age.

BARBARA KOJIS: Do we want to mention in there, for blue tang, that length analysis is not appropriate and therefore, the SSC recommends using an age analysis methodology or obtaining catch at age data to inform an age analysis methodology or an age-structured model.

JULIE NEER: To inform an age-structured model.

BARBARA KOJIS: It should be like the SSC recommends obtaining or collecting catch at age data for an age-structured model.

JORGE GARCIA-SAIS: What would be the catch at age data?

MEAGHAN BRYAN: How many fish of a particular age that you caught in a given timeframe, a year, say. You would have to get the otoliths to age the fish.

RICHARD APPELDOORN: If you randomly sample your fish for the otolith analysis, you should get the age of the catch.

JORGE GARCIA-SAIS: You do the sampling from -- You construct the empirical relationship of age based on the otoliths first? Okay.

JULIE NEER: To develop an age and growth curve and then you also have information on old all the fish were that you sampled in the catch and you use that to age all of the catch. It's going to be very sloppy anyway, because of the fact that you have multiple ages for different sizes.

BARBARA KOJIS: Blue tang live to about twenty years and if most of the fish you catch are like five years old or less, then you

know you've got --

JORGE GARCIA-SAIS: Blue tang live that long?

BARBARA KOJIS: Yes, about sixteen years. Because they grow fast, at about four years they get to their maximum size and then they live a long time. In some places, surgeonfish live thirty to forty years.

JORGE GARCIA-SAIS: That is surprising. I didn't know that. When here we refer to the surgeonfish or to the blue tang, did you also consider that like the doctorfish and the ocean surgeon is in the same category or it's just one species that you are referring to?

BARBARA KOJIS: Blue tang is just one species.

MEAGHAN BRYAN: In the TIP database, it's one.

GRACIELA GARCIA-MOLINER: They are supposed to be.

MEAGHAN BRYAN: They are supposed to identify it correctly.

JORGE GARCIA-SAIS: It's just like I don't see much great difference between the three of them in terms of their ecological value and shape, size, taste. I don't know. It could be.

BARBARA KOJIS: People will -- Fishermen seem to go after doctorfish maybe the most. I don't know whether that's because they're most abundant and ocean surgeon is not oftentimes fished and they may taste different, but I don't know.

JORGE GARCIA-SAIS: Why are we dealing with blue tang?

BARBARA KOJIS: Blue tang is also fished.

BILL ARNOLD: Because they are ranked higher in the probability of successful outcome list.

JORGE GARCIA-SAIS: If you say so.

BILL ARNOLD: It's not me.

GRACIELA GARCIA-MOLINER: But there is also a concern because it's one of the top species in St. Croix. It might not be anywhere else, but it is --

BARBARA KOJIS: It is a top species.

BILL ARNOLD: And the ecological implications relative to a problem. They wanted to do a surgeonfish.

GRACIELA GARCIA-MOLINER: Can I put the 500 length measurements down here also for the queen trigger?

BARBARA KOJIS: Yes, because you really -- People will look at just the recommendations, I'm sure, in some cases.

GRACIELA GARCIA-MOLINER: We can repeat here the need for the age information, urgent need.

BARBARA KOJIS: Yes. Do we want to say something like clearly -- Something about clearly without age and life history -- Local age and life history parameters, availability of the local --

JULIE NEER: Be really specific.

BARBARA KOJIS: SEDARs are unsuccessful or something like that.

GRACIELA GARCIA-MOLINER: So without?

BARBARA KOJIS: Yes, without --

JULIE NEER: Will SEDAR conduct them if you don't have the data and they're still not going to provide the --

BARBARA KOJIS: Just say assessments will continue to be unsuccessful and somebody can word that better, I'm sure. How about will continue to be not very informative? That might be better.

JULIE NEER: The assessment was okay. It's just whether you guys can do anything with it.

BARBARA KOJIS: Yes, how you define unsuccessful.

JULIE NEER: It was not very informative for you guys' discussion to make decisions.

GRACIELA GARCIA-MOLINER: For scientific advice and management.

BARBARA KOJIS: Yes, very good. Should you just put that in with that bullet point?

GRACIELA GARCIA-MOLINER: Should I put it in bold?

BARBARA KOJIS: If you need that, Graciela, then yes.

GRACIELA GARCIA-MOLINER: Because it's the same thing and we're really tired of repeating the same thing over and over and over again and now we've tried everything, from the full length assessments to length-based assessments. It's the same thing time after time.

BARBARA KOJIS: Then are we going to say something about the reliable catch data?

GRACIELA GARCIA-MOLINER: We've got the validation of the catch data using the other -- It's just that I don't have a copy of --

BARBARA KOJIS: I've got it. Graciela, did you have any other points?

GRACIELA GARCIA-MOLINER: No. I have otoliths everywhere. That has been my song for the past I don't know how many years. Maybe I will go do the training and learn another skill. Why not?

BARBARA KOJIS: Does anybody else have any other recommendations?

BILL ARNOLD: Buy low and sell high.

TODD GEDAMKE: The only other thing, the last thing, you could just put expansion factors too, validation of catch data and expansion factors.

GRACIELA GARCIA-MOLINER: Two bullets or one bullet?

BARBARA KOJIS: Make it one bullet, validation of catch data --

TODD GEDAMKE: Including expansion factors.

BARBARA KOJIS: Including Puerto Rican expansion factors.

JULIE NEER: That's the only ones we have.

TODD GEDAMKE: I wouldn't put Puerto Rico in there, just because we know it's necessary in Puerto Rico, because we have it and we've got problems with it. Just the fact that we have punted on the VI, it doesn't mean that they're not necessary.

BILL ARNOLD: So you would not put Puerto Rico in there?

TODD GEDAMKE: I would not.

BARBARA KOJIS: That's fine. Anything else? Graciela?

GRACIELA GARCIA-MOLINER: No.

BARBARA KOJIS: Richard, do you have anything else?

RICHARD APPELDOORN: No.

BILL ARNOLD: I don't know if this fits in here, but Todd and I both talked a little bit, but it's -- When it comes to the otoliths, it's not just a matter of analyzing them, but it's a matter of properly collecting them and validating them.

BARBARA KOJIS: Yes.

BILL ARNOLD: I can just talk with Graciela about this separately, but that's a discussion I want to have with her, about these guys are going to be going out sampling and what's their scheme and what's their plan and what kind of data are we going to get out of this that's actually usable?

GRACIELA GARCIA-MOLINER: That's why my first attempt at doing this was to actually use what we had from the report on the queen snappers and the silk snapper, because we already have all that length and weight information, et cetera. I was going to see how that moved along before doing anything else.

BILL ARNOLD: But they're going out sampling starting now, starting two months from now. They're out there sampling.

BARBARA KOJIS: Who?

BILL ARNOLD: Amy and her fishermen, the ones that we got the EFP for.

GRACIELA GARCIA-MOLINER: Right and they have been sampling.

BILL ARNOLD: Yes, but what, where, how, and why?

GRACIELA GARCIA-MOLINER: I don't think that they have started sampling yet, but I will find out.

BILL ARNOLD: Regardless --

BARBARA KOJIS: Who is Amy?

GRACIELA GARCIA-MOLINER: Remember the woman that gave the presentation on the reproductive biology of so many species and she talked about the information that they collect and --

BARBARA KOJIS: I don't remember that. Was it a council meeting that I missed?

GRACIELA GARCIA-MOLINER: No, it was an SSC meeting, but it was a number of years ago, but she's the one that does the histology and keeps a lab.

BILL ARNOLD: This is who we trained to do otolith analyses. They are building an otolith lab at the Fisheries Lab in western Puerto Rico. They requested an EFP from us and we gave it to them and my understanding is that's so that they can catch fish to do otolith analyses. What we don't know is what their sampling framework is for that and so I'm a little concerned that --

GRACIELA GARCIA-MOLINER: The fishing permit was for the Nassau grouper, wasn't it?

BILL ARNOLD: No, they were catching all kinds of fish and I'm a little concerned that they're catching all kinds of fish.

JULIE NEER: They're doing their own sampling and they're not just sampling the catch?

BILL ARNOLD: That's what I'm talking about, is this is all a mystery. Exactly how they're going about this is a mystery. Are they saying we're going to go out and we're going to get --

BARBARA KOJIS: What does it mean for an EFP, first of all?

BILL ARNOLD: It's an exempted fishing permit. It just allows them to fish wherever for whatever, but whether they're going to get thirty samples of a particular species once a month to create the annual validation scheme for these things or incremental -- What they're going to do is a mystery to me.

I would hate for them to go out there and do all this and them not be able to validate and so we don't know if they're annual increments or what. There needs to be some sort of rigorous experimental design.

BARBARA KOJIS: We should come up with a recommendation that an experimental design be developed?

BILL ARNOLD: I think that that might carry more weight than just Graciela telling them you need to come up with an experimental design. Nothing against Graciela, but --

BARBARA KOJIS: The Southeast Fisheries Science Center could come up with an experimental design for collecting and analyzing otoliths, right?

BILL ARNOLD: Whatever you guys think, but we've got this otolith component in here and it might need to be --

TODD GEDAMKE: So let's just put it right there. Without a basic life history, the assessment could not be informative for scientific -- The SSC understands a new age growth laboratory or new collection of otoliths is underway and this should be a -- A sampling design strategy should be implemented in the development of this process or something like that.

BILL ARNOLD: It should follow a carefully designed sampling strategy or sampling design or strategy, whatever you want to put.

BARBARA KOJIS: Carefully designed sampling strategy.

JULIE NEER: Strategy or protocol.

BARBARA KOJIS: The collection of otoliths is underway and a carefully designed protocol should be developed or should be followed. Maybe should be developed and followed or just followed?

JULIE NEER: Implemented. Just do it. If you haven't developed it, develop it. I think Todd's started that sentence with "The SSC understands" -- Then you have told them that you recommend that a carefully designed sampling protocol be implemented.

BARBARA KOJIS: And get rid of the "should" in the last part.

GRACIELA GARCIA-MOLINER: I did find one more note here, but I think it might be in Todd's thing from this morning, but to associate the TIP and the catch data.

TODD GEDAMKE: No, that's old. We've already captured that from yesterday's report.

JULIE NEER: Graciela, because the council is meeting next week, are they not meeting in August?

GRACIELA GARCIA-MOLINER: They are meeting in August, because they have to do the selection of officers.

RICHARD APPELDOORN: We're supposed to do a presentation, too.

BARBARA KOJIS: Anything else then? Any further recommendations? If not, is there anything else that we need to do? I think if you go down on that, Graciela, there's something that you have on there.

GRACIELA GARCIA-MOLINER: You've asked that question.

RICHARD APPELDOORN: We've covered that.

JULIE NEER: You did not explicitly say that you are recommending or not recommending changing the existing ABCs for the SEDAR-30 species.

You should probably make a clear recommendation whether you think you should with what you have or if you should change it or else they're going to come back and ask you, so here's the assessment and are you changing your ABC, like they did for SEDAR-26. This is a very similar report to what you gave for SEDAR-26 and then the council said, so what do we do with this? You may want to say you're sticking or you're changing or whatever you wish to do. I would state that.

TODD GEDAMKE: This is the end of the paragraph. At this time, the SSC does not recommend changing current --

RICHARD APPELDOORN: Let's say the SSC says there's no basis for changing.

GRACIELA GARCIA-MOLINER: The ACLs are based on triggerfish and surgeonfish.

JULIE NEER: So then you're not recommending any modifications, if that's what you're recommending.

BILL ARNOLD: Way up in the previous recommendations, it says no scientific basis for modifying ABC.

JULIE NEER: Perfect. As long as it's in there somewhere.

BILL ARNOLD: There's another group of recommendations further up.

JULIE NEER: That is from yesterday, Bill. That was for queen and silk. You need to say something for queen trigger and blue tang.

BILL ARNOLD: That's not what I have. I have it for today. It's in my notes, but these were recommendations that were being made.

RICHARD APPELDOORN: You're not talking about something actually written by Graciela?

GRACIELA GARCIA-MOLINER: It's from his notes.

BARBARA KOJIS: We need to scroll down.

JULIE NEER: Somewhere, before recommendations, it should probably state, after you've said what your thoughts were about the status, whether you want to change your ABCs for either of these species.

RICHARD APPELDOORN: I would say given the above, the SSC finds no basis for changing the ABCs for queen trigger and blue tang.

BARBARA KOJIS: With queen trigger and blue tang, we're not running into overages, are we, at all?

GRACIELA GARCIA-MOLINER: It's going to be the Snapper Unit 2. We didn't even deal with the groupers.

BARBARA KOJIS: Do we have any information on the groupers? No. The groupers are only two weeks. It's only a two-week closure.

GRACIELA GARCIA-MOLINER: But it's right at Christmastime.

BARBARA KOJIS: Were you expecting anything to happen, especially in St. Thomas, with the groupers, so many regulations and so many monitoring and so many -- It took me by surprise.

JORGE GARCIA-SAIS: Are you talking about red hind?

GRACIELA GARCIA-MOLINER: Groupers in general. They don't have species-specific information and so it's just groupers. It includes all of the larger ones like the yellowfin and the red grouper that they do harvest over there.

BARBARA KOJIS: The other aspect of it is because red hind was on the list now and sometimes when -- Probably coney is on the list as butterfish and stuff like that and sometimes butterfish

went both in the snapper unit before, because people didn't know that butterfish were not -- I think they couldn't really tell the groupers from snappers and so some of the smaller guys in particular were not very good at identifying things into those broad categories that were meaningless for them.

That was clear. I mean I remember David Olsen saying the fishermen can identify the fish and sure they can, but then they identify them as snapper and grouper and so on and they know they're butterfish or they know they're ole wife or they know all of these things, but these broader categories may be meaningless to them.

I think he concluded later on, because he compared what fishermen -- They actually did the catches with the fishermen and looked at the catches of the fishermen for one of the projects and then compared what they had recorded with what the fishermen had recorded.

There were some substantial differences, especially in the grouper and snapper, but in other species as well. The fishermen were not accurately reporting what they were catching in terms of pounds, but nobody has ever sat down to really help the fishermen -- When you've got 300 or 400 pounds of fish that you're coming back with with traps, how do you separate out all of these things and come up with some sort of reasonable, quick way of coming up with how many pounds of fish you've caught in this area. They'll come in and people buy them. Sometimes they will buy them right on the beach, buy the fish.

GRACIELA GARCIA-MOLINER: Very soon, we will have a catalog of parrotfish for the fishermen.

BARBARA KOJIS: Very good.

GRACIELA GARCIA-MOLINER: That's coming online very soon.

BARBARA KOJIS: Parrotfish are difficult, because they've got the initial phase and the terminal phase.

GRACIELA GARCIA-MOLINER: Then we can do the groupers and the snappers and if these are successful, then we will move on to all the others.

BARBARA KOJIS: It's not only identifying, but it's also how do you actually go out and can you have coolers and you know how many pounds a cooler is and you try to keep all your groupers in this one and your snappers in this one and --

GRACIELA GARCIA-MOLINER: We will see if that's successful.

BILL ARNOLD: Just going back to this Snapper Unit 2 thing, so this morning, we first did a summary of yesterday's stuff before we started in on SEDAR-30. During that discussion, we had a series of recommendations that I wrote down and I don't know how formalized they were, but one of those was what I had said before, no scientific basis for modifying ABC. That's going to be very important for this council meeting and I'm just asking you guys if you want to make that --

TODD GEDAMKE: It's in yesterday's report.

BILL ARNOLD: Is it? So it's clearly stated?

JULIE NEER: That's what you're reading. That's probably the recommendation from this morning.

BILL ARNOLD: I understand we made the recommendation. I just want to make sure it's as clearly stated as our blue tang and queen triggerfish recommendation.

BARBARA KOJIS: It says here, at the very end of this report that Todd sent to me for the queen snapper, it says the SSC concluded that at this time there was no scientific basis for modifying the ABC.

BILL ARNOLD: Okay. That's what I have here and I just wanted to make sure you guys feel it's clear enough.

BARBARA KOJIS: The SSC is concerned about the reliability of expanded catch and uncertainty in life history estimates and then the SSC concluded -- It's clear as a bell and it's the last thing there and that's the summary statement, part of the summary statement. I will read the whole summary statement too, Bill, so that you're confident.

Both the SEDAR-26 results and the information presented from the new methodology suggests that overfishing is not occurring, although the assessment is too uncertain to be confident and there isn't much room for further development of the fishery.

It was pointed out that the analysis shows some probability that overfishing is occurring. The SSC is concerned about the reliability of expanded catch data and uncertainty in life history estimates. The SSC concluded that at this time there was no scientific basis for modifying the ABC.

GRACIELA GARCIA-MOLINER: I do have a couple of answers for you. They do have ninety-nine otoliths for the silk snapper, 380 for the cardinal snapper, 328 for the queen snapper, and they are collecting vermilion snapper as we speak.

I haven't seen the protocol that they use for the collection of the data, but this is basically the same report that they do every year for every species and we were trying to also get them to do fecundity, but I don't think they do and Daniel Matos said that they did not get good results because of the lack of people to collect the information on the expansion factors and so he used 2009 for both 2010 and 2011.

BILL ARNOLD: That's comforting.

GRACIELA GARCIA-MOLINER: That's what you get.

JORGE GARCIA-SAIS: That can cause errors of -- That landings data, with that expansion factor, is -- It's whatever.

GRACIELA GARCIA-MOLINER: He didn't have the people to go around to do anything and so -- I don't know if you can read that, but that's observed pounds landed, the reported by fishers, and the correction factor. It's quite significant.

JORGE GARCIA-SAIS: Look at this, Bill. To use the word that you used, the bogus data, and on top of the bogus data, you put the expansion factor, which is -- What kind of information are we dealing with here? An expansion factor over a bogus data. That's really scientific.

BILL ARNOLD: There it is.

JULIE NEER: If we're on to Other Business, I have one thing to bring up, when you're done.

BARBARA KOJIS: If there's nothing else with respect to this, then go ahead.

OTHER BUSINESS

JULIE NEER: I was just going to say that we are gearing up to start working on SEDAR-35, red hind. The data workshop is October 9 through 11 and the assessment is going to be conducted via webinars between January and April of 2014 and the review workshop is going to be May 13 through 15.

If any of the SSC members have interest in participating at any of those stages of the red hind assessment, you should let Graciela know.

GRACIELA GARCIA-MOLINER: For the review, they cannot participate at that time.

JULIE NEER: If you are a reviewer, you cannot have been in data or assessment, but you can serve as the review panel chair if you've been on the other panels, because the chair is not a reviewer. We're working on red hind and if red hind is a species near and dear to your heart, let Graciela know that you would like to be involved.

GRACIELA GARCIA-MOLINER: I will be there.

JULIE NEER: I will be there and Meaghan will be there. It will be fund.

RICHARD APPELDOORN: Do you know the timeframe?

JULIE NEER: Data is October 9 through 11 in St. Thomas. The assessment webinars are -- The dates aren't set, but it's January through April. The review workshop is May 13 through 15, 2014 in Miami. So it's St. Thomas for data and Miami for review and assessment webinars.

GRACIELA GARCIA-MOLINER: All positions are open.

JULIE NEER: If anyone is interested, let Graciela know. I have sent the memo to the council requesting appointments. That was all I had, just to let you all know it's coming up if you're interested.

BARBARA KOJIS: Is there any other topic that anybody needs to bring up? If not, I am going to adjourn the meeting.

RICHARD APPELDOORN: I don't want to bring it up, but we were sent a bunch of stuff on queen conch and is that just notification to us, the change of the daily catch limit in St. Croix?

GRACIELA GARCIA-MOLINER: That's just information, yes. That's been dealt with.

RICHARD APPELDOORN: And the grouper letter from the St. Thomas Fishermen's Association? That's called the grouper letter in --

GRACIELA GARCIA-MOLINER: With what?

RICHARD APPELDOORN: Notification of definition of overfishing, optimum yield requirement, best available data.

GRACIELA GARCIA-MOLINER: I didn't see that.

RICHARD APPELDOORN: It's largely about red hind.

GRACIELA GARCIA-MOLINER: It was probably in response to the grouper closing in December.

RICHARD APPELDOORN: Yes, I'm sure it is.

GRACIELA GARCIA-MOLINER: I haven't seen that one. Sorry, but if you want to -- We didn't -- What's the date on the email or on the letter?

RICHARD APPELDOORN: The letter is January 23.

GRACIELA GARCIA-MOLINER: January 23?

RICHARD APPELDOORN: Yes and when it was sent to us, it would have been --

GRACIELA GARCIA-MOLINER: That was in response to the December 2012 presentation by the Southeast Fisheries Science Center at the council.

RICHARD APPELDOORN: So was this sent to us for our notification and enlightenment or are we supposed to be doing something with it?

GRACIELA GARCIA-MOLINER: I don't have it in my list of items for you, but if you see anything --

BARBARA KOJIS: I don't believe it's on the agenda and I don't know that we can discuss it here, because it hasn't been put on the agenda.

RICHARD APPELDOORN: Stuff is being sent to us and that was one of the things that was sent to us and if it's not on the --

BARBARA KOJIS: I think this was only for SSC information and there was not -- The council hasn't requested that we react on this.

GRACIELA GARCIA-MOLINER: But it's in our list because of the

red hind and stuff like that and we're trying to figure out what to do about the ACLs.

BARBARA KOJIS: If there's nothing else, I am going to adjourn the meeting and so thank you very much. I thank everybody for coming and attending and all the input everybody -- Meaghan in particular. Wonderful job and it's been great having Julie here as well, because she was able to keep us on the straight and narrow and get the questions answered that she needs and that the council needs and so thank you. Graciela, thank you so much for typing up this information so quickly and Todd, of course, for doing the queen snapper report and everybody else for all their contributions. Thanks a lot. The meeting is adjourned.

(Whereupon, the meeting adjourned on June 20, 2013.)

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