SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SOCIO-ECONOMIC PANEL

Town and Country Inn
Charleston, SC

May 3, 2016

SUMMARY MINUTES

Socio-Economic Panel

Dr. Scott Crosson, Chair
Dr. Christopher Dumas
Dr. Jason Murray
Dr. Jim Waters
Dr. Tracy Yandle
Dr. Ben Blount
John Hadley
Kurt Schnier
Dr. John Whitehead

Council Members:

Zack Bowen
Ben Hartig

Council Staff:

John Carmichael
Myra Brouwer
Mike Collins
Dr. Kari MacLauchlin
Amber Von Harten
Dr. Brian Cheuvront
Chip Collier
Dr. Mike Errigo
Julie O'Dell

Observers/Participants:

Dr. David Records
Dr. Alexei Sharov
Dr. Marcel Reichert
Dr. Fred Serchuk

Other Attendees Attached

The Socio-Economic Panel of the South Atlantic Fishery Management Council convened at the Town and Country Inn, Charleston, South Carolina, May 3, 2016, and was called to order at 8:30 o'clock a.m. by Chairman Scott Crosson.

DR. CROSSON: This is Scott Crosson, and I am the Chair of the South Atlantic Council's Socio-Economic Panel, and we are going to get going here on our 2016 meeting. I am going to go around the room and have folks introduce themselves, for the record, and be on the mic. We also have a few other members of the SEP that are calling in through the internet, and so we'll start up here with Jim.

DR. WATERS: Jim Waters, economist, retired.

DR. BLOUNT: Ben Blount, anthropologist, retired.

DR. MACLAUCHLIN: Kari MacLauchlin, council staff.

DR. CROSSON: Scott Crosson, NOAA Southeast Fisheries Science Center.

DR. YANDLE: Tracy Yandle, Emory University.

DR. MURRAY: Jason Murray, NOAA's Assessment and Restoration Division.

MR. HADLEY: John Hadley, North Carolina Division of Marine Fisheries.

DR. CROSSON: Then calling in is Chris Dumas.

DR. DUMAS: Chris Dumas, and I'm an economist at UNC Wilmington.

DR. CROSSON: Also, we have Kurt Schnier.

DR. SCHNIER: Kurt Schnier from UC Merced.

DR. CROSSON: Good morning out there.

DR. SCHNIER: Yes, it is morning.

DR. CROSSON: John Whitehead.

DR. WHITEHEAD: John Whitehead, economist at Appalachian State University.

DR. CROSSON: We're going to get going now. I guess the first item on the agenda is to approve the agenda, and does anyone have any edits or changes to the agenda, the suggested agenda? Seeing none, we will move on. Does anybody have any edits for the April 2015 meeting? It looks like we're good on that as well, and so we've approved the agenda and old minutes.

I'm going to be chairing this, and Kari is going to help me with that. She is also going to be alerting me when Chris or John or Kurt would like to say something, so that we can pause it and

hear it and not have everybody speaking over the top of each other. The very first item we have on the agenda is discussing OY, discussing optimum yield, and Kari, did you want to help frame this out for us?

DR. MACLAUCHLIN: This is the overview document.

DR. CROSSON: As we get going on this, I'm going to encourage folks to try and take as many notes as they're willing to do, because, when we finish up today, we're going to have to assemble the report from the SEP, and so it will be very useful if people have lots of different notes.

DR. MACLAUCHLIN: I will be taking notes also to give to you guys while you're developing your recommendations. I sent a couple of documents out, the excerpt on optimum yield from the NMFS guidance, and then I sent the 2016 to 2020 vision blueprint for the snapper grouper fishery, because that outlines some of the overall management goals and objectives that the council has been working on.

I sent some background information on OY in the Snapper Grouper and Dolphin Wahoo FMPs, and then an attachment that was provided by the North Pacific Fishery Management Council about the Bering Sea and Aleutian Islands groundfish OY. Then, also, we listed a couple of additional references that the group was looking at.

The MSA defines optimum yield as the amount of fish that will provide the greatest overall benefits to the nation, particularly with respect to food production and recreational opportunities and taking into account protection of marine ecosystems. It's prescribed on the basis of MSY, as reduced by any relevant economic, social, or ecological factor. In the case of an overfished fishery, it provided for rebuilding to a level consistent with producing the MSY in each fishery, and it should be established at a stock or stock complex level or the fishery level.

The council has been discussing OY. For almost all of the stocks, the annual catch limit is equal to OY, which is equal to the acceptable biological catch, the ABC, and that's the total ACL. For almost all of our stocks, total ACL equals OY, and so what the council has defined as optimum yield is hitting that total ACL, and, for almost all of our stocks, we have recreational and commercial allocations, and not always do each of those hit their ACL.

In particular, we've seen some examples with the recreational ACL for some of our stocks, where maybe 40 or 50 percent of the recreational ACL is caught, but then the commercial ACL is either they're at 100 percent, they've gone over a little bit, they've had some early closures, and so the council has been looking into could you move some of that. If optimum yield is equal to total ACL, then, at this point, we're not reaching OY.

However, when they started talking about, for example, Atlantic Spanish mackerel, which you guys talked about the last time we met, that would be -- You know there was input that we received from the recreational sector and from the council members and from you all about a recreational optimum use of the resource is not necessarily removing all you can, all that's possible, under an MSY or an MEY.

What we wanted to do is have you guys talk about this, and this is the first time, and it may be -- This may be a less structured conversation. Jim Waters sent me kind of a format to follow as we

were going through these, using the different references that we sent out, but we wanted to kind of get this conversation started about can we expand the definition of OY and can we look at ecosystem-based management and multi-fishery participation? How do we incorporate that? Can there be different OYs for different sectors and uses for the fishery? How do you talk about OY in the context of an ACL if that's not your ultimate goal, is to hit an ACL, like in some of our recreational fisheries?

I'm going to let Scott facilitate. I'm going to take notes and answer any questions if you have any questions, but your discussion should include, but is not limited to, different ways to define OY. Right now, it's based on an MSY approach and different levels of OY, with the Bering Sea/Aleutian Islands groundfish example, where there they have a groundfish OY and then they have stock OYs that they change and they adjust, but it never goes over their complex OY, and it's working out okay. They have sector OYs and stock OYs and then an overall fishery OY there.

Then other considerations for OY decisions, such as social and economic and ecosystem-based, and then applications of OY in the management decisions and long-term goals. When we're talking about what the council sees in their vision blueprint, what is this long-term outcome that they're looking for, how do we fit in different ways to look at OY? If anyone has any questions, I can answer those, or you guys can get started.

DR. CROSSON: Thanks, Kari. This is a very open question, but does anybody have anything to start with that they would like? Everybody is looking at me. There is obviously different definitions of OY. MSY is one that Kari mentioned. MEY, maximum economic yield, is another one. I'm not sure if there are any on the social side that would be applicable. Ben is shaking his head, but I guess the first question is, looking at the groundfish example -- I also sent something off, and I know the Australians are looking at some ways of implementing OY that are -- They say MEY, but it's similar to OY, I think, in the way that we're looking at it, but these tend to be commercial fisheries that they're looking at.

When we have something with the recreational sector, especially if there's a catch-and-release component, is it possible to have an optimum yield for the recreational sector without it being harvesting all of the quota?

DR. BLOUNT: I was shaking my head about the social part of it, but maybe this would be the point to say something more specific. In fact, Jim and I were talking before the meeting started about the definition of OY sort of being expanded through slippage, if no other way, but I see that there's some growth in the notion, at least in the social sciences, that OY should include distribution, seafood not just in terms of fish caught, but in terms of seafood available for the best interests of the country, of stable seafood distributions, and of looking at sort of what happens to the catch once you document all of that, but I really can't point to anything that sort of summarizes that work or is very specific about it.

I will just report that I know, from colleagues and from going to conferences and so on, that that's an area of growth, in terms of interest and research. Whether OY should be formally expanded to include that, I don't know. That gets into lots of other issues, but it's not that -- I wanted to correct what may have been in the initial assumption, that nothing is going on in terms of social research in regard to OY. It is, but it's in terms of seafood, as far as I can tell.

DR. YANDLE: Just building upon that, there is a lot of work out there in terms of how do you and do you want to be taking account of things like working waterfronts and rural communities and how the fish is interacting with the local communities and the local economies, or is it just a pure financial of are we extracting the most dollar yield possible from the fish? I think it's an open discussion of which one of those is the appropriate measure.

DR. BLOUNT: If I could just follow up on that, yes, I agree, Tracy, and thanks for saying that. There's been an interesting research spinning-off of the development of social indicators, where initially that was done really for a few communities in the Gulf of Mexico. Now, it's pretty much nationwide, and that information tends to get used by some of the councils, at least, and kind of the theoretical ideas behind all of that has to do with community vulnerability and resilience and well-being and maybe a summary way of saying it.

Yes, that's another area of interest and growth, certainly, that's going on in terms of the social part of it, and I know that Michael Jepson and Lisa Colburn are doing some very interesting work, where they're actually trying to develop methodologies that will allow for some degree of accuracy and measurement of the business impact in communities of actually providing a framework, so you can begin to talk about communities in terms of the extent to which business within the community, and therefore the community economic well-being, depends on the fishery.

DR. MURRAY: I think it's important for us as social scientists to pay attention to the difference between sort of ACL and allocation, and we get asked about allocation all the time, and we're not that good at it, because there are competing values. OY should include consumers who eat fish. It should include the value that recreational fishers have as well, and how to balance that is not something we are particularly good at. We can deliver facts, but we can't weigh those various values, and I think we should be very clear about that as we deliver recommendations.

DR. WATERS: My preference would be to try to back up just a little bit and clean up the semantics of the discussion. I think, in the economics literature, the concept of optimum yield was that of a sustainable yield, and it's a long-term objective for the fishery.

In a sense, it's an alternative to MSY as a long-term objective, and then we have short-term annual catch limits and allowable biological catches that help guide the fishery during a transition from its current state to that long-term management objective, and so I think that if we talk in terms of allocating the ACL or allocating the ABC, but not allocating the OY, because let's keep the definition of OY as a long-term management objective, and then focus on the ACL and ABC and the allocation of ACL and ABC as the short-term management to facilitate the achievement of the long-term goal. I'm not saying that we shouldn't be talking about allocation, but I would like to clean up the semantics a little bit.

DR. CROSSON: So if the long-term goal, if defining optimum yield is a long-term prospect, is it possible for that to include an F that is lower than FMSY? Is that logical, under that?

DR. WATERS: As a long-term yield, OY could be equal to MSY, or it could be less than MSY, but it cannot exceed MSY, but the interesting thing is that, for every long-term sustainable yield, there's an associated biomass that is sustainable, and that MSY has a biomass that at one point. OY could have a biomass that is actually larger than MSY or a biomass that is smaller than MSY, and that has ramifications for the F, also. Now, the NMFS guidelines state that if OY does not

equal to MSY that we have to choose an OY such that the biomass associated with that OY cannot be less than the biomass associated with MSY, and so that does restrict our Fs a little bit.

DR. MACLAUCHLIN: When the council is talking about allocations -- For example, that's just one -- I don't want this to be super focused on allocations. That's just a current topic that this is going to fit into, and that has become challenging for them, because there are different outcomes that they're looking at. When we were talking about allocations decisions in which the recreational is not reaching their ACL, and therefore the total ACL is not reached, do you recommend the council changing the OY for the stock?

When it's set at ACL equals OY equals ABC, and without changing an allocation, you will never reach OY, do you recommend them changing their definition of OY for that stock, or for each stock, and then -- I think that's the push/pull that we're coming up against and the council is coming up against, is go for OY or not, and part of the problem is it's just different for the different resource uses, even when you talk about habitat and ecosystem level. I mean would you also recommend moving away from using OY at all and defining your management goals in a different way?

DR. CROSSON: I don't know that I would recommend that. When I think about this conceptually, and, please, the group can correct me if I'm not grasping this, but if you have a sector that's not catching all of its allocation, there's a number of potential reasons that that could be happening. The first is that regulatory restrictions for the size, the bag limit, or whatever are too tight to allow the fishery to really achieve that target.

The second is that, especially for the recreational sector, it is already essentially at OY. If they're not catching all of the fish and it's not regulations that are impeding them, then is the fishery -- Like the mackerel fishery that Kari brought up as an example. I think you said Spanish has a bag limit of like ten fish. I'm not sure what the size limit is for Spanish or what the discard rate is, but if that's not the restriction, is that sector already at OY, by definition?

DR. WATERS: I would claim no, because OY as a long-term objective, we're not there yet. We're in that short-term transition path toward the long-term objective, and so, naturally, the ACL and ABC have to be less than OY. Now, one sector may not be catching its portion of the ACL, and there's nothing wrong with reallocating to do that, but, in my purest version of the definition of OY, we're not at OY yet there. Let's assume that OY equals MSY. Are we harvesting at MSY right now? Probably not, because we're still in a transition toward that long-term goal.

DR. MURRAY: If we're going to go down that road through, and not to belabor the point about dynamical systems and all that, but if we're not at that OY, are we to the left or to the right? If we're already past that point, then it does become important to think about dialing back, rather than dialing up.

DR. CROSSON: Jim, I don't understand this. When do you know that you're at OY? You keep saying it's a long-term -- If you have a fishery that year in and year out is not catching all of its ACL, it's allocation of the ACL, when do you know? If it happens for five or six years in a row? I just don't understand.

DR. WATERS: Let's assume that, just for the sake of argument and to minimize confusion, that the council has set OY equal to MSY. The SEDAR stock assessments will tell us when the biomass of MSY has been achieved. In the same sense, if we're trying to go beyond the biomass of MSY, to a larger sustainable biomass that we think is associated with OY, the stock assessment will let us know when we get there.

DR. CROSSON: There are some biological limits -- Our former council chair is going to help us here.

MR. HARTIG: Thank you. My name is Ben Hartig, and I'm a council member. I'm also a fisherman and also a mackerel fisherman. I am getting kind of what Jim is saying, but, in Spanish in particular, we have taken that species all the way down to the bottom and rebuilt it all the way to a stable population now, and so I think what I've seen in the last probably eight or ten years with mackerel is the stability of the fishery -- We're probably where we need to be long term. We're not rebuilding to any more mackerel, based on what we're getting out of the population now. In the recreational fishery, and Kari may correct me, but I think there might have been one year where they actually caught their allocation, but, in most years, they have not --

DR. MACLAUCHLIN: Like twenty years ago.

MR. HARTIG: -- approximated the allocation since we set the allocations, a long, long time ago, back in the 1980s. I mean the council gets into these discussions about the recreational importance of more fish in the water and things of that nature, leaving fish in the water. OY is not the same as the commercial fishery catching their allocation, the recreational fishery benefits from having more fish in the water and the availability. Their focus is not to catch every fish that they have, but just have the opportunity to have a successful fishing trip, really.

When you have a stable population like that and you have some fish that they have never caught out of that allocation, there is some sense that the council would like to see maybe some of that given to the commercial, but not the whole portion that they're not catching. I mean that's where we get into this push and pull about how much should we transfer back to the commercial fishery.

We also talked about not transferring it on a -- Not just setting it in stone, the allocation, that we're going to do this forever. We'll do it on a yearly basis. We'll leave the allocations in place as they are, but we'll have a floating allocation that really each one could use, a common pool of a portion of the ABC that each portion could use in any given year, but you could always go back to what the allocations were, if the recreational fishery starts expanding for some reason.

We've brought the recreational fishery up to fifteen fish for Spanish. That's a lot of fish. If you start getting any more, you start getting almost into commercial quantities of fish, and we had a lot of questions from people when we switched it to ten to fifteen, especially the for-hire, saying why did you do that? Now I've got to clean more Spanish mackerel for my people, when I was happy catching ten apiece, which is a lot of fish.

I think the real point is trying to get at this recreational OY. What in the world is a recreational OY? It keeps getting bantered around the table, but we never reach a definition of what that really is, what it really means. I think even NMFS has struggled to define what a recreational OY actually is. I think we understand it from the point of, as I tried to say before, that having more fish in the

water, but I think somewhere there's a balance there, where the commercial fishery could get a little bit more and we could add a little more benefit to the nation, in that regard, but then still have the benefit to the nation of the major recreational fisheries that we have, of having the opportunity to catch an animal from the ocean being at a higher level. It's a balance, but where do you draw the line to start balancing those two competing issues?

DR. WATERS: I don't have any arguments with what you just said. I think economists have a well-defined method of determining allocation, based on values, but the problem is that it's really hard to measure. In concept, we sort of know how to do it, but, in practice, it's a lot harder than it looks, and it may come down to the council, just on an ad hoc basis, feels that the value is more highly placed in one sector than another place. I mean we could try, from a research perspective, to estimate some of the quantities that we think the theory deserves, but, like I said, it's hard to put in practice.

DR. MURRAY: I will just say it once. I mean we could have them be tradable allocations, and then I will shut up.

MR. HADLEY: I was wondering if it would be helpful if we -- I don't think we can pin down an OY for each, just because of the variation in fisheries. I mean golden crab versus dolphin, it's totally different, but I wonder if we could provide some guidelines as far as does OY depend on the certainty of the stock assessment? How certain are you in that MSY estimate? Guidelines along those lines, general parameters.

DR. MURRAY: I think that would be a welcome idea, yes.

MR. HADLEY: That was going off the dolphin versus the wahoo ACL, where the dolphin you had a little bit better estimate and you could provide more of a -- I think it was a 15 percent buffer there, and then wahoo is right at MSY, because the assessment wasn't quite as certain.

DR. CROSSON: I love the Spanish example though, because I think that's really kind of what the council is asking about, and I look at that, and I was an SSC representative on the last two SEDARs for Spanish, and I remember, the first one, it was -- Overfishing was not occurring, but they couldn't define whether it was overfished, and then they came back on the second time around and said it's not overfished either. It's a healthy stock, and it's been pointed out that it's rebuilt itself from a low point, I guess in the 1980s.

I look at this example, and I see that, to my mind -- I understand the difference in what Jim is saying with the long-term OY versus the short-term ACL. One is the long-term target and the other is the tool for getting there, but, over the long term, it just seems obvious to me that that fishery, the recreational sector, has caught as many fish as it wishes to, given how they value Spanish mackerel, and maybe they do or don't value the flesh.

If you were to reallocate some of that, on a temporary basis, over to the commercial sector, would there be a significant loss of value for the recreational fishery, and, if so, would that outweigh the corresponding increase, assuming that there is a certain amount of elasticity in the Spanish mackerel market commercially? Would that outweigh whatever minimal loss happens in the recreational sector?

DR. CHEUVRONT: One of the other things that might be helpful, if you all could discuss about this, is looking in terms of risk and whether it's economic or social risk. For example, and I'm going to use dolphin as the example, and I'm not advocating for one thing over another, but just as an example.

Last year, dolphin was closed after six months in the commercial fishery, because it reached its ACL, its sector ACL. Yet, you had a recreational fishery that had about thirteen-and-a-half million pounds that was allocated to it. The commercial sector had about a million-and-a-half pounds allocated to it, and those are just rough numbers. The recreational sector landed maybe half of its sector ACL, and so you've got -- In this case now, you have over six-million pounds of dolphin left on the table.

There is no way that either sector could have caught the entire ACL in the fishing year. What I'm thinking is, in terms of risk, in my sense of it, it would be less risky, say in the dolphin fishery, to have at least a temporary transfer from the recreational sector to the commercial sector. You also have to remember the biology of dolphin. They're basically the rabbits of the ocean. They're almost like shrimp. It's almost impossible to do a stock assessment on them, because they reproduce and grow so quickly that it's really difficult to do that.

Can you offer some kind of guidelines where it might be okay, economically or socially, to consider when to make a shift and how much risk is acceptable or, for example, something like do away with sector ACLs, just have one overall ACL, know what the breakdown has been in the past historically, and then you sort of keep that in your back pocket and you just let everybody fish. As long as the total ACL isn't met, everybody is happy.

DR. WATERS: Can you explain risk of what?

DR. CHEUVRONT: Risk of exceeding an ACL and what the -- We kind of know, when we do the effects analysis, what the risk of exceeding an ACL is, but is there some kind of a way or the parameters that we should be looking at, that we should keep in mind, that if we're going to consider shifts between sectors, or consider doing something like getting rid of sector allocations, are there cautions that the council should be looking at to make sure that they're not going to harm one sector or the other, in the long run, by doing this? What kind of risks would the council be taking if they decided to make these temporary shifts or get rid of sector allocations altogether?

I think there is probably some room for some discussion there on that. If you say, well, we don't think there are any, that's fine. That's okay. I think the council would like to hear that too, but my hunch is that the council is going to want to talk about this in June, and if we could offer them some information, words of caution, so to speak, if they decide that they want to go down this route, what could we do to say, okay, now think about this when you're considering making allocation shifts.

DR. MURRAY: Could you tell us a little bit about the relationship between the sectors, because I think that would help inform this, because if it's contentious or not contentious, that makes a difference, I think.

DR. CHEUVRONT: Pretty much anytime there's going to be a shift from recreational to commercial, you're going to have some contention by some folks, because, in general, there is a

feeling of if we give them some of our allocation, we're losing opportunity, and more fish in the water makes it easier for me to catch a fish. Even if we don't catch our entire ACL, we have more opportunity to catch fish.

If you think that through even further, by keeping more fish in the water, you're potentially increasing the biomass, which even makes it easier for the commercial folks to catch fish as well, and so it kind of works both ways, but when you've got a stock like dolphin that you almost can't even really do a stock assessment on, because, by the time you have a stock assessment and you publish the results and you do something about it, you're about five generations down the road from the stock that you actually assessed, and so what do you do?

I guess really what would be helpful, I think to the council, is if you can offer some words of advice. Even if you can't interpret everything, what are some of the things that you think the council ought to take into its deliberations when it's talking about shifting allocation from one sector to another or doing away with sector allocations altogether? That would probably be very helpful.

DR. CROSSON: How quickly this shifts into an allocation discussion is interesting.

DR. MURRAY: What if there was a fudge factor that was reserved for no sector, and that, as uncertainty is resolved, the allocation of that fudge factor is then determined?

DR. CHEUVRONT: That's a possibility. That has actually been done in other fisheries and things, and so I would like to hear what you all have to say on even things like that. There is some cases where there's like a reserve. There's three allocations. There's a reserve allocation and you get towards the end of the fishing year and if somebody is getting close to meeting their allocation, they can draw into that reserve, but it doesn't really change their allocation, because, next year, if they don't go close to that, then they don't get any of those fish.

DR. YANDLE: It's certainly a simple, relatively direct way of dealing with the risk.

DR. CHEUVRONT: That's the kind of thing that I think we need to have on the record, you guys saying stuff like that.

DR. BLOUNT: I'm not sure I have anything new to say. I agree with what Tracy was saying, but the idea that is certainly appealing is the idea of having three allocations and then making sector allocations annually on that basis, in regard to need. I think that would go far in minimizing whatever contentiousness there may be.

If you start trying to either eliminate the ACLs for each sector or shifting them -- If you shift them, you really have to have a very clear, and I think a fairly long-term, basis for it, and it would be less flexible than having sort of three allocations, and so I think the three-allocation is -- As Tracy said, and maybe I'm just sort of elaborating on what your point was, but it would minimize the risk, and I think be more politically feasible.

MR. BOWEN: That's all well and good when we're talking about, as Brian said, millions of pounds, but one question that was raised, and that's the reason that I came up to the table, is we also should consider species where we're dealing in not so many pounds, such as just a few

hundred thousand, and so the fudge factor, as you labeled it, would definitely be a smaller percentage. When we get into smaller pound numbers, we're talking a little more of a struggle, I would think, or a little more in-depth thinking that needs to come out, and so I just wanted to put that out there for food for thought, and I will go back and listen in. Thank you.

DR. CROSSON: I remember that the council has allocated like 5 percent of the wreckfish fishery over to the recreational sector, but I'm not sure how often anybody is actually going all the way out there and catching a recreational wreckfish, but it would, certainly considering the way that the ACL has jumped up and down for that fishery, it certainly would probably be a benefit to the wreckfish fishermen, commercially.

DR. SCHNIER: You had about sort of things to consider with the sector piece, and one thing I wanted to sort of mention was an issue might come up of timing, which is what is the relative timing between recreational demand and commercial demand? If they line up, I think you're fine, but if there is any asymmetry between when the commercial guys want to target and when the recreational guys want to target it, you could generate issues with not having some sort of sector allocation model.

DR. CROSSON: That's a really good point. Sort of to John Hadley's suggestion about thinking about different variables that we could tell the council to consider, and I've already written down how certain is the assessment, the longevity of the species, but I guess the relative timing between the commercial and recreational sector, which I guess is also going to depend, in the South Atlantic, somewhat, on where the fishery is occurring, because I know when I go out for dolphin in North Carolina that it's going to be a lot different than when I can go out for it off of South Florida, having fished in both of those areas. There is a lot longer period that you can go for dolphin off of South Florida than you can up in the Carolinas, and so I don't know when the commercial sector for dolphin is at its peak, but that would be something to take into account.

I have written down some of these variables. I have how certain is the assessment, the longevity of the species/productivity, and the example of dolphin came up, this fudge factor question about not moving all of the fish on a permanent basis, but possibly having a reserve sector. I have Ben's point that long-term shifts need better justification and short-term shifts do not, because they can be, I guess, amended. This question that Kurt brought up, the relative timing between the commercial and recreational demand for the fish, is important, and what else am I missing here? What are some other things?

DR. BLOUNT: This would be an expansion and not really something missing, but I was thinking that, in regard to the comments about having a reserve for all species may be a little bit sort of questionable or dicey, but maybe the council could have some procedures in place where it's very clear, in some instances, as in dolphin, where the ACLs are generally not met, that maybe shifts would be much more easily done and more justifiable.

The point I wanted to make, in regard to all of that, is that if we're taking OY as a sort of generic, long-term objective here, one could certainly argue that if you are not catching a significant part of the ACL and those fish could be shifted to another sector that you're going to have both social and economic benefits to communities, to the fisheries in general, but certainly in terms of the business aspects or considerations in regard to the communities, whether it's commercial or recreational.

I suspect probably the shift would be from recreational to commercial, but maybe not always. I don't know, and it might depend on the species. I just simply don't know enough about that to be able to sort that out, but, anyway, I think economic business and social considerations is something that we could put in there in regard to improving meeting the goal, or better meeting the goal, of OY.

DR. MACLAUCHLIN: I have two questions. One is what is long-term? Two is when you were talking about a management tool to reach a management goal, when we don't know -- That's, I think, what I was trying to get at, to get a little more input. I know that your direction, the direction that we've given you guys, is very broad and vague, but I think -- You know when we're talking about, for example, allocations, and we don't know what the management goal is, then there's no point in -- I mean is it to maximize the most money we can make off of that, and there's different ways to measure that with commercial and economic? Is it the most recreational fishing opportunities?

I mean, with a lot of the fisheries, when I look at them separately and the management goals separately for the sectors, the commercial is to get the most money, a long-term yield that makes the most money, but still allows the population to replenish itself, your MSY, but recreational is the most recreational opportunities that you can get out of it, and that requires fish in the water, and so it's not going to be the most fish that you can take out of the water, and that may even be the maximum economic yield, because you want as many fish in the water, so that people come and spend money to go fishing in that area.

Maybe Ben and Zack would want to talk about it a little more, about what the council would look for. I mean, should the council change their definition of OY for the stocks? Should it not be the total ACL? If they do that, how are we going to talk about that? They can't move forward with an allocation when the OY is defined as reaching the total ACL. If the OY is the long term, then what is the long term? Is it twenty years?

With Spanish mackerel, I would say they haven't been reaching their OY for twenty years, because the recreational doesn't hit their quota, and they haven't in a long time. Those allocations were 50/50 when they were set a long time ago, and that was simply for fairness. It wasn't based on landings history of those two, and then they shifted 5 percent over to commercial, just to kind of give them a little bit and shift it. That allocation decision was not even made on a landings proportion. It was more of a fairness issue.

DR. CROSSON: I'm a recreational fisherman, and so what I am looking for? I'm looking for maximizing my opportunities to catch a fish, and if it's something that I value, I am looking to be able to retain it. I fish for king mackerel, which I don't usually retain, and I fish for dolphin, which I almost always retain, and I don't do it anymore, because I'm down in South Florida and the reefs are getting picked clean, in my experience, down here, and so I don't bottom fish much off of South Florida, at least in the range that I'm willing to bring a boat out and pay for the fuel.

I think the locality of the fish, the nature of the fish, is important. I mean a pelagic fish -- If you shift some unused allocation, in my mind, from the recreational sector over to the commercial sector and it's something like dolphin, I think the chances of it really lessening my opportunities to catch the fish, if it's a small shift, I'm not that worried about it, but if it's my local reef and you talk about shifting something benthic, something in the snapper grouper complex, over, and now

my opportunities have diminished -- I would have been very annoyed in North Carolina if some of the spots that I hit black sea bass had been picked clean by the commercial sector.

I mean that's another factor going in, but I do think it is, for the recreational sector, it is maximizing my opportunities to catch and retain a fish, because you have to spend money, and the biggest cost is boat fuel. If you're spending all that money to go out in the ocean, you want to be able to encounter a fish. I'm pretty happy right now with my opportunities to catch dolphin. If they're around, I know where to look for them. If they're not around, I don't catch them, but if something happened that would lessen that opportunity, then I would be annoyed, but I think we're getting at some of these questions in our discussion.

DR. BLOUNT: I will go ahead. I was debating whether to follow up on this old, old argument and discussion of the relative amount of economic value that is derived in communities from recreational fishing as opposed to commercial fishing, and so yes, you have all these expenses, but recreational fishing brings a huge amount of money into communities, through marinas and boats and fuel and so on.

It would seem, to me, that any allocation really should look at what the consequences might be, in terms of the communities. In regard to that, I sort of like the idea of maybe trying to come back to a little bit of what Kari was saying. I like the idea of sticking fairly closely to the more generic and long-term view of OY, long-term then being defined separately for each species, depending on the circumstances. The OY, it seems that the OY is in relation to species, and, of course, not to collectivities of species.

If you do that, you avoid getting into all these other proliferations of OY and the way that Jim had talked about it. I think it's better to deal with those issues in terms of the ACL levels and talking about allocation or surplus or whatever it may be, but not to -- If you bring OY into that as a tool, I think things can get confused fairly quickly, although the Bering Sea thing might be a counterexample to that. I'm not quite sure how to assess that just yet, but, anyway, I wanted to make that point, the general point being that if you're thinking about risk or economic gain or social gain or whatever, any shift is going to have some sort of impact on seafood availability and communities in regard to that.

DR. CROSSON: Yes, but it's kind of -- You can define it more easily for the commercial sector, especially if you're shifting to the commercial sector and you add value. We have some idea of what the fish sells for, and so there's ex-vessel value. We can do I-O modeling, if you want to talk about local impacts on communities. You can look at the social indicators that Lisa and Mike Jepson have come up with. That's very measureable. The uncertainty is around what its impact is going to be on the recreational fishermen's opportunity to encounter and catch or release the fish. That's a tough tradeoff.

DR. BLOUNT: Yes, that's hard to measure.

DR. CROSSON: Which is why any move in this direction should be done carefully and not long-term, because if the recreational fishermen do notice that there's going to be a decreased likelihood, they're liable to get pretty vocal about it.

DR. MURRAY: I think we owe Kari a serious answer to the question about what is long-term, and, unfortunately, it's the most unsatisfying answer possible, which is we are grossly unqualified to determine what is long-term. The public determines that, and we just don't have an answer for that.

MR. HADLEY: I will come back to that, because I have another comment going in a little bit different direction, and so I will reserve my comment.

MR. HARTIG: I think you guys are helping me out a lot. I mean the assessment question is critical to this, because mackerel, Jim, if you remember, we assessed those back in -- It started in I think it was 1986 or 1987 that we started the stock assessment process for mackerels, and we did them every year, Spanish and kings, for a few years. Then we went to biannual, and then we went into the SEDAR process, but we had a number of assessments for mackerel.

Then, when you compare reef fish though, like even vermilion, our most important reef fish now that's driving the commercial and recreational fishery, to some extent, that's probably only been assessed about four times, compared to the other species, and so how comfortable you are with your assessments over time -- Like you said, it's a longer time span. You're going to have to have a number of assessments under your belt, until you feel that you're comfortable with the productivity of those stocks and where you should start shifting those allocations. I'm getting a lot out of this, out of you guys' discussion, and it's helped me a lot, because I hadn't thought about it in those terms, but that makes a really good point.

DR. WATERS: I would argue that the definition of long-term depends on the biological characteristics of the species. If you have a species that reproduces very quickly, you will probably be able to rebuild that species in a fairly short timeframe. If you have a species that is relatively slow-growing and long-lived, the long-term is going to be much more distant into the future.

DR. CROSSON: Given all the uncertainties around a stock assessment -- When I look at a stock assessment, assuming it has been assessed, I always look for that stacked bar chart that has all the age classes and the biomass, and I think about that in terms of its relationship with the biology of fish. When you talk about something like Spanish mackerel, knowing how it hit a low in the 1980s, I want to see all those age classes increasing over time, steadily, for a pretty long period before I'm willing to think about --

DR. WATERS: If Ben is right and we're already at a sustainable fishery for Spanish mackerel, then we've already hit the long-term. We're already there.

DR. CROSSON: John Hadley, did you have a chance to say what you were thinking about?

MR. HADLEY: I had a little bit different direction, but it was one thing that Brian had brought up as far as the doing away with sector allocations and having a single ACL and how that would relate to OY, and I just thought more group discussion. To me, doing that immediately would change the fishing behavior quite a bit. Whether perceived or realized, people may be trying to fish to get more allocation in the future, basically to reset those. To me, that would be -- I would caution against that, but I wanted to see what the rest of the group had to say.

DR. CROSSON: I would completely agree with that. Given all the variables that we've been talking about and all of these warnings that we've been giving, that seems like getting rid of the sector allocations for something like this would be quite dangerous. It would go in the opposite direction, given that a lot of times the commercial sector can ramp up production pretty quickly, much faster than recreational demand usually shifts.

MR. BOWEN: To your point that you were making earlier, from a recreational perspective, and let's take Spanish mackerel for an example, since that seems to be a topic of discussion. From the recreational perspective, if our limit, or the recreational limit, is fifteen now per person and it stays fifteen per person, they don't really think about ACLs and ABCs, as a recreational angler.

If their daily bag limit stays the same and their fishery doesn't close, it's pretty much okay with them. The same as like king mackerel. If it's three per person and they can go catch three kings per person year-round, they're not looking -- For the most part, the recreational angler is not looking at the yearly ACL and how much proportion or how much allocation he or she is getting. They're looking at the availability and the opportunity to be able to go catch their daily limit anytime during the year that they would see fit.

DR. CROSSON: That's why you have to -- Again, I don't know if I've scratched this down, but you have to be looking at the regulations and whether those are the constraining factors, which probably we had that discussion early on, but whether those are the constraining factors for a sector not approaching its ACL or getting anywhere near its ACL.

DR. MURRAY: This brings up an interesting question then, in predicting how the bag limits translate into the total expected catch. That, I guess, we're not going to be able to help with that.

DR. DUMAS: I was just thinking about this. I'm an economist, and from sort of a general point of view, one way that might help to conceptualize this is to sort of think about three buckets. You've got commercial, recreational, and then biomass. Commercial is the number of fish caught per year by the commercial fishery and the value per fish to the commercial fishery. Then there's value per fish caught to the recreational fishery, and then there's value per fish left remaining in the ocean, at the end of all fishing seasons, and those fish also have value. They have existence value to people, people who are not fishermen, but just want to know that there's a healthy fish population off there, and they also have reserve value, or risk-management value, like you guys were talking about earlier.

You could think about the beginning of all fishing seasons and you've got a certain biomass. Some of those fish are allocated to the commercial fishery, some are allocated to the recreational fishery, and some are just left in the ocean for as that biomass reserve. As far as optimum yield goes, what we would want to do is equalize the value per fish across the three different buckets.

The value per fish caught by the commercial fishery should equal the value per fish caught in the recreational fishery should equal the value per fish left remaining in that biomass pool at the end of the season. The value per fish depends on multiple things. For example, in the commercial, the value per fish depends on the fish price, the harvest cost, the fish growth rates, the interest rates and so on. For recreational, it depends on prices, harvest costs, including the price of gas and so on, and those other factors.

The key important feedback is that the number of fish that are left remaining at the end of the season, the biomass, affects the harvest costs the next fishing season. If a larger biomass is left, then it's easier to catch a fish the next season, which reduces commercial harvest costs, and it also, because it's easier to catch fish for the recreational, which reduces their harvest costs. You spend less money on gas motoring around. It's easier to catch a fish, your first fish, and it's easier to catch more fish if you've got a larger biomass.

Conceptually, optimum yield is sort the optimum yield for the commercial and optimum yield for the recreational and optimum yield for that sort of remaining pool, that remaining biomass pool. We want to equalize the value per fish across those three uses, value per fish caught commercial, value per fish caught recreational, and value per fish left remaining in the biomass pool, and equalize those three.

Those optimal yields, the number of fish that would satisfy that rule, the value per fish is the same in those three buckets. The number of fish that would equalize the value per fish across those three buckets would change from year to year. For example, if gas prices went up, that would affect optimum yield in the buckets, or, if for some reason, there was a bad year biologically and the growth rate of the fish changed, the fish population changed, that would affect optimum yield. It would be something that would have to be updated. What the optimum yields were would need to be sort of updated every year, depending on how factors changed. You could make that process more detailed or less detailed, depending on how many resources you have to put into the economic and social assessment, as well as the biological assessment.

Finally, the value per fish can include, for commercial, not only the fishermen's value, but also value to the community. If folks talk about the fishing community and economic impacts, that can be included in value per fish, in some type of assessment, but on the recreational side also, not only the value to the fishermen, but also the value to the community of all the money spent by the recreational fishermen in the area. That could be factored into sort of the value per fish of those three different buckets, to try to equalize value per fish across the three different buckets. With that, I will be quiet.

DR. WATERS: Very well said, Chris.

DR. CROSSON: I concur.

DR. WATERS: This is Jim Waters, again. I will add to what Chris just said. If you have a situation like Brian described, in which one sector is not catching its allocation, that's probably a de facto evidence that the marginal value of the fish for that sector is zero at the moment, which would be a good reason for reallocation.

DR. CROSSON: Another very good point.

DR. SCHNIER: That was exactly the point I was going to make, and so thank you for making that.

DR. DUMAS: That's true, but, if you reallocate, you've got to keep the key feedback mechanism in mind. If you reallocate some unused recreational catch to the commercial sector and the commercial sector catches those fish, then it's going to reduce the remaining biomass left at the

end of the season, and that's going to make it more difficult for the recreational fishery to catch fish, increase their harvest costs, and it will also increase harvest costs for the commercial fishery itself, if it makes the fish more scarce by reducing the biomass. There is a cost to reallocating the recreational cost to the commercial. The cost is it reduces the biomass, and that makes it more difficult to find the fish, and that raises harvest costs for everyone. The feedback effect on the biomass and how that affects harvest costs just should be taken into account when you think about reallocation. That's my point. Thanks.

DR. WATERS: All of this is easier said than done, and I think it would be good for our analysts in the National Marine Fisheries Service and our contractors to really focus on methods of trying to measure these values that Chris is referring to.

DR. DUMAS: I agree with Jim, and there have been a lot of studies along those lines. Of course, a lot of commercial fishery studies, but also recreational fishing studies, where we try to measure the value per fish to the recreational fishermen, the consumer surplus value. John Whitehead, of course, did a lot of those types of studies, and other folks as well, and, also, there have been studies of the shore-side sort of economic impacts of the commercial fishing activity to businesses along the shore and also recreational fishing activity to businesses along the shore, tourism and so on.

A lot of these numbers do exist for a lot of different fish species for a lot of different areas. Not all areas and not all fish species have been covered, but there's been a lot of progress, and we could do more, but I think it's useful just to have sort of a general -- If you think about that general three-bucket framework and then think about filling in the pieces.

I think, if we look, a lot of pieces have been filled in. It would be work to update it every year or every few years with new stock assessments and changes in prices and things like that, harvest costs and things, and trying to look at the biological -- Look at the effect of the different biomass levels on catch rates and harvest costs, and sometimes it may be possible and sometimes it just may be too difficult, practically, to do.

We might have to make some estimates, but it's useful to have sort of the overall framework in mind and the potential feedback effects in place, and we can talk to the biologists and try to get some essence of order of magnitude of the feedback effects between biomass and the catch rates or encounter rates, so that we could look at the feedback effects of shifting some allocation from recreational to commercial.

One of the reasons why commercial might be always near 100 percent of the ACL and recreational is not is because the commercial fishery has a much lower harvest cost per fish, and so they're always at the limit, whereas the recreational harvest costs per fish is much higher. After all, that's the reason why the commercial fishermen use the fishing methods that they do, because it's lower costs per fish.

If, in a totally unconstrained world, the fish population would be overfished by the commercial fishermen, because harvest costs are so low and because of open access, then, if we prevent that overfishing, the commercial fishermen are always going to be right at the limit, if they have a lower harvest cost than the recreational fishermen. The recreational fishermen may or may not be at their limit, depending on how their harvest costs compare to the commercial fishermen and so on.

To me, it's not surprising that commercial is at the limit and recreational is not, and that might almost always be the case, in a situation where we're constraining the commercial fishermen from overharvesting the biomass. If it were to occur in an unconstrained world that the commercial fishermen would overharvest the biomass, because of their lower harvest costs, then we're probably always going to be in this situation, where commercial is at 100 percent ACL, or close to it, and recreational is below that somewhat, because the recreational has a higher harvest cost.

DR. SCHNIER: I guess what I was going to add to this is I think the models that we have currently, that we're using for the sector allocation stuff, tend to work very localized changes, so when we're dealing with small changes from where we currently are. I think one of the major challenges, and I'm doing work with another council on this, but is trying to be able to really predict out of much larger changes.

If you deal with 30 or 40 percent changes from where you currently are, it's hard to get those marginal values that Chris is sort of referring to, and I think, in order to do this, one really needs to have sort of an integrated model that models production practices for the commercial side and the recreational side that are a function of sort of the availability and the scarcity of the species. It's actually really, really difficult to try to pull off, and it's hard to do with sort of the conventional methods right now, when you're not looking at the localized stuff.

Looking the 50/50, that seemed more like just an egalitarian split, but it really has nothing to do with marginal value, which is kind of what Chris is referring to, and I just wanted to make the point that we probably have to look at new methods if we're really trying to look at sweeping changes that are much larger than a few percentage points away from where we are right now.

DR. DUMAS: I agree with what was just said about the difficulty of estimating marginal values, although we do have some information on that. It's true that you're not going to get those extremely precise, given the cost of gathering the information and the speed of processing information, but, if you can get ballpark estimates, even for large changes, if you could ballpark how much those marginal values might change, it can go a long way to helping us get at least an order of magnitude better management.

I think it's really useful to try to keep the overall system and the overall sort of goal in mind of trying to equalize the value per fish when a lot of different types of values are included in that value, kind of keeping value per fish in sort of the three different buckets roughly equalized, and that's kind of what we're going for. If we kind of keep that in mind as we talk about the different issues, or, otherwise, we end up just sort of spinning around and around and chasing our tail.

It seemed like, at the beginning of this conversation today, that people were going back and forth between MSY, OY, ACL, catches, and allocations. Without an overall framework, a conceptual framework, of how these things fit together, you keep spinning around in circles, because of the feedback loop, because of the feedback between biomass and the direct relationship of biomass back to commercial, because those feedback loops will cause you to keep spinning around if you try to look at any part of it in isolation.

You need to sort of keep the overall picture in mind and fill in what we can, and, in places where it's too difficult to make precise estimates, we might need to make less precise estimates, but then we can clearly state that, that that's what we're doing, and move forward from there, but, with the

whole system in mind, we can make some progress and not sort of getting caught in these loops, where you go back and forth and end up thinking about things in sort of the chicken-and-the-egg kind of dilemmas that the discussion seemed to be heading towards earlier in the day. Thanks.

DR. CROSSON: I think, unless anybody else has anything to add, I think we've had a pretty good discussion.

DR. WATERS: I would like to ask a provocative question to Chris and Kurt and maybe anybody else. When considering marginal values for the different sectors, commercial fishermen are often -- They are squeezed by cost considerations. It's sometimes hard to make a profit. The consumer demand for commercial fish products is often very elastic, because of competition for fish from other countries or for other types of food items, and so the question is, is there an underlying situation where marginal values for the recreational sector might be enduring than marginal values for the commercial sector?

DR. SCHNIER: I think some of the models that I've seen been done do tend to indicate that some of the recreational value is higher, but I have a difficult time with it, because it tends to be kind of an apples and oranges thing, because you're looking at a marginal value per extra fish for a recreational person, and per extra fish on commercial is kind of interesting, and it's kind of hard to think about when they're catching much higher volumes.

One thing that I've been trying to think about more recently is thinking about the fact that, on the commercial side, that fish species is often a complement in production for other fish that are being caught, and so there's not only the value for that fish, but there's also the value that comes from the fact that they're able to fish for other species at the same time, and that's true for the recreational side too, but my thought on the recreational is that they're smaller limits, and there's perhaps more targeted on that side, and so that you've got a little bit of a different animal going on there.

I mean if you had forced a recreational person to be catching thousands of pounds of fish, their marginal value is going to be really low, and so I think you kind of have to really think about where that is on their sort of demand curve and how we think about those marginal values. It's a difficult task to really grasp that notion, but the other side of it is, if you're thinking about the commercial side, suppose they had very little TAC or OY, we'll call it, whatever their allowable catch is that they have. In a very, very small amount, that marginal value is probably very high, because they're going to be able to commercially catch, but that also allows them to fish for other things, because they need to have that allocation to catch other species.

DR. BLOUNT: This is getting toward the end of the discussion, and this idea may be way out in left field somewhere, and I have to also interject that I am not an economist and I can get lost in the discussions very easily, but I wonder about the marginal value of fish for the recreational sector, and I agree that that value may be relatively higher than it would be for the commercial, but one of the things I've been thinking about for some time now is the growth of recreational fisheries, and I don't have any facts and figures in front of me, but the general sense I have is that, if you look at demography, human demography, and population growth, it tends to be centered on the coast, and we know that, and particularly sort of in urban areas, and the increase in recreational fishing in those areas can sometimes really be immense.

I know the Gulf much better than I do the South Atlantic in regard to this, so that the Houston/Galveston area had massive increases, in terms of the numbers of recreational fishermen, and, of course, the more recreational fishermen come into the system, then the greater the economic impact for the communities, and so I wonder if it makes sense to think about sort of the marginal or residual value of the fish left in the ocean for actually being kind of a stimulant, or a factor in the growth of recreational fishing, and that there being important consequences for the communities involved, because of that.

DR. SCHNIER: You would call that a shadow value, which is sort of the implicit value of a species. It's sort of the opportunity cost of what it represents, and so that -- If you have models that are sort of complex biochemical models, that will come out, and they will have that sort of shadow value for the species, which is what I think you're referring to here.

DR. CROSSON: I think we're going to wrap up this discussion, and we're going to take a ten-minute break. I have 9:56, and so at 10:06, we're going to start back up, because we have a web presentation from Dave Records. We're going to break for the moment, and we'll be back at 10:06.

DR. CROSSON: We are resuming promptly at 10:06, and so the next discussion is we're going to be talking about hogfish and Snapper Grouper Amendment 37. Actually, Myra, from the council staff, is going to give a presentation, and Kari is going to do the slides for her. We will have a short presentation by council staff, and then Dave Records, from the Regional Office in St. Petersburg, is going to run a slide show for us as well, before our discussion.

MS. BROUWER: Thank you, and good morning, everybody. I'm Myra Brouwer, and I'm council staff. I help the council with the snapper grouper amendments to the FMP, and so I just wanted to give you a little background to inform your subsequent discussions on this decision tool that you're going to hear about.

This is Amendment 37. It deals with hogfish. There was an assessment of the stock conducted in 2014, with data through 2012 and, during the process, there was some evidence -- There was research going on that pointed to there being two genetically-distinct populations of hogfish, and so the SSC recommended that the council manage them separately.

One of them spans from the Georgia/Florida border through North Carolina, and we call that the Georgia through North Carolina stock, and then the other one goes along the east coast of Florida and wraps around the Florida Keys, and so the assessment was reviewed by the SSC, and it was not deemed applicable, I guess, to the Georgia/North Carolina stock, due to scarcity of data, and so the status of that stock remains unknown. For the Florida Keys/East Florida stock, that stock is overfished and undergoing overfishing.

For Georgia/North Carolina, the SSC recommended using the ORCS approach to establish an ABC, and so they went through and used that methodology, and then we're using the projections from the stock assessment to set the ABC for the Florida Keys/East Florida stock. This goes into a little bit more about what ORCS is, and I'm sure you guys are all familiar with it, but, basically, it's a data-poor approach that uses just historical landings to arrive at an ABC.

For hogfish, I believe they used the catch statistic, which was the highest landings between 1999 and 2007, and that happened to be the year 2006, and then they applied a scalar to denote the risk of overexploitation and another one to denote the management risk, and that's how we get to the ABC of thirty-five-thousand-and-some-odd pounds. Then here are just the numbers for the Florida Keys/East Florida stock, and then, of course, the council, once they receive a letter stating that a stock has been found to be overfished, then they have two years to put in a rebuilding plan, and so that's what Amendment 37 also is doing.

We're going to use the assessment to specify the boundaries of these two various stocks and then establish all the various benchmarks and biological parameters and fishing levels for each of the two stocks and then put in commercial or recreational management measures, as needed, to achieve the desired reduction in harvest.

Part of what the Regional Office has done to facilitate this, because the council is considering changes to a lot of the management measures, bag limit, size limit, commercial trip limit. They're also considering putting in a recreational season for Florida, and so they've developed these tools that you're going to hear about to help predict the effects, the combined effects, of these various management measures. With that, if you have any questions or need any clarifications before you proceed, I would be happy to oblige.

DR. RECORDS: Good morning, SEP members. This is David Records over at the Southeast Regional Office. I'm an economist here. The council staff has asked me to give you a brief overview on the commercial sector economic effects estimation that we did for the South Atlantic Amendment 37 to the Snapper Grouper FMP. There was also a recreational analysis that was done as part of another tool. I won't be presenting that here. That's going to be presented by Nick Farmer on Thursday to the general SSC, but there is an economic component there as well.

The goals of this analysis were pretty typical for the type of work we do when designing regulations. Here, specifically, we're looking at estimating the economic effects of the various management alternatives that were included in Amendment 37 to the commercial sector, and we're measuring these as changes in commercial landings, changes in ex-vessel revenue, which is our proxy for profit in the absence of sufficient cost data to really estimate profit, and we're also looking at changes in season length.

The first step in this analysis was to estimate baseline landings for the future years for each of the subregions. The graph below, you can see hogfish landings in pounds whole weight from 1986 to 2014. I would like to point out in the East Florida/Florida Keys line, which is the bluish/green line, you can see a clear increasing trend in the last four years of the observed data. For Georgia through North Carolina, which is the gold line, you don't see really any trend. It's kind of random.

Based on that graph, we decided to use two separate approaches, one for East Florida/Florida Keys and one for Georgia through North Carolina, to estimate those baseline landings. For the East Florida/Florida Keys region, we decided to build a time series model to try and capture that increasing trend and to account for seasonality. In Georgia to North Carolina, we just took a more simple approach and used the average landings from the most recent three years of available data.

For the East Florida/Florida Keys model, we chose to fit a seasonal autoregressive integrated moving average model to average daily landings by month. The reason we did daily landings by

month is because, ultimately, we're interested in changes in season length, and so we needed a way to get at daily level estimates.

In the graph below, you can see, in blue, the average daily landings by month. Overlaid are the predicted values from the SARIMA model in red, and, as you can see, the observed dataset goes through 2014. After that, we predicted two years into the future, through 2016. The gray and blue-shaded areas represent the 75 percent and 95 percent confidence limits. after you get past the observed data, they're actually prediction intervals, and you can see they're rapidly expanding as we go further into the future, and that's because of compounding uncertainty as we start basing future predictions off of past predictions.

Out of the SARIMA forecast, we end up with an estimate of 28,406 pounds whole weight for 2016. We decided to use this as our proxy for 2017 landings. Because of that rapidly-expanding prediction interval, we didn't feel comfortable going any further into time. This was a judgment call, and there may be a better way to handle this, but that's what we did.

For Georgia through North Carolina, again, we just took a simple three-year average of annual landings, and that comes to 20,534 pounds. When you sum these two baseline landings estimates together, they're less than the status quo ACL, in the absence of Amendment 37, and so, if we didn't have Amendment 37 and we didn't break the stocks into two subregions, we would not expect a quota closure.

In East Florida/Florida Keys for 2017, our baseline season length is estimated to be 365 days. Our baseline landings, as estimated by the SARIMA model, would be 28,406 pounds whole weight. We take an average annual price and multiply that by the baseline landings to generate our ex-vessel revenue estimates of $106,228. This assumes that this average annual price that we're using is a good representation of what prices will be like in 2017.

For Georgia through North Carolina for 2017, our baseline landings, again estimated by just taking a three-year average, are 20,534 pounds whole weight. The lowest ACL alternative that they're considering in Amendment 37 is 22,222 pounds whole weight, which is higher than our baseline landings estimate. Therefore, we would expect our season to be 365 days under any of the management alternative combinations, including the status quo. Now, once again, to get the baseline ex-vessel revenue estimates, we simply multiplied by that average annual price for the South Atlantic hogfish landings.

Now that we have our baseline landings, we want to project our new landings under these different management measures. The way we handled this for trip limits and size limits is we generated two percent remaining scalars that could be applied to those baseline landings to account for a reduction in landings as a result of those measures.

The way the trip limit percent remaining scalar was calculated is, within a given time period, we truncated all trip-level landings at the proposed trip limit, and then we summed those truncated pounds across all trips in that time period and then divided that by the sum of all non-truncated pounds in that time period.

Now, applying this percent remaining scalar to future baseline landings to get at new landings makes a few assumptions. One assumption is that the distribution of trip-level landings would be

the same in the future as it is in this historical data. It also assumes that effort would not shift as a result of changing the trip limits. in other words, if we lower our trip limit, commercial vessels won't cancel those trips. They will just harvest less than they would have harvested.

For the minimum size limit percent remaining scalar, this was calculated by adding the weight of all fish that were greater than or equal to the proposed minimum size limit plus the weight of fish smaller than the current minimum size limit to account for some level of non-compliance or measurement error, and then we divide that by the total catch, in pounds, for that time period.

For the East Florida/Florida Keys subregion, these percent remaining scalars were generated at the month level, and that's because ultimately we expected the ACLs to be constraining, and so we were interested in estimating season length. For Georgia through North Carolina, these were estimated at the annual level, and that's, again, because we don't think the ACLs will be constraining.

Now we have our baseline landings estimates and we have our percent remaining scalars, and we want to project what are the new landings, the new season lengths, and ex-vessel revenue, and so, for East Florida/Florida Keys, again, we want to do this at the daily level, and so what we do is we sum the average daily baseline landings that were estimated from that SARIMA model by month. We apply those percent remaining scalars to those daily landings, and then we sum across the year.

When the cumulative sum is equivalent to the proposed ACLs, we simulate a quota closure. At that time, we would consider the cumulative sum at that point what the new landings would be under these new management measures. The season length would be calculated as the number of days from the start of the fishing year, January 1, to that estimated closure date, and then, to get the ex-vessel revenue estimates, we would multiply by that average annual price.

Now, using the average annual price here makes an implicit assumption that there won't be any price effects from changing the temporal distribution of landings throughout the year. This assumption was based on the fact that hogfish have a lot of substitutes in the ex-vessel market, and so we felt that it had a high price elasticity.

For Georgia through North Carolina, again, it was a simpler model. All we did is we took these annual trip limit and size limit percent remaining scalars and we multiplied those by the baseline landings, and then we calculated ex-vessel revenue using that same average annual price.

Just a few result highlights. For the East Florida/Florida Keys region, our status quo landings and ex-vessel revenue would be reduced by 87 percent to 88 percent. In percentage terms, this is obviously a very high reduction, almost 90 percent. In terms of actual magnitude, it's not really all that substantial, and that's because the hogfish commercial fishery does not generate all that much revenue, as can be seen in the baseline estimates. The season length was estimated to be anywhere from fifty-five to 191 days under the various combinations of management measures. The status quo season, once again, was open all year.

For Georgia through North Carolina, again, the ACL alternatives are not expected to constrain landings, and so, therefore, our season length would be 365 days under any combination of alternatives. Here, the status quo landings and ex-vessel revenue would be reduced by zero percent to 47 percent, and, now, if our baseline landings estimates happen to be underestimates and maybe

they actually would have harvested more, then the higher the ACL selected, the higher the potential landings, the higher the economic benefits. That type of qualitative discussion, I believe, is included in the economics effects discussion within the actual amendment.

This is when I would like to open it up for questions. For model details on the model, if you want model fit statistics or anything along those lines, I encourage you to look at the corresponding files that were included in the briefing book. Thank you very much.

DR. MACLAUCHLIN: Just for everyone on the webinar and the SEP members, that first bullet is Attachment 2b. Then the Excel file is a link that I sent you. It's actually an attachment in the SSC briefing book.

DR. CROSSON: Does anybody have any questions for Dave?

DR. WATERS: I do have a question about the calculation of the predicted landings for the Florida East Coast and Keys Region. When I'm looking at this graph, which is labeled Figure 1 in the attachment, it looks like there's a long-term pattern in which landings increased for three or four years and then there's a substantial decline, so that the long-term pattern is a decline. Here, post-2010, we have this four-year increase, and then the prediction is for a much larger increase in the near future. I'm wondering, why isn't the prediction for a big decline, similar to what we had in that previous historical period?

DR. RECORDS: That would probably have to do with how the SARIMA model was specified. This was a non-stationary time series, and so the difference is at one and twelve, to handle non-seasonal and seasonal trends. I think, as you get further into the future, you're only picking up the past few periods, and so the increasing trend is kind of just compounding on top of itself and leads us into the future, and this is one of the problems with using a time series model to predict multiple periods out into the future.

I think they're very good at predicting a single period into the future, but, if we want to go several years out, the uncertainty gets very large, and so, again, taking an average annual landings estimate may have been just as valid as using the SARIMA model, but that is what the SARIMA model forecasted, and the SARIMA model did have a good fit to the data.

DR. SERCHUK: I'm with the SSC, but now is as good a time as any to follow up on the observation. I am wondering, just to gauge how far off the model might be, given this pattern that we've seen now multiple times, I wonder if you had fit the model the first three periods. If we could go back to the graph for a second, you can see that between 1992 and 1996 that we had three points that increased and then we came down again. Then there was another period between 2000 and 2004, which we've seen three points increase, and then 2005 to 2008.

The analyses that predicted for the future show landings above 20,000 pounds, and I'm just wondering, if you validated the model, or perhaps if you wanted to assess how sensitive the model was to the dimensions that were just talked about, in terms of the last data points, could you see what would happen after 2004, what you would have predicted in 2005, 2006, 2007, and 2008, based on the three points?

DR. RECORDS: I believe you're talking about out-of-sample predictions, and that's something that I did do during the model design phase. I would estimate the model and leave out some of our actual observed years. The estimates came out very good, and, again, the issue just becomes, as we go way out into the future, the uncertainty is just rapidly expanding, and I tried to capture that in those prediction intervals. Really, we're just trying to -- This is one of those situations where statistics is more of an art than a science, I think.

We're making an assumption that that trend is going to continue, and there may be another approach. The uncertainty is so large that you probably could do a variety of different approaches to estimating landings in 2017. If the SSC or the SEP has recommendations on a better way to estimate those landings, we could always revisit this and do so.

DR. DUMAS: Two questions. One is on the time series of landings slide. You have a lag in there for four years, because there seems to be --

DR. RECORDS: No, it was the difference by one and twelve, and so it's just a one-year lag, but it's done seasonally, and so you get the monthly pattern.

DR. DUMAS: Right, and I think that's good and appropriate, but you might also want to check out a lag at four years, because it looks like every four years, roughly, it's peaking and every four years it's troughing, and so there might be some biological maybe cohort something -- I don't know what the life cycle is like for hogfish. Do they take four years or five years to reach maturity or something like that? There could be some kind of biological reason for why there is this sort of four-year peak to trough cycle, and if you added the four-year lag, it might improve fit. I don't know, but that's just one possibility.

DR. RECORDS: Yes, we could try and do that. When I was looking at fitting SARIMA models, a lot of the recommendations that I read were not to put in multiple differences. It hurts your model fit and your predictions. I mean I can try and play around with a four-year lag, in addition. I did try all different combinations of lag and autoregressive terms, moving-average terms. This is the best that I came up with, but I'm happy to look at that again, and I do see what you're saying about that four-year pattern.

DR. DUMAS: Or maybe something where you've got also, in addition to the landings variable and differences in lags, maybe some other independent variable that has something to do with either the biology or the climate that would somehow explain the -- The four-year pattern seems to be pretty pronounced, at least over the time period that we have, and so there might be something behind that. Anyway, that's the first question.

The second question is could we go back to Slide 2 or 3? I know that's not a very precise request. How about Number 2? That's definitely not the correct slide. Keep going. Stop. It's the one with the summation symbol. The trip limits, should that be percent remaining? Should that be one minus that? Is that percent caught?

DR. RECORDS: No, because it's percent remaining of the landings, because you're getting rid of -- You're basically taking a trip and you're taking its landings, and, if the landings were over the trip limit, you're just setting it at the trip limit, and so that's how much we would expect would be left. If there were exactly the same number of trips and they went out and they would have

encountered the same number of fish in their nets or on their longlines, and then they would throw back anything above the trip limit, and so it's percent remaining. Then we would apply the baseline landings to get some sense of new landings under these different trip limits.

DR. DUMAS: The numerator is how many were landed, right?

DR. RECORDS: Yes, pounds landed up until the new trip limit that we're proposing.

DR. WATERS: I would like to follow up on this, since we got to this slide right now. I am also referring to Attachment 2b that was given to us. This is the text description of the model that you did. I would recommend that you do the computation for the minimum size limits first, rather than the computation for the trip limits first.

It seems, to me, that the result of the trip limit analysis does depend on the presence or absence of the minimum size limit, and so if you have a catch of say 200 pounds per trip, and you're going to lose about 10 percent of that because of the minimum size limit, you would want to account for this in your computation. I would think that the analysis for trip limits would be conditioned on the results of the analysis for the minimum size limits.

In your write-up, in 2b, you acknowledge that fact, I think, but you try to dispense with it in a couple of footnotes, saying that you're working with two different datasets, but I'm not exactly sure why that's a problem that would preclude you for doing the condition-type analysis, and I wonder if you could address that.

DR. CROSSON: He got cut off for a second. Hold on.

DR. RECORDS: I'm back. Can you hear me? (The rest of the comment is not audible on the recording.)

DR. WATERS: That's correct, and then applying the percentage lost to all of the catches before you calculate your trip limit analysis.

DR. RECORDS: They're independent of each other, and so they could overestimate the actual reduction, because, as you're pointing out, you may have already thrown back those undersized fish, and now you don't need to further reduce it to meet the trip limit. The reason that we weren't able to estimate them conjointly is because they come from two totally different datasets, and so we don't have fish size in the logbook data where we have the trip-level landings. The size limit information comes from I believe it's called the TIP database. It's a separate dataset, and so that was a limitation that we were forced to live with, and I just tried to write it up in the paper as best as possible, but you're absolutely correct.

DR. WATERS: Even though you have two different datasets, couldn't you do the analysis from the TIP dataset first and calculate that percentage that would be lost and then simply multiply all of your catches in the second dataset by that percentage and then do the trip limit analysis? Would that be too difficult to do?

DR. RECORDS: I think we could do that. I'm wondering if it would have a different effect on it. I think we could do that, yes. I'm not sure if it will come out to be the same result as just multiplying these two scalars by the baseline landings. I have to think about that.

DR. WATERS: It should not be the same result. I don't know if it would be a big difference in the result, but you would have fewer people bumping against the constraint of the trip limit if they've already thrown some fish back because of the minimum size limit.

DR. RECORDS: Right. Yes, I think that's a great idea. I think I can pretty easily go back and do that. I will just calculate the minimum size limit percent remaining scalar and go to the logbook data and I will multiply trip-level landings by that and then reduce them and then run my code for the trip limit scalar. I think that's a good idea.

DR. CROSSON: I like that as well. Any other thoughts on that aspect of it? Kari, this is actually addressing one of the items we're supposed to address, the one about the SARIMA modeling.

DR. MACLAUCHLIN: Brian, do you want to talk a little bit about those specific questions for them?

DR. CROSSON: Ben Hartig had something to add.

MR. HARTIG: Thank you. The only concern I had was with the value considerations, where it's about a 90 percent decline in the income coming from that fishery, but, when you look at it overall, through the commercial reef fish fishery, it's a relatively small impact. However, if you take that and possibly compare it to who is actually producing those fish, which is predominantly the spear fishermen, is that impact higher on them compared to the rest of the reef fish fishery? That was my question.

DR. RECORDS: In terms of breaking it down by effects on different gear types, I didn't go to that level. I think that's something we could look at, if you're interested in it.

MR. HARTIG: Yes, I mean especially the dive part of it, since so much of that fishery is caught by spearfishing and not by hook and line. I mean that's a pretty -- It's a defined segment of the fishery.

DR. RECORDS: That's something I would definitely be looking at anyway when I go to the do the Regulatory Flexibility Act analysis. I will get down to that level, to try and identify who are the actual vessels that are going to be affected by this and by how much, but that's something we could kind of frontload, and hopefully it would help the council decision process, and so that's a great idea. Thanks.

DR. CROSSON: Brian, you wanted to ask us some specific questions or --

DR. CHEUVRONT: I am trying to clarify what Kari wanted me to speak on first, because you've asked me a couple of different things.

DR. MACLAUCHLIN: One thing is that we had a question about just some more clarification about the recreational analysis and then just also make sure that all of your questions are answered by the SEP, all your specific questions.

DR. CHEUVRONT: Dave, I'm assuming you're still here. In looking at the second and third question, I think those two have been fairly well discussed by the SEP, but the -- I just wanted to make sure, but are you in agreement there, Dave, that the two questions regarding estimate of value for the commercial fishery using average price per pound of hogfish, that question, and then there has been some discussion about the modeling used, and Jim Waters' suggestion for reversing the order of the two separate analyses before you continue, I think that deals with that third question.

DR. RECORDS: Right, I think they covered those two questions. I think that was a good suggestion as well, about looking about putting another lag into the model, and so that was helpful. In terms of the assumption about no price effects, I don't think they explicitly discussed that, but I'm assuming everybody is okay with that assumption, based on the fact that they didn't have any questions.

DR. CROSSON: I'm fine with that. I don't know if anybody else has anything to add. Are you talking about the elasticity of the commercial value?

DR. RECORDS: Yes.

DR. DUMAS: I agree with that assumption.

DR. RECORDS: Perfect.

DR. CROSSON: Okay, but then we do have another question here about -- I guess, Dave, you feel that we've answered the second and third ones, but you would like feedback on using consumer surplus values for red snapper?

DR. RECORDS: That's on the recreational side. Again, there's a separate set of recreational decision tools, one for each subregion, and that estimates changes in landings, based on the different management measures. What I did is I inserted an economic component to those tools. It's very simple. It just multiplies a willingness to pay scalar by the landings in numbers of fish, to get at what the consumer surplus is. There wasn't a specific consumer surplus value for hogfish. We have values for snappers and we have values for groupers.

I chose to use the snapper value for those estimates, because I thought it was a better representation of what hogfish might be worth. The grouper values are much higher than the generic snapper value, again, leaving red snapper out of the picture. I don't know how you guys feel about using that willingness to pay value for generic snapper, as a substitute information for hogfish.

DR. CROSSON: Kurt, are you there? Did you have a question?

DR. SCHNIER: I was just going to agree with Chris and the others about the price stuff, and that was the previous point that was made.

DR. CROSSON: Okay. Do have thoughts on the consumer surplus numbers, using grouper as a substitute?

DR. RECORDS: It's snapper.

DR. CROSSON: My apologies.

MR. HADLEY: I had one thought, especially for the northern part of the population. At least around North Carolina, I would think it would be more so around a red snapper or grouper value than a generic snapper, and I'm assuming that the generic snappers are more along the lines of vermilions and mangroves. I guess that's the current estimate, just because it's such a high --

DR. RECORDS: Yes, I believe so, and there is a reference to the study that we used. It may have actually been John Whitehead's study, but I think it's only like a twelve-dollar willingness to pay for a snapper, and so I believe that it would be one of those species that you mentioned.

DR. WHITEHEAD: If I can, I would like to provide a general comment that, after listening to the awesome discussion on optimum yield and allocation between the recreational and commercial sectors, I think it would have been just as awesome to see the recreational analysis that's being presented to the SSC along with the commercial analysis. I think it would have helped frame that discussion and clarify a lot of things, and so I apologize for throwing that in at this point.

The consumer surplus estimate, and this is, again, a comment on the recreational presentation. I don't know if I'm allowed to do that, but that recreational presentation does a great job of presenting the uncertainty around the landings estimates and how they might change with different management actions, and then the twelve-dollar consumer surplus estimate is presented as a point estimate as the value for hogfish, and there's a lot of uncertainty about that consumer surplus estimate as well in the Haab et al. paper. That includes myself and Kurt Schnier and others.

There are several recreational demand models that are presented, and I don't think we came out as preferring the best model, but the range of consumer surplus values goes from nine to twenty-five dollars for a generic snapper, and the nine-dollar value, the lowest value, I think it was used and inflated to 2014 dollars, and that's where the twelve-dollar value comes from.

I would prefer that in an analysis like this that the uncertainty around the consumer surplus values are given as much attention as uncertainty around landings, recreational landings, and one more thing about the consumer surplus analysis that was chosen. In those models, the fishing mode was -- I think it was private boat, and the gear used was exclusively hook and line, and it's my understanding that hogfish trips, the gear is very different, and I have no idea how that might affect the consumer surplus for catching one of those fish, and so thanks.

DR. RECORDS: Thanks, John, and those are excellent points, and I suppose we could go back and look at another range of consumer surplus values to try and handle this. Again, because it's a scalar value, in terms of comparing management alternatives to other management alternatives, relatively speaking, it's going to be the same, regardless of which consumer surplus scalar value we use, but we could include that, and, really, we just tried to work with the best estimates we thought we could find for this fishery. I don't think there are any willingness to pay values for spear fishermen that we can get our hands on, and so we're just trying to work with what we have.

DR. SCHNIER: I just want to follow up here. John, thanks for recalling what we've done before better than I did. In any case, I had a quick question about differences in bag limits between hogfish and snapper. Can somebody just tell me briefly what the differences would be, because I'm wondering how that might come into trying to be conservative about what this value is for the surpluses.

DR. CHEUVRONT: Myra, can we get your help on bag limits for hogfish? I don't recall the recreational bag limits for hogfish.

MS. BROUWER: What the council is currently proposing for Florida is to go down to one fish per person per day, and, currently, the bag limit is five. Is that what you're looking for?

DR. SCHNIER: How is that relative to the greater snapper assemblage? I mean it's lot more, the bags, right, for those different species that we were looking at, from and John and I's work? I'm just trying to think that if you go from the five to one that you're moving pretty far up the demand curve, and so that willingness to pay from that could -- I mean the values could be higher. That's what I'm kind of concerned about. Hopefully this makes sense to some of the other economists hanging out there.

DR. RECORDS: I think that definitely makes sense, Kurt. I agree about your comments on the demand curve and moving further up that as we reduce the number of fish that would be harvested. Is there some way we can estimate that increase? I don't know if we have any kind of information on those demand curves by which to get an estimate, and we're kind of stuck just using these average scalar values, but you definitely raise a very interesting point.

DR. WHITEHEAD: I guess my understanding was the idea of you would use the snapper value for the hogfish, right?

DR. RECORDS: That's correct.

DR. SCHNIER: If we use the values that John was talking about, there is the lower end on the conservative side, but we don't know how -- I guess it could be a little bit higher, too, from there. It's just what I was thinking of.

DR. RECORDS: Got it.

DR. CHEUVRONT: I just kind of wanted to suggest, going back to the conversation that was related to the consumer surplus value and what to use and then trying to put some kind of a confidence interval around that. Dave, I would like to suggest that maybe you be in contact with John Whitehead and perhaps Kurt as well and help them, because they basically helped develop these consumer surplus values, in figuring out what an appropriate range would be of those values, because there are some big differences between these consumer surplus point estimates, based on different species.

As we have acknowledged, we really don't have anything for spearfishing, and any help that we could get in what would be a realistic interval to look at I think would be very, very helpful here, because it could be a huge difference in the economic effects when we start looking at the different

alternatives, based on what these ranges could be. If it's fuzzy, it's fuzzy, but we would like to be able to say that the value falls within a given range. Thanks.

DR. SCHNIER: I think the answer to that question sort of depends on what that number is going to be used for. I think when we have these uncertainties with these values that it's always kind of informative to think of it the other way, which is what does the consumer surplus have to be in order sort of warrant the decision that's being made and then think if the analysis is robust enough to validate that.

I kind of like to turn it on its head a little bit, from that perspective, because if you can get by with the conservative estimates and you ensure that it has the value that you're thinking of, that point, then I think you're doing a good job. It's when we start getting into the twenty-some-dollar per pound estimates that are sort of rationalizing a decision that things become a lot more tenuous.

DR. RECORDS: I think the impetus for the amendment in general, in terms of reducing the ACL by such a large amount, has to do with biological needs, and so I'm not sure how much the estimate we provide for consumer surplus is really going to affect that decision. I think it's just going to vary, based on whatever that scalar is. We could do a sensitivity analysis and use the snapper value and then also present it with the grouper value, but, again, if you're just looking at relative differences across those different alternatives, we're going to be able to get at that, regardless of which consumer surplus estimate we use.

DR. WHITEHEAD: Again, two points. In terms of the broader conversation that was conducted this morning, looking at the SSC agenda, it looks like the SSC will receive presentations on both the recreational model and the commercial model, and I don't know if there's going to be an explicit comparison of values at that time or not, but, if I was sitting in the SSC room and I'm looking at the numbers, I'm making the comparison myself, and so I think it's more important than just -- This discussion is more important than just attaching a scalar value to landings to monetize it.

The second point goes back to Kurt's point of where we're reducing the bag limit from five to one and those values could be very different. The consumer surplus values per fish could be very different, and that's a great point. I'm looking at the overview document, where this issue was raised, the consumer surplus issue was raised, and it mentions there is a consumer surplus value for grouper, but it is much higher. It's $135 for a first grouper and $133 for a second grouper and $69 for a third and so on.

I don't know if those numbers are from the Haab et al. study. I am thinking it's from another study that's done by Southeast NMFS economists, but when we do these types of analysis and you don't have the perfect number, the case and context specific number, we're doing benefit transfer, and benefit transfers can be conducted for a point estimate of willingness to pay. They can also be conducted for a demand curve, and so what's been laid out in our guidance document is a demand curve for grouper and, as far as I can tell, that might be the best estimate of diminishing marginal returns for a hogfish. I would take the percentage change and attach it to the twelve-dollars and crank it up by four fish and see how high it goes and consider that number as well in the analysis. Thanks.

DR. RECORDS: Thank you, John. That's an excellent idea.

DR. DUMAS: I just wanted to say that I agree what John and Kurt are saying about using the demand curve to look at the value per fish on the hogfish as the bag limit is reduced. Also, I wanted to go back to the time series model, the possible four-year lag. I'm looking at the hogfish entry on FishBase, and their generation time is three to five years, and so four years could be something -- Again, it sort of reinforces to look at the four years. Something that whacks them in a year, that effect comes back around four years later, and so if they've got that time to maturity of three to five years.

DR. CROSSON: I think we've gone through the questions that have been asked of us for this. Are we ready to move on to red snapper?

DR. CHEUVRONT: I just want to say I think that discussion on the consumer surplus is really, really helpful. I think Dave would probably agree, that it's going to help us to refine that a little better and make it a little more defensible.

DR. RECORDS: I would agree with that, Brian, and thank you to all the SEP members for reviewing this model and providing such helpful suggestions.

DR. CROSSON: Okay. On to red snapper. Chip Collier from the council staff is going to do a presentation, first.

MR. COLLIER: Thank you, guys. What this paper does is basically it was a bridge between when the stock assessment was going to be completed for red snapper and before the council meeting, and so it's more or less providing a glimpse of data for council members as they're being questioned about the finalization of the stock assessment, and so it gives a brief background on what's changed in the snapper grouper fishery.

As you guys know, there was a significant change in management for red snapper beginning in 2010, where the moratorium was established, and that continued in 2010 and 2011. Then mini-seasons were allowed in 2012, 2013, and 2014. 2015, the season was not allowed for red snapper, and so there were no landings, or minimal landings, for that, no directed fishery in federal waters, although there are some discards.

Those estimates for 2015 landings will be presented by National Marine Fisheries Service to the council at the June council meeting, and so this data has information from 2006 to 2014, and then concentrating on some areas from 2010 to 2014, when the shortened season or moratorium was in place.

Table 1 is actually the ABC, and, for red snapper, within the ABC, there are landings and discards that are included in that. On the left side of that, you can see the total removals for 2012 was 86,000 red snapper. We're doing this in numbers of fish, because discards are a significant portion of the overall landings for the red snapper. 2013, there was 96,000 fish. In 2014, it was 106,000 fish was the ABC, and, if you look over to the right, you begin to see our issues with this fishery, where the discards alone exceeded the ABC, and those are dead discards. Then the landings are constrained, and they were below the ABC that was allowed, but, once again, due to dead discards, they exceeded their ABC significantly.

Continuing down, on page 2, it is just the typical landings graphs. It's given to you in pounds, numbers of fish, and also discards. The discards are pretty significant in this. In 2008, that was the highest discard number. That was around 600,000 fish. In 2014, it was about half of that. These are separated out by sector for the two different sectors. Recreational is going to be in gray and commercial is in black. The commercial had very -- Actually, I had confidential landings in 2011, they were so low.

Seasonality, the first one is the recreational seasonality. This is weighted for the recreational fishery, and what I was trying to figure out was, prior to the shortened season and the mini-seasons, was there a season of typical harvest, and so, looking from 2006 to 2010, you can't really see any seasonal harvest patterns in that, and then if you also look at the discards, that could be continuing throughout the year. There's not really a great indication of exactly when the discards occur. They begin to peak up in the last few years, 2012, 2013, and 2014. Obviously they're going to be picking up right around the time when the mini-season is occurring.

Continuing on into the commercial seasonality, because the commercial season was constrained and we have very little information on the discards for the commercial fishery, it's just presented as landings, and I just have that from 2006 to 2009. Anything beyond that, it's very limited on -- The season was just constrained so much that it's not going to provide you much insight. Once again, you're not getting a great picture of if there is seasonality for red snapper. It seems like harvest is occurring pretty much throughout the year for this.

Continuing on to page 5, this is the length distribution for the red snapper in the recreational fishery. It goes from twenty-four centimeters on up to ninety-six centimeters, and I have it for you from 2006 to 2014. If you notice the black dot on there, that was the twenty-inch minimum size limit that was in effect prior to 2010, and the 2012 to 2014 time period, there was no minimum size limit, but I just had that on the graph just as reference for the other ones.

Prior to 2010, there was a definite peak right around the minimum size limit, a lot of fish that were being caught right around twenty inches. From 2012 to 2014, the fishermen are catching some fish smaller than the minimum size limit, but there is also a secondary peak at much larger sizes, around twenty-four inches. You're beginning to see some of those larger fish picked up.

Continuing down on page 6 to the commercial fishery, it's a very similar graph, with that dot on there representing the minimum size limit, with the ranges going from twenty-four centimeters on up to ninety-six centimeters. Prior to 2010, there was definitely a lumping around the minimum size limit. Then, after 2010, 2012 to 2014, you're seeing more of the larger fish represented in the commercial fishery.

The distribution of the recreational catch, we have number caught per angler, and so that includes number of fish that were harvested as well as number of fish that were released. 2010, we had a significant number of anglers that were catching four fish per trip, and you can see those occur throughout the time period. When fish are very present, it is possible to catch a lot of red snapper. The majority of the trips are catching less than a half a fish, and you can get a half a fish because it's averaged out amongst anglers on a vessel.

The next graph, on page 8, represents the actual landings of fish, and most fish -- In 2010 and 2011, when there was a moratorium, there were very few documented observations of red snapper.

2012, 2013, and 2014, when there was a mini-season, you're beginning to see more and more fish being harvested, and it's right around the legal limit that's allowed.

Going into the commercial fishery, this is a little bit extended from what was represented in the recreational fishery, because we don't have the discards and the trips that were targeting red snapper like we do for the recreational fishery. With this, prior to the mini-season going in place and the moratorium, it was possible to have trips catching up to 500 pounds of red snapper on a trip, but the dominant trip was the one to twenty-four pounds. Continuing into the mini-season, from 2012 to 2014, the dominant catch is fifty to ninety-nine pounds, and that's right around what the allowable trip limit was for red snapper.

I would like to go back to actually Table Number 1 and potentially get you guys to discuss potential things that the council should consider, given this information that we have presented to you, on things to consider when they're managing this fishery, especially when it is dominated by these dead discards, and the impact it can have on the overall management of the fish and on the ABC values.

DR. CROSSON: Chip, I have a question. Looking at Table 1, the mini-seasons were in 2012, 2013, and 2014?

MR. COLLIER: Yes.

DR. CROSSON: Okay, and so what were the discard numbers for 2010 and 2011, when there was no mini-season? Is that in Figure 1?

MR. COLLIER: I didn't put those numbers there, but it looks like they were similar to -- 2012 would probably be a good reference.

DR. CROSSON: What I see here is, looking at these numbers, we've been asked to give input on how to allow and lengthen the red snapper commercial and recreational season? Is that right?

MR. COLLIER: I wouldn't say allow and lengthen. I mean you can see this is going to be a very difficult fishery to manage, if we want to have any opening at all. Are there any considerations that we could potentially do or any ideas that you guys have for this fishery, so it's -- I mean when we have the mini-seasons, it was a nine-day season. That's not great. It's not great for estimation of recreational catch. They had to develop new methods in Florida to calculate harvest there. It perpetuates throughout several different things.

You have a shortened season like that, and fishermen get angry, because they can only do it three weekends out of the year. They also have a higher incentive to go out those three weekends more than any other time period. The commercial guys, they are -- There is obviously some targeting that was going on in that time period, when you're looking at the dominant catch was fifty to ninety-nine pounds, as opposed to the one to twenty-four pounds, and so I mean there are several different issues that go on here, and we're just trying to get some advice that the council can consider while they're making their management decisions, and it would be nice to get it prior to the October meeting. Do you guys meet annually or --

DR. MACLAUCHLIN: Yes, the SEP generally meets in the spring, but we could always have a webinar meeting or something like that, but we were hoping -- This is still in the options paper phase, and so it's just getting some input from you all about potential ways to manage before it goes to the council. There's a good chance that you will see more detailed information that the council is considering.

DR. SCHNIER: I had a question. To what degree would the council be amenable to sort of more of a market-based mechanism, given the fact that you've got really, really short seasons here, like nine days and stuff, and -- Have they thought about whether or not they would think about things like auctioning tags or stuff like that to have it be more accountable?

DR. CROSSON: I was wondering about that too, Kurt, because I know that was an option at one point, but, when I'm looking at this, a lot of this is the discard issue, and it looks like, looking at the 2010 and 2011 data in Figure 1, the bottom and the number discarded, it still looks like even if you -- Again, it looks like it's a discard issue, even with the closed season altogether, and so I'm not sure how you can address this.

DR. SCHNIER: I guess one way of doing it would be just accounting for that a loss, so that you have the expected loss per tag, and so the tag would be lower, knowing that there's a discard loss as well.

MR. HARTIG: We've thought a lot about this, in trying to find a way to turn dead discards into landed catch. That's the basis of what we're going to be trying to do with this fishery. Whether or not NMFS buys into what we're going to propose is still a matter of question. You know, the season part is one thing, having a recreational season of some length. I mean we want to try something different, based on the fact that the discard mortality estimates are the most uncertain input into the assessment and that they have dramatic impacts on the assessment as well.

Knowing that, we want to try and have a conservative way to have a season for red snapper, based on the tags is one of them. For-hire limited entry is one of the things we're thinking about, which these are all things you guys are going to chime in on when you get a chance to in the future. We're talking about a recreational season, which I mentioned. We're talking about a possible depth contour of somewhere around 100 to 120 feet, where you may be able to fish shallower than that for some of the other species in the complex, but, during that season we're talking about, you would only be able to fish in that depth for any of the other species, because of the discard concerns for red snapper. That's another thing we're thinking about.

I mentioned limited access for the for-hire. Possibly sector separation and, down the line -- Those are things that have been done in the Gulf to get more accountability in this fishery, and that's what we're looking to do, is increase accountability, to get some more information on these discards. Mandatory reporting, we've talked about mandatory reporting now as part of our options for the recreational fishery. Do we use this as some portion of it, 20 or 25 percent, and then alternate those every year, to try to get a better handle on what the recreational fishery is going to catch? We don't know how many people will report and how you validate that. That all remains to be seen, but I think, with the recreational reporting, on average, is that other states are doing it.

We're going to have a lot of information in the near future about what the Gulf has done with red snapper and their reporting requirements and how well recreational reporting has worked. You've

got the iSnapper example of the for-hire charter boats in the Gulf. You've got the Gulf reef fish Florida program, which requires reporting now for red snapper, and I think -- I'm not sure about the other species in the Gulf, but I know they require red snapper reporting for the recreational fishery, and so I think recreational fishery reporting has its problems, but I think those are going to be overcome in the next few years and we're going to be able to move forward with some kind of recreational reporting.

You just have to balance the uncertainty in the discards versus the uncertainty in the recreational reporting requirements over time and how accurate those are going to be, but we have -- Like I said, there's some other things that I'm leaving out here about what we've proposed, but these are things that -- We want to use adaptive management and see what the recreational catches are going to be over time and see how these tie into how many discards can we allow to be landed without going over your discard estimates that you have now, which are constraining your fishery considerably.

That's just some of the things that we've been thinking about in moving forward with a fishery in the future, because the council's concern is that, as I mentioned, that the recreational discards are so uncertain that we believe that there can be a fishery occurring that allows us to better show what the catches are and what the discards are at those points and how to minimize some of those discards, and so I will leave it at that.

DR. WATERS: I think we can probably make a couple of suggestions that may or may not be good, but I want to ask, first, are you concerned mostly about discards of red snapper from people who are fishing for red snapper or are you worried about discards of incidental catches by people who are fishing for other species and they just happen to be running into red snapper?

MR. HARTIG: We're concerned about both. I mean we want to minimize discards as much as possible across the board. You see that we can't have a fishery, based on the discards now, and so somehow changing some of those discards into landed catch is the goal, but we also want to minimize discards throughout the year, and that's why we talked about some season or some depth contour, where you can reduce your discard mortality significantly throughout the year.

DR. WATERS: Okay, and so here goes. Your bag limits, your trip limits, and your seasons are pretty short and pretty small right now, and so it sounds like the traditional management measures are -- You have wrung about as much out of them as you can get, and so here are some ideas that are trying to be out-of-the-box thinking, and you may consider them to be wild and crazy, but here's some ideas.

If discards are primarily when they're fishing for other species, you might want to consider maybe a single season for the entire fishery. Right now, you have open seasons for different species that are all over the calendar, and if you're fishing for one species and you're picking up red snapper incidentally for a different species, you might want to go to more of an ecosystem-type approach, where you have a single season for all the species and let them fish during that time.

Now, I'm sure there are all sorts of detail problems of how to implement that, and so I'm just throwing that out as kind of a wild-and-crazy idea. I don't know whether it would go anywhere. It seems, to me, if you have discards that are primarily occurring for other species, another possible management alternative is related to the depth contour that you just mentioned, but you might want

to permanently close certain -- Say a core red snapper area, enough area that you can feel confident that you're getting the biological conservation that you need. Then just let fishermen go for it in the other areas. Just let them go. Over time, there would be a huge discrepancy in the open areas and the closed areas, but go for it.

DR. CROSSON: I'm having a flashback to a few years ago, when there were certain closed areas that were being proposed for dealing with red snapper, and the council chose other things.

MR. BOWEN: To your point, and you brought up could we avoid them, but it's been on record in testimony with fishermen and council members that are also fishermen that south of the 30/100 line that the fishermen cannot avoid them. North of the 30/100 line, fishermen can't avoid them, and I just wanted to mention that, that that's testimony, but I like your ideas, and I am steady taking notes, and so if you have more, I'm sure willing to listen.

DR. YANDLE: I just wanted to second the idea of really trying to do some more administrative simplicity here, just step back the degree -- Just sort of stepping back and thinking about -- Every single time, I'm hearing about this complex. There are so many different moving pieces to it, and it's really hard, I think, for anybody, us, the council, the commercial and recreational fishers, to easily keep track of it and to understand what's going on, and so I would support what Jim was saying, in terms of how do we step back and look at broader, more holistic ways of dealing with it, whether that's a single complex fishery or if it's simplifying with spatial depth, I'm not in as great a position to say, but, I think, from a policy perspective, this has got to be simplified.

MR. BOWEN: Just for some clarification, you said a single season. Do you mean maybe a single start date and a single end date with no fishing for snapper grouper species outside of that closure date, kind of like a deer season or a duck season?

DR. WATERS: That's exactly what I was suggesting, yes.

DR. CROSSON: I'm going to get to Chris Dumas here in a second, but I do believe that -- I think it's Pew, but it's one of the environmental groups that's trying to do a study right now of what the impact of that might be in the Gulf of Mexico for recreational fisheries, if they had a single closed season. I know that that study is undergoing right now, but I think it's just beginning though.

DR. DUMAS: I think I hear my parole officer coming down the hall towards my office, and so I'm going to have to beat a hasty retreat here, but, seriously, I've got to go give an exam, and so I appreciate the opportunity to give some comments today, but I'm going to be signing off for a few hours here while I go inflict some econometric pain, but I will leave you in the capable hands of my other colleagues on the SEP, and I hope to join you in a few hours.

DR. CROSSON: Chris, we wrap up at noon, and so I think this may be the sayonara for you right now.

DR. DUMAS: Then this is my swan song. Bye, guys, and thank you.

DR. CROSSON: This shift that Jim is talking about, to having a single season for multiple species and trying to synchronize it, is just kind of the opposite of the way that the councils tend to act in

the Southeast. I think they're usually trying to provide access year-round, so that people are not disproportionately impacted and they always have something to go for.

MR. BOWEN: For the commercial sector, we heard in our visioning process that took place that the commercial guys are wanting and looking for a year-round fishery, but, on the recreational side, maybe not so much. It has been talked about, the single season. There are several details or problems, if you would, that would need to be worked out.

One thing that arises is our wide geographical range in the South Atlantic, and what works for a single season for North Carolina really might not work for Florida, but if we're keeping in mind the terms of our red snapper and the problems that we're seeing with the discards, the index of abundance is Florida, south of the 30/100 line. I think, at the 30/100 line, when this idea has been brought up before, we've heard, well, you will have fishermen going into an open area when they're closed, and vice versa.

The 30/100 line that I keep bringing up is probably the less, and this is anecdotal evidence, by the way, but it's probably the less populated, for lack of a better term, mixing zone at the Georgia/Florida line. There's probably less effort right there than anywhere south of there, and so I like the idea, but just keep in mind the geographical differences in the South Atlantic are huge, and what works for Georgia might not work for South Florida, and so we would need to come up with different seasons, I guess.

DR. WATERS: I just wanted to add that I'm not necessarily advocating these things, because I haven't really thought them through a lot, but it seems like you're sort of in a box here, and I'm trying to think of ideas that maybe haven't been pursued enough for the future.

MR. BOWEN: Well, I like your testimony. I have actually brought this before the council before, and I think, with the negative outcome of red snapper, it may gain some traction, and so it's definitely a solution that could work. We just need to work out the details. Thanks.

DR. CROSSON: Other thoughts on red snapper?

DR. BLOUNT: Judging from what Zack said, I may know the answer to this question already, but I don't know really very much about the distribution of red snapper in the South Atlantic. Is the distribution such that closing core areas is something that could be done fairly readily? In the Gulf of Mexico, it's very easy to do that, because of the concentrations off of the West Florida Shelf, but I don't know about the South Atlantic.

MR. BOWEN: The east coast of Florida, historically, has caught 97 percent of the snapper in the South Atlantic, and so it's a very core area. Don't get me wrong. We catch them off of Georgia and South Carolina and North Carolina as well, but, historically, the east coast of Florida is catching 97 percent of the snapper being caught.

DR. CROSSON: Am I remembering correctly that it's mostly the northeastern Florida, right? It's the Cape Canaveral up to the Georgia border?

MR. BOWEN: That's correct. The 30/100 line down to about the Cape. Now, again, they do catch them south of there and we do catch them north of there, but that is really the heart and the center of abundance.

DR. CROSSON: We also have listed here -- Do we have any recommendations for economic and social analysis?

DR. MACLAUCHLIN: Just a general question, and anything else that you would like to add. Hopefully, we will be bringing back, even if it's via webinar or email, recommendations to you all later in the year.

MR. HADLEY: When I was reading over this, I was thinking of possible ways to tie it into the snapper grouper blueprint, and one thing, and I don't know if it's a good idea or not, but it would be interesting to get some input, is changing the commercial season to be available during the snapper grouper shallow-water complex closure. I'm just thinking that red snapper would be a good substitute product for grouper and availability -- There again, increasing the availability of a high-quality product throughout the year. There's a lot of uncertainty there, in not knowing what the future holds and what the limits would be. No one is going to go out for seventy-five pounds of red snapper, I would think, but, in the future, as it rebuilds, possibly having those high value fish available when another high-value fish is closed, and so looking at that shallow-water grouper closure.

DR. CROSSON: Any other thoughts? Okay. Thanks, Chip.

MR. COLLIER: Thank you, all, very much for your comments.

DR. CROSSON: I have listed next on the agenda to get back to Kari with recent and developing council actions. It's 11:26.

DR. MACLAUCHLIN: We have an attachment that we sent out. This is our document. This is Attachment 4. We keep this updated and it's just the active amendments. I am not going to go through all of these, but I just wanted to point out a few of them, just so you all are aware of some up and coming -- Some current decisions and potential upcoming decisions that we may bring back to you or anything else that you may just be interested in.

We have the hogfish that we're working on. We're also working on an amendment for mutton snapper. We have spiny lobster that has exceeded its ACT, annual catch target, a couple of times during the past couple of years and the annual catch limit twice in the past three years. The SSC will probably be asked to evaluate that again in October. I'm going to give them an update on a review panel recommendations and advisory panel recommendations.

Then we also have something that may be of interest to you. We had a mackerel amendment with lots of actions for king mackerel recently. That was approved, and it had an action in there to change the recreational/commercial allocations for Gulf king mackerel, and so a similar situation, where recreational king mackerel, Gulf king mackerel, was not hitting its ACL, but the commercial were bumping up against it, and they were also kind of reallocating among their commercial zones, and some of those zones close earlier, close early in the year, and so they wanted to get a little more quota to those commercial zones.

They took some of the similar ideas that we had for Atlantic Spanish mackerel, when the council was exploring that, where it was a permanent reallocation and incremental, moving allocation back and forth, and they were looking at those, but then they also -- The Gulf Council also developed a really interesting alternative in which there was an incremental moving from recreational to commercial until the recreational hit a certain trigger, and then it would go back to the status quo.

What they were hoping to do was put this into place and be able just to use a different kind of allocation approach and mechanism, and so there were some concerns about that, and so they actually just took it out of the amendment they were working on, or the councils were working on, so that everything else could continue on and get implemented, and it was updated annual catch limits and everything.

They're going to put that Gulf king mackerel allocation action in a new amendment, so that they can work on it and make sure everybody is comfortable with it. This is a joint amendment, and so both councils have to approve it, and so the South Atlantic Council will be looking at it, but it just a different way of looking at changing the recreational and commercial allocation, and so that's interesting.

Then, for Atlantic cobia, Atlantic cobia, the Georgia through New York -- The stock boundary between cobia is at the Florida/Georgia line, and so Atlantic cobia is only north of the Georgia line, through the Mid-Atlantic, and cobia, in 2015, exceeded the recreational ACL by a substantial amount, and the accountability measure for that is to shorten the subsequent fishing year, recreational fishing year, and so that will close, as of now, June 20, 2016.

This is right about the time that the North Carolina and Virginia fishermen really start targeting cobia, and so this is going to have an economic and social impact on them. The council is looking at a framework amendment. That's one that can move a little faster, and it's just management measures, and they are going to look at some bag limits and trip limits. Then they will also potentially be working with the Atlantic States Commission to look at like a state-by-state quota, maybe, or some kind of state-by-state season, just so that everybody can have access to the cobia, and so that's in the works.

Then we also -- I wanted to just bring to your attention that we had a Citizen Science Workshop in January. This is an initiative by the council, and it was here, at the hotel. It was a three-day workshop. It brought in folks from all over, from the agencies, from the state agencies and the federal agencies, and our data folks and Sea Grant people and fishermen. There were breakout groups, and it was to kind of go over what kind of citizen science projects, how would you handle the data, and where would funding come from and all kinds of just brainstorming ideas and then also obstacles that may come up, so that the council can start working towards developing a citizen science program here. We will keep you updated on that.

DR. CROSSON: Any questions for Kari? Moving on --

DR. MACLAUCHLIN: If there is anything that we talked about before that you would want to bring back up --

DR. CROSSON: Okay. Any other business of note, before I start assigning writing? Good. We're moving ahead of schedule here. I am looking at my -- Usually, when we've had these

meetings, generally two or three of us at a time take hold of something and sort of do a quick write-up. Looking at what's on the -- The biggest discussion we had was the OY discussion, and I have lots of notes going in different directions on that, but we also have the SSC as a whole that's going to be looking at Amendment 37 and also the red snapper management stuff, and so those both definitely need to be done before the end of the SSC meeting, because we need to make recommendations to the SSC.

Going in order, do we have any volunteers for the OY, who wants to start pulling that together, several people, and keep in mind if you don't volunteer that you're likely going to get get stuck with one of the other ones. Let me see who spoke the most. How about the hogfish thing? Jim, you and Kurt had some very specific recommendations, some technical recommendations. Do you have time in the next half-hour here to start writing something up and maybe email back and forth with Kurt? Anyone else? Who else was part of that discussion? John Whitehead, if you provide their emails, you can do a little write-up and then, in the next couple of days, get it to me. All right. That's that.

Red snapper management, you also spoke a lot on that. Who wants to take over on the writing of the red snapper? Ben or Tracy, can you try to -- Would you rather take the lead on the OY stuff, in pulling together a lot of that? I mean I will help you on the OY one, if you would rather do that. Then Jason and myself and you will start working on the OY one, and we'll start pulling those things together. That's it, right? That's the only three items that we had.

It's 11:36 right now. Maybe we'll take half-an-hour and work on those things, and then I know people need to go to lunch and some people need to depart. What time is the SSC meeting this afternoon? Is it 1:30? Okay. Unless I have any objections to that, we are adjourned.

(Whereupon, the meeting was adjourned on May 3, 2016.)

Certified By: _____ Date: 4/24/17

Transcribed By:
Amanda Thomas
May 18, 2016

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SOCIO-ECONOMIC PANEL OF THE SSC

Dr. Scott Crosson, Chairman
NMFS SEFSC
75 Virginia Beach Drive
Miami, FL 33149
305/361-4468
Scott.Crosson@noaa.gov
6/09*, 6/15*

Dr. Ben Blount
SocioEcological Informatics
13239 Spring Run
Helotes, TX 78023-4568
21-627-3265
Ben.blount23@gmail.com
06/13*, 6/15*

Dr. Christopher Dumas
Dept. of Economics and Finance
UNC Wilmington
601 South College Rd.
Wilmington, NC 28403
910/962-4026 (ph)
910/962-7464 (f)
dumasc@uncw.edu
6/09*,6/15*

John Hadley
NC Division of Marine Fisheries
3441 Arendell Street (P.O. Box 769)
Morehead City, NC 28557
(252) 808-8107 (ph)
john.hadley@ncdenr.gov
06/13*, 6/15*

Dr. Sherry L. Larkin
Food & Resource Economics Dept.
P.O. Box 110240, University of Florida
Gainesville, FL 32611-0240
352/392-1845 Ext. 431(ph);
352/392-3646 (f)
SLarkin@ufl.edu
6/09*, 6/15*

Dr. Jason Murray
NOAA Office of Response and Restoration
1305 East-West HWY
Silver Spring, MD 20910
jason.murray@noaa.gov
6/10*, 6/15*

Kurt Schnier
Professor of Economics
University of California, Merced
School of Social Sciences, Humanities and Arts
5200 North Lake Road
Merced CA 95343
kschnier@ucmerced.edu
6/09*, 6/15*

Dr. Jim Waters
700 Hedrick Blvd.
Morehead City, NC 28557
252/726-6227 (ph)
jwaters8@gmail.com
6/15*

Dr. John C. Whitehead
3094 Raley Hall, Dept. of Economics
Appalachian State University
Boone, NC 28608-2051
828/262-6121(ph); 828/262-6105 (f)
whiteheadjc@appstate.edu
6/09*, 6/15*

Dr. Tracy Yandle
Dept. of Environmental Studies
Mathematics and Science Center
Emory University
400 Dowman Dr.
Atlanta, GA 30322
404/727-4216 (ph)
404/727-4448 (f)
tyandle@emory.edu
6/11*, 6/15*

* Denotes year of appointment. Note that as of June 2015, members of the SEP are appointed for 5-year terms.

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2016 COUNCIL MEMBERSHIP

COUNCIL CHAIR
Dr. Michelle Duval
NC Division of Marine Fisheries
3441 Arendell Street
(PO Box 769)
Morehead City, NC 28557
252/808-8011 (ph);
252/726-0254 (f)
michelle.duval@ncdenr.gov

VICE-CHAIR
Charlie Phillips
Phillips Seafood/Sapelo Sea Farms
1418 Sapelo Avenue, N.E.
Townsend, GA 31331
912/832-4423 (ph); 912/832-6228 (f)
Ga_capt@yahoo.com

Robert E. Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St., Suite 200 A-N
Arlington, VA 20001
703/842-0740 (ph); 703/842-0741 (f)
rbeal@asmfc.org

Anna Beckwith
1907 Paulette Road
Morehead City, NC 28557
252/671-3474 (ph)
AnnaBarriosBeckwith@gmail.com

Mel Bell
S.C. Dept. of Natural Resources
Marine Resources Division
P.O. Box 12559
(217 Ft. Johnson Road)
Charleston, SC 29422-2559
843/953-9007 (ph)
843/953-9159 (fax)
bellm@dnr.sc.gov

Zack Bowen
P.O. Box 30825
Savannah, GA 31410
912/398-3733 (ph)
fishzack@comcast.net

W. Chester Brewer
250 Australian Ave. South
Suite 1400
West Palm Beach, FL 33408
561/655-4777 (ph)
WCBLAW@aol.com

Mark Brown
3642 Pandora Drive
Mt. Pleasant, SC 29466
843/881-9735 (ph); 843/881-4446 (f)
capt.markbrown@comcast.net

Chris Conklin
P.O. Box 972
Murrells Inlet, SC 29576
843/543-3833
conklinsafmc@gmail.com

Jack Cox
2010 Bridges Street
Morehead City, NC 28557
252/728-9548
Dayboat1965@gmail.com

Dr. Roy Crabtree
Regional Administrator
NOAA Fisheries, Southeast Region
263 13th Avenue South
St. Petersburg, FL 33701
727/824-5301 (ph); 727/824-5320 (f)
roy.crabtree@noaa.gov

Ben Hartig
9277 Sharon Street
Hobe Sound, FL 33455
772/546-1541 (ph)
mackattackben@att.net

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

2016 COUNCIL MEMBERSHIP (continued)

Doug Haymans
Coastal Resources Division
GA Dept. of Natural Resources
One Conservation Way, Suite 300
Brunswick, GA 31520-8687
912/264-7218 (ph); 912/262-2318 (f)
doughaymans@gmail.com

Dr. Wilson Laney
U.S. Fish and Wildlife Service
South Atlantic Fisheries Coordinator
P.O. Box 33683
Raleigh, NC 27695-7617
(110 Brooks Ave
237 David Clark Laboratories,
NCSU Campus
Raleigh, NC 27695-7617)
919/515-5019 (ph)
919/515-4415 (f)
Wilson_Laney@fws.gov

Jessica McCawley
Florida Fish and Wildlife
Conservation Commission
2590 Executive Center Circle E.,
Suite 201
Tallahassee, FL 32301
850/487-0554 (ph); 850/487-4847(f)
jessica.mccawley@myfwc.com

LTJG Tara Pray
U.S. Coast Guard
909 SE 1st Ave.
Miami, FL 33131
tara.c.pray@uscg.mil

Deirdre Warner-Kramer
Office of Marine Conservation
OES/OMC
2201 C Street, N.W.
Department of State, Room 5806
Washington, DC 20520
202/647-3228 (ph); 202/736-7350 (f)
Warner-KramerDM@state.gov

DAVID RECORDS
DR. MARCEL REICHERT
DR. ALEXEI SHAROV
DR. FRED SERCHUK

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

COUNCIL STAFF

Executive Director
Gregg T. Waugh
gregg.waugh@safmc.net

Deputy Director – Science & Statistics
John Carmichael
john.carmichael@safmc.net

Deputy Director - Management
Dr. Brian Cheuvront
brian.cheuvront@safmc.net

Fishery Scientist
Myra Brouwer
myra.brouwer@safmc.net

Financial Secretary
Debra Buscher
deb.buscher@safmc.net

Admin. Secretary /Travel Coordinator
Cindy Chaya
cindy.chaya@safmc.net

Fishery Scientist
Chip Collier
chip.collier@safmc.net

Administrative Officer
Mike Collins
mike.collins@safmc.net

Fishery Biologist
Dr. Mike Errigo
mike.errigo@safmc.net

Public Information Officer
Kim Iverson
kim.iverson@safmc.net

Fisheries Social Scientist
Dr. Kari MacLauchlin
kari.maclauchlin@safmc.net

Purchasing & Grants
Julie O'Dell
kari.maclauchlin@safmc.net

Senior Fishery Biologist
Roger Pugliese
roger.pugliese@safmc.net

Fishery Outreach Specialist
Amber Von Harten
amber.vonharten@safmc.net

SEDAR Coordinators
Dr. Julie Neer - julie.neer@safmc.net
Julia Byrd – julia.byrd@safmc.net

SAFMC Socio-Economic Panel Meeting - May 3, 2016

First name	Last name	Address (If contact info is on file, type 'on file')	City	State	Zip Code	E-mail	Sector / Affiliation / Organization
Lora	Clarke	on file					Pew Trust
Rusty	Hudson	on file					
Zack	Bowen	on file					*SAFMC member*
Ben	Hartig	on file					*SAFMC member*
Peter	Barile	on file					

SEP WEBINAR ATTENDEES MAY 3, 2016

Last Name	First Name	Email Address
Ballenger	Joey	ballengerj@dnr.sc.gov
Byrd	Julia	julia.byrd@safmc.net
Dumas	Chris	dumasc@uncw.edu
FARMER	NICK	nick.farmer@noaa.gov
Freitag	Amy	afreitag33@gmail.com
Helies	Frank	fchelies@verizon.net
Hudson	Rusty	DSF2009@aol.com
Iverson	Kim	kim.iverson@safmc.net
Larkin	Michael	michael.larkin@noaa.gov
MacLauchlin	Kari	kari.maclauchlin@safmc.net
Mehta	Nikhil	nikhil.mehta@noaa.gov
Ralston	Kellie	kralston@asafishing.org
Records	David	david.records@noaa.gov
Schnier	Kurt	kschnier@ucmerced.edu
Southard	Lee	leesouthard1801@comcast.net
Whitehead	John	whiteheadjc@appstate.edu
holiman	stephen	stephen.holiman@noaa.gov