

Meeting Minutes

Florida Beaches Habitat Conservation Plan

Steering Committee

Quarterly Meeting

Tuesday, March 20
9:00am-4:00pm
Florida Fish and Wildlife Conservation Commission
Bryant Building, Room 272

Chair: Thomas Eason, FWC
Co- Chair: Danielle Fondren, DEP

Steering Committee members present: Thomas Eason (Chair; FWC), Danielle Fondren (Co-Chair; DEP), Brett Moore (Humiston & Moore), Gary Appelson (STC), Ryan Matthews (League of Cities), Julie Wraithmell (Audubon), Blair Witherington (via phone; FWRI)

Other participants: Kat Diersen (FWC), Bob Ernest (EAI), Gene Chalecki (DEP), Robbin Trindell (FWC), Kim Colstad (CT), Michele Mayo (DEP), Jackie Larson (DEP), Tom Ostertag (FWC), Jimmy Sellers (CT), Trish Adams (via phone, USFWS), Sally Davenport (via phone; CT), Kelly Samek (FWC)

Recorder: Rebecca Pfaller (FWC)

TE Welcome. (Introductions)

KD We'll start by addressing minutes from the December 2011 meeting. We do have a quorum, so we can vote on the minutes from the last few meetings. We'll start with December 2011 minutes. Any comments/ concerns/ corrections?

BM There were a couple areas that were highlighted. Was that significant?

KD That was just an oversight on not cleaning it up. Thanks for catching that. Any other concerns?

TE There was one typo in spacing, but nothing really substantive. I'll send it to Kat in an email. Can we block approve all of these? Kelly, can we do that?

KS You can do that.

BM I move to approve the minutes from the last four meeting.

JW Second.

*All 2011 minutes approved.

KD We'll move forward with reviewing the agenda for today. I'll take a few minutes this morning on the staff reports, just covering the day to day business. We'll spend the next part of the morning going over the final study reports. After a quick break we'll move into a discussion of Chapter 9, Alternatives Analysis. The Steering Committee had indicated an interest at our last meeting of diving into the draft chapters at greater length, so we set up a process to allow the Steering Committee members to go into these, and we're going to start with Chapter 9 today. We'll have a working lunch. The entire afternoon is open to discuss the team's progress on determining take. We thought we'd start from the beginning and go through our development of this and get your feedback. I just want the team to have an opportunity to go as far and deep as they want into this topic. So those are the major points of the agenda. If you don't have any questions or concerns, we'll get right into it.

TE We have an interesting situation where the Chair and Vice Chair are the newest members of the committee, so I will ask a lot of questions, and I encourage Danielle to do the same. So I just wanted to remind you all that we do have new members, and I'd encourage everyone to not be shy about asking questions, because it will help us all out.

Staff Reports

KD Workbooks. Rebecca and I updated these for you. There are a couple of things in the Table of Contents. The Gantt chart is supposed to be in the first section, but it's actually in the back of your book, along with the primer. We wanted to point out that we thought it would be wise to start keeping electronic versions for you, so in the front you'll find instructions on how to go online and find those documents on an ftp site. We'll let you know when we've updated these, so you can go online and update your workbooks. Feel free to suggest revisions or reorganizations. Reminder, meeting dates for 2012, June 13, September 30, December 10. Those should already be on everyone's outlook calendar. At least one of those meetings we'll do another day-long meeting like this. Maybe two. It just depends on how far we get with the take issue and if we can start on mitigation this year. We've also begun scheduling WebEx meetings to go over draft chapters with you. We already had one where we covered Chapters 1 and 2. We find it's a useful and more interactive way of getting these chapters to you. We haven't scheduled the next one, but we will in the next few weeks. We'll try to do one between every quarterly meeting.

TE I assume everyone knows that we're operating under the Sunshine Law, and that means we can't interact individually on anything decisional, so staff have done a lot to accommodate that. How many Steering Committee members were able to attend that webinar?

(Julie and Blair)

TE How did it go?

- JW I thought it went very well. The content of that section was elementary, so it was a good place to start. One thing that appealed to me was the ability for Steering Committee members to have a conversation about the material, but that depends on Steering Committee members showing up. It wasn't as important for that first meeting, but it would certainly make it more meaningful for me to have the other Steering Committee members present.
- BW I thought it went well also. I had a question about final decision on these chapters. Who makes that? Is that up for a vote?
- KD We've had this discussion. The way it's set up now, we have room for infinite review. I don't think any of them will be considered final until they go to the Secretary of DEP.
- BW I'm fine with reducing the workload. I'm fine with the Work Group keeping track of comments and dealing with them at the end.
- BE I think the substantive issues will require Steering Committee consensus and approval before they go to the Secretary of DEP. So we've already done term of the ITP, covered species...
- KD What we've historically done is when we have a question related to a fundamental component the of HCP, we piece it together in an issues analysis and bring it to the Steering Committee to vote on.
- BE After we have one of these meetings, we receive comments, address those we feel are appropriate, then perhaps we should send the revised draft back out to the Steering Committee so they can make sure their comments were adequately addressed.
- BW That's fine. It's just that the whole committee should review those changes and agree on those changes.
- BE Yeah. We'd send it to the whole committee.
- TE The Work Group has my confidence to handle the mid and low level things, and I think you're getting at the issues that percolate above all that and making sure that they're bringing those higher level issues back to us to agree on. I think that's appropriate and flexible. I think we leave most of it to the Work Group to tease out.
- BW I agree with that method.
- TE I want to get a sense of how many of us will realistically make it to the webinar meetings.
- BM I plan on attending them. It sounds like a good way to deal with this and make progress on the development of these chapters.
- GA I second that. I fully intend to be there.

- BW How was the date and time selected?
- KD We polled the Steering Committee. Obviously we've got a nine member Steering Committee, and we prioritize getting the quarterly meetings around your schedules. We can't really expect to get you guys in the same room eight times a year, so the webinars are second priority.
- DF I'll prioritize making my attendance there. I would prefer to digest one or two chapters at a time rather than the entire document.
- BE I think those are our only options. Either we do those interim meetings, or we use the quarterly meetings for that.
- TE I agree, and I think you guys said it that Chapters 1 and 2 are not particularly contentious, so I have a feeling that with the other chapters we'll see more interest.
- KD Not too much news on the grant. We submitted the grant for a sixth year of funding, which would go into effect January, 1 2013. We have no reason to believe it won't be awarded. We had one major IT project we anticipated undertaking in year 4, which we couldn't get to, so we got an extension on the grant. So we're currently working on year 4 and year 5 work. We have drafted all species accounts and have sent them all out for peer review. We're getting conflicting information on the status of the Wilson's plover, so we want to wait until we know what's going on with that before we move forward with the species account. But basically the heavy lifting on the species accounts is wrapping up. There are 12 core species, which are federally listed, and seven additional species (Santa Rosa beach mouse, gopher tortoise, Wilson's plover, snowy plover, least tern, American oystercatcher, black skimmer). Three of the four current studies are complete. The beach cleaning study is still waiting for a year of data to come (in June). These were initiated in year 3 and were a priority in year 4. We'll look at those reports later today. The last issue I have is the Gantt chart. Jimmy?
- JS We've been updating this on a monthly basis. It was developed in year 2 to try to get a handle on the overall project tasks and timing. What you'll notice is on the first page, much of this work has been completed until you get to the bottom at estimating impacts. Working on Chapter 8 is a large part of where we are now. That's one place to focus your attention. Moving onto page 2, these are a lot of the studies that we've completed over the last year or two. The IT project is in the middle of the page there. It's labeled the OTIS project. Onto page 3, we've tried to parse out the predecessor work that will go into minimization and mitigation. Overall I think it's an aggressive schedule, but as we are aware of more realistic schedules, we update the timelines.
- KD A lot of these things are moving targets. So the Gantt chart reflects what we anticipate to be able to achieve and also what we've already achieved.
- TE Are you embedding in Steering Committee review and final approval through the Secretary? I was expecting to see that in here.

- JS That is not in here. In large part this Gantt chart is used as tool to track Work Group internal works, but that's probably a good thing to put in here.
- KD That's not a bad idea.
- BE The ultimate final work product will be the ITP application. The back end of this whole thing is still so nebulous, that to put a timeline on that would be very difficult.
- TE I understand. I would just encourage you to keep that in mind.
- BM Last meeting there was discussion about working with MIT. Will that be discussed today?
- KD That is the aforementioned decision support tool. I've had numerous conversations with MIT and they have sent a discussion draft proposal. The Work Group met for several hours yesterday to critique that and get a response to them. It's taking longer to get them under contract than I anticipated, and it's because they are trying to anticipate what we need without having any tenure with the team. So we're just trying to figure out exactly where they fit so there's no redundancy in work. So it's taking a bit longer than I had hoped to get them on board. So that covers my staff report. Any comments or questions?

Study Final Reports

- JS Back in the summer of 2010, it was recognized that on a statewide scale, there's not much information representing baseline data for CCCL activities. So we initiated four separate studies to fill data gaps in determining take. Those four studies looked at armoring, dune walkovers, upland development, and beach cleaning. The goal of the armoring study was to create baseline database for existing armoring and to also look into the future looking at erosion predictions. With the walkover study we went through 25 counties and identified through GIS aeriels the extent of walkovers. For upland development, we identified vacant parcels and land use. And for beach cleaning, we created a field survey for beach cleaners.
- GA Is there a need for supporting study on the issue of lighting?
- BE In our Chapter 7 we talk about all the threats, including lighting. But as far as teasing that out, what we're doing with the take analysis, we treat each CCCL activity and assess take, both direct and indirect, from that activity so we're not going to tease out every impact. We're looking at collectively all the impacts associated with building a house inside the CCCL, say.
- GA I understand that, but for lighting, there are tens of thousands of disorientations each year. There are ways to address that in the permit process, and it seems like you'd need data in order to address it in the permit process. For instance, how many permitted lighting projects aren't complied with? How are issues like this going to be addressed with lighting?

- KD When you say permitted lighting projects, what do you mean?
- GA Permitted CCCL projects that have a lighting component.
- RT I think Gary makes a good point that lighting is an issue that should be addressed.
- BE It seems like that would take a considerable amount of effort, and I think through minimization measures, we can address lighting without actually going out and estimating exact take from lighting.
- GA There's a lighting plan as a component of a CCCL permit, and then there's follow up. Whether or not there's follow up, there are lighting plans that still cause disorientations, for whatever reason. How do you address that in a take situation when you don't have the data for how often that occurs?
- RT Is this a directive from the Steering Committee to look deeper into this?
- KD What I'm hearing is that lighting and disorientations is an issue. When we ask for the take permit from the Service, it can only be to authorize take for an activity that the CCCL program permits. It was my understanding that the CCCL program doesn't actually permit lighting; they permit projects that have a lighting component.
- JW I think it sounds pretty straight forward. I think there's a real way there to get at what take is occurring there.
- BE Does STC have those data?
- RT Our staff spent a lot of time approving lighting plans. There is some information that can be collected.
- BM I agree with Robbin and Gary that it's a significant item. It is a big part of the permitting process, but there's a real issue, and that is if someone builds a dune walkover and they build the house and the new owner changes it. With lighting, it's a different story. When the permit expires, no one's checking it. If you have a local government that doesn't have a good monitoring program, then there's a problem.
- GA I think the key term is effectiveness. Is what we do now effective enough? If it isn't, what kind of assessment do we need to get at that? I think that information is available.
- GC Clarification—simply to note under 162.053 F.S., we do not have jurisdiction where lighting is the only issue. Once we establish jurisdiction through an activity, then through the permit process we have the ability to regulate lighting.
- KD That jurisdiction issue is where I was struggling. What we have to consider as the folks responsible for developing the HCP is when we are asking for authorization for take, it has to be authorization for take over which they have jurisdiction. I think where the

pieces come together for me is one of the ways we propose to mitigation writ large is there will be sweeping changes, and making the guidelines for lighting more robust will be part of it. But collecting take data related to lighting now, I'm not sure how we could package that with asking for take, since it's outside DEP jurisdiction.

BE Mitigation is where this is liable to come in. I think assessing the effectiveness is justification of why we should look at that in mitigation. When we look at take we're looking at habitat affected, not individuals.

JW Then I think this is good discussion to have because if there's light filtering out on the beach, then that's affecting the habitat.

TA We do have to evaluate the indirect effects of the actions. So as far as the jurisdiction discussion, we still have to consider indirect effects. I agree with Bob that it's more looking at it from a mitigation standpoint.

BW When it comes to calculating take from lighting, the job will be a difficult one. We don't really have a good data set to turn to. The disorientation reports are not good and are probably underestimated.

GA I'm not proposing any particular kind of study. In terms of DEP jurisdiction, there may not be statutory jurisdiction, but there's indirect impact and in terms of being on the hook, and it doesn't matter if the agency has statutory jurisdiction if it causes take. The lighting component of a permit is a condition of the permit. The problem with CCCL lighting conditions is that there's no maintenance component. So as Brett said, once the permit expires, people can do whatever they want with lighting. I still wonder if we need additional data on this in order to address it.

MM Blair, since we are looking at an approach where we're using habitat as a surrogate for take, it seems we have a better shot at getting at take in terms of habitat, and if we can interpret habitat as a measure...

BW I'm not sure if that's a very good way of coming up with a number. You're suggesting we look at nesting densities and use that as take estimate.

MM Are you saying we don't have enough knowledge of quality of lighting?

BW We don't have enough knowledge of the take associated with it.

TE I think the consensus is the Work Group needs to wrap your minds around this. There's a strong interest here. To me the key linkage is, can we get enough data to identify this as a take item, and then in mitigation we get creative with how we address it.

BE And we've already done that; we've laid the background. I think we need to figure out the effectiveness of the lighting program and how to ensure continued monitoring of that.

- KD If we make a special case for lighting, I think we could make the same case for cats and people walking their dogs, etc.
- JW Recreational disturbance would be a comparable issue.
- KD So it's an indirect effect. We have to get at it in a way that's effective, but we have to consider all the other indirect effects.
- GA We're talking about a permitted issue by DEP which is to construct a building, which along with that comes lighting. It's very different from someone letting their cat out. I think the Work Group just needs to look into this to see if the current way we deal with lighting is effective and how it's going to be dealt with in minimization and mitigation.
- DF Gary, I think that would be very useful. Lighting has come up many times in permitting.
- JW I fully support dealing with lighting, I would just say there are other types of take that are occurring because of these permits that DEP doesn't address, and I don't think we should ignore them because they aren't addressed in DEP permits. So, I think we still need to consider cats, raccoons, etc.
- TE I'm hearing as direction to the Work Group to think about why these four studies were done, and then think about all other issues with emphasis on lighting and are we giving enough attention to other indirect impacts and focus on how we're going to address them.
- KD I think we can start to chew on that and bring you something at the next meeting.

Final Study Summaries

Armoring

- JS Armoring—We took the most recent aerials, DEP permitting data and queried local government records to get existing data. What we produced were shape files, organized by county. We wanted to put in some qualifiers on how we came to mark what parcel with armoring, so fields E-H show how we came up with that. For the 25 year projection, we selected 2-4 profiles within each county, ran the s-beach model to determine impacts of a 15 year storm event and then from that erosion line, we backed it up a minimum of one foot per year to try to get the erosion line in 25 years. Based on that erosion line, we went parcel by parcel to identify vulnerable parcels.
- BM What was basis for selection of profiles?
- JS They were approached on a county by county basis. The county was divided into similar erosion characteristics, 2-4 regions. Within that they'd select a profile without existing armoring, and a couple other characteristics; it's in the appendix.
- BM There was in each case you looked at the state's designation of critical erosion.

- JS That had to do with linking with the SBMP. There are limitations in this approach, and we want to be very clear about those limitations.
- BM The reason I bring that up is if it's designated by the State that it's critically eroded, then there's a good chance you'd see armoring there.
- DF Why is eligibility not addressed?
- JS That information is not readily available statewide...when the structure was built and whether it was built with a permit.
- GA I think this is a remarkable study, but I think the only way to really get at this information is on a parcel by parcel basis.
- RT The outcome of this will underestimate the amount of armoring. It might be good to know how much shoreline falls under that designation, because in my experience you can't count on that stopping armoring.
- BE I think the overarching philosophy on this was to come up with a conservative estimate. Because we've got a lot of miscellaneous activities, which we're not really specifically addressing in the HCP, we thought if we overestimate, we're covering for those other things. I think we're trying to provide a little balance to not go too conservatively.
- JL We already have that percentage.
- KD Right now what we've created is the best available.
- GA On page 9 of the spreadsheet, under geo textile sand bag, why in some counties there's nothing there?
- JS Either there was so little that it rounded down to 0 or we didn't identify any there.
- RT The structures in Gulf and Walton went in under local emergency authority. There are actually ordinances against armoring in Gulf and maybe Walton.
- GA Do you want to address that? There's six geotube projects in Walton and three in Brevard.
- RT I think there is a database.
- JS I know we looked at Brevard, and we looked at properties and I think there's only one left, but I'll have to look into that.
- BE Was a cutoff date a factor?

- JS I'll have to check. As far as Walton, they wouldn't show up if they were installed without a permit.
- GC We have a very extensive spreadsheet of all coastal armoring in Walton county and unfortunately staff didn't share that with you.
- BE No, we got that.
- JS I'll go back and check on that.
- BM Geotubes in Walton—I'd recommend you talk to the violations section in DEP. I think this is a really good document, but I think it does provide a good basis for additional follow up, and I think we can get that quickly.

Dune Walkovers

- JS The dune walkover study was done along with aerial interpretations from the armoring study. So we were using the same data. What we did for each visible walkover was delineated that within the vegetative dune and on the sandy beach.
- TE So you went through every aerial photo?
- JS Sure did. We started in the summer of 2010 and just finished up in November 2011. We had about four staff working on it. So the highlights of this study...there's approx 100 acres of walkover statewide. That's about 78 miles in dunes and 22 miles on sandy beach.
- BW Do you have the crossover data assigned by type of crossover?
- JS We don't have those labeled as such. The best way I would get at that is set a threshold for area on sandy beach. When you're looking at ADA walkovers, you have a higher proportion on the beach.
- BW One of the measures I think might be more important than acres is linear feet of shoreline.
- JS We do have polygons that we could measure that from.
- DF On page 3, it seems like some aerials are pretty dated. Duval has very recent aerials online for public consumption.
- JS Duval was one of the first counties we did, so I think what you're talking about probably weren't available then. Some of the local aerials are fuzzy, so for some we went with DEP aerials with a higher resolution.
- TE Did you calculate any area outside of walkovers where there's shadow?

JS No. Just the structure.

TE The tables in this workbook don't match up.

KD Our mistake. We must have sent last year's version to the printer. What's on the ftp site is the most recent. We'll get you the most recent hard copies.

Beach Cleaning

JS On the beach cleaning surveys, we got a response from just over half. We took a different approach and are now coordinating with DEP field inspectors, and they fill out the survey with the permittees. So we should get the rest of those back by August, and then we'll do a final summary.

JW Beach cleaning is often permitted for a certain area, but sometimes they stray beyond the permitted areas. Did you do any evaluation of that?

JS Each field permit has the shore parallel that the permit is good for. We do ask how much they really clean, so we rely on their honesty. But we haven't initiated a ground truthing.

GA So people get a permit just to clean in front of one or two parcels and the parcel in between isn't clean?

JS That's the assumption. I would say in the Gulf Coast region the norm seems to be contractors will go to condos and get contracts that cover many parcels.

RM I know in Martin and Lee counties local government gets the permit.

JS So we'll get you the correct final reports and later we'll talk about how we're using this data in trying to calculate take.

TE This is a lot of great information and work, and some of the pieces are starting to fall into place for me.

Chapter 9 : Alternatives Analysis

BE The Alternatives Analysis is a requirement of the HCP. It's also part of the NEPA process. There are two aspects of it—the HCP includes an Alternatives Analysis and the Environmental Assessment (EA)/ Environmental Impact Statement (EIS) also includes an Alternatives Analysis. The one we're talking about today is a lot less formal. The HCP is the applicant's document and the EA/EIS is the Service's document. The EIS is going to consider the effects on the human environment. In the HCP Alternatives Analysis, all we need to do is consider alternatives to the proposed action. We don't have to consider every iteration, just embrace a few alternatives that encompass the range available to us. They don't have to be practical, and we don't have to look at which has a greatest risk or benefit to the covered species. So we came up with six alternatives. 1) The preferred alternative is what the applicant is proposing to do; 2) Do nothing; 3) Take avoidance; 4) Abandon the CCCL program; 5) Delegate CCCL responsibilities to local government;

and 6) Get off the coast. The preferred alternative is to apply for an ITP. The HCP will minimize and mitigate so there's a net conservation benefit. It will allow the Bureau of Beaches and Coastal Systems (BBCS) to conduct its program in compliance with the ESA. There will also be several benefits to stakeholders. Under the no action alternative, DEP continues business as usual and all those benefits are absent. With take avoidance, DEP could say we're not going to issue permits that will result in take. That is very difficult to do, and it only applies to turtles and construction impacts. They could get around that by continuing to consult with FWS and FWC, but even with the best of intentions, take could still occur and they wouldn't be covered.

TE How is that different than no action?

BE It's more restrictive in that some permits that are issued for turtles now wouldn't be issued.

TE The bullet that threw me was current policy. I think this would be a change to current policy.

BE Under this take avoidance, they wouldn't be issuing permits even for marine turtles. Now they feel comfortable about issuing for marine turtles, because they feel they're doing everything they can to avoid take. These are just my talking points for the presentation. Look at the chapter and let's see if there's a problem there. On the abandon the CCCL program, DEP could say let's just not do CCCL permits anymore, and all liabilities would be amplified. DEP is required by statute to do this program. Delegation of CCCL program—you could delegate to local government. There is some precedent in statute for that, but all the shortfalls of the other alternatives would be present, and local governments would be at risk in not being compliant with the ESA. And there would be no unified standard; every local government would be doing their own thing. And finally, maybe we shouldn't be building in the coastal zone. But this isn't going to resolve those issues immediately, and it would be very expensive. It would take a long time to implement that, and those other effects would still be present until it is implemented. So those are the broad alternatives we've built into the HCP. And as a sequel to that background, basically the Service has to consider those effects to the human environment. They could add or remove from that list, compare benefits and deficiencies for each of those options. And the preferred alternative for the applicant doesn't have to work out best for the species, because we're looking at social issues under the NEPA process. The ITP issuance criteria is that the proposed action is lawful, take is incidental to that action and that take will not cause jeopardy, and the plan can be funded.

JW With regard to coastal retreat, I agree with how you evaluated it. I just wanted to raise that there may be opportunities where this HCP will not drive coastal retreat, but may be able to piggyback on other options.

- BM When I read this, I was trying to figure out the alternatives your presented, are they supposed to address the risk to the Department, or are they there to promote protection to the species?
- BE Neither. They're there to present options for routes DEP could take.
- BM Why would you include the option of abolishing the CCCL program?
- BE Some of these things are unlikely to be considered, but it is an option.
- KD The point is to be representative of all possible worlds.
- TE What jumps out to me is that prior to getting this to the Feds it has to run the gauntlet of State politics. I think shifting to the county may be very appealing to some of the counties. If we don't have to have these in here the way they are, we may want to discuss what options should be in here.
- BE I don't know that we're restricted to include a certain number. I know you have to have the preferred option and the no action. Beyond those two, I don't know what others are required.
- JW Ryan, do you have a sense of whether that would be attractive to local government? It's basically passing the liability.
- RM I would say from the liability standpoint, they would not be supportive of that. We do try to fight as many unfunded mandates as possible.
- JW So maybe it would be appropriate to address that in the narrative that it's unlikely we'd have wholesale adoption by counties and cities because of liability issues.
- BM I think that part of their program, it's been in there a long time, giving local government the option to run their own program, and no one wants to do that.
- TA I don't think there's a set number of alternatives you have to have, but I think it's good to at least have three. So it may be a good idea to evaluate your concerns and to be honest. I share some of that concern. I think it would be worth reevaluating, and maybe we can tweak this in the Work Group and see if we can come up with something else.
- BW My thought was if we don't include that alternative, that doesn't mean someone won't float the idea. It seems to me part of the reason to mention these is to provide the statement that this alternative is not preferred because x, y and z.
- KC In the NEPA documents, we have different kinds of documents, there are alternatives to be evaluated in detail and those alternatives that are not evaluated in detail. And maybe we can push this one to not being evaluated.

- BE Are there options not on here that you all feel would be appropriate? And if we stick to just three alternatives, which ones do we want to include?
- GA Abandonment and delegation, would you want to wrap those up into one?
- TE I like that idea. Again, I'm just raising issues. Blair, I agree with you that sometimes it's better to face a potential unpleasant reality and then get it out of the way. I just want to make sure we're putting enough into the pros and cons for each of these. I like the idea of combining that with the abolishment of CCCL.
- BE If you see pros or cons that I haven't captured, let us know.
- BM Were you thinking about possibly an introductory paragraph explaining what the alternatives analysis is trying to accomplish?
- BE Well this goes to the Service, and they understand what the Alternatives Analysis is, but considering that this will go out to the public too, that wouldn't be a bad idea to include that in the background section.
- BM I think I would not state a timeline it would take for coastal retreat.
- TE Any other comments on this section?
- KD We will make sure we get it right, and check back with you.
- BE I'd like better guidance on...I'm not sure if you think we should tweak what we've got or if you'd prefer to pare down that list and come up with just a third alternative.
- TE My sense is the former. You've gotten feedback on tweaks. I didn't hear anyone say we have fatal flaws in this.
- BW I'm comfortable with the current list. My only comment is the explanation for why it's not a preferred alternative.
- DF I agree with Blair on that. Be more clear about pros and cons.
- BE We'll send out revised draft, and you look at that, and we can chat about it at the next Steering Committee meeting if we need to.
- TE I also heard suggestions for a beefed up introduction about why we're doing this.

Lunch

Chapter 9 (continued)

GA What about cumulative impacts? The proposed alternative would, it seems to me, address cumulative impacts. So then a con for the other options would be that it doesn't address cumulative impacts.

BE I don't know that it needs to be explicit in the Alternatives Analysis, but I also don't think it harms anything.

KD And that is a benefit, so, sure.

TE Any other last thoughts on this?

BE The no action and take avoidance you seemed to think were close in nature. Is that something that's combinable?

TE I actually don't think they're that similar.

Calculation of Take

KD I'm going to go back to the formative components of the HCP, and then outline the critical components of a take calculation that the team has come up with, and then talk about the way that we ultimately combined those components into a coarse version of the working formula. We'll talk about some of the data gaps and other problems the formula has, then we'll move into some examples, and then we'll talk about where some of the pitfalls of our approach are, and how we've started to work on those.

Background—FWS authorizes take that's incidental to otherwise lawful activity. In order to receive an ITP, the applicant has to spell out the activity, predict how much take it will cause over the life of the permit, lay out a plan to avoid and minimize, and a plan to mitigate. We started off with the development of the threats matrix, which describes all potential impacts to covered species within the plan area. It was from that universe of impacts that we began narrowing down specifics of the take equation. When you talk about take, you have to bear in mind you have to minimize to the extent practicable, and mitigation is anything beyond that. So the question is, given this world of threats, how do we define a defensible estimation of take? We talked in the beginning a lot of developing a formula or model. We realized that there are so many complex aspects that we'll have to look at it in many ways. The large geographical area has been tricky for us because it represents a tremendous amount and different types of locations and species. We're also looking at the entire suite of activities the CCCL program covers. And then missing data. For some impacts we know what's happening on the ground, for others we don't.

Timeline—we started working on the threats matrix a year and a half ago. We started delving into turning the threats matrix into a working model last summer. We set up a schedule for take workshops. We met in person and via WebEx, and also enlisted additional support, Perran Ross for facilitation and FNAI (Gary Knight and Amy Knight) for GIS expertise.

Major pieces—results of our first couple of sessions, the objective was to think of everything important to consider. Some are no-brainers—species, activities—and also where, when, likelihood, amount of habitat impacted, and duration of activity. These were the seven components we came up with. We started parsing this out. We already knew the species, and we grouped those into sea turtles, beach mice, gopher tortoise, non-breeding sea/shorebirds, solitary nesting shorebirds, and colonial nesting seabirds. This way we don't have to go through each individual species. For activities, we had a robust discussion over this. The list of activities the CCCL program permits is a pretty big list. So we lumped similar activities based on impact to species. The big one is coastal development of major structures. It encompasses a wide range of activities. This includes redevelopment. We haven't figured out a good way for estimating take from redevelopment.

BW I wasn't quite on board with the reasoning with redevelopment. In my mind, one aspect of redevelopment could be retreat. There's a potential to eliminate that take completely, and that would be different from redeveloping on the same footprint in the same exact way.

MM I have seen cases where we show in GIS a permit for a house built in 1990, and you take a look at the aerials and there's nothing there, and there's evidence the shoreline has been pushed back. I thought about how we'd track those cases, and I'm not sure how we'd do it.

BW I see the difficulty. I'm just thinking of any individual building; it's on the beach and what take it'll contribute to. The building won't last forever. We might assign a lifetime to that building, and that would limit the amount of take that building contributes. I'm not sure how we're assigning take relative to the amount of time a structure exists.

BE We haven't gotten that far. When we started laying out the approach, it came up that there could be a structure that's redeveloped in the next 25 years. Say someone comes in and buys a house and wants to redevelop it as a condo. But we haven't gotten that far. We're just saying redevelopment needs to be addressed, and we're not sure yet how it's going to be done.

JL The whole reason we're not able to parse out redevelopment from new development is because in the database BBCM has, we don't differentiate between redevelopment and development. So when we started down this road of putting the studies together, we went with the data that was available to us.

GA Is the idea that we could provide some form of mitigation by restricting redevelopment?

KD Hadn't thought of that. The reason it's in there is because we realized that as Florida's coastline gets built out, there stands a chance of as many or more impacts from redevelopment as new development, and there'd be something qualitative to that.

GA So you're just looking at it as a calculation of take.

- KD For now, yes. But we highlight it because we realize its impacts are significant and we can't parse it out. So we'll have to come up with a way to signify it and value it. The next one—dune restoration—it's fairly unique in activity and impacts. Armoring includes all different kinds of armoring.
- TE Dune restoration—why are we looking at that as take?
- KD It could have pros and cons, but at the end of the day the CCCL program permits it, so we have to consider it.
- BE The other thing here is that it doesn't matter if a certain activity has a net positive effect, because take still occurs, and that has to be addressed.
- KD Beach cleaning—it's a very unique activity because of its iterative nature. Sand fencing is on its own because it comes with a unique set of impacts. Emergency response activities. Special events is another broad category that includes weddings, concerts, etc. Miscellaneous low impact and moderate impact; we are not going to try to estimate take for these two. They are catch-all categories for minor activities that we are hoping that our conservative estimates for the first seven will cover these.
- GA How would you take on special events? It's not predictive.
- KD I don't know.
- DF How are you going to estimate emergency response?
- KD Storm frequency and average post storm activity...Next, where is take occurring? The CCCL program is administered on a county by county basis, so that's how we've been looking at it. We're going to use 10 years of that history for jumping off for predicting the next 25 years.
- GA For special events and emergency response...is there any requirement to put those in there? Could the Steering Committee make a decision to take them out?
- BE As long as we are able to come up with a reasonable estimate of take. We have descriptive text that talks about all the impacts associated with emergency response and special events. Now we want to try to quantify that, and there will be a lot of assumptions. But if in the end we can't do that, we can decide to not use those in our estimate.
- KD We might be able to say we've used a much more coarse filter in estimating take, but we're not just going to wipe them off.
- TE We're not going to accurately, to the decimal point, estimate take for any of these, so it will end up being a more qualitative estimate. Even if we can't define that it's going to

be 44 acres of weddings each year, we'll just say when there's a wedding, these are the things that must happen.

- BE The important consideration is we are asking the Service for incidental take coverage for everything the CCCL program permits.
- KD Could we bump 8 into same category as 9 and 10? Yes, but for now, we're trying to standardize it.
- BW I'm thinking about dune removal...what category would that fall under?
- DF I think I'd like more discussion on emergency response. Most of these result in after-the-fact permits. I've seen cases where after-the-fact permits couldn't be issued because take occurred. Will this eliminate those? How does this connect with that?
- KD One aspect of our ultimate avoidance, minimization and mitigation plan will be guidelines for how you should do business in a post storm situation. As far as eliminating situations for after-the-fact permits, I don't think it'll do that.
- JL This is the emergency response activities that we permit. You're talking about permits where the county would authorize temporarily and then come to us. We'd talked about making that a partnership, and we're not addressing that in this scenario.
- BE I think there's a consensus that if we could allow local government to assume that authority, then there would be a mechanism where they would be covered. It's tricky because DEP is responsible for complying with the ITP. So there may need to be a MOA or something like that.
- KD As Jackie said, when we talk about emergency permits, there are two categories, and this isn't after-the-fact. Moving on...location. Essentially where is the activity occurring? In which county? And we'll be determining take on county by county basis. We've got lots of different geographical delineations—there are 4 major regions of state, and then there's county by county, and also PSMUs, and those are based on occurrence of our species. The PSMUs are biologically similar enough such that any minimization and mitigation requirements would be applicable within any one of those regions. Time of year—this has to do with presence or absence and nesting or non nesting.
- JW How are you handling that? Time of year is relevant for short term, but what about long term impacts?
- KD Fantastic question.
- TE Well, certain activities will have long lasting impacts and some will have only short term impacts.

- JW I could see one application for a house where the construction may or may not have an impact, so it would be time restricted, but you'll also have lasting lighting, habitat occurrence, etc.
- BE Those are addressed under duration.
- KD One way we get at that is the Service's definition of direct, indirect, and cumulative impacts.
- BE I think once we work through the whole thing, then you can go back and see if we captured everything.
- KD Likelihood—this means how likely is it that a permit will be issued for each activity in a given county over the next 25 years? Again, the baseline linear model is we look at the county, permit history, and multiply it out to project over 25 yrs. That is obviously a very coarse linear way to look at it. Amount of habitat—we're using habitat as a proxy. If an impact occurs in an area where the species doesn't occur, then it's not an impact to that species. We're using acres for mice and gopher tortoise and linear feet for birds and turtles. At this stage we're treating all habitat equally. This is a conservative approach, and the idea is that if you permit an impact within beach mouse habitat and it's x numbers of impact, and whether the species is in that habitat at the moment of activity doesn't matter.
- JW If you're assuming equal value for take, will it also be equal on the mitigation side?
- KD No. We'll get to that later, too. Next is duration of impacts. A direct impact occurs at a place and time. A temporary impact occurs only during the time the activity is taking place. Indirect impacts occur spatially removed from a specific impact. Repetitive activities are where we have to consider rate of return. Beach cleaning is big one here; impacts could be direct and temporary or indirect and temporary. At what point does something happen so frequently that it could be considered permanent? This is a two sided problem—quantitative and qualitative. There's an 8th factor—qualitative. This is habitat value. Is armored shoreline in Miami the same as armored shoreline in an undeveloped part of the state? Can an activity be considered worse if it's in the middle of already fragmented habitat, as opposed to cutting clean in half a beach mouse population. The qualitative aspect of this is something we've captured descriptively but not yet formulaically. So once we get how much take and how bad, we'll subtract minimization and what's left over will be mitigation.
- TE So factors 1-7 are all of what we're quantitatively estimating, then you have smaller qualitative or how bad. What are you doing with 8 and 1-7?
- JS For example, beach cleaning and beach mice. Beach cleaning occurs on the beach berm, not in the dune, so we may have a large area being raked, and that will show up under beach mice impact, but how bad is it actually? It's not as bad as if the activity is occurring in the dune.

- BE Its going to be a geographic calculation, too.
- TE I would suggest for a way to talk about this process, add a layer on top of this for avoidance. I just want to make sure we're capturing that in our thought and our narrative, because I think that's a very important first step.
- BE I think that should go down there with minimization.
- DF I think it would defeat purpose of the HCP process and getting an ITP if we bring the subjective part in afterward. I think it has to be built in up front.
- JW I'm worried about determining if there's take after the first 4 steps.
- JL I struggled with the fact that we have to calculate take first before we even think about avoidance. This is a very linear equation.
- TE I was thinking that avoidance would come first, and then you calculate take.
- BE And that was the guidance the Service gave, because DEP should get credit for the avoidance that they're already doing.
- KD One thing that keeps coming back to me is if you calculate take in isolation from mitigation, you could forget to leave enough space for mitigation. And our GIS tool will allow us to look at those concurrently.
- BE The Service will say, okay we'll authorize 50 miles of armored shoreline and DEP will track all of that. And you don't want to overestimate because you have to mitigate for that, but you also don't want to get 10 years into the project and near your threshold and have to go back and renegotiate with the Service.
- GA This is new for the Service, too, so they're going to be leaning toward whatever we propose.
- KD And they're on the working group, and we're working very closely with them.
- JW On the flow chart, I would encourage you to consult the species experts to look for scenarios that may slip through the cracks.
- BE One thing we could do is just take time of year out of the equation.
- JW I like the time of year aspect because it's an incentive for applicants to focus activities during good times of the year, but I want to make sure we don't lose sight of lasting impacts.
- MM Regardless of direct or indirect, there are multiple sources of take from one project.

KD I see exactly what you're driving at.

(Break)

KD We've been through this list of the seven components of the take equation. The next thing we had to do was figure out the relationship between those seven components. A full day of work-shopping led us to this equation. The first four components are species, activity, where, and when. If you look at each of those four first, it should tell you is there take, yes or no. If there is potential for take, the next step is, what is the likelihood take will occur? We already know that a linear projection will not fit the bill. PWM=people, weather, money...the three components of likelihood—what are human populations likely to do along coast in next 25 years? Economic booms/busts? Weather means climate, sea level rise. There are factors outside of our ability to calculate. This slide is the number one reason we're pursuing the partnership with MIT. Their modeling expertise is in this exact area. They possess a very sophisticated modeling capability to provide us with a predictive capacity. So take or no take, how likely it is to happen, what is the actual scale, and duration. When we say duration, we mean temporary, repetitive, or permanent. And repetitive has a scale, too, depending on how often. So if we've decided take is going to occur, then we multiply by all these factors to give us a number of how much take there is in a given area, for a given species, for a given activity, during a given time of year.

BE I guess the question is, are there any obvious omissions? Julie pointed out that indirect impacts are going to fall through the cracks.

TE The main one that comes to my mind is we're looking at a system that has a finite amount of habitat, and there's a potential that you're going to show take of the same acres multiple times.

Issues with take formula

JS We decided to look at this on county basis. For example, this is a list for Indian River county. First one, sea turtles, commercial development, Indian River county, spring. Permitting history—only two permits issued for this in the last 10 years. Project that out over 25 years and you get a five for likelihood. The average linear footage for commercial development in Indian River county is 137 linear feet. You project out to 25 years and get 685 linear feet. The gopher tortoise, looking at same activity, so you get the same likelihood, and now we're looking at an average area of activity, and we get over 260,000 square feet. For duration of beach cleaning we came up with this duration key where mostly these multipliers are how we characterize each cleaning. Daily we multiply by .75, weekly .5 and so on. What we came up with in going through these examples, in looking at likelihood, our activity groupings don't necessarily correspond to how DEP tracks activities. For example, walkovers, up until recently DEP, whenever a walkover was coded, it could include sidewalks and others. Also commercial development, DEP codes public or commercial; they're not separated out. Next, for beach mouse ranges, they are less than county wide. The other thing is the amount of

habitat could exceed total habitat in the county. So some of these issues are easy to address. Walkover—we could take a random sample of permits and see if they were referencing stairs or walkovers and get a rate. For commercial development, we thought commercial and public are high use so we could keep those together. Also, we found we could query the DEP database in terms of r-monuments, as opposed to county wide, so that will be useful for beach mice. There are a few other issues we came up with in other categories, too.

BM I can see likelihood as being very key. When you get a 10 year dataset, are you getting a lump amount? In the Indian River county example, in 10 years they got 100 walkovers. What happens if 80 of them were after the 2004 hurricane season?

JS I get a total number of permits for a 10 year period.

KD We made the 10 year choice because it had an economic boom and bust and different severities of storm season.

BM I know it's difficult, but if we were able to take the data and break it down into different time periods...

KD Help me understand how stratifying year by year would help with a 25 year projection.

BM We had extreme activity after the hurricane season, so that could really skew the annual average.

KD So we need to apply a correction factor.

GC I guess with almost everything there are exceptions, and that may not work for Walton county. ...

KD I think this is one of our hopes for MIT. Their predictive capabilities are much better than ours. If MIT comes up with a better equation for predicting likelihood...they can even predict responses to political change.

DF I'm curious how redevelopment factors into this. Is take occurring again during redevelopment? Also for the gopher tortoise, it's my understanding we're assessing based on vacant parcels. What if it's only been vacant for a year and gopher tortoises moved in?

BE The take authorization that DEP gets is for things it will do in the future. In the future, if you were to permit a dune crossover and that were destroyed in a storm, you account for take there. The tricky part is the dune crossover that was built before the ITP was issued, then you ask for a permit to rebuild that. You never had prior authorization for take there.

JW Don't underestimate the ability of the species to respond to some of those events.

- BE Again, you can see how complex this whole thing is. This approach is going to be flawed no matter what we do. It's an estimate. We need to look at the big picture. The service wants us to take our best shot with best available data. We don't want there to be some big deficiency, but we're not going to be able to get into all these nuances.
- MM Well, there are ways to make your response more flexible.
- TE We're focusing on take, and I'm wondering if there's a way to hold this where it is now and look at the same equation from the other end of it. Instead of looking at a specific impact, look at it from the species point, where their habitat is, where the impacts are going to be. And then you could spatially look at where that overlaps. What I'm struggling with is how do we connect all these potential impacts?
- MM What you're talking about relates to how you represent the different elements of your model, and that's what we're digging into right now.
- TE Another thought is you've all said that this isn't linear. I think we know the maximum linear feet of undeveloped parcels, and we know linear feet of gopher tortoise habitat, so I think if you take this model and keep developing forward...
- KD We know this is fraught with problems and much too coarse, but we had to start somewhere. And we're still struggling with what's the relationship between those things.
- RT We should also consider components of take we're just not going to be able to address mathematically, and those will link to minimization and mitigation. And those will address those things Julie was concerned about. We could get simpler on some of these things.
- TE Did we talk about the nature of multiple activities occurring at a single location? My big fear is we're going to break the asymptote off at how much habitat is available.
- BM The more things you can throw on your list gives you more room for adjustment. I was thinking of, at this point you're calculating impact to habitat, so are you assuming habitat is static?
- JS Right now, FNAI is looking at occurrence based habitat.
- BM We're also doing reports assuming rate of loss of habitat. So you could factor in habitat that's reducing over time.
- KD Also, one thing we haven't figured out is we haven't started looking at SLR projections, but we're assuming we'll see some relationship between, for example, number of sea wall permits coming in as a result of SLR. That's just another exacerbating effect.
- BE Blair, what's your input?

- BW I was wondering why we'd only go back 10 years. Certainly we must have a whole lot of data on the things we hope to use as components. If we can leverage an understanding of issuance of permits, it seems we can go back further in time.
- KD How far back can you query past 10 years?
- MM Right now you can't do anything at all because there are some structural problems. But I think it goes back to 1985.
- GC The original database was created in 1985, but I wouldn't go back much further than the early 1990s.
- BW Even without permit data, it seems going back in time for things like storm frequency data may be helpful.
- BM Jimmy, I'd suggest if you do look at any more data, don't go back further than the last time the CCCL was set.
- BE Walton county is not a good example of what could happen after a hurricane season. I don't think you'd expect that to occur in other counties after a storm event.
- GA You have to include storm events. Walton county clearly is an anomaly. But at the same token, after major storm events, you see a frenzy of activity along the beach—some legal, some illegal—but you see them. So you have to include them.
- BE So the question is, do we go back further looking at storm events before 10 years?
- MM You could model a background trend that excludes storm related activity, and then integrate what happens when you have a storm situation. It's possible to have that modeled, but that would assume no climate change.
- TE Random thought—how do we lump the complexity? Another way of visualizing this is doing it by species groups. Think about one county, you have all of the beach front property. Some proportion is already developed, some is in conservation of some sort, and some is currently undeveloped but likely to be developed. Could we go by species group and break it out that way? I would bet that we could estimate 100% take of undeveloped parcels. That also helps paint the picture that it's a habitat conservation plan.
- KD We could go to the Service and ask for take for all undeveloped coastline in the state.
- TE Whether it's that approach or not, we have to find a way to back away from doing a million examples.
- RT I think that's a good idea because I think we're already vulnerable of being accused of over-calculating.

- TE Any other comments?
- BW I noticed that everything is organized by activity and species. But activities are very different, and I'm wondering if for calculating take, if interactions are more important than the activity. Separation of activity from interaction?
- KD I think you're describing the difference between direct, indirect and cumulative impacts.
- BE These equations we're running are the direct impacts. These don't address the interactions you're suggesting.
- TE What I hear Blair saying is that you're building a house that has 100 ft direct impact, but maybe it's a 1000ft impact for lighting.
- DF We're focusing on how much impact, and I'm trying to think about this UMAM (Uniform Mitigation Assessment Methodology). Here we're getting into more impact than area you have to impact. So, I'm wondering if we should look more at the how bad.
- MM So far the discussion has been we have this tabular numeric approach, but we are beginning to discuss spatially explicit approaches. A spatially explicit approach builds in some vigor we don't have with a tabular approach. It takes care of the issue of exceeding county length. We're running tests that would be structured to accurately represent the variable we want to represent. We're currently going around with those on the ground tests, and there's nothing to report at this point...
- JW So the end product would be a map?
- MM Visualize a visual with layers. It sounds complex but once you put everything in a matrix of species by threats, and figure out the weights if each, then you've got an infrastructure.
- JW I like that idea because I keep thinking in terms of the state, and so many of the birds are discrete.
- MM I would love to see a review like that. I don't even know if both of our solitary nesters are like the snowy.
- JW They behave differently in different parts of state. And with some species, some are highly mobile.
- MM I'm thinking the species representation needs to be a sub model in itself so it could be easily updated.
- BE Danielle, I'm not sure we can do that. They need to know how much take will occur for each species because that's what the Service asks for.

- TE I think whichever way you do it, I think it may take experimenting with some of these products.
- MM Jimmy and I were going to compare methods, but we haven't been able to work out our internal database issues.
- BE Keep in mind that although this is an important exercise, ultimately the Service wants to see minimization and mitigation—the conservation benefits. We don't want to create such a monster that it bogs the whole process down.
- GA Is this the monster?
- BE Well, you can see we're struggling with it.
- KD Michele's modeling project is fairly new to this effort, so between that and what we've worked on, and what MIT we're hoping will work on, there are different ways we're trying to get at this.
- JW I also see utility in Michele's model to prioritize our mitigation opportunities. My biggest fear for all of this is everything does mitigation on site or in some local but distributed way so that benefits are negligible.
- DF It sounds like Michele's approach would need more than just your brain and resources on it. From what I understand about it, that's a significant undertaking, so I don't know if that's something MIT can help with, and if so, let's task MIT to do this, and we can start wrapping our head around the mitigation aspect. Is that reasonable?
- KD As far as tasking MIT with this, it's not that simple. For one thing we need to make sure they have accurate understanding of what we've already done and what we need done, and also, I think we've learned that it's probably not advisable to work on take in a bubble and mitigation in a bubble. I think a GIS based visual way of looking at it is going to be crucial.
- MM The basic take model doesn't need to be complicated. It can provide a foundation for the more sophisticated modeling that MIT can do. But it's going to take them time also to go over all the complexities and review the data structures that have already been done. I see it more as a cooperative effort and extremely interrelated. I'm approaching this with the goal of identifying mitigation opportunities more so than predicting 25 year take.
- TE Let's leave it at that for now. I think people are getting drained. Let's start exploring the other half of this as well. I'd like to say thanks for all the work, Jimmy, for doing all these iterations. It's helpful to see all these complexities and challenges you're facing. It helps better inform where we are. So with that we'll shift into wrap up and parking lot. Anyone from the public on the phone who wishes to comment? Kat, anything specific for parking lot?

- KD No specifics. Some generalized comments. I want to reiterate the reason we structured this meeting this way. We knew it would be brain drain because we've exposed ourselves to the complexity of take, and you guys showed us at the last meeting that it was important to show this to you as well. I would be interested in taking a minute to get feedback from the Steering Committee about this meeting and this type of meeting. Is this the route you want us to continue to go? Is this the sort of engagement you want?
- DF First, I am blown away at how much work the Work Group has put into this, and the wealth of information you've brought to me is abundantly clear. The involvement I've had today is very helpful to me to feel like I'm being a part of it. So it's not really fair for the Steering Committee to force all those questions on you without giving good feedback, so once a quarter a meeting like this is good.
- GA I think we all knew that we'd eventually get to this stage. We do need to have this kind of interchange. I don't want to do it every meeting, but I think it's essential. Hopefully we provided some good feedback. We're not dictating what your guys are doing, but I hope we're being helpful.
- BM I agree with that. I though the exchanges were very healthy.
- KD You guys continue to impress me with the level you're willing to go, and we really appreciate that.
- TE My take on this is I think it was worthwhile and productive. I personally could do this every quarter. Things to think about for next meetings...I think we should keep them scheduled for most of the day. For the Work Group to think about if there are clear areas where you're wanting feedback and lay that out. I feel like today we were just giving general feedback, but let us know if you want more direct feedback.
- BW I agree with everyone that the amount of work gone into this is extremely impressive. Two thoughts: it would be great to insert additional detail, and second, this is incredibly complex so it needs to be simplified, so there's a dilemma. I think I'm leaning toward simplification, but haven't had sufficient thinking time.
- GA It does seem like we gave a lot of feedback, but it does seem like the overarching theme is simplification, in any category we can, to move this process forward.
- BW A helpful exercise might be to understand the principle driving factors of take. There are enough data to describe whether that's linear or reaching an asymptote or...
- TE I would suggest the Work Group get with Blair, because it seems like he has some good ideas. I want to quickly walk through my recollection of action items...webinar to be scheduled; there was good discussion about lighting, and do we need a special study? I don't think we need a special study, but make sure we look into that more. We'll get updated reports out. The alternatives work, work on introduction and beef up pros and cons. Take, I agree with the overriding theme is let's work to pull back up and lump and

simplify. And you got direction from the Steering Committee to start wrapping your head around minimization and mitigation. So to wrap up, thank you everybody. Folks on the phone, thanks for hanging in there. With that, thank you. Meeting adjourned.

3:45p