

Meeting Minutes
FBHCP Steering Committee Meeting
Carr Building and WebEx
21 February 2013

Steering Committee members present: Thomas Eason (FWC), Brett Moore (Humiston and Moore)

Steering Committee members via WebEx: Gary Appelton (STC), Julie Wraithmell (Audubon)

Steering Committee members not present: Danielle Fondren (FDEP), Blair Witherington (FWC), Tamara Pigott (Lee County)

Other participants present: Kat Diersen (FWC), Tom Ostertag (FWC), Kipp Frohlich (FWC), Robbin Trindell (FWC), Kelly Roberts (FWC), Amy Knight (FNAI), Jackie Larson (FDEP)

Other participants via WebEx: Andrew Grayson (FWC), Bob Ernest (EAI), Jimmy Sellers (Coastal Tech), Kim Colstad (Coastal Tech), Sally Davenport (Coastal Tech), Gary Knight (FNAI), Gene Chalecki (FDEP), Lisa Robertson (FDEP), Trish Adams (USFWS), Brian Powell (USFWS), Elizabeth Fleming (Defenders of Wildlife), Mike Flaxman (Geo Design), Kamie Carney (FDEP)

Staff Updates

KD Thanks for calling in. We've relied on WebEx in the past. If you have questions or problems with anything showing up on your screen, just give us a shout; Jimmy should be able to help you out with that. As I mentioned in the email I sent out, this is going to be a short meeting. It will basically be a review of major topics that staff have worked on in the last quarter. The second part of the meeting, Mike Flaxman will be presenting some of the work he's been doing on the take model. We don't have a quorum, so we can't approve the minutes from the December meeting, but if you have any comments or corrections, we'll take those now.

(none)

KD For those of you who are not regular attendees, we do post these minutes on our website www.flbeacheshcp.com, and you're more than welcome to access them.

The last time we met was in December 2012. We are now officially operating within the first quarter of year 6. I do want to mention that we have had a couple setbacks this quarter, but I think we'll be more than back on schedule for the next meeting, so plan on a whole day meeting in June. The main thing that took more time than we thought was we went back into the chapters to put on the website, and we had to get some more feedback on that. There are 4 chapters currently on the web – 1 (Introduction), 2 (Biological Goals and Objectives), 4 (Covered Activities), and 9 (Alternatives Analysis). None of these revisions we did in the last month were substantive enough to warrant a third round of review by the Steering Committee. We've had ongoing efforts throughout this process to keep the public and stakeholders engaged, but this is the first time we

really have something to show for it. I should mention that because we do have these on the web, one of the initial conversations the Work Group is starting to have about this is what to do with the comments on these chapters. The U.S. Fish and Wildlife Service has a required public commenting period for these documents, but we felt very strongly that it's important to start rolling this out to the public beforehand, not only because of the size and scope, but we want it to be informed by the stakeholders on the front end, and not just the back end. So we started talking about what to do with the comments, and at a minimum...we're working on a tracking mechanism where we record and categorize comments. Part of the transparency of this process is that we have to be able to show what the level of involvement was and who it's coming from. We've already been documenting interactions with experts and peer reviewers throughout this process. As comments come up that may be contentious or possibly result in conflict, we'll be bringing them to the Steering Committee periodically as appropriate.

BM So at one point there will be a more formal notice for public input.

KD Right.

BM Okay. So is there some type of notice on there now advising that this is preliminary, and that there will be a formal period for commenting?

KD Actually, yes, it is in there. In fact, I just posted it up there and it specifically clarifies that this is not the same as the formal commenting period at the end. In addition to that, early next week I'm planning to do a large scale email update to my entire contacts list, and inform folks who probably don't visit the website very frequently that the chapters are up there. We're also planning our annual stakeholder WebEx, which is basically outreach to stakeholders. We let folks know what we've done over the last year and invite their feedback. Normally we do that earlier in the year, but for this one I intentionally delayed it because I wanted those chapters to be on the website for a month before we did the WebEx. So that email will be going out next week, the WebEx is tentatively slated for the last week in March, so hopefully those who have an interest will have an opportunity to look at those chapters before the WebEx, and maybe come to it prepared to comment. So we do have multiple levels of ability to garner interest and awareness of what we're doing. And I also want to mention that after this meeting, I'm driving down to Gainesville for a legal conference that's focusing on the ESA. I'm going to be on a panel, and Trish is also on that panel, and we're going to have a chance to push the HCP a little bit. So we're getting feelers out all over the place.

BM The reason I made that comment was in case someone slips through the cracks. It's an informal process right now, and you don't want anyone to be offended or whatever it may be if they think they missed a legal opportunity to provide comments.

KD Right, and that's an important clarification. It's not the legal opportunity, but in my mind it has even more value than that final commenting period, because we have a broader opportunity to actually deal with and incorporate those comments. So, you can never get

to all of them; you can't always reach everybody, but we can do the best we can with the mechanisms that we have.

TE Kat – a thought or suggestion as it's appropriate – as it's part of the informal approach, I would encourage the Work Group to think about reaching out to specific entities, like perhaps coastal counties and/or Chamber of Commerce and/or environmental groups, just to do a little bit of targeted discussion, because it's hard when you're just reviewing a document to really fully understand the context and how it all fits together. So it might be worth a handful of reaching out to specific constituencies who we know are going to be interested, just to build that understanding and trust and be able to get verbal feedback as well as written feedback. I don't think it has to be comprehensive and we don't have to hit everybody, but just try and reach out to the folks we know are interested that are likely going to be affected.

KD I think you're very right to say that in particular the counties need to be engaged in this. I made a very hard initial push with the counties early in the process, but you're right, it's time to start bringing them back in.

JW Kat, you did an excellent job of outreach in the beginning. Unfortunately groups have short memories and there's also turnover within groups, so there's likely new blood that hasn't yet been exposed to what the HCP is.

KD That's a really good point.

KF What about the described media plan...do we have a media contact plan that we know exactly who's the spokesperson?

KD One of Coastal Tech's deliverables is every year we have a draft outreach plan and we update and modify it. But it outlines the major target events that we should try to hit every year, and the annual WebEx is part of it, the primer was part of it. So we actually do have that plan. But the next year to two years will be when the stakeholder involvement will go from the sort of low, mid continual level we've had to just through the roof. So there's going to be an increased need for stakeholder management.

So chapters 1, 2, 4, and 9 are on the website, and we'll be getting that message out. The other chapters we had initially hoped would go up at the end of this year were 5, 6, 7, and 14. Chapters 5, 6, 7 have been in development for a long time now. They're very dense and challenging, and chapter 7 was thoroughly revised by the Steering Committee. Chapter 6 was influenced strongly by the Steering Committee as well as feedback from external reviewers. Chapter 5 – the species accounts have proven to be immensely more complex and nuanced than we anticipated, so once each species account has been completed revised from the first round of review, we'll send out for a second round of peer review. We expect 5, 6, and 7 will be on the web before our next meeting, and possibly chapter 14 as well. Jimmy, now might be a good time for me to put you on the spot. Did I miss anything?

- JS The only things left on my list we've been working on since December is GeoDesign has been doing a lot of work on developing the mapping support, which Mike will tell us about later. FNAI has been working on revising their maps based on a bit of work that Coastal Tech has done with identifying mean high water line, and also the sea turtle workshop, which Amy will present on. During the next 6 months, our main focus is going to be on tackling minimization measures and to start looking at implementation. We have some meetings lined up with DEP's CCCL staff to start to make sure as we start to put together our minimization and mitigation plans, that it meshes with what the program's capabilities are.
- BM The chapter 6 interviews with the Steering Committee members – You had questions or discussions about potential mitigation and implementation.
- KD Your answers to those questions will inform our initial dive into that and how we structure what we'll bring to you as we begin working on that. the interviews themselves were under the auspices of chapter 6.
- BM You're going to start having meetings with the Department; what's that with regard to? Mitigation?
- KD Well, the implementation strategy is going to be based upon how we take the decisions for minimization and mitigation and make them real on the ground. So, if one of our minimization strategies is to work with local governments to standardize lighting requirements across the state, let's say, then how do we realistically make that happen? Well, we partner with counties, we maybe find some funding for code enforcers to go out and keep an eye on it. You know, what are the nuts and bolts that actually make the concept a reality? Implementation is probably the first chapter we actually started working on. We pick it up, we massage it, we put it down. It's sort in this ongoing feedback loop.
- BE Jimmy and Coastal Tech conducted the analysis, but I think the intent was to get an idea of what the big hurdles are going to be going forward.
- JS I would echo that. And that's what we plan on tackling in the next 6 months – taking the biggest challenges identified by the Steering Committee and making sure we address those with DEP's CCCL staff.
- GA At the last Steering Committee meeting, we talked about the need to prioritize the minimization and mitigation chapters. I think Kat said you'd bring it up at the following Work Group meeting. Is what you guys have been saying about that what was discussed at that Work Group meeting? Or are there other things that were discussed regarding how to prioritize those chapters and get them out quicker?

KD We did meet the day after the last Steering Committee meeting and initiate our conversation about minimization. Bob sort of elucidated at our last meeting that, structure wise, the way to think about this is chapter 7 outlines the threats, chapter 10 is minimization, and you should in your mind link chapter 7 to chapter 10 because minimization specifically targets the threats. So, how do we minimize existing threats? And then chapter 8 is take, and the take chapter discusses essentially all of the impacts to species that we can't avoid and minimize. And then chapter 11 is mitigation. So you minimize the threats, and you mitigate the take. So, because now we are very nearly done with threats, and on the cusp of being done at least with the preliminary run through of take, we can now focus on minimization and mitigation. So the number one, big heavy thing for this quarter coming up is minimization, and the number two, big heavy thing for this upcoming quarter and into the next quarter is mitigation. So they are absolutely our top two priorities. Implementation, as I mentioned, is sort of a continual feedback loop. We can't devise a minimization and mitigation strategy without at least an eye to whether or not they can realistically be implemented.

You'd think compared to take and mitigation, the concept of minimization would be the low hanging fruit, but as it turns out there is just no such thing as low hanging fruit in the Beaches HCP. So we almost immediately began to realize toward the end of last year as we started getting into minimization conversations that we did not have sufficient information at our disposal to be making good decisions about what the strategy should look like. So our first decision was to take a step back, scale back our approach, touch base with the folks in DEP who are already working on this process, and who deal with minimization as it's currently implemented for the CCCL program. So with that in mind we set up a preliminary workshop with DEP permitting staff in a couple of weeks, with the objective being for the entire staff working on the minimization component to get intimately familiar with the process as it exists now, and to present our preliminary ideas about the process as we'd like it to look in the future, and start to get the permitting staff's feedback on what's possible, what's not possible, what's feasible, what's likely. So it's my expectation that we're actually moving into a phase of heightened coordination on the individual staff level with the folks over at DEP who may have not been fully looped in on the Beaches HCP. We're going to be following up our preliminary meeting with the DEP permitting staff with a similar meeting, slated, not yet scheduled, with FWC's commenting staff. So understanding the aspects of what goes into the decision making on what their recommendations are. So there's been a little bit of scaling back and a little more acknowledgement that we have more homework to do before we can start making good judgment calls about what the minimization strategy's going to look like. But that having been said, we still have deliverables so we still anticipate having a draft minimization chapter out by the end of this year. I'm not sure how far we will have gotten with mitigation by the end of this year, but we have a list of deliverables related to that as well.

KF I just want to make sure I understand. So the Work Group, of which there are members a few of DEP CCCL folks, that group is going to bring the whole team in and really talk about how things are currently working and minimization. Then the same team will go to

FWC's commenting, and again there's some members on the Work Group who do that, but they expand it out to all the FWC commenting.

KD That's correct.

KF Okay, and those are going to happen when and where?

KD Well, the DEP permitting meeting is scheduled for February 26. And we haven't scheduled the FWC commenting meeting yet.

KF Will that be a broad commenting staff? More than just the CCCL folks?

KD To be honest, Robbin and Kelly and I need to talk about it a little more, but I think anyone who plays a role in commenting on CCCL permits should be involved.

KR I think the difference is, currently the CCCL coordination is for sea turtles, and the HCP will cover other species that we sometimes know about, but we don't necessarily include.

GA Is it possible to have Rebecca at those meetings so that there could be minutes that the Steering Committee could look at?

TE I think it's a good idea. I wouldn't say minutes, but rather major discussion topics and/or action items or pseudo-decisions made.

GA That would be fine, just so we could be adequately apprised of those meetings.

KD There's no reason why we shouldn't be able to give you the salient points from those meetings, and we're happy to do so.

TE I just want to reiterate that as we move into minimization and mitigation, my comment about reaching out to more specific stakeholder groups is exponentially more important. And we don't want to rush out when we don't have any product, but we also don't want to go out with an almost fully cooked product, because that's going to be harder to tweak. So we need to find that balance of having straw dogs that are decently well thought out, but able to have arms ripped off or new arms put on, or whatever the need may be, and get all of the different groups involved. We're getting down to where people are going to be really interested.

KD I couldn't agree more, and I would actually say that we're talking about minimization and mitigation, but the gigantic hurdle to date has been take, and we're now getting really close to the finish line on that. To that end, we've now had these species expert workshops, two of which we talked about at the last meeting. Amy, in particular has gone to great lengths to bring the right people to the table for these conversations. They're not just experts, but they're experts from a wide array of backgrounds and locales, and they're a strongly representative groups. And we plan to utilize those folks

heavily in the future as our first line of outreach to help push that out into the broader world. With that, I'll pass it over to Amy to talk about the recent sea turtle workshop.

Recap of sea turtle expert workshop with FNAI

AK We had the sea turtle workshop this past Friday, and there was really an excellent turnout, but I have to credit Robbin and Kelly for getting the list of people together. We had a total of 28 people who were either at the meeting or participating via WebEx.

The agenda for the meeting was divided into three main sections. We wanted to get feedback on the habitat mapping work that we (FNAI) were doing that was going to inform the take model. So, we had the experts review some examples and the definition from which we were working to do that mapping. The middle part of the meeting was mainly Mike Flaxman talking about the take model and trying to get feedback on impacts from the different CCCL activities to sea turtles that would inform that model. And then at the end, we had a presentation by Annie Meylan on work that they had done to categorize beaches by nest density. And that information is going to be very useful for mitigation.

When we talked about the beach mice and shorebirds, you might remember that we had some questions about what would be the definition of habitat given some of the gaps in data for the need to map potential habitat. And for sea turtles, we thought we had a better handle on this, and we went with a working definition that is in the Florida Administrative Code. And it seemed simpler because, basically, it's all sandy beaches in Florida that we should map for sea turtles. So that's the first thing that we talked about was the location of where these nesting beaches are. To help us identify where the sandy beaches were that we should be mapping, we were relying on information from FWC nesting beach data from a limited number of years, and that's what you see in green and purple is the original datasets that we relied on. But looking at years beyond that, for example 2006, we could see that there were some gaps in what our original draft map was, especially in Monroe County, and we also have gaps in the Everglades. So one of the things we're going to do, and this came out of the workshop, is we're going to try to fill those gaps by using as much presence/absence data from FWC as we can get, and also making sure that we do completely map all the beaches within the plan area and within coastal erosion areas within Monroe County.

So, there are two aspects for which these mapping data will be used – for the take model that needs to be within the plan area, but also for mitigation to identify where appropriate mitigation might occur that we want to map outside of the plan area. So that would include all the federal lands.

The second part of the definition was mapping the beach zone. And we're following the definition that would allow us to map the landward extent of the beach as the permanent line of vegetation, because that's something that we could see on high resolution aerial photos. So we prepared draft maps based on that and presented those for review, and I'll

just show one example of what that looks like. So this is an example of a map where we were attempting to get some feedback on where that permanent line of vegetation should be. So what we were asking about is the blue line here. The feedback we got was that on the east coast, 10-15% of nesting actually occurs in the vegetation for green turtles, and in the panhandle, for loggerheads, they're often nesting in the vegetation as well.

What we're going to try to do now is, for certain regions of the state and counties where they have good GPS data points for nests, we're going to gather that data to try to calibrate where the vegetation line should be and also establish a distance that we can potentially buffer landward of that line to capture a reasonable distance into the vegetation, so that we're not excluding nesting data for all the different species of turtles. So that's really our main next step, to gather that data and revise our habitat maps based on the empirical data we can get. We're not going to be able to get that data statewide, but we should be able to get it for different regions of the state that would allow us to extrapolate regionally. Any questions about that?

The next discussion was mainly on the work that Mike is doing and trying to get information on what the impacts of the different activity groups are for sea turtles. And the main part of that discussion really focused on lighting, and that it's really the main threat to sea turtles and it's a very complicated thing to try to estimate and to put into the take model. But I think there were a lot of ideas generated, and Mike has some ideas and can talk more about that.

The last part was Annie Meylan discussing sea turtle nesting density data. She was able to rank beaches, and I think that having that dataset, and having it be something that is statistically valid and supported by the sea turtle folks is going to go a long way for moving us forward on a first step in mitigation, which is categorizing habitat that can be used to identify mitigation needs.

KD I just want to point out that we've already talked a lot about stakeholder engagement today and the peer review process as well, and I couldn't be happier with how these workshops are going. They're doing exactly what we intended them to do. They're pointing out to us that we don't always get it 100% right on the first pass through, but they are also supporting that at least in the broad sense we're barking up the right tree. The folks that we have invited are engaged, they're curious, they're excited, they're feedback is very constructive, and it is absolutely contributing to us developing a more robust process.

BM I think that timing of your workshop with DEP as well as with the commenting folks at FWC seems really good, because I think what's really going to reel this is figuring out what are we really going to be able to implement, and this could go on forever. You know, everyone could be very idealistic about doing all these wonderful things, but there are going to be some very significant locations in the program that will help steer the process to try to achieve some of the mitigation efforts. I'll be interested to hear how those workshops turn out, and to Gary's comment, we don't need a word by word

account, but it will be good to have some sort of summary. I assume you'll have more meetings with them as you get into the development of the minimization and mitigation, so I'll be very interested in hearing how that progresses.

KD First, let me note that I have now heard enough times that you all are interested in hearing the outcomes of these workshops. You have my word; you will have detailed reports. What I would really like to do is at this preliminary meeting with DEP and the preliminary meeting with FWC, one of my objectives is to essentially collar some folks and get them to be more regular participants, even maybe calling in on the Work Group meetings and really getting up to speed on the Beaches HCP and getting them more in depth on our side of the process, at least for the duration of the minimization and mitigation part. Certainly we can do these once every few months, but I think to some degree, we're at a stage where nominal representation in this process by FWC and DEP is probably not enough. So I'm really hoping that is kind of the springboard for some enhanced section-wide participation from FWC and DEP.

BM There's a lot of people changing positions, so you're going to need to be very strategic about who's involved in those meetings and get the right people.

KD Yeah, and another thing I want to add in addition to that is we got in on our first really focused minimization meeting and almost immediately realized that we did not have what we needed. And I would say that with take that we were either blind or stubborn to that fact. We tried so hard to create a take model in the absence of the right kind and amount of information for a long time before we finally stepped back and said, okay the reality is we need to bring in a different set of screws. I don't want to say we were wasting time, because time wasn't wasted, but we're going to make better use of our time with minimization and mitigation. I'm hoping that we'll still get them both out by the end of the year.

The last update I have is I want to give you guys an update on grants and contracts. The grant for year 7 has been drafted and submitted, year 7 being 2014. We don't know when the awards will come out; the Service has been on a little weird off schedule lately, but I'm not concerned about it. It will come out before it's time to put it in place, and I have every confidence that we will be awarded that grant, as we always have been. We continue to have tremendous support and engagement from the Service on this project. We are technically in segment 6 now of the grant, which started on January 1, 2013. We have had some hiccups with getting the year 6 contracts executed, but luckily there's an overlap with the year 5 grant and contract, so there has not been a work stoppage. We expect to have the year 6 contract executed very soon.

The only other items I have are a quick reminder about the meeting dates for 2013. They should be on everyone's calendars. The next meeting, June 11, will probably be a full day. That pretty much covers my updates. Are there any questions or last minute comments on staff's work in the last quarter?

GeoDesign Preliminary Take Model

MF I have five things to go over, some of them very briefly because you're already familiar with the background. I'm going to concentrate on walking through some of the methods as currently applied and as visually as possible. I'll be showing you some of the results from December, which were the initial results on this. And then discussing basically what we think about the first pass and what some of the expert review has informed us about.

So, just a quick reminder, the Beaches HCP has to estimate future incidental take for which DEP is responsible. The methods used have to be transparent, repeatable and defensible. We're talking about approximately 50 directly permitted activities simulated over 25 years. And the environment is changing, which of course makes this complicated. Even when the changes are not DEP's responsibility, we have to take into account the context in which these future permits are occurring. In terms of overall status and schedule of this component of the work, we held initial consultations with the beach mice and shorebird expert groups in the Fall, we completed the work I'm about to show you as of December, and that is what I'm calling initial incidental take estimates. And then just recently, last week, we met with the sea turtle experts, and so what we learned from them is not reflected in the 2012 results. We have scheduled for the first quarter of this year to finish up incidental take, so we've got a bunch of related work underway, and have now met once with each expert group.

So, effectively there are kind of two major steps in the methods we're using. The first you can think of as permit simulation, and the second one is incidental take simulation. And so within permit simulation we conducted an analysis of historic CCCL permits, which I showed you during the last Steering Committee meeting. We developed linear regression models based on the historic CCCL permits, and used those combined with state demographic estimates and our prior scenarios from MIT to project future permit amounts and then, finally, permit locations. In terms of incidental take simulation, there are basically three steps. We're dealing with points, and not areas, and that's a direct result of the way in which the historic CCCL permits were recorded. We need to get to area to have a likely estimate of impacts to things, so we used buffering. We buffer the points of simulated future permit locations. We intersect those with habitat polygons that Amy showed you that are done species at a time or species group at a time. And we count the area of that intersection, and we do that repeatedly over time.

So as a summary of the historic permit analysis, we're looking at 30 years of permits and their relationships to major obvious drivers. We found that the problem is not just greenfield development, which a lot of other scenarios had emphasized, but there was a very significant number of CCCL permits that were issued on previously developed plots. Greenfield development is correlated with overall coastal population growth and available land. Redevelopment is correlated to, what I'm calling now, the general economic climate at the county level, and also to the time since prior development. In

both cases, we're lucky we don't need a brilliant model, because just 10-year time lagged prior rates predicted future rates pretty well. So we used that to build simple linear regression models based on three main drivers: human population growth rates, available land supply, and time since prior development. We went and obtained the freshest version of the state demographers population forecast, because in 2012 they redid those. And we used our AttCon simulation model to allocate the number of permits expected as point locations. Basically, within the plan areas, we set back from the ocean by the historic average setback in that location, and we randomly plot the points within those zones in legally developable areas, so private and state lands.

This table is really busy, but I just wanted to step back in terms of one of the main drivers, here are the top five projected growth rates for county population. So Flagler, St. Johns, St. Lucie, Lee and Walton are basically, even after accounting for the recession, etcetera, etcetera, are still expected to grow by approximately 20% per decade on average over the next 25 years. So give that as a major driver, I wanted to show you now an example of how this actually works when we're doing the modeling. We basically start with one decade of activity spots, which are our simulated future permit locations as GIS points. Our time step is 2010 to 2020. Then we buffer each point by a specified distance. We started by doing simple buffers, which are just circles, but we ended up revising that technique to use what are called voronoi polygons, which guarantees that the circles do not overlap. And that turned out to be a good way to accomplish two goals: avoid double counting and the second is just computational. It was getting difficult with the GIS software to run results for the whole state with every possible intersection of everything to everything. So basically we buffer the points but with a constraint that the buffers don't overlap, and then we intersect the results with the habitat polygons from FNAI. And we do this repeatedly over time, at the moment by decade.

Now, finally visually, here's a really tight zoom so that you can start to see some of these activities. This is in the central east coast. So we start off with an airphoto underneath, and the orange polygons shown here are, as I described last time, R-zones, or the area in between R-monuments that are surveyed across the coast. They're approximately 1000 feet long. They are calculated on top of FNAI's cooperative land cover data, and so they are done in raster at 15 meter resolution. And you'll see some funny edges at the margin of those 15 meter pixels. That's basically driven by the terrain modeling and which areas are considered dry or not dry. So for each R-zone we have what's shown here as yellow dots, which are historic CCCL permit points. The main thing that came up from looking at these is that there are many activities that are spatially attributed to one location. So for instance, what visually looks to be a single point at the bottom, actually has 19 different permits. It was attributed to a specific geographic location, but the activities are occurring across a pretty large parcel. So the permit locations are accurate in some ways and inaccurate in other ways, and that's an issue in terms of thinking through how to simulate this in the future. The main thing we did was take more seriously the setback from the ocean, and less the horizontal layout. So when we simulated the geography in which we would expect the permits to be located, we came up with these zones – the yellow outlined hash here – and that's based on the setback of the existing points for a

particular R-zone from the mean high water line. And we just kept them dry, so they're also on dry land as defined by FNAI's mapping. Basically, we have a zone in which two standard deviations of the where the points are occurring, and that's the zone or area in which we're allocating future simulated activity spots. We have no basis for locating them geographically precisely within those zones, but essentially we try to get the right number of points in approximately the right zone location, but the very specific location of each of these is entirely random. It's a hard thing to talk about, but hopefully it's visually apparent. For example, in this R-zone there were 19 historic points, and they look like they're only two or three, historically, but they're all piled up in one location. But when you go and simulate the future with a reasonable number of random points, they are actually more dispersed.

The next thing we do is the buffering, and the buffering is done in raster for reasons of computational efficiency. And when you're doing buffering, you're basically looking at equidistant distance from every simulated permit point. When you do that with circles, the circles will overlap. But what we did with voronoi polygons, when you have polygons that are close together, the voronoi approach goes halfway to the nearest neighbor. So we're simulating take here as being up to 100 ft. away from a particular point, but no closer than half the distance to the nearest neighbor. So this approach avoids overlaps, and take is always attributed to the closest point. It's not perfect, I have to say, and there are other ways of doing this, but it also turns out to be very computationally efficient, and working at state scale that becomes important very quickly. Commercial GIS software can barely handle doing all 30,000 of our points. The approach works very well, in general. If you want assignment of blame, so to speak, for take, the assignments in any particular case may be influenced by the neighbors, but on average, you get a pretty good result over 30,000 points.

The next step in the simulation approach is to intersect with habitat. This was done for each type of habitat. The blue line here is the mean high high water (MHHW) line. And I'll mention that FNAI is in the process of revising the habitat maps based on the workshops and based on input from Coastal Tech, including a consistent MHHW line from the survey data. The original digitization of habitat was done on airplane photos that had varying tide levels. And in this case, I show one of the perils of that which is that at low tide it's hard to estimate where the MHHW line should be. In any case, we're clipping the habitat to the MHHW line so that our projected impacts don't extend into the water. But also clipping on the landward side to the plan area, and it's shown in an olive color here, that's the CCCL.

So the results of this approach initially look something like this. We've gone ahead and clipped for the MHHW line on one side and for habitat on the other side. And there are points that are halfway in the middle, and the activity is simulated as occurring in the plan area, but outside of the habitat. On the other hand, their influence, or buffer, extends into the habitat, you can see what's left of that is that little piece, which is take from an activity that's occurring outside of the habitat, but close enough that it's actually having

influence inside the habitat. Conceptually, basically you've got multiple levels of filtering going on.

So if you add up the areas from this kind of analysis, you can start to account for take across very large areas. The goal for 2012 was to do this for the peninsular Florida LCC geography, and the main reason for that was just that we had better data for those areas. Our scope of work for this quarter is to extend to statewide, and I'll show you a few statewide results in a moment. To be clear, this is not for the full state. These numbers are for the southern two thirds of the state, so the beach mouse numbers, in particular, should be looked at skeptically. What we did in the initial runs was basically to choose a somewhat arbitrary large distance for all buffers for one species. And we made that large enough to include a range of what we'd actually expect. So we intentionally kind of overshot things to do a very conservative estimate of take. We used 100 meters, which is wider than the likely widest beach and larger than the standard guidance for flushing distances for birds. And for beach mice we went with a really large buffer to try to account for all indirect effects on beach mice. We actually went out three kilometers. I don't want to read too many numbers to you, but for sea turtles, for example, in the direct footprint of a development accounted for 2,700 acres. If you expand that by 100 meters, we've got about 7,500 acres for the Peninsular Florida LCC. So when you get up to the state level, approximately half of their habitat is counted for incidental take. The shorebirds do better. We have approximately 1,500 acres of incidental take for both the least tern and black skimmer in the Peninsular Florida LCC area. For the beach mouse, as I mentioned we did a little bit of sensitivity testing, so this is only really dealing with the Southeast beach mouse. Approximately 270 acres of take if you're using 100 meter buffer, and about 550 acres of take if you're using that three kilometer buffer.

AG Mike, this may be a devil's advocate question, but I'm watching the presentation and looking at it graphically and listening to you. How do you account for, and I assume that this is projecting forward on an incidental take, how do you account for the fact that you're hitting hard surface? For instance, a sea turtle, I guess two concerns there are can it nest and do we have lighting that may complicate its nesting process. How do you account for the existing hard surface that's there?

MF It's a complicated answer. We can account for the direct footprint effect, so direct footprint of hardscape based on what we can glean from the permit category. For example, some permit types are very explicit. There's a permit type for small parking lots that are up to 12 x 12 feet. We know we have up to 12 x 12 feet of asphalt, and at the moment we're assuming it's 12 x 12 feet of asphalt. So that gives us the direct footprint number. We will actually be doing some additional work in the Spring to look more carefully at the actual sizes of these things, as opposed to their hypothetical permit sizes. So that's where the direct impact comes from. And lighting I was going to talk a little more about in a moment, but in general right now lighting is accounted for with a simple buffer distance. And that has one really major advantage in that it's computationally tractable across very large areas, and one major disadvantage is that in reality lighting is a 3D problem, not a 2D problem. And if you have lighting that's blocked or screened by

something, basically that can minimize the impact. So we have a better mechanism for dealing with direct impacts, and a less good mechanism for dealing with particularly lighting. Lighting is one of the most problematic specific impacts in this regard. I guess I'll mention the other one that's weakly done with buffering is dogs walking on the beach or any other kind of pedestrian traffic generation stuff. We're really estimating the effects of human activities occurring relative to the construction itself, and that's done reasonably well with buffering. As you go out further and away from things and consider more indirect impacts, the approach works less well. So for example, imagine a dune crossover that allows 10,000 people a day access to a particular stretch of beach...

TE Mike, I just want to jump in real quick. We've got a max 10 minutes, maybe we can stretch it to 12 or 13, but if you've got another question like Andy's, I'd ask that you save it. I just want to make sure you get through your presentation, Mike. If there are more questions like Andy's, I think we're going to have to do those offline and/or figure out a different way to do it.

MF Sure. Thanks for the reminder. In addition to the work we did for the PFLCC scale, we also did some preliminary work, where we could, at the full state scale. And what we used here was some different datasets. Basically, ones which had been created in advance by Coastal Tech. And so we have the full state geography for these particular types of activities, but only two activity types. So Coastal Tech had already done an analysis of vacant parcels, and that was done statewide. And they had already done a shoreline armoring study, and that again was done statewide. So for those particular types of activities, which were important ones, we went ahead and ran these take estimates for the whole state, and so that's why the first column here is labeled 'buildout.' It's not necessarily realistic that all this stuff will be built. On the other hand, as we talked about before, there are only about 4,000 vacant parcels left on the coast of Florida, so it's not unrealistic that they get built. And under continued coastal erosion and sea level rise, it is not unrealistic that places get armored. With that said, these are subsets of the impacts, but superset of the geography. Apologies if this is a little confusing. For sea turtles statewide, we have 30,000 acres of habitat identified based on basically all white sand beaches, and we have a fairly massive take number just coming from the greenfield development. this number is for un-minimized take, so it's kind of the worst legal behavior or average legal behavior under current circumstances. So if you minimize you can reduce these numbers, obviously.

So basically here are some of my initial reflections on these results. As we've started to workshop them with the experts first, and then we'll be rolling back to the Work Group to talk about these, but these are really just my personal reflections. For shorebirds, they're the easiest of the three groups to address because the take estimated forms a relatively small fraction of the overall habitat, and there are many options geographically. It's still a significant take, but there are a lot of possible points and ways to minimize. For beach mice, the total take numbers are necessarily incomplete and not particularly representative, so we have to be cautious about interpreting the initial numbers. Without effective minimization, though, you can say that at least 1,000 acres of mitigation or

equivalent will need to be determined. Given the current total approximate range of 20,000 acres, this is logically possible. The sea turtles are the most difficult because they have the largest range and the biggest take. In rough numbers, approximately half of current measured habitat has potential for incidental take. So we're talking about 14,000 acres occurring literally all over the state. Obviously the minimization and mitigation measures for these will have a very different character than for the other species. The bottom line there is you cannot possibly geographically acquire that large of an amount of pristine new beach. As I started to mention in answer to Andrew's question, the recent workshop we did highlighted the fact that lighting is a major driver of take, and it's not necessarily well captured with buffers. There's a real challenge related to that, which is that lighting is basically a view shed issue, not just a simple distance issue.

Just briefly, where we're aiming is we want to adjust the final parameters based on expert reviews. So we've taken the feedback from the three expert meetings, and we're using that to set up a set of initial parameters that are more biologically realistic. We are refining the impact model in kind of a fundamental way to deal with different buffer distances for each type of permit for each species.

So as I described to the group before, we're building an online system so that we can revise these distances provisionally, and get expert feedback about them. We are also now in the position to accept revised inputs, so Coastal Tech and FNAI have both been doing a lot of work, and that was not reflected the 2012 projections. The bottom line of that is that that work will provide a dynamic future habitat base that considers coastal erosion, storm surge, and revised estimate of MHHW line. The main issues we've come across, and we can discuss at a later time, are that there's very limited human factors literature on interactions with specific CCCL permit activities. Coastal Tech will be conducting a targeted literature review to help us with this. Most experts want to see occurrence data to judge this, but so far we've only been able to show them partial. The basic buffering approach seems reasonable for most activity types, but somewhat problematic for sea turtles and lighting. And we hadn't scoped that in this year's work, so we have a scope and budget problem there. And there are spatial limits on the historical permit data. We have scoped work for this year to do some work with Coastal Tech on parcel level sample mapping, so we can get better than point aggregates, and actually measure instead of impute the size of activities. So, that's all I had.

TE Thanks, Mike. A suggestion I have to be sensitive to peoples' time and schedules, if people want to hang out after 11:00, follow up then with Q and A for Mike. I did want to wrap up with a little bit of business before giving people that option.

KD To those of you who are just seeing this information for the first time, I know it's a lot to digest. You're always welcome to email Mike or me or others on the team with questions. With that, we'll hold on to any questions for Mike until after 11:00. Final segment of agenda – parking lot. I don't think we parked any issues today other than questions for Mike. Anybody have comments, questions?

With that, I really do hate to end a meeting on a down note, but a bit of sad news. Jackie?

- JL I have accepted a new position within the Department. It will be under Deputy Secretary Greg Munson's group of Office of Water Policy and Ecosystem Restoration. My new position I'll start on March 6, so this will be my last Steering Committee meeting. A few folks within the Beaches Section will take over my duties. That includes Gene Chalecki, Lisa Robertson and Kamie Carney, who's been helping me through the invoicing and contracting. I will miss this project very much and working with all of you. My email address will stay the same, so call or email me if you have any questions.
- TE Thank you, Jackie, for your efforts and work. You've really done a lot, and we appreciate that, so thank you. The next set of news is that I am taking a new job, and last day with FWC is March 8, and then I will start with the Fish and Wildlife Service on the 11th. I'll be the Science Coordinator, working with Tim Breault on the Peninsular Florida LCC. So I'll still be involved, but in a different role. I've really enjoyed being a part of this project. I want to make the official hand off for FWC to Kipp Frohlich. Kipp will become FWC's co chair for the HCP. So I'll leave it at that. Anybody have any important comments or questions? We're out of time, but if you've got anything...
- EF I just had a broad question about the public input and meetings and all of that. Is there going to be a NEPA process associated with the HCP? An EA or an EIS?
- KD Yes. It'll be an EIS. I've had some preliminary conversations with our partners at the Service about it. I wrote in a reasonable chunk of funding into the year 7 grant to facilitate this team to begin working on the NEPA process. So we foresee that getting underway in year 7.
- EF Thanks. I couldn't imagine undertaking something like this without one, but I just hadn't seen anything about it.
- GA I just wanted to echo some of the thoughts about our sincere appreciation for all of Jackie and Thomas' work. We wouldn't be where we are without them. Thank you both immensely.

Questions for Mike

- JW I was curious, in a future iteration of this do you plan on including solitary nesting shorebirds?
- MF The intention is to extend the approach to all covered species where it makes sense. We've had challenges in that the limitation with solitary nesters is data limitations. The approach would make sense for areas where we have good survey data, however, in our discussions we've started with colonial nesters because we have much higher confidence in the extent of the survey data for them, and the other data sets that are just coming

online should help us in judging if it's appropriate for solitary nesters, but we haven't come to a decision as a group yet.

- JW So you might have an analog approach? Of course it's always easier to monitor and accommodate larger colonies, but solitary nesters aren't less important. Similarly, it's easier to consider nesting birds, how do you intend to factor in critical wintering habitat for piping plovers?
- MF The work you've seen so far is pushing on activities. We've have an idea of where the threats are coming from. What we'll need to do is look for opportunities where we think we have good presence data or some stratified sample for an area.
- JW Are the datasets and maps you're working off of representing occupied habitat available for Steering Committee review?
- KD It's not there yet, but you will have access to it when it is.
- AK The data for shorebirds is the most difficult and the ones we have yet to settle decisions. Since the workshop, we've had good back and forth with experts and next week I'll send out a summary from that workshop and an update of where we are. I think we may be able to answer some of your questions after we've settled some decisions on where we're going with the shorebird data.
- BE Keep in mind what Mike's doing is developing a technique. The output numbers are just to show how the model will work.
- JW I think it's an impressive technique. I'm just trying to decide if it's really accurately characterizing the situation on our beaches. I have a hard time knowing if my questions are because of a shortcoming in the model or the inputs.
- MF Part of our next steps are to develop an online system, so of course the Steering Committee will have access to that as well. That should prove useful in digging down into habitat data or the impact model as computed.
- GA Is the large take that you describe for turtles due to range or extent of the impact, or is that impossible to tell right now?
- MF It's a result of a combination of a very broad definition of habitat, which is basically all white sand beach and a broad definition of take generating activities.