

ENDANGERED SPECIES RECOVERY COMMITTEE (ESRC) MEETING

July 25, 2019 MEETING MINUTES

Meeting Location: Department of Land and Natural Resources, Division of Forestry and Wildlife,
1151 Punchbowl Street, Honolulu, Hawai'i 96707

MEMBERS: David Smith (DLNR), Jim Jacobi (USGS), Lisa Spain (At-Large), Michelle Bogardus (USFWS), Kawika Winter (At-Large), Loyal Mehrhoff (At-Large)

STAFF: DOFAW: Jim Cogswell, Glenn Metzler, Lauren Taylor, Lainie Berry, Afsheen Siddiqi
DLNR: Linda Chow

OTHERS: Adam Young, Brita Woeck, Alicia Oller, Matt Stelmach, Marilyn Teague, George Akau, Marie VanZandt, David Moser, Lily Henning, Diane Sether, Gil Riviere, John-Carl Watson

AGENDA

ITEM 1. Call to order

SMITH: Let's come to order. I'm Dave Smith, I represent the Chair of the Department of Land and Natural Resources on the committee.

ITEM 2. Announcements

SMITH: I just want to mention. So Scott Fretz was the previous representative. He was the chair of the committee. We don't have it on our agenda to vote on another chair, so my recommendation would be that I just continue as chair for this meeting and then at the next meeting if we want we can open it up to consideration as far as nominating another chair.

JACOBI: Yeah, I think that's fine as far as I'm concerned. But before we get started first of all I would like to acknowledge the contributions that Scott Fretz made to this committee and get it on the record, you know, Scott's both insight and leadership I think really helped us on the ESRC to achieve the mission that we have, which is to provide really good, strong scientific basis for evaluating the biological aspects of HCPs and Safe Harbor Agreements and making those recommendations to the Board of Land and Natural Resources. And so again I just wanted to make sure we acknowledged that, and I personally as a member of the committee really appreciate all the effort he put into it.

SMITH: Yeah, Scott was awesome. Very, very dedicated, put in lots of time. He was very good. Okay, so we'll move right into the agenda. Announcements: so there's an update from staff on the *Abutilon menziesii* action and I think Jim Cogswell was going to present that.

JIM COGSWELL: Just really briefly. It was requested to have it on our agenda in light of the fact that the *Abutilon* license is expiring in 2021 and the criteria are not going to be met at that point. Staff have been trying to engage with DOT to try to get them to make some decisions on how they want to proceed forward. Haven't been able to do that but we're continuing to try to get them to respond and make some decisions on how to go forward.

JACOBI: Can we make a plan to have that on our next agenda? I think this is a really critical issue. It's one of the first HCPs really coming to conclusion. It certainly is the first one that has not met its goals and I think that's a really important issue that we need to figure out from ESRC's perspective in terms of the biological recommendations and so forth that we put forth, and then how that relates to enforcement—and that is somebody else's kuleana, but I think it's an important thing that we bring that back to this discussion here and see really how to proceed on that, and what the role of ESRC may be in that.

BOGARDUS: I was looking through the notes on *Abutilon* from a couple of months ago. Remember when we had that meeting and there was an action item on there about talking to Linda about a judgment call on how we deal with meeting the success criteria between the action agency versus DOFAW? Was the staff able to have that conversation with Linda Chow? Linda, do you remember this conversation at all? I don't think you were at that meeting.

LINDA CHOW: Can you repeat the question?

BOGARDUS: So for *Abutilon* there's a question on meeting the success criteria. It's pretty clear that they're not meeting the success criteria right now but the question is whether or not the onus is on the action agency, HDOT, versus DOFAW which was charged with implementing the conservation actions. And so there was a question on the ability to go back to HDOT in order to meet those success criteria. I can't remember the exact phrasing of the question that needed to get answered by you but there's a legal component there that we need clarity on as a committee, in terms of how do we address them not meeting the success criteria under the HCP. Does anyone else remember this?

LINDA CHOW: I don't think I've fully explored that question with the staff yet, so we can go back to that and then come back. So part of that would depend on how the HCP itself was drafted. I think now, the way we would approve an HCP being drafted is the action agency or the applicant would almost always be responsible to meet the HCP goals, and then the implementing entity would just be a contractor to that. Then it would be up to them to communicate with them back and forth if those goals were not being met. That would be how we would currently review HCPs in that type of arrangement. But we'd have to go back and look at the terms of that particular HCP.

BOGARDUS: Can we go back and look at that as well as the agreement that existed between HDOT and DOFAW at the time that that was made to better figure out what the compliance piece might be moving forward?

JACOBI: And can we clarify also what the termination date was on the HCP? I mean I know funds have run out, but what is the actual close date? If we can do that, because I think it's really important that we have this next meeting before that end date. Because otherwise we're sort of playing catch up and we want to be as proactive as possible and we should have been doing this a year ago.

BOGARDUS: And it may limit the options moving forward if it's after the end date.

WINTER: I seem to recall this stemmed from me just wanting to get this off our plate and I made a motion to vote that they're not in compliance then everybody was like, wait, we've got to do some looking into this first. So I just want to make sure that this looking into gets done so that we can make the vote and get this off our plate.

JACOBI: So it is important that we have this as an agenda item in our next meeting, as I see it.

BOGARDUS: Theoretically August?

MEHRHOFF: I thought that the actions though for the determination were fairly well laid out. So what other things did you need to work out with HDOT?

JIM COGSWELL: Just how they want to move forward if the results weren't what was expected.

SMITH: I think based on what Linda said you just have to determine who's responsible, right? Is it DOFAW or HDOT? How is that document written up?

JACOBI: Yeah, that seems to be the first step but the second step is then: then what? Yeah, it would be who's responsible but what are the actions going to be taken to address the issue?

MEHRHOFF: Yeah, I just thought when it was over, it was over and the reserve area stayed, but that was the end of their responsibilities. Yeah, I think it was any additional obligation from each other after that determination.

BOGARDUS: I think we agreed the reserve area stays.

MEHRHOFF: I don't think there was any additional obligation after the termination.

WINTER: Wasn't there a desire to build something through there, like we've met our obligations and now we can build something?

JACOBI: There were two things. They wanted to first of all reduce the size of it and the second thing was maybe build something there instead, so we weren't really clear in terms of what that was.

SMITH: The answer for now would be no because they haven't met the obligations, so we just need to determine what is going to be required to meet their obligations. Which is essentially other breeding populations, right?

JACOBI: Three successful breeding populations was the obligation there in terms of the long-term success criteria.

SMITH: So it seems pretty straightforward. It's just a matter of which agency would be responsible.

JACOBI: I think the direction is clear. It has been clear right from the beginning that the ability to actually pull it off in the field has been a real challenge and we all recognize that still and that's what adaptive management is all about.

And speaking of the next meeting, I just want to get this so I don't forget it. If there is a way that we can shift our regular meeting schedule from a Thursday that would better ensure that USGS can participate because Gordon Tribble definitely cannot make Thursdays. Every Thursday of every week he's tied up with regional meetings and cannot get out of that and I can come when I can, but if there's a way we can shift that. We can come back to that at the end of the meeting, but I just want to make sure I don't forget it. We can make Wednesday, Friday, Monday, Tuesday. So let's come back to it.

SMITH: So what are we asking from staff? We are asking for an update on success criteria; take a look at the HCP and see which is the responsible agency for me to test criteria, right?

JACOBI: And it would be very good at that meeting to have DOT present and eager to speak at it rather than just a person who says well, I don't know anything about this because I haven't been around because if they are the responsible agency, they need to have a person who knows what's going on with it.

WINTER: And if they refuse to come that shouldn't hold us up from taking action, right?

JACOBI: They should not refuse to come.

WINTER: Well, they haven't been responsive. We need to get this off our plate.

ITEM 3. [Approval of Minutes: August 30, 2018 ESRC Meeting](#)

SMITH: Do we have minutes?

JACOBI: I wasn't here for that meeting but reading through the minutes I was very pleased with how clear they were and it was a very useful summary I thought so I could understand as if I almost was at the meeting and so I appreciate that. That's my only comment on it.

SMITH: I'm going to abstain since I wasn't at that meeting. Is there a motion to approve?

MEHRHOFF: I shall move.

SMITH: And to accept?

SPAIN: I second.

SMITH: All in favor?

BOGARDUS, JACOBI, SPAIN, WINTER, MEHRHOFF: Aye.

SMITH: All opposed? Abstain? (SMITH raises hand.) Okay. So approved.

SPAIN: Did we miss those minutes or they were just new minutes? I was confused about those minutes.

JACOBI: I think they were just late.

SMITH: Yeah, I'm not sure why.

ITEM 4. [ESRC review of Kawaioloa Wind Power HCP Amendment dated June 2019](#)

SMITH: Okay item 4, ESRC review of Kawaioloa Wind Power HCP Amendment. So I will have Kawaioloa present.

BRITA WOECK: Thanks for being here everyone. I don't know if there's limitations on anyone's schedule, but my thought is that we could run through our slides just so you can kind of see what we have laid out and then go back to any of the topics that you want to discuss in more detail. Does that work okay for everybody?

JACOBI: We'll take the time needed to go through the whole thing.

BRITA WOECK: Okay, perfect.

BOGARDUS: I guess while we're waiting to set up I'll give a quick update to the committee on the Fish and Wildlife Service's timeline on the four wind projects. I mean, one new and three amendments. This includes the Pakini Nui new HCP, the KWP II amendment, the Auwahi amendment, and the Kawaioloa amendment. This is actually new information that the applicants haven't heard yet. We did get approval so the publication of the programmatic EIS

with the current final draft of the HCPs is publishing on August 2nd. We would then have a waiting period between August 2nd and we would make our final permit decisions early September; probably around September 3rd. So that's the timeline that we're working with. No major changes from the last time I provided an update but I wanted to make sure the committee knows that's where we are at. We did, by the way, as you guys saw Auwahi submitted a new draft of their HCP following our ESRC meeting last month, right? That version of the HCP for them is the one that we're using for the final, so we were able to swap it out with the latest version. And as of today we can release those final documents to our interested stakeholders, which includes you guys. So expect an email from me today with the official publication. The official document publishes on the 2nd, but everyone here gets an early copy because they've been involved in the process of it.

BRITA WOECK: Well, thank you everybody for being here today. We really appreciate it. As most of you know, I'm Britta WoECK with Kawaiiloa Wind. We are the largest wind farm in Hawai'i located on the North Shore of O'ahu. Also, one of the largest renewable energy projects in the state. Our original HCP was approved in 2012 and we are currently seeking an amendment to increase the bat take authorization and add the Hawaiian Petrel as a covered species.

So to start I just wanted to spend a minute telling the story of our project, particularly for those of you that haven't been as deeply involved until more recent years. We initiated the HCP amendment process back in 2015, well before we reached our take authorization in 2017. And since that time as most of you know, we've been working really closely with DOFAW staff and staff from U.S. Fish and Wildlife to develop a robust HCP amendment. Today we're going to walk you through our proposed final HC Amendment and we are seeking your recommendation of approval.

The other thing I want to call your attention to is the orange boxes on the timeline. One thing that we've done since the beginning of the project, as soon as we suspected that the rate of bat take was higher than when we anticipated, is proactively look at ways to understand and minimize our bat take. So those orange dots represent the major adaptive management actions that we've taken over the course of the project and that includes expansions of our low wind speed curtailment regime made in 2012, 2013, 2015, and 2017. After that time we started looking more closely at other tools available to us to try to reduce bat take and that's culminated in the installation of acoustic deterrents on all of our turbines which was completed last month.

So today what I want to do in the interest of time is really focus on the revisions that we've made between our draft which we presented to you in October and our proposed final. All of the revisions have been made directly in response to the comments that all of you provided to us during the meeting or in writing and then also public comments that we received during the comment period. So there's five key areas that I'm going to focus on today: updates on the minimization measures section; we've reduced our bat take request, so I'll talk through that a bit; we've clarified some of our adaptive management; we added a quantitative bat population

and cumulative impacts analysis; and then finally we've strengthened the monitoring and adaptive management components of our mitigation plan.

So to start with minimization measures, we are now the first project in the U.S. to have installed acoustic deterrents commercially. So in June they were installed on all 30 of our turbines and now are operational. The pictures at the bottom show just as an example the deterrent system made up of five different units that are installed on the nacelle and then the graph on the right shows the attenuation of the sound frequencies from the deterrent. So a question that comes up a lot is how far out do those deterrents project sound. So for our project the deterrents are set up to capture the full range of Hawaiian Hoary Bat echolocation frequencies which extend at a minimum to the end of the turbine blade but the higher frequencies actually extend beyond that. So we're effectively producing sound that covers the entire rotor swept area, but bats are still able to forage above, below the turbines and elsewhere in the wind farm. One thing that we're really excited about is that if you recall we did a proof of concept test at turbine 30; we installed the deterrent system last summer and that was the turbine that had the most bat fatalities since the beginning of the project. And we haven't observed any fatalities at that turbine for over a year. So far, even though the deterrents were installed sitewide in June, we haven't had any fatalities yet. While we don't expect this to be an avoidance measure we are really hopeful that this is a trend we're going to start seeing, so excited to see as we as we move forward through time. I also just want to point out quickly that in addition to the deterrents we're continuing to do our low wind speed curtailment, which now includes a 0.2 meter per second hysteresis and a 20-minute rolling average, and what those two terms mean is we're working to extend the down time of the turbine and also reduce the turbine cycling which more recently has been shown to be something that's correlated with bat fatalities. So that will continue for the life of the project.

WINTER: What is that image on the left?

BRITA WOECK: It's the turbine nacelle and then you can see the little black squares that are on it are the deterrent units.

JACOBI: The circles are the blades coming out.

BRITA WOECK: Yeah. It's like a cross section kind of.

WINTER: The dark gray thing is what?

BRITA WOECK: That's the nacelle. You're looking at it from about 3 o'clock. So there's five units and so the sound goes up and below so it goes to where the turbine extends and down towards the ground and then up and in all directions.

JACOBI: Have you observed bats responding to that?

BRITA WOECK: So we're still waiting for the full results from our proof of concept test. We did acoustic monitoring and video. What we could tell from, I mean, it's tough because it's one turbine and a really small amount of bat activity. So ideally we would have a larger sample. What we could tell from the acoustic data is that the nights the deterrent unit was turned on we were seeing less bat activity surrounding the turbine. The video though is intended to look at what exactly they're doing; are they moving away? And so we don't have the results from BCI yet on that.

So now I'll touch on our bat take requests and adaptive management. We worked over the last nine months with DOFAW and U.S. Fish and Wildlife to refine our take estimate. Originally we had proposed a request of 265 bats; that was extremely conservative but basically assumed no measure would be taken to minimize impacts. We've reduced that now to 220 bats and that assumes a minimum reduction of fatalities at 25 percent due to the deterrents. We feel like that's fairly realistic but conservative based on results from mainland studies. There are two studies that came out in 2019 that showed mainland hoary bat take reduction reducing by over 70% for mainland hoary bats at two test sites where these same deterrent units were installed. We've maintained the same three tier structure that we presented back in October when we came before you. I guess the last thing I'll say is the tier structure here relates to our adaptive management strategy.

WINTER: Can you clarify, the 265 came from what?

BRITA WOECK: It was assuming our take rate with no future reduction, like kind of worst case scenario. We didn't think we'd get close to that. But at one point in time—go ahead.

BOGARDUS: I will just say on the U.S. Fish and Wildlife side, we required them to do that because we didn't have any assurance that the take would be reduced with the methods that they had identified at that time. We needed something concrete to be able to say the take is going to be less than that. So we asked them to do, if there was no minimization methods, or we don't have faith in those minimization measures, then you have to analyze what it would be in absence of those minimization measures, which is the 265. Now they've addressed that, but I just wanted to say that was the reason we asked them to it that way.

BRITA WOECK: Yeah, and we really want to find that balance between we want to be realistic, we don't want to come in with a fake number; we don't want to have to come back for an amendment. So this is still somewhat conservative because we have reason to believe that the deterrents will be more effective. But we feel this is the most realistic number that we can land on.

JACOBI: I'm not sure I understand what the basis means there?

BRITA WOECK: That was I think because we had identified a mitigation project that was identified as compensating for 55 bats so we didn't touch that.

JACOBI: So that's a different thing.

MEHRHOFF: Yeah, that should be 75 or something like that?

BRITA WOECK: It's probably roughly like that. The calculation isn't as straightforward. But yes, it's assuming that it's a greater than 50% reduction.

JACOBI: 50% is what you're expecting with your current methodology?

BRITA WOECK: Yeah. That's right. There's a very good possibility that we could stay within tier 5. It's not out of the realm of possibility that those deterrents could reduce take by 50%, but there's some uncertainty there so we want to make sure we're accounting for that as well. And so our adaptive management strategy is directly tied to those tiers. The approach we're taking is to implement a strategy that both keeps us from exceeding our authorized take limit, but also keeps us within the lowest tier of take possible. So I'll just point out that in the final HCP we've clarified our commitment to do regular evaluations of take outside of the adaptive management triggers. And so what that looks like is we will be looking at our take rate and comparing it to our predictions after each fatality, quarterly and annually. So those check ins are not a trigger for taking an adaptive management action necessarily but they're opportunities for us to continue tracking what's going on at the site, looking to see if there's anything unusual outside of normal interannual variation, and working with the agencies to see if there's any pattern that's sort of revealing that we need to be monitoring more closely.

JACOBI: What are your triggers?

BRITA WOECK: So that's what I'm going to tell you next. I think that had been a request from somebody on the ESRC, is just to state the commitment more formally that we're not going to wait till the trigger to look at what's going on, we're going to continually be looking. The triggers are set up on a sliding scale that way we have them set up when we reach 75% of a tier and the take trajectory looks like it's going to exceed the take of the authorized take limit we will implement an adaptive management action. There's no time frame associated with the triggers so they act on a sliding scale; so an adaptive management measure could be triggered in three years or could be in ten years, but it's designed so we can identify exceedance of our predictions quickly and while still allowing enough time to implement a measure that will keep us within that lowest tier.

BOGARDUS: So the point that you hit 75% of any given tier?

BRITA WOECK: Yeah, that's right. And it's also, the way we have it is that we also have that paired with mitigation planning. So as soon as we have to plan for another mitigation project, we just don't move forward with only the mitigation. We also take an action to try to keep us within that tier.

JACOBI: One concern I've got is, you may give the example of three years versus ten years to hit the trigger—if you hit the trigger in three years your rate is really fast and so you have less time to actually react whereas, if you hit at ten years it's going to be a longer time to get there so you've got a longer time to react. So I'm concerned that you've got to really keep on top of it and if you see the things are happening sooner than later. I would actually reduce that trigger down to a lower threshold because you need more time to react in terms to how to plan for your actions.

BRITA WOECK: Okay, I see what you're saying.

BOGARDUS: And that is being addressed in quarterly reports on take and every time they have a take we project the rate of take going forward.

BRITA WOECK: The way it's set up is so there's a firm action that will be taken, but before we even hit that action, we're going to know if we're even getting close to that 50 percent; we'll have been talking with you two years before, five years before, so it won't be a wait until that one moment in time to do something.

JACOBI: Right, I think it's important because it's got two components. One is that threshold value in terms of your 75% percent. The other is the rate, the slope that you've got going to that point and you need to bring both of those into account in terms of the affect on what your actual trigger is.

BRITA WOECK: We have those two elements in there. That's right. So when those triggers if they are hit and it looks like we would exceed our predictions the HCP outlines a number of management actions or adaptive management actions that we could take. That could be testing or installing new deterrent technology, making some operational adjustments, altering site conditions if it looks like there's a land use that could be changing bat behavior in the area, or implementing alternative technologies. I want to point out two reasons why we have it set up this way. One being that Kawailoa is minimizing impacts to the maximum extent practicable. We are doing all the low wind speed curtailment we can do right now. We've sought out cutting edge technologies and we've installed them on the turbines. There's not a lot of, like, we're doing everything we believe we can do to minimize impacts. The other thing is we've got the benefit of data now and so when we're talking about our take estimate and our take predictions we can be pretty realistic because we know what impacts are likely to happen. So these triggers are really set up if something is really outside of our ability to predict and happens we can respond to that. We also believe that minimization is going to evolve over time. There are going to be new technologies and new ways of doing things and we want the flexibility to work with the agencies in figuring out what makes the most sense for this project specifically.

So this table here, this is just a graphic showing the adaptive management triggers and the adaptive management actions. I want to bring your attention to the top two rows which indicate two of the recent major adaptive management actions that we've taken. One in

response to exceeding our authorized take level and the second one in response to reaching 75% of our tier 4. That's why we decided to proactively install the acoustic deterrents on all the turbines. And again, I'll just emphasize that this is set up to keep us in the lowest tier possible and provide some assurance that we're not going to exceed the take authorization.

JACOBI: What is your current number of bats?

BRITA WOECK: It's about 86.

MEHRHOFF: Can you go back just a second? So you said 75% of tier 4?

BRITA WOECK: So because we've been obviously working on this amendment for a while our current cumulative take estimate at that 85% credibility level is about 86 bats. So if we had an approved amendment, this is where we would fall in that time frame. So that's why we chose to take an adaptive management action. And that's also why we decided to move forward with additional mitigation that was above and beyond our original HCP.

BOGARDUS: If their amendment was approved they would be in the midst of tier 4 right now.

MEHRHOFF: Correct. I just was trying to figure out the adaptive management, why 75% of tier 4 was under tier 5.

BRITA WOECK: I should clarify, that's kind of planning for tier 5 mitigation.

MEHRHOFF: That's you're planning for tier 5 mitigation, but that's not you're trying to minimize tier 4.

BRITA WOECK: It's to keep us within tier 4 if we can do that. Okay now I'll talk a bit about the bat impact analysis. So I think everyone's aware of the difference between the State and Federal requirements, the state being to conduct an analysis that looks at the O'ahu population specifically. At several of the ESRC meetings in 2018 we talked about sort of what science is available to us and how we get at this question because obviously there are a lot of uncertainties and so at the 2018 meetings the ESRC had asked all applicants to gather what they understand to be the best available science, conduct a quantitative analysis, and incorporate that analysis into our HCPs. And so that's what we've worked hard to do in this final HCP. So there's a more robust population and cumulative impact analysis, which recognizes the uncertainties in the data gaps that are out there, it draws from the best available science, and the approach we took was to use that information and look at the population a couple of different ways in terms of occupancy and land use, and model a range of growth rates and population sizes. So our overall goal here despite the uncertainties was to provide an analysis that would demonstrate that the O'ahu bat population could support our take request alone, but then also in combination with the other wind projects on O'ahu.

I just want to state you know for clarity that this analysis is for risk assessment purposes only. We are not attempting to actually estimate the population size. It is simply for the analysis of our HCP. All the details of the modeling are described in great detail in the actual document so I'm just going to highlight a couple of the key findings. One of them was that the analysis indicates that maximum predicted impacts of our project and as well as in combination with the other wind projects is likely to impact no more than one percent of the population annually. So for our project that's 11 bats per year; cumulatively across all the wind projects on O'ahu, that's 15 bats per year. It would take a very low natural growth rate to replace those losses but we think that the Hawaiian Hoary Bat actually has a much higher growth rate. One of the important things that our analysis highlighted is the Hawaiian Hoary Bats are resilient, they have a high capacity for growth. They're prey and habitat generalists. They're highly mobile, and they're widely distributed on O'ahu. And what our analysis of the available data also shows is there's really no indication of population decline on O'ahu. Project specific acoustic data that's been collected since the beginning of the project's operation shows no decline in activity within the wind farm. Data from the ongoing O'ahu occupancy studies shows continuous detections of bats across O'ahu. So there is evidence to suggest that the population is not declining in light of the existing impacts that are occurring.

JACOBI: But the bat detection technology has increased considerably and the detectors now are much more sensitive than they were before. How does that figure into the analysis?

BRITA WOECK: Well, I think that's true.

JACOBI: At the beginning back in 2013 we had Anabats and they weren't very sensitive.

MATT STELMACH: I was just going to say in 2013 the project was still using Wildlife Acoustics. The microphones have changed a little bit but even given the change in technology there's still an indication the bats are... (INAUDIBLE).

BRITA WOECK: So the key findings that I want to just draw your attention to are that there is evidence to suggest that the population on O'ahu is robust enough to continue at carrying capacity despite impacts. We found no evidence that the O'ahu bat population is declining and based on the best available science we have reasonable certainty that the O'ahu bat population can support Kawailoa's take request. One other thing I want to mention is that the analysis that we did does not include any benefits of mitigation so it's just straight impacts but no additional benefit of habitat restoration or acquisition.

JACOBI: What's the confidence you have in terms of there's no evidence O'ahu's bat population is declining? What's your probability on that?

MATT STELMACH: I think the WEST study will speak to that better than we can infer.

JACOBI: But we've only got one year. To say that right now... yes, there's no evidence it's declining but there's no evidence that it's stable either. Or increasing.

MATT STELMACH: We have evidence at the wind farm site that we have a stable population, and they continue to be detected across the island.

JACOBI: But do you have a probability value with that? Is it significant?

MATT STELMACH: I don't. It's not a probability we can do.

JACOBI: That's a very strong statement.

BRITA WOECK: That's a fair question. But I think the best we can do is look at the best available science that is out there. I mean, there are uncertainties that I think we can all agree on that exist. And so this is our best attempt to respond to your request and draw together the information that's available, even if we may not see eye to eye on certain components of it. Okay, so I want to highlight the key changes that we made in our tier 5 and 6 mitigation. So first of all, we retained the same framework that you saw in the draft and that includes a series of project options which identify for each project biological goals, restoration actions that would be taken, success criteria, monitoring, and adaptive management. That framework would then be carried into a site specific mitigation implementation plan that would take all the elements that are in the HCP, but it would really tailor it to the final selection of the site. That plan would be worked on closely of course with DOFAW and Fish and Wildlife before we would implement anything. We did add another project that we've been working on with the Ko'olau Mountains Watershed Partnership. And that is a riparian bat foraging habitat restoration project in the central Ko'olau, so the picture on the right is a picture of existing habitat in that area from a site visit that we conducted. The objective of this project is to restore diverse native forest and open waterways for bat foraging so we're focusing on implementing actions that increase insect abundance and also enhance habitat structure. The project is intended to work on a watershed scale and have benefits well beyond the riparian areas that we would be actively managing with the overall goal of increasing carrying capacity for bats in this area. The other thing I want to point out, and I know Jim you've made a number of comments on you know, just the need for robust monitoring and adaptive management, and so in this proposed final HCP, we've really worked hard to enhance those two pieces and I'll talk about that on the next slide.

So for the monitoring of our mitigation areas, the goal above all is to ensure that we are meeting our success criteria. We've set this up so that we will do a before and after control impact framework, which will include some baseline monitoring before the restoration is conducted, so acoustic monitoring, monitoring of insects, vegetation structure so we can get a solid baseline, and then some periodic monitoring of those same metrics at different time frames once restoration is implemented. So our goal obviously in this process is to make sure we're meeting success criteria and inform adaptive management. So if we have to do other manipulations on site, but effectively it will function as a small research project so we can we can try to get at that question of what do bats need, what is most effective. So that's a key change that you'll see. And then I just want to point out for adaptive management the HCP sort of outlines it in two pieces. One is with respect to the final selection of a mitigation area, we

have some additional information about what new information would be considered, and then also as I mentioned it identifies the restoration or management actions that could be done or enhanced if it looks like we're not meeting our success criteria.

WINTER: Are you speaking of the Koʻoalau site specifically?

BRITA WOECK: Well, so for any project that we would do we would implement the same approach. I think that project is probably popping to the top as a priority for us. It's just a really interesting project not just for bat reasons and I think just has the opportunity to enhance that watershed. So it could be for any project but obviously if that's the project we selected we would do it then as well.

WINTER: Do you have a map of that location?

BRITA WOECK: I don't think we do here. So we work with J.C. on this.

JACOBI: I like that approach. I think it's got some promise. The challenge is how to relay the trend to a population change. That's a challenge we're all facing. Is that a thing that will be applied to the Helemano site?

BRITA WOECK: No, because that's an acquisition. After acquisition that mitigation is done. There's no need to monitor it over time.

JACOBI: I think this is one of the things we've asked for for a long time and it's not just your project, it's all the other projects, is for before and after management of mitigation sites is to put in monitoring such as this that actually has got some substance to it that would be able to see whether it really makes a difference. You know, doing an acquisition is almost like an act of faith whether something is going to happen. We don't really know it. And so that's why you know the Helemano would be an important one, since that is just getting started now, is to introduce something like this.

BRITA WOECK: Helemano is different because it's preventing something from happening in the future. So we're not managing it. We don't own it. We're not proposing to manage it as part of our HCP. But this does definitely apply for restoration. We would take all these steps because that is a case where we want to see what's happening, get the baseline and see how our actions are changing the landscape.

JACOBI: But it does have application in the sense that you're expecting a certain level of productivity which will meet your take obligation and so forth; even in a place like Helemano, if we don't know if there's production or not, that's another issue whether there's other issues causing the bat population going down. So that's why I think having that kind of monitoring is an important thing. Again, I don't know how that relates to this project specifically. It's more of a statement of need.

BRITA WOECK: I think in our HCP we do have a commitment to provide updates on DOFAW management. So there will be that tracking of what's going on, but the parcel has been turned over.

BOGARDUS: They're required to ensure that—well we can dive into it later—whoever's taking over management of the parcel is doing it in a way that is consistent with the survival and recovery of bats. Right? But the benefit of land acquisition is protecting what's there, not necessarily doing a restoration action that would increase bat productivity over time. So the monitoring component is weird. But I agree, we should have monitoring at sites. It's just, it's on DOFAW to do that.

MEHRHOFF: So how much is there now?

BOGARDUS: That part I don't know. That's a Marigold question.

SMITH: It wasn't part of the agreement.

BRITA WOECK: As far as I understand they're working on the management plan for that. So I think that has to happen first.

SMITH: Marigold certainly will consider bats and hope to improve conditions for bats.

JACOBI: There's also an option that potentially some restoration could be done in adjacent parcels as part of a future mitigation and in the case like that, it is a place we'd definitely want to get started on that.

SMITH: I think you could come into this parcel and do value added, if you took the value for just protecting the area and not have it further degrade into agricultural. Now you could come in and do additional improved forest management to get additional bats. And that's when you come in and establish a baseline and that would be another project. But this project was just the acquisition.

JACOBI: I understand.

MEHRHOFF: And you're sure there's bats?

BOGARDUS: There's baseline information that there's bats there.

BRITA WOECK: There's an appendix of the HCP that in excruciating detail lays out what we know about that parcel.

ALICIA OLLER: And doing management there could also be an option for tiers 5 and 6.

BOGARDUS: They identified management at Helemano as a possibility for mitigation for tiers 5 and 6 for restoration. I expressed concern over, you can't do that and double count the bats that are already there, and so the baseline conditions and establishing that, it adds a higher bar on the monitoring to be able to establish that and that would be something we would all need to work out.

JACOBI: So whose shoulders does that fall on in terms of getting that baseline before a trigger comes?

BRITA WOECK: If we were to do that project that would fall on us, but that's not a focal project for us. We kept it in as an option for some flexibility that made sense to do, but I do think this riparian restoration project that's just a cleaner, fresh project, I think that's bumping higher on our priority list because you don't have the complication of figuring out how do you parse out credit for one tier versus another? I mean we talked about that during the site visit. It's a little bit messy.

JACOBI: We have talked about having another bat workshop and I'm hoping that's still somewhere on the agenda and this will be an issue we want to jump into in great detail and not just superficially but to get into what is monitoring, what is really needed. I like the concept of what you have up there; the practicality is what I'm looking for there.

BRITA WOECK: This site specific mitigation implementation plan concept that we've included I think is going to address that because if no reduction in fatalities happen, we still wouldn't need to implement tier 5 five mitigation until at least two or three more years, but that gives us time to really hone in on what will make it count so we can actually make some comparisons and not do it quickly.

I want to touch on mitigation net benefit for bats. You know, we have incorporated recommendations from the ESRC bat guidance. Our mitigation is intended to increase carrying capacity on O'ahu, either for long term protection of high quality habitat or improving foraging habitat and insect resources for bats. The mitigation areas that we've identified also increase connectivity between other important conservation areas on O'ahu. So the goal is to have benefit beyond what we're just doing on the ground. So looking at a watershed scale and having benefits to other species as well. Because the acquisition is protected in perpetuity and restoration will have long-term impacts we are going to be benefiting multiple generations of bats. We're also met the bat guidance recommendation of \$50,000 per bat and we feel confident that the mitigation that we've proposed will contribute to the survival and recovery of the species.

I'll just quickly touch on Hawaiian Petrel mitigation. We didn't make any major changes to the mitigation. I know we discussed this one in detail back in October, but he did have a request to include cost estimates and that's been added to appendix 18.

And then just to briefly summarize, you know, our project makes an important contribution to renewable energy on O'ahu, and you know the fight against climate change which is going to affect every plant and animal species in Hawai'i. We're a really important part of that mission. We feel that the HCP as written meets the requirements of Chapter 195D both by providing a net environmental benefit and also contributing to the survival and recovery of the species. We've incorporated recommendations from the ESRC bat guidance and everything we've proposed is also consistent with the Hawaiian Hoary Bat recovery plan goals. And with that I'll open the floor for questions.

WINTER: Question related to something that didn't change, the 'A'o or Newell's. Can you remind me since it wasn't in the document we just reviewed what the mitigation plan was for them?

BRITA WOECK: It was something that was done before our time. We haven't had any Newell's Shearwater take but I think it was a NFWF contribution. It was made upfront at the beginning of the project.

MEHRHOFF: In no particular order, just going through some questions. So for the deterrent stuff, which is really good. I mean there's a lot of the stuff that I think is really quite good. I really like the deterrence that you put in; I'm pretty excited about that, very excited about that actually, and I like land acquisitions, so those are two very good things, for sure. On the deterrents I think it would be good if in your reporting you report if they're nonfunctioning, if there's noncompliance, so to speak, so that we get an idea how reliable the systems are down the road for us and other people to kinda understand stuff. So understanding when they're nonfunctional would be good. The same with the low wind speed curtailment, when you're not in compliance with that or it's not working for whatever reason. I think those are two good things that should be reported. Your activity monitoring on the site I think is also pretty good. And it's somewhere in there that you had like 70 on site activity monitors, is that right?

BRITA WOECK: No, that was part of a study during 2015.

MEHRHOFF: How much are you going to have on a regular basis?

BRITA WOECK: We have four right now.

MEHRHOFF: The same comment that I've had and will proceed with Auwahi is there needs to be activity monitoring on the sites that can continue on like your study where you're saying it's not showing a change. Exactly how that needs to be done is not I think identified by the bat task force, for example, as to what exactly that monitoring should be, but we need to have some ability to be able to look at what is going on on site and whatever mitigation sites are being done.

BOGARDUS: I think going back to the original HCP and I can't remember which HCP it was because it's different between all of them, which is a problem...

MEHRHOFF: That's exactly right, that's a problem.

BOGARDUS: But in Kawaihoa I thought that it was every three years they did increased site monitoring.

MEHRHOFF: It might be in the original but we're in an amendment and we're in an amendment because of exceedance of take.

BOGARDUS: I agree. Does anyone remember this?

MATT STELMACH: The original HCP talks about monitoring in conjunction with the fatality site monitoring. The PCM amount.

MEHRHOFF: So I will put that out as a need. For specifics I think there needs to be standardization that we talked about that has not been agreed upon as far I know by the bat task force or anybody else but that needs to happen.

BOGARDUS: The goal is trends for the potential of localized extirpation.

JACOBI: That study that was done—you're talking about the USGS study—is that's a good foundation for that and using that to then determine the number of stations you need to be able to get to that, that's a good starting point. I mean, the difference between 70 and four is quite dramatic.

BRITA WOECK: Well, I think and maybe Matt can weigh in, I feel that that study really didn't reveal that there were any obvious trends.

MATT STELMACH: Part of the goal was to look for informing curtailment and activity trends at the site.

JACOBI: It was a snapshot.

MATT STELMACH: Over two years. I think it was difficult to correlate because of the unknowns surrounding the timing of fatalities. Because you don't know the exact timing of fatalities it's difficult to associate any prior conditions and acoustic activity with the occurrence of a fatality.

BRITA WOECK: I think the value in this case would be different. It would be to sort of continue documenting bat activity on site so if, fingers crossed, we have a situation where the deterrents are very effective, we could see that bats are still there, still using the wind farm. It provides that comparison. I don't think we would propose a very detailed study with 70 deterrents but I think we would be open to doing some additional monitoring on site so we have a better sense of just trends in bat activity.

JACOBI: I wasn't suggesting 70 is what you'd need. I was suggesting that's a good starting point to look at what's going on there and then decide what configuration and number is necessary to look at that. And part of what they were doing too is looking at the correlates, looking at the inside populations as well as the different habitat characteristics and so forth. So getting that into the discussion. And I think this is something that I think our workshop should be able to dive into great detail because it's got application well beyond just Kawaihoa.

MEHRHOFF: And my point is it just needs to be provided for in this amendment rather than you changing, everybody else changing, and two years later somebody saying, how do I do it?

BRITA WOECK: Okay, got it.

MEHRHOFF: On the triggers, I had some questions on how everybody knows when the triggers are hit—the big triggers, the 75% triggers on that. Can you walk us through that again in real numbers for how you actually do that?

BRITA WOECK: Yeah, actually I'm going to point you to a page because there is a calculation that kind of shows an example, but basically we're constantly evaluating the take rate. You know for the annual report, for example, we have to have a cumulative take estimate. And so at that point if the estimated take at the 80% credibility level showed that we were at that 75% point and then we would also look at how much longer we have in our permit term, and so if it looked based on those two factors that we were going to potentially exceed our authorized take limit we would take a significant adaptive management action to try to stay below that take limit.

ALICIA OLLER: It's Section 8.3.1. On my printed copy it's pages 75 and 76.

BRITA WOECK: There's two examples of how that calculation would work. An important point in my mind is that it's not set up on a periodic scale. We're always looking for this trigger at all times. So although it's really unlikely that it would happen in the next few years if that were to happen, you know, some crazy thing happens that we didn't predict we have that chance to take a big action, or it could be that we're two years out from the end of our permit term and we can look and go nope, we have enough take to cover us for the remaining two years. So we're constantly looking for the intersection of those two pieces of information and working, obviously we work closely with U.S. Fish and Wildlife and DOFAW to determine is it appropriate to implement that measure, did those two things align?

BOGARDUS: And that depends on an annual level for the annual review as well as a quarterly level because we do quarterly reports and at this point, on a take by take level. So every time there's a take there's a reevaluation where it is on that trajectory.

BRITA WOECK: And that 75%, for example, 75% of tier 5 still leaves us assuming no reduction in take rate six years before we would even hit tier 6. So it's catching something unexpected early so we have time to do something about it and try to stay in that tier 5 level. That's our goal with

this and this is our best shot at figuring out how do we do that so it's not arbitrary and it gives us enough time to do something and catch it ahead of time. Not like one year before, and then we're in a bad situation.

BOGARDUS: Brita, there's nothing to preclude you from implementing the adaptive management earlier than the trigger time?

BRITA WOECK: And I think that's been demonstrated by the things we've done today. We have not been asked to expand our low wind speed curtailment, but we've done it. I mean we've done the deterrence; we've done the hysteresis. So yes. This is a minimum standard for us, yes. So you have some assurance that regardless of changeover, people will do something even if we're all not sitting at this table.

BOGARDUS: I agree with your comment that if the rate is substantial it gives us less reaction time in that remaining 25 or 30%, right?

BRITA WOECK: I agree with that point, but there's just no reason to think that that's going to happen.

BOGARDUS: My point is that's on the coordination between them, the State, and us to identify potential situations that would be like that and to work through it.

JACOBI: But you meet with them quarterly?

BOGARDUS: At a bare minimum.

JACOBI: Because we on the ESRC, I mean, set aside amendments and new projects and so forth, we do it on an annual basis. And so it's important that that is brought into that annual review.

BRITA WOECK: There's a lot of coordination that happens and we did try to clarify, I mean we have some of that outlined in our reporting requirements. But we put that specifically in adaptive management to solidify we are going to do these regular evaluations.

JACOBI: And if something comes up sooner than the annual review?

BRITA WOECK: It behooves all of us to do that because we're able to identify if any pattern's revealing for if anything unexpected is happening we want to have our eyes on.

MATT STELMACH: One of the important pieces is that we now have seven years of data for the project and so the take rate is well established. The new minimization measures are likely to decrease that. We're very unlikely to be in a situation where we would require adaptive management.

JACOBI: Right, but we want to be in a situation where we're certain.

MEHRHOFF: I like that point. We may come back to this later and on and talk about this in a different situation towards the end of the day, but I am a little concerned on the adaptive management. The triggers are fairly decent hard triggers but the resulting actions are more iffy, and you've left more discretion in what do you end up doing when you choose between those three or four different activity groups, and I do think it would be useful to identify in more detail what those are.

BRITA WOECK: I understand your question and we did spend some time this last week really looking at that to see what would make sense, what could be more specific. I know that Loyal, you're familiar, maybe others are familiar with some of the Midwest HCPs that are recent for bats and they do have very specific low wind speed curtailment actions that are taken if take rates hit a certain level. We just are a different—that model just doesn't fit us. We've been operating for seven years and so as Matt said we have a really good understanding of what our take rate will be. We've maxed out our low wind speed curtailment. It's different because we're an operating project that is now seeking an amendment and we are required to minimize to the maximum extent practicable. So we can't put other things on the table that are not realistic for us to do. So I understand the desire to have a more specific action, but I think what our actions are going to look like is they're going to be based on data that is still to be collected and it's going to be forward thinking. I think we're going to have to look at what new minimization measures and technologies come out over the next ten years and take advantage of that and we've done that. The hysteresis and the averaging time is something that in May 2018 was found to be useful. So we did it. Acoustic deterrence, just in 2019 the published results of how effective they were came out and we were the first to grasp onto that. So I want to provide some confidence that we are actively looking for those new things and I think that the model of having a very specific curtailment increase which we just don't even have confidence that that would do anything further to minimize our take just doesn't fit us and again, I think the specific measure that would be taken, we've got to have some flexibility to incorporate new science. And I think that if that time comes the selection of the measure is something that we would work with DOFAW and U.S. Fish and Wildlife to figure out what's best for the site given that we're doing all these other measures already.

MEHRHOFF: Okay, I disagree. The last two things left: one is on the mitigation. I'm sure we'll talk about this most of the day, periodically, which is your having got approval from Fish and Wildlife Service and DOFAW to use 20 acres per bat for mitigation and just like last time we met, I still disagree with that and I think that's not correct. I'll ask my folks across the street as to why that is appropriate. I don't think it is. I have problems with that; I don't have problems with using the mitigation area that you've got. I think you have enough habitat in there to mitigate for your 55 bats in tier 4, even at the 40 acre rate. So I'm comfortable with that. I'm good there, just not at the 20 acre rate. So that would throw into the discussion what happens in tiers 5 and 6.

My next set of questions or statements on that are going to be I don't think that there's 2,000 bats on the island personally, when I look at the data. So I think it's probably much less than that, seeing that you've got the activity levels on O'ahu an order of magnitude less than Maui or Big Island. I just don't think we've got much more than 1,000.

BRITA WOECK: Okay let's maybe start with the first part of that. And would you like me to respond and if you have other perspectives on the acreage? So when we look at the ESRC bat guidance, I think it's clear that the science shows that 20.3 acres is an appropriate core area. It makes sense because these restoration projects and the acquisition are long term projects. They're going to benefit multiple generations of bats. That core area size does not even account for reproduction. I mean, a female bat using that kind of area is going to produce like half a young per year—that's not even factored into the equation. The restoration activities that we're proposing have benefits that extend way beyond the specific actions. We're not even incorporating any sort of indirect benefit to the areas outside of the mitigation area. I know that in the April and July 2017 ESRC meetings, which is documented in the notes, there was a lot of discussion about the arbitrary selection of that acreage and I think Scott had made the point of it's flexible: come forward with something that you can justify. And that's what we've done. We just, we do not feel that 40 acres per bat is appropriate. There's no scientific basis for it. And so we're comfortable with what we've proposed in our HCP and that it will produce a net environmental benefit.

WINTER: Have you calculated the thing you mentioned about the multiple generations somewhere in here?

BRITA WOECK: We have not factored that in but that's a benefit that will result from the long term protection and the restoration. So even on a 20.3 acre area there's going to be more than one bat that will use that area. The goal of this is increased carrying capacity on O'ahu by doing these large landscape scale actions through habitat manipulation or creation or increases in connectivity. There are many benefits to bats that are not even incorporated into this and so that's sort of, I think we're not counting additional benefits that aren't factored into that.

JACOBI: Let me just make one quick comment on the core area thing. The core use area is something that came from a USGS study. USGS has commented several times that that's sort of not the appropriate use of that information for calculating that, and I think it's important that we rethink, in terms of the interpretation of that, in the first place. That being said, one of the questions that I've had and we've tried to address this with some of our studies and so forth is the question as to: is forest a limiting factor for bats? By putting in more forest, does that give more bats? That's different from a core use area, what a bat uses, however that's calculated. A core use area in terms of one versus what they're finding on Maui and also the USGS studies, is that bats work here, here, here, so their area is there, with several focal areas, is what it is. So it's a different kind of a construct in terms of looking at it but it really comes down to the whole question in terms of is lack of forest, lack of trees a limiting factor and we don't have anything to really substantiate that at this point.

BRITA WOECK: And that's why our proposed mitigation for tiers 5 and 6 is not focused on creating new forest. It's focused on enhancing existing foraging habitat for bats, opening up riparian areas that will increase insect abundance and habitat complexity, because we think that is probably more of a limiting factor based on what's known than just the availability of roosting habitat, for example. So I think by also taking those measures and improving foraging habitat it's not likely that only one bat is going to use that area at a given time; it's going to benefit any of the bats that are using that area.

BOGARDUS: Obviously we've been doing a pretty deep dive into all of the available information—I mean we as in the Fish and Wildlife Service, as well as the ESRC—and I'm going to totally make Diane get up in a minute and put her on the spot, but the existing information on core use area is challenging, and there's extreme limitations to the data. There's wide variety in each individual bat, when you look at the individual bats across time; there's outliers, there's differences from what we saw on Hawai'i Island versus what we see on Maui. It's not an easy data set to make big, broad assumptions about the value of habitat on. I will just say that at this point, my read of all of this is that acreage is not the thing that we should necessarily be using to determine the adequacy of mitigation. In my mind it's a package: it's availability of the resources, it's a variety of ecological components within that site. I don't have a quick and easy metric for what that looks like, which is challenging for all of us. And I think ideally that's something that we talk about in the bat workshop: what do we think? But at this point I can't say that 40 acres of forest will equal a bat. I can't say that 20 acres of forest will equal a bat. I can't say that 100 acres of forest will equal a bat. What I can say is that mitigation projects should encompass all of that best available science about what we know about what bats like and need in terms of resource availability, and use that as the benchmark to move off of. Anything else you'd like to add in terms of 20 acres, 40 acres? At this point what we're saying is for Fish and Wildlife Service 20 acres is the baseline. From there, justify how the mitigation package as a whole sets you up for success as the adequacy of this mitigation project.

BRITA WOECK: And an important part of that package too is the monitoring piece. I mean, because it gives us a chance to look at that and say well, are our actions actually having an effect? Are we seeing increased insects, are we seeing increased activity? And that will inform the next step of that.

JACOBI: But that really hasn't been incorporated into any mitigation as far as I can see, in any substantial way. That's a limitation.

BRITA WOECK: Past projects, right?

JACOBI: Yes.

BRITA WOECK: Okay, because it is laid out in ours.

WINTER: Speaking of the monitoring and the mitigation, so, I forget if it was the October meeting—it was in the big room downstairs—I think we all agreed we should be striving to use the sharpest tools that we have, not continuing to run with the blunt ones, and I think we all agree acoustic monitoring in conjunction with thermal monitoring was the sharpest tool that we had, so I'm curious about why you guys are not proposing to use that sharper combination in your monitoring.

BRITA WOECK: I think that the metrics that we've put in here are examples of what we would use. I really think that once we select a mitigation project that will probably dictate what is most appropriate. That could be acoustic monitoring; that could be a different tool. But it's going to depend on the specific site that we pick. I think the goal here is to demonstrate that we're committed to doing before and after monitoring and looking at things in addition to just measuring bat activity. We really want to get at how our actions are changing the ecosystem in ways that can be beneficial to bats.

WINTER: So this site has been selected or hasn't been selected?

BRITA WOECK: No, the HCP amendment is set up so it has I think four projects lined up. I mean to be a little more transparent. We are working in parallel with J.C. and others to craft a tier 5 mitigation project. So I think that one in particular is sort of popping up to the top of our list because we think it's a really good project, but right now we do have a series of restoration projects. And then also we've maintained an option to do habitat acquisition as well. But so far we haven't in our work with different land management agencies, we just haven't seen any acquisitions that look like they would necessarily be good mitigation projects. So we want to keep those options on the table.

WINTER: So it's within this that you're looking at the 20.5 acres? So how many acres would you be looking at for tier 5?

BRITA WOECK: 1,700.

SPAIN: Mitigation options and prioritization in my version starts on page 63. Section 7.6.4.1.

BOGARDUS: Where is this site relative to Helemano?

MATT STELMACH: It ends below, south of where Helemano is.

SMITH: The area is heavily impacted with haole koa grass right now and we've been trying to get a restoration project going up there for a number of years and so this is a way to bring in some funding to help restore the area to native forest.

(MATT STELMACH demonstrates location of parcel.)

WINTER: You're looking to do a certain amount of acreage within that range?

BRITA WOECK: If that was the site that we pick, assuming we have an amendment, then we would dive in and figure out what portions are going to be most impactful and work with the watershed partnership to put the details of the project together.

JACOBI: Will that come back to the ESRC for review?

BRITA WOECK: I think the implementation plan is something we'd work on with DOFAW and U.S. Fish and Wildlife, I mean, after an amendment was approved.

JACOBI: Why wouldn't it come to the ESRC? My understanding from day one of the ESRC is we sit here as science experts bringing science into assessing things. It's not just to simply to say okay, we have confidence that the State and Fish and Wildlife have done their job. I mean we are asked to bring our scientific expertise into this and I would feel that to do justice to my sitting here is that we have that opportunity also, so I think it's an important part of it.

SPAIN: And I would agree. I appreciated seeing the new potential for a project. But the way I read the HCP, it didn't make it sound like this was the priority, unless I missed something. So it had a lot of generalities, no maps, and I also got the sense when we were talking about double mitigation on the Helemano project last time that DOFAW has a big stake in what project comes out of this and it's still very general to me, and having kind of a lot of reference to DOFAW and U.S. Fish and Wildlife will figure it out—it didn't sit quite comfortable with me for understanding how that was going to play out, and how the numbers were actually going to match.

BRITA WOECK: We actually did have conversations with both agencies about how to approach tiers 5 and 6 for the amendment. At our most recent meetings the direction we were given was to just keep the options in there. But add detail about the monitoring, adaptive management. So we can basically then select a project, lift that framework and then really refine it to the project. The reason I think for this HCP we did that as well, is because we've already completed one chunk of the mitigation; we've already done tier 4. So that's what we really focused on being very specific on. I think there's enough detail in the HCP to understand the types of actions we would do but we were given direction to keep the flexibility in there, acknowledging though the trouble with Helemano and I don't think that that's a high priority for us because of having to figure out the double counting or not double counting of mitigation, but we were asked to keep that in as an option to provide flexibility.

BOGARDUS: Recall that when they started working on the Helemano acquisition with the ESRC, the guidance was \$50,000 a bat, which we, Fish and Wildlife Service, would not use to determine adequacy of mitigation, so we did a deep dive on the acreage component. And so we did, I think it's in the file somewhere, we took the total amount of acreage, all the contributors that were submitting funding for the land purchase, did a deep dive on the percentage of the acreage that was included for mitigation versus the acreage that was not, made sure that we had our calculations correct, and then at that point Fish and Wildlife Service

said this how we're proceeding with this and this is how we're viewing this. We committed to that because the land purchase was time sensitive. That does not do anything obviously on the State process but I'm telling you that so you know that's how we viewed it.

SPAIN: I don't have an issue with tier 4; it's tier 5 and 6 where I'm more wondering about that.

WINTER: Maybe I can reframe that in a slightly different way. So this HCP amendment is requesting take of 220 bats, so 195D says that there should be a cumulative net benefit to the species. So I think part of the issue is there are so many unknowns in tier 5 that we can't really assess whether or not the mitigation is going to effectively result in a cumulative net benefit to the species.

BRITA WOECK: I think there's two things that have to be considered. One is that we're a renewable energy project. We are benefiting the environment by offsetting fossil fuel use. That's one huge thing when we talk about a net environmental benefit.

WINTER: Okay but 195D doesn't talk about a net environmental benefit, it talks about a cumulative net benefit for endangered species.

BRITA WOECK: No, 195D talks about a net environmental benefit. There is no requirement for a plus one. Now typically we have addressed seabirds that way because that's a really black and white, manage the colony, count one more bird, check the box. The language in the statute is net environmental benefit and you have to have reasonable certainty that you're contributing to the survival and recovery of the species. So I think when we're talking about net environmental benefit here, the fact that we're a renewable project needs to be taken into account, but I also think just getting back to just tier 5 and tier 6, we're proposing to do all the actions that the U.S. Fish and Wildlife Service and DOFAW is currently doing to recover bats. One of our comments on our HCP amendment from Scott was that both the State and U.S. Fish and Wildlife are doing restoration projects to benefit bats. That is what we know now to be the only measure to really help recover the bat population. That's why we're proposing this. What we wanted to line out in the HCP and which I think we do in enough detail is to show that we're going to do those measures that we at least right now know to be something to help recover the bat. The next step upon permit issuance is we pivot to our tier 5 mitigation and I would leave it up to the discretion of the agencies, but we'd be happy to get your input on the mitigation implementation plan and have you help us work through that.

But that's the next step. That comes after permit issuance. That's not a step we're going to do right now because we've already implemented a huge chunk of mitigation. And so I think what you're almost asking is why aren't we just continuing to do implementation when we don't have an amendment approved yet? So that's the next step there.

WINTER: Before we get too far, I'd like the AG's opinion because my understanding is different than what the applicant is telling me, about what our role is on the Endangered Species

Recovery Committee. Are we looking at cumulative net benefit to the species, to endangered species?

LINDA CHOW: There's two requirements. One is for net environmental benefit and the other one is, should result in overall net gain in the recovery of Hawai'i's threatened and endangered species. So there's two different requirements.

WINTER: So cumulative net gain would mean 221.

BRITA WOECK: No, it's not about a plus one. A net environmental gain is we're doing something to contribute to the recovery of the species. So we're looking at big restoration projects that are going to have an impact to carrying capacity on O'ahu. It's not about creating one bat. We can't do that. We don't know how to do that. But that's why we're looking at these large landscape scale projects that we have reasonable certainty are going to contribute to the recovery of the species through our actions but then also through our increases in connectivity to available existing habitat.

ALICIA OLLER: And it's also to the knowledge of the species, of just understanding what really does benefit them with the actions and the monitoring.

BRITA WOECK: I think that we all know that there's a lot of uncertainties here and they're just uncertainties that we're not going to resolve in the near future and I would encourage the ESRC to be open to working through those uncertainties with us. We are open to sharing our information as we move forward with these restoration projects, but I think there are questions that we just aren't going to be able to answer in a group until we have more data and that's what I want to come away from, is how do we get to a point where we can just look at that, acknowledge it, and figure out a path forward.

JACOBI: I agree completely and that's why I was asking for more details, and to be included in the development of those plans.

SMITH: Can I make a comment on the criteria. So maximum extent practicable, minimize and mitigate impacts of the take, guarantee adequate funding, increase likelihood that the species will survive and recover—and that's not necessarily a plus one, that could be looked at various ways—considering full range of species on the island, and provide net environmental benefits not likely to cause loss of genetic representation. So those are the issuance criteria.

LINDA CHOW: The net environmental benefit is based on the cumulative impacts of the activity, so it's not just the mitigation but the cumulative impacts of the activity that is being permitted.

WINTER: To put it simply, endangered species should be better off with this project in place. Right? And the ESRC, if we're going to vote in favor of this we need to have some level of confidence that endangered species are better off because this project is in place.

JACOBI: Yes. That may not be because we have everything in front of us, but we have the confidence that we are going to be partners in evaluating and developing those strategies, which is again what I see our role is.

SMITH: I think that we need to consider intangibles as well, such as the benefits of renewable energy versus burning coal and oil. I think those are going to have net benefits to species that are very hard to quantify.

JACOBI: Absolutely.

MEHRHOFF: Back to my 20 acre question. But I think it's one of those things that you know, you're going to have to see whether or not it's going to make a difference to the particular species. I'm going to come back to that Dave, but I agree with you there is an intangible there. How you bring an intangible in is going to be the question, but it was net environmental benefits.

BOGARDUS: There's no question there's all sorts of uncertainties throughout the bat discussion. And despite the incredible minds that are sitting around this table and struggling with this for the last four years, we still don't have a clear and easy answer. The question is how do we track that uncertainty, how do we make progress on reducing that uncertainty, and how do we ensure we maintain compliance for all these things moving forward even in light of that uncertainty.

MEHRHOFF: But, 20 acres. I appreciate everybody that talked about it and said why they think Y, Y, and Z and why 20 seems as good as anything else. I still don't find that compelling compared to what's already in the 2015 guidance which moved everything up to 40.

BOGARDUS: The 2015 guidance basically says because of the uncertainty we're going with the 40 versus the 20.

MEHRHOFF: No it doesn't really. If you go back and look at it that's not really what it implies. It says if you're going to go with the median rather than the mean, that's covering about half the bats, double it and that will cover the other half because they really comes down to those, you know, so there's a question on that. I find that more compelling than what you guys have already talked about today because of the fact of how the mean works versus the median.

However, the biggest reason that I have an issue with going down to 20 is the document that looks at core areas that we've been discussing is 60 plus acres as an average, not a median. But you also have, if the write up in the 2015 document is correct, you know one of the leading bat biologists, PhD bat biologist with four years of experience, saying you should be looking at the 60 acres plus. I don't see anything that leads me to cut that expertise's opinion down to 20 acres. I honestly don't. I don't see it. I'm not a bat biologist, but this is something that I think is

important and I don't see how you can drop down to 20 with a straight face and say this is bat mitigation.

MATT STELMACH: Loyal, are you referring to the quote from Frank in the guidance?

MEHRHOFF: I am.

MATT STELMACH: You mentioned this in the April meeting, and I'm concerned about the use of that citation because as I recall in that 2015 meeting, that quote had to be yanked from Frank, and in the same meeting he also said that the species could be recovered based on the Gorresen data. So it's really like, if we're going to take anecdotal evidence into this we're really going down a slippery slope.

MEHRHOFF: You may call it anecdotal but I call it he's the species expert in this, okay? So I'm unconvinced at all, by any stretch of the imagination, that 20 is adequate.

SMITH: The other thing is they're at \$50,000, which has sort of been an unofficial...

MEHRHOFF: I don't like that either. I don't think it should be a dollar thing. As far as the mitigation goes you may assign if you want the dollar amount for the research stuff but I don't think that for mitigation you should assign a dollar fee. You should say this is what we want, what we need as far as the biological reality on the ground. That's what you should strive for. Sometimes you get it for less, sometimes you get it for more.

BRITA WOECK: I think what we've done here is really focused on the impact of the actions.

MEHRHOFF: And again, I like a lot of what's in this HCP. My biggest complaints are not nuances, but even the 20 acres for you guys doesn't make as much difference because you've done an acquisition that I think has 40 acres worth in there. And I really like the fact that you went in in great detail and tried to estimate populations or at least go through that exercise and also with the population viability assessments as well because that moves us further along in the long run because we're talking about that and more people are getting involved trying to figure out how we really can look at this stuff. So those are really good. I don't agree with the end outcomes on that. I think it is an overestimation of the size of the population and the adult mortality is I think quite low that is being portrayed in the analysis. But those are analyses that you guys did and I really like that. My analyses are that it's probably a level of take at 220, 300 plus for the island as a whole is probably too much. I think you'll see a decline in the population over that from both what I've done and what Friedenber and Frick have kind of implied from their hoary bat stuff on the mainland. So I am not optimistic that that level of take is sustainable for O'ahu. So I'm just not comfortable with that either.

BRITA WOECK: Matt, do you want to talk a little bit about the Friedenber and Frick paper and about the modelling?

MATT STELMACH: Yeah, there's a couple of concerns about the Frick paper. I mean one, the dynamics of the population is dependent on the environment and the environment of the mainland hoary bat is much different than the Hawaiian Hoary Bat. And two, the Frick paper is entirely based on expert elicitation, not on variable data, so you see a range of magnitude. It could be 10,000 or it could be a 100 million bats. And really there's not very good confidence intervals there, as Jim was saying earlier. The Frick paper does make an effort to do it but it doesn't seem like it has much application to Hawai'i.

MEHRHOFF: Where I think it has application is in the discussion that they talk about what it really means if you look at some of the big picture aspects. Assessing a bat population if you're assuming that it's stable. In our case we assume it's stable or slightly increasing—they didn't assume the slightly increasing aspect of it. And what they come out with is one of their conclusions is the most important thing is you're going to get a decline in the absence of some sort of compensatory reproduction. You're going to have a decline if your take is exceeding whatever your annual increase is. I think that's exactly what my looking at the Hawaiian Hoary Bat shows the same thing. If you think you're slightly increasing, maybe 1% per year, you can't go over that as far as take goes without causing the population to go down. You can get around that if you think you have compensatory reproduction occurring but we have no indication of that and it would also mean that you'd be up pushing near the realm of being at carrying capacity and we'd expect that to be kicking in. Especially for O'ahu, it doesn't seem very reasonable that we're at carrying capacity.

MATT STELMACH: I'm curious what the mechanism would be that would limit the population to something less than carrying capacity.

MEHRHOFF: I don't know the answer to that. But it seems like, as far as you believe that carrying capacity, particularly if you look at carrying capacity for the island using a 20 acre habitat assessment you get some extremely large numbers for O'ahu and Maui, but particularly for O'ahu, which I found to be not very realistic. So from that perspective, it seems like you know, it's hard for me to see where there's probably much more than a thousand bats here, in which case you need to be down in the realm of about 10 bats per year take. It puts it down to about 200 take for the whole island.

WINTER: When is one project the whole island?

MEHRHOFF: Yeah, that's why I'm uncomfortable with that tier 5 and 6. I'm marginally uncomfortable at tier 4 for 115, but I'm very uncomfortable at 200.

WINTER: Do we have a DOFAW staff that know how much all the projects are requesting to take for the whole island? Does anyone know that number off the top of their head?

BRITA WOECK: It's 15 per year on average for what we're requesting.

SMITH: I think it's important to note too that this is ongoing take and it has been for what, ten years? So this isn't something new, we're not suggesting anything new that we haven't been watching for a relatively long period of time. So it's an ongoing thing. Now, we're actually implementing more deterrence. So our expectation is that our take rate is going to go down for this particular project and the flip side of this huge uncertainty bubble that we're working in is we don't actually have evidence the population is declining. We're had ongoing take, we've had it for a number of years, we're actually proposing to decrease that take, and we haven't really seen any evidence of decline in the population. So that's the flip side of the uncertainty.

MEHRHOFF: That's a big difference between saying you have to prove a decline versus everything's okay.

SMITH: I'm not saying we're proving a decline, I'm saying we can't demonstrate there is a decline based on the years of data.

MEHRHOFF: I don't find that compelling at all.

MATT STELMACH: One of the things that was most compelling to me was the discussion about reproductive capacity, and there are a number of lines of evidence that suggest that the Hawaiian Hoary Bat has a high reproductive capacity and whether or not the nearness to carrying capacity would influence the actual growth rate. But we know that twinning is common in hoary bats and we've seen it documented in the Hawaiian Hoary Bat and from similar species we see that appropriately over 90% of females are expected to breed in any given year. So these things combined, we see like a pretty high juvenile survival survivorship and we see high reproductive rates. All these things point to a population that can sustain take, and that would reproduce sufficiently to replace lost bats.

MEHRHOFF: When I looked at the numbers and the models I don't find that.

BRITA WOECK: So how do we find a middle ground here? Because I think what we're faced with is we're all looking at the same information. There are slightly different ways of looking at it and interpreting it. So how do we get to a place where we can just acknowledge that uncertainty, that nobody knows the real answer, and there's just different perspectives on the situation. That not one is right and not one with is wrong, until some of those fundamental questions are answered.

MEHRHOFF: Well that's what everybody has to decide as far as the agencies have to decide that for their actions and I'm assuming that us around the table are going to have to make that decision based on their best professional judgment as to what they think is appropriate.

JACOBI: There are some more projects that are being proposed to go beyond the existing projects. Is that correct? That if they were approved could result in bat take.

BOGARDUS: There are a couple of projects that we know of that are working through MECO and HECO RFP processes.

JACOBI: I recognize that is separate from the individual project that is already in the line but it's something that in terms of the bigger picture, what the overall impacts are. It brings another challenge to our thinking in terms of how to proceed.

SMITH: We need to take a big global look at it, island by island. It would be nice to have an overall monitoring plan for every island. It's not part of this particular proposal.

JACOBI: We do need to recognize that we do have some major challenges in terms of looking at population trends. We are getting sharper tools to do better monitoring and I think this is one area to be able to look at rather than just model changes, to be able to actually document it is where we need to be shifting a whole lot more. This is why I'm asking again that we on the ESRC are able to participate in looking at and developing and reviewing those plans. I wanted to make sure that I clarify that it's not that I don't have confidence in the staff at DOFAW and U.S. Fish and Wildlife Service in terms of doing that but we're partners.

MEHRHOFF: I actually don't think we'll make the big steps in figuring out the impacts on the bats before we figure out the deterrent stuff and actually address the situation that way. I think we've shown much greater progress on deterrence and minimization efforts than we have on the ability to accurately count Hawaiian Hoary Bats. I'm actually more optimistic that we'll end up with good bat deterrents and in an ideal world make it somewhat mute.

JACOBI: We do have minimization tools, not all of which want to be used, such as don't spin at night, and things like that. But in terms of deterrents I agree with Loyal. I really applaud the efforts your organization has made in working with deterrents and helping to develop them, but at the same time it would be really nice to determine how well those are working. And to go beyond that to not make it proprietary but to share that information with others because we're talking well beyond simply your project in terms of our thinking about all the impacts.

BOGARDUS: So Jim you brought up earlier the role of the ESRC in the implementation pieces of this. In the past the annual review involves all of that but it's typically between the applicant and the agencies to develop implementation plans, and those aren't necessarily held for ESRC approval, but they're routed through the ESRC at the time of the annual review. I'm fine with whatever you guys want to do and given the nature of all of these this may be something you want to talk about in the bat workshop—what do we want to do with implementation of those things—but I do think there's value in this discussion so that we don't run into surprises later on down the line when we do come up against a tier. My preference would be we set that up in a way that is consistent across all projects and not just one or two of them.

JACOBI: When we started this committee it was involved with all the potential applicants from day one and that changed relative to Sunshine requirements. So that sort of changed the game. But part of what I'm seeing on the committee is that we go long intervals before the committee

necessarily sees certain types of things. We sort of scratch our heads and say how about changing this and so forth and then it goes another year or a longer interval before it comes back even though it may go through some iterations through the agencies and I think that sort of slows the process down. The purpose of the ESRC is to bring expertise to the table, to the discussion. Take advantage of that. I think it really is much more useful rather than this bounce it back kind of a thing. It would be much more effective and efficient if we could go back to more of the old style where we are involved in more detail.

BOGARDUS: Having sat on that side of the table, I will tell you the ESRC schedule and availability to be able to adequately do that in a time sensitive way is the confounding factor. If we want to do something like that then we have to be committed to doing this basically once a month. There's too many projects, too many moving parts; we're relying on adaptive management to do this. I think there are 17 HCPs and SHAs now. This is why on the agency side we have dedicated staff that are literally doing this on a daily basis. So we need to refine what that looks like.

JACOBI: I agree, and we have addressed that to some degree with the bat task force. I think that's one strategy which involves more participation from other ESRC members and I realize there are some restrictions in terms of how to do that the proper way, but it does allow for more than just simply the two agencies working with the applicant or permittee on it. So I think that model is something that we need to think about a little bit more and I'll speak for myself and a few other members of the committee: we've put in an awful lot of extra time above and beyond just our regular meetings to participate in that too. Hopefully that's useful. We on our agency, for our seat we are committed to trying to bring the best science we can to solve these problems. It's more effective if we can have much more interaction and involvement in some of the details.

ALICIA OLLER: Jim, I just want to add too, I think you were talking about the timeline between seeing some of these projects. There was some change in agency guidance as far as what was appropriate mitigation so some of the different projects were working on mitigation and then, you know, research may not necessarily be the thing anymore. It takes time to switch gears and come up with a new plan and then, you know, ideally vet it with U.S. Fish and Wildlife Service and DOWAW before bringing it to you just to make sure we have their buy-in. So just, you know, a little bit that I think contributed which is why we're in four years plus for these amendments.

JACOBI: Wherever we can speed up is really what we all want to do.

ALICIA OLLER: Agreed, and I'm sure everybody else is on the same page.

MEHRHOFF: I'm okay just finding out in the annual reports what goes on as long as they're in cycles. So for example leaving the acreage up in the air is maybe not good to figure out what's going on. Generally where the focus of the mitigation, on island, off island, whether it's going

to be on private lands, things like what—those are the kind of sideboards I'd be interested in seeing in the actual HCP.

BOGARDUS: So there's some in there about what island, that kind of stuff, but I don't think they do public/private lands.

MEHRHOFF: I'd rather once the HCP is done the agencies take it and let us know what goes on at the end of the year, unless there's reasons to ask for opinions on it. But that means I want to see some information in the HCP on tiers 5 and 6.

SMITH: Okay, can we take a recess? Five minutes.

BREAK

SMITH: Okay, so there is concern about how we circle back to the ESRC then or how we get there. We don't have a problem with it; it's just going to take a considerable amount of time.

JACOBI: Two things. One is we have had the bat task force and I presume that's continuing on, in terms of trying to help address some of those issues. The second piece is we have talked about having a bat workshop and I'm hoping that still is on the agenda because that's where we can do a lot more of the deep diving in terms of some of these issues which will be beyond an individual project.

MEHRHOFF: The nice thing about the bat workshop is you get everybody there so it makes for a better outcome.

JACOBI: The task force is really aimed at more of trying to look at updating the guidance.

SMITH: You were concerned about the agencies consulting you regarding mitigation projects?

JACOBI: Just making sure that that we are having the kind of discussion we're having today which I think is very productive in terms of trying to ask questions and come up with pathways to if not solve things, have confidence that we're on the same track to try to resolve issues. And so I just want to make sure that we're still able to do that.

SMITH: Recognize on the State side we're committed to that. Another thing I really like that you've mentioned many times is, and I'm not a big fan of modelling, I would like to see is monitoring. To some extent it's to the extent practical so you won't have a perfect system. We could probably do it but it could be quite expensive. But how do we do that in a way that everybody can contribute so you end up having a better, real monitoring program. That's something I think we should continue to work for as we move forward. We're not there yet so we just can't wait for that day but I think that's where we should try to get to. I think we're going to continue to learn.

Another thing is I'm comfortable with the adaptive management piece because I think we're going to continue to learn rapidly in the next two years, five years, and certainly ten. I think what we've done so far and even the research around bats and bat management and bat monitoring has come a long way. And I think that stuff has increased the likelihood of recovery of bats, quite frankly. I think we're doing pretty good on bats as far as I can tell. I think those things still in the pipeline are going to start coming out, the products, which will push us forward as far as our level of understanding, ability to monitor, what it takes to mitigate for bats. And I think we're going to learn a lot very quickly about deterrents. On this project the potential for deterrents to make a really positive impact in terms of minimization is huge.

MEHRHOFF: I agree, particularly as you had the one prototype that did good for a year. What was the annual take before that deterrent went on that one particular turbine?

BRITA WOECK: About one a year if you average it out at that turbine. Six total.

MEHRHOFF: Yes we are going to learn a lot, but I still think when you get back to the triggers and the hardness of what the actions are, for example, we talked a little bit about that Mid-America Multi-State HCP for bats, their hard trigger is if the total take authorization is going to be exceeded the wind project goes to 6.9 m/s for low wind speed curtailment.

BOGARDUS: Up until the point where they get into compliance again.

BRITA WOECK: That wouldn't be realistic to our project. The average wind speed hovers around our cut in speed of 5 m/s which means we're curtailing all the time. So it's really different from even some of the other projects in Hawai'i and those Midwest projects as well.

MEHRHOF: Some of the Midwest projects do have low wind speeds, but not like that usually.

BOGARDUS: Even at 6.9 m/s we've had take.

MEHRHOFF: The mainland calls 6.9 take avoidance whereas we would say more likely would be 8.0, or something like that, and even that would be questionable. What I want to emphasize on is the hardness of the triggers, which is saying you're exceeding the estimated take and then there's a hard action. I think that for the purposes of Hawai'i, we should be looking at a hard action, but then there should be a caveat that that's the default of that trigger, but then that can be changed based on consultations with the Fish and Wildlife Service and DOFAW to do something that is more tailored or more appropriate. I'm comfortable with that kind of a trigger so it doesn't tie everybody to that one thing, but I think there needs to be some sort of a trigger with a hard action associated to it that they may deviate from based on what the agencies would like to do to get within bounds.

BRITA WOECK: Would you be looking from our set of options selecting one that we are committing to do but that include language that would allow some flexibility?

MEHRHOFF: Absolutely. That's what I would suggest. I'm hopeful that won't be the case in your project but the Midwestern ones, what they've done are sequential triggers, so if you get to choose whatever and say this is what we do, and it still may not be enough so maybe you trigger a second one, and maybe a third one if you need to. They were doing it based upon different amounts of Evidence of Absence, jacking up the confidence to 95% and then dropping it down, but I'm not sure we really want to go there. I think 80% is cumbersome enough for us.

BOGARDUS: Can I frame it a slightly different way and see if I'm right on this? Essentially what you're asking is say pretend that trigger is reached next year: what would you do if the trigger really was next year based on the information you have today, but leave in the flexibility so as the information changes, as new techniques are evaluated, leave it flexible so those can be incorporated in later years?

MEHRHOFF: Ideally as you guys have proposed doing, you should have a trigger for the tiers. So you trigger a tier and you do certain things; that's one level of trigger. But there's this big trigger out there also, which is exceeding your overall take. That one needs to be paid attention to as well. You may only have the option of stay in business or not, or you operate without an incidental take license. I don't know. Ideally you have a trigger that keeps you from going over that. The one that they did for the Mid-America one was basically take avoidance when you hit that trigger, the big one.

BRITA WOECK: We have our trigger set up so that if for some reason we were to reach 60 or 75 percent of tier 6 that's when we would implement an additional adaptive management measure, if it looked like we didn't have enough take to cover the remainder of the permit term. So I think that conceptually we're saying the same thing; we're catching ourselves with enough time to do something about it. But what I'm hearing is that you would prefer to see one of our actions just more explicitly selected as the priority and then the rest of them could be, you know alternatives that we work from.

BOGARDUS: Or based on the information you have available to you right now, what would that look like. And then we have the wriggle room of changing that as new information becomes available.

BRITA WOECK: I think right now we are knowledgeable about other deterrent technologies that are in development so that's something that's on the horizon to pilot test and implement, if for some reason it seems that the ones that we're using don't work, but I think that I understand what you're asking.

JACOBI: There's two functions of the trigger. One is to trigger the adaptive management to reduce what's happening; the second is to start to plan for what your mitigation is and execute. That's what I'd like to see also in that mitigation part, something that has more details. And although that mitigation may change in the future as we have more opportunities, better information, better ideas, at least have something that is a little bit more.

BRITA WOECK: We have an entire appendix about our first tier of mitigation. And so what we're talking about is stuff that's not going to happen for years into the future and we have as much information in there as we know right now. If we were to do it tomorrow, we would just build from what's in there and say okay J.C., let's really look at the site. So that's the effort there is to give you enough that you kind of get what we're proposing and it's enough to make a decision on but then as soon as permit issuance happens—should that happen—then we pivot to the actual planning and work on that mitigation plan with the agencies.

BOGARDUS: I would anticipate that what happens next after if this goes through, essentially we would immediately go into working with them, fleshing out that plan, getting the baseline information set up, getting MOUs in place, so by the time they got to next annual review they're able to show what a fleshed out version of that mitigation proposal looks like.

JACOBI: I agree.

MEHRHOFF: So for tiers 4, 5, and 6 for example, you say you're going to do insect monitoring. Does that include malaise traps and light traps?

BRITA WOECK: Certainly can.

MEHRHOFF: See certainly can is different from will. Generally it's not that you guys can't do something; we just want to know that we can count on that.

BRITA WOECK: Some of those detailed decisions about what type of insect monitoring that we would do can't be determined until we get on the ground with an invertebrate expert that can look at, what type of traps do we have available? What's the latest and greatest technology for trapping and monitoring insects? Where would we put those traps on the landscape? What's the land access like? I mean, that's the minutiae that we would do in our first step of putting that implementation plan where we would have that framework that we have in HCP right now, but just now refined because we have a project site.

MEHRHOFF: When we have left that to chance, it has not worked out too well. I think it would be good to put down what is appropriate based on what you know now and again put in the caveat that that can be modified in consultation with the agencies.

BRITA WOECK: How would specifying what kind of insect traps we're using influence the ability to approve this amendment? I believe that's a detail that we have to identify at some point, but when it's time to start planning and implementing that piece of mitigation. That's why we put so much effort into the description of tier 4, because we knew we had to do that first and then we did that proactively, but to me, I'm not seeing the black and white if we don't specify the insect traps, that's a real deal breaker.

JACOBI: Make and model of insect traps is not critical.

SMITH: Even insect monitoring, is that really what we want to do? What we really want to do is monitor bats: what's our baseline and what's our impact.

JACOBI: Insect monitoring is a sharp tool that we've got in terms of understanding bat utilization of habitat, so it is a piece of the bat monitoring program, and the tools are pretty straightforward. The difficulty is the design and deployment, which gets into the details of the site.

BOGARDUS: It's a question of defining what the success criteria for that mitigation is going to look like for that project, defining that there will be sufficient monitoring in order to inform whether or not the success criteria are being met, as well as the components that would change if it turns out that monitoring was showing we weren't meeting the success criteria. For me, in order to approve upper tiers, that's what makes a difference—there is sufficient detail to be able to say this is what those success criteria will look like. Types of traps, I'm not sure, but the insect monitoring is important because if you don't have the insect monitoring, I didn't have enough confidence to be able to say that the success criteria were going to be met. Do you know what I mean? Is that the level of detail you're looking for? Where's the line?

MEHRHOFF: Again this goes back to some extent on my problems with tiers, in that the tiers are left to the future and they're vague and I don't see them as being very useful, although you guys may actually turn them into something that's useful and that would be a first for an HCP, in my opinion. So that would be great. That in itself would be a great proof of concept. When the project goes forward there should be enough information in there to be able to say that yes, you have reasonable certainty that you're going to get out of it what you need get out in order to say that the project can be approved. And it's going to depend upon whether insects are really important or not very important for example, using insects, to your overall hypothesis from where you're going to be getting your take.

So if you're producing a mitigation plan that is I'm going to make a bunch of native forest in this area and it's going to be good forest and it's going to be good bat habitat, then maybe insects are not going to be that important. But if you're going to be designing a project that is going to say, create corridors and riparian zones and your purpose is not necessarily to produce a native forest that's going to be a nice functioning ecosystem but instead you're going to up the amount of prey base for bats then yes, you should in that case talk about how you're going to go about monitoring that, what your level of success is going to be, upfront for those. That can change but you should be able to do that to make sense for people. So it's going to depend on how much weight is going on that individual metric you're using to identify the success of your project.

SMITH: I think success should be bat utilization, not insects.

MEHRHOFF: And that could be very good; I'm not going to argue with you on that. But other people have said we want to increase the number of insects, other people have said we want to increase the number of bats, or bat activity. Whatever it is that's what you're going to be

needing to do your monitoring on and what level of confidence you have that you actually can say whether or not you've reached that goal.

BOGARDUS: It's depending on what the goals of the mitigation plan are, right? So if they're saying they're trying to increase bat activity by increasing the resources available in the site then they have to monitor the resources that are available in the site. Do you know what I mean?

SMITH: I know what you mean. I don't necessarily agree with it. I think you're trying to increase bat activity.

MEHRHOFF: You're actually trying to increase the number of baby bats. So those are my concerns. I don't think I have any additional ones.

SMITH: Any other concerns, comments?

WINTER: I certainly have some. I think a general concern, and I'm just taking a big step back and looking at the pattern, I believe when the projects first started coming out people said there may be translocated bats on O'ahu but there's no breeding population here. Now skip forward to today and you're putting figures of potentially 2,200 bats. That's a big jump from the point of assuming there were no breeding colonies to now there's a lot, potentially. So I'm seeing the same kind of language in here about 'Ua'u: while there might be transients there's no breeding colonies here. But as more and more evidence comes up, it seems pretty clear there are breeding colonies here. Recently many of us here in the room were at the Hawai'i Conservation Conference and every ornithologist that I spoke to there seemed very confident there are breeding colonies of 'Ua'u on O'ahu. So I'm curious about why this HCP claims that there are no breeding colonies when the broad scientific understanding within the ornithological community in Hawai'i agrees that there is. So we do have a letter, testimony from Dr. Sheila Conant that I distributed to the committee last night and asked the staff to make sure it's in the public record. I don't believe that I need to read the whole thing, but the key statement in here is, "As you know Dr. Lindsay Young has collected recordings of both species in the mountains of O'ahu. Although her group has not yet been able to confirm the existence of burrows (they were recently prevented from attempting this because their helicopter crashed), in addition to the acoustic recordings, there exists sufficient data to strongly indicate there actually are colonies. Let me explain." And then she goes on to explain for about four paragraphs her reasoning behind that. So I'm wondering how is it that the ornithologists think that there are but your HCP claims that there aren't.

BRITA WOECK: That might be a misinterpretation. I think the HCP says there's no documented breeding colony. That's the reason why we're asking to add them to the HCP, and the HCP cites some of those ongoing studies. We know there's evidence of birds on the island more than just transients. When the original HCP was put together the decision was made not to include them for that first reason because we thought it's just not likely that they're going to be here. But that doesn't seem to be the case anymore. The reason that we're not mitigating on O'ahu

where those potential colonies are is because they're not being currently managed; we don't know where they are. And so our mitigation follows suit with other projects and it's contributing funding to manage a known colony. So I don't think we're inconsistent with what you're saying and that's really the crux of why we're even adding 'Ua'u as a covered species for the project.

WINTER: Glad to hear you say that, thank you.

ALICIA OLLER: And we are, just to clarify, using the best available information that is out there, the publicly available information, the same study that you mentioned. That carries more weight than you know, conversations with different people and you know if I'm remembering correctly from it, it said it could be prospecting birds. They don't have enough information to confirm that. So we are acknowledging the best available information that is out there.

WINTER: So you're acknowledging the best published information but I was corresponding with Lindsey and she said her publication did not include the 2018 data which they now have that indicates very strongly that there are breeding colonies here.

BRITA WOECK: I don't think that would change the approach of our HCP and again, that's why we're including that. We're asking to add them just for that reason, because there is new information each year about what's going on on O'ahu.

WINTER: I don't know if it's been published yet but Lindsey also mentioned the downed bird in Waikiki which had a brood patch indicating it was sitting on an egg. They analyzed the genetics of that and it had unique haplotypes, indicating O'ahu has potentially a unique gene pool, which is very important because in 195D-4 it speaks of the importance of making sure that we don't lose genetic diversity of endangered species. And so when we look back at the HCPs that were dealing with the Kaua'i seabird populations, in the very beginning we were at the same place where we are right now: we don't know where the colonies are, we don't know where the seabirds are. So the mitigation measures on Kaua'i were focused on that island's population, focused on research to figure out what was going on. Jump forward ten years and we know so much more, a much better understanding of how to protect those colonies and those gene pools representing genetic diversity. So I think the most appropriate move for this HCP is to follow the precedence of those other HCPs and focus mitigation on this island, on research, so we can get a better understanding of what's happening here. So we can better understand how to protect them and that to me would be the best pathway towards benefiting the species.

JACOBI: Before you get into the issue of where to mitigate and so forth, I just want to add caveats to what Kawika said. In Section 6.3.4 it says that there is no evidence to suggest that the O'ahu population is genetically distinct from colonies on the other islands, the mitigation ensures the project is committed to ensuring there are no population level effects. That's assuming the broader population of O'ahu and Hawai'i as a whole. And I'm sure you're aware of the two papers that really do talk about the differentiation between the different islands,

one morphometric and the other one on genetics. Again, it gets to the point that we don't know potentially about the O'ahu population but certainly you can't throw it into the bigger population which is overly dominated by the East Maui population in terms of numbers of individuals. It is potentially an important thing we should examine a bit more. Where to mitigate is a whole other issue and that's another discussion we need to have obviously. But I think it is important you do make a correction to this; it recognizes there is a likelihood there is differentiation between the populations of the different islands which suggests that there are genetic differences between them. This statement as whole basically says it doesn't really matter on O'ahu.

BOGARDUS: Did we do genetic testing on the birds that came down on Kawailoa?

ALICIA OLLER: I know the first one. It was just to verify it was a Hawaiian Petrel. I don't know about the second one.

JACOBI: It's a valid question.

BRITA WOECK: I think it's important to remember the time scale too. I think if there was a colony that we knew of on O'ahu that we could manage yes, we'd put the funds there.

SMITH: It sounds like you're suggesting we shift mitigation to O'ahu but we don't even know where they are on O'ahu.

JACOBI: No, I'm just saying to acknowledge in here that there is differentiation between the islands. I think it's a very important point because the way it's written right now is basically saying this is a small drop. It doesn't really matter in the ocean, in terms of the effects.

MEHRHOFF: I do think it would be good to know from the seabird working group or whatever it is whether trying to increase the reproductive output of birds on another island is more important than say, doing a survey on O'ahu for breeding sites.

BOGARDUS: First thing, the inclusion of petrels into the HCP in the first place based on new information and recognizing the importance of that information. Second piece, the mitigation piece.

WINTER: No, the genetic piece.

JACOBI: That's what she's saying, in terms of uniqueness.

SMITH: It's uniqueness and then there's mitigation.

JACOBI: It is potentially but we need to know more on that. It's too general in here.

SMITH: We're here today to figure out what's going to be in the plan for mitigation, right? How will you mitigate for something you don't know where they are, or if they're even there?

WINTER: We're here today to approve the entire HCP and there's language in the HCP that Jim pointed out should likely change based on what we know.

BRITA WOECK: Maybe we need to differentiate the goals here because I think what we're talking about are some larger questions that are ones to be faced by the managing agencies who are responsible for recovery. I don't think the onus is on us as HCP applicants to fund questions that need to be answered from your perspective. We need to figure out a mitigation plan that we can implement upon permit issuance. So that's not discounting the fact that there are uncertainties and questions that need to be answered but I don't know if our pocketbook is the tool to answer all these unknown questions. I think that we need to differentiate those two efforts, recognizing that both are important.

BOGARDUS: So your question is the kicker of what's more important: to work through where are they on O'ahu, what management strategies could you employ on O'ahu, how would you keep them alive on O'ahu? What's more important, doing that or doing something that would contribute to the recovery of the species in an area where we already know where they are and they are in precipitous decline?

WINTER: They're in precipitous decline everywhere. You're at a high risk of eliminating a gene pool on O'ahu and 195D-4 speaks specifically to not likely to cause the loss of genetic representation of the populations.

MATT STELMACH: I think it's an important distinction of that part of 195D that it refers to plant species.

ALICIA OLLER: Just to clarify, we coordinated with the seabird biologists with both the State and U.S. Fish and Wildlife Service and had this discussion about you know, where's the best place to mitigate because as you know, typically you do want to do it on the island of the take but in this case, you know, we coordinated with Afsheen and with the Service and their recommendation was for us to go with this project on Kaua'i because they didn't have the funding and it would definitely benefit the overall population. So that's why I ended up there and had the support and you know, Michelle, you can share more on that.

BOGARDUS: So to be very clear, when this came up we had conversations between the agencies with Lindsay, with Andre, with the broader seabird working group to identify what the best option would be. And we did very specifically talk about the idea of doing this on O'ahu and we talked very specifically about whether we should put money into doing further research on O'ahu to figure out what that might look like for O'ahu. So we had those conversations, we do have those notes. Very specifically from the seabird group we heard that is less important than doing the work on Kaua'i where we know that action is needed in order to support the recovery of the species.

SMITH: At this point in time. Going forward that's really important and I think it could become an issue in the future HCPs but at this point in time I think we have to act on what we have.

BOGARDUS: So that is where we went with it. If it did turn out that there was a documented breeding colony on O'ahu to the point that we knew exactly where the burrows were we would take management actions.

WINTER: We're never going to get there without research.

SMITH: We have research going on right now. I've been looking for these birds on O'ahu my entire career. We're working on it! We're finally getting to the point where we may be honing in on something. We're just not there yet. We had people in the helicopter with Lindsey when it went down. We're looking for these birds regardless of this HCP or anything else. We're going to continue that effort. And if we find them, I can guarantee you we are going to manage them.

BOGARDUS: We're going to get there with research. It doesn't necessarily mean it's appropriate mitigation.

JACOBI: And we were in the same position on Kaua'i 15 years ago... was it 25?

BOGARDUS: If this project was coming up ten years from now at the point where we knew where the colony was, we had identified the management actions that would be likely to support that colony and we had figured out the whole lighting issue between that colony and the coast, then this would be a different conversation. Given the discussion that was had by the seabird experts at the time this came, this was the priority.

JACOBI: Is there any opportunity to do some of the similar measures that are going on on Kaua'i for some of the flyways in terms of minimizing light pollution and so forth to make it so that O'ahu isn't such a death trap?

SMITH: Here's what I have to say about that. It's not a death trap; you get one of these birds down what, every ten years or something like that? And if they were up there and they were going back and forth every night and with the ring of lights on O'ahu, don't you think we'd be seeing birds coming down a lot? That's to me an indicator. I would think if they're in any kind of numbers at all, you'd be seeing them more often.

MEHRHOFF: It's not the adults though. It's the juveniles going out.

BOGARDUS: So we've had no recruitment.

SMITH: Well it's the adults of these birds that are going back and forth to feed, right? It's the juveniles that get distracted when they go out. So it's both. I don't know if we've even seen a juvenile come down.

BOGARDUS: We had a juvenile NESH a couple years ago at the airport.

SMITH: I see them prospecting at night in places I've never, ever seen them in the day. I've worked on this, and I've looked at it carefully, and I'm not convinced. And we're saying probably and high likelihood but there's data. When you look at the whole picture it's really marginal still. We haven't been able to find them despite a really active effort.

MEHRHOFF: But it's a good question.

SMITH: Absolutely. It's super important. It's a good question going forward but not right here at this point in time.

JACOBI: The question is where does it fit in to mitigation obligations versus other obligations that you've stated that this state is actively going in that direction no matter what.

SMITH: I think we need to confirm something first. That they're actually nesting on O'ahu.

JACOBI: Would it be worthwhile to think, I'm going to shift to the mitigation part now, while there is mitigation strategy in here but we've talked about it after management and so forth, if there is an active opportunity to do some action is it possible to potentially shift some of that action over to a place like this? Because basically what it seems like in reading what the mitigation actions are is money is going to DOFAW to do something that DOFAW is already doing.

BOGARDUS: We can't shift it after the start of this because the way it's set up, it happens quick. It happens right away. Once it's permitted, it can't switch gears. It won't have adaptive management in the funding stream because it's a relatively short funding turnaround.

ALICIA OLLER: They don't have funding for 2020.

WINTER: Do we have tiers for this species?

BOGARDUS: No. It's 24, so they're doing it altogether.

JACOBI: They're not expecting much take.

MEHRHOFF: So it's an upfront thing and then it's gone. Which is what you want your mitigation to generally do.

SMITH: Acknowledging Kawika's concern, it is very important and going forward we may eventually get enough information to make it something where we could act on O'ahu, and we would recommend that in the future. But given the information we have now, the agencies got together and decided the Kaua'i project was the one to do.

MEHRHOFF: And you went through this with Maui, right?

BOGARDUS: I did by the way look up what the mitigation was for NESH in the original permit which was funding through NFWF to support NESH conservation on Kaua'i as well as the development of the Good Nature cat trap. They funded their portion and got all the way to the point where it was created but those creations are still dealing with humaneness trials.

ALICIA OLLER: And you have to recognize the applicant's position too, which is we have to trust what the agencies, those that are charged with recovery of the species what they're telling us is the best mitigation and that's what they moved forward with it. And you know when you're coming for approval and you know, and it's coming up with something different it totally changes the mark there.

JACOBI: That's why I think it's so important that we look at this in a much broader perspective. Not just simply a project-by-project basis and understand the bigger picture, but how agency actions, both Fish and Wildlife Service, DOFAW, Nature Conservancy, nongovernment agencies, and others work together in this broader context and I think that's where we need to be thinking and I think it's a challenge to expect—I've gone through the same thing working with the Army's mitigation for a Biological Opinion for the Fish and Wildlife Service. It's not the burden of the Army to recover the species, it's to do certain kinds of things and how to parse that out relative to the bigger efforts that are going on. So I think we need to have that broad perspective there but we also have to have confidence that that's going to carry through beyond having to rely on mitigation projects to get anything done.

BOGARDUS: Seabirds are in such decline and in such bad shape at the moment that the seabird group is looking at the species as a whole. Granted there is variations in those seabirds and we have different islands and populations and different environmental factors going on with each of those populations, but they're looking at the broad sense of what do we do to at the very least try to stabilize the major populations that we've got. That we know of, that we know we can manage. Rather than just see all of these populations continue to decline and many of them blank out. So they're looking at these overarching goals for the species as a whole across the state and asking what we can do, and prioritizing because we can't do all of it. So how do we at least bring stabilization to the main colonies? There's a strategy that goes behind all this.

MEHRHOFF: But that doesn't necessarily fall in place with the language in 195D.

BOGARDUS: I agree, and it's not up to the seabird group to define what the strategy looks like within 195D. They're just looking at the recovery and persistence of the species.

JACOBI: Our narrow scope really looks at things that come to our table as is. We try to expand out and bring in information otherwise. I know you don't want me to ask for a seabird workshop and I won't. But that being said, I do think it is appropriate for somebody from one of your agencies or representing the seabird group to come into the ESRC and give us a broader perspective as an agenda item in terms of seabird issues and conservation so that we can better understand these projects as they come to our table. We're not participating in those discussions and so forth, but it's really pertinent to the kinds of things that we need to address.

BOGARDUS: I actually think it's a brilliant idea and we should do it before we talk about Makaka'ole.

SPAIN: So an impression I would have is how this project then integrates into the greater Kaua'i seabird strategy.

BOGARDUS: After September we the ESRC will be switching gears off of bats and diving into seabirds because Kaua'i Seabird HCP is coming down the pike.

SPAIN: So this project would be considered completely separate from whatever comes up in that?

BOGARDUS: Completely separate.

SMITH: We do have a global approach. We're doing exactly what you're talking about Jim on Kaua'i. We have a global approach managing seabirds, there's lots of different inputs. This is a perfect example. They have an obligation, they're plugging in to that approach. So there's a big overarching approach with lots of different inputs coming in in terms of funding.

JACOBI: I agree with you but to bring that information or at least a summary of it to the ESRC would be really important because right now we're focusing on a project-by-project basis, which isn't helpful.

SPAIN: The point being is we have applicants here. We need to and we can talk about endangered species in general. I understand today we need to vote whether we're approving, amending, or rejecting this HCP.

WINTER: I'm not quite done with this mitigation thing. I think there's a general precedence of focusing the mitigation on the island the project is, and seems like the applicant is being advised by both DOFAW and Fish and Wildlife to do mitigation on Kaua'i. So there's that pulling us this way but there's a precedence pointing us to focus on O'ahu. There's an identified need for research on O'ahu. And so I'm trying to in my mind weigh the breaking of precedence. Is this enough justification for us to break precedence and set precedence to focusing mitigation on another island? Look at the big picture. We're setting a precedence here.

BOGARDUS: I don't think so.

SMITH: It's actually a continuum of what we're doing. And the new information coming in is part of a continuum, not precedence. Because we don't know if we have birds here.

ALICIA OLLER: And there has been mitigation approved in other HCPs that has been implemented on other islands from where the project occurs for both seabirds and bats. So there's precedence both ways.

WINTER: Which projects? I'm not familiar with those.

ALICIA OLLER: I believe Kahuku.

BOGARDUS: Basically of the O'ahu projects have been mitigating for seabirds on Kaua'i, including the seabirds listed under Na Pua Makani and Kahuku, and the existing NESH under Kawailoa. Maui Nui generally treats similarly. KWP II does some of their lost productivity mitigation on Lana'i. Big Island is all Big Island but there's no permitted take there. Bats are all on the island on which it occurs because we know they're there. Waterbirds are all on the same island where it occurs.

JACOBI: I don't think it's an issue of precedence. I think it's more of an issue of timing right now. It's a question of where the funds available through this mitigation should be best applied. I certainly understand and share the concerns with walking away from O'ahu. I feel less concerned about that with Dave's assurance that the State is trying to find what they can. My only caveat is I would like to have a better summary of that whole seabird strategy brought to the ESRC ASAP so we don't get into the same kind of place again.

SMITH: The good thing about seabirds is we know how to count them and we know how to make them.

BOGARDUS: We know how to make like, 20. Whether we know how to make 3,000 a year is a different story.

SMITH: If we find seabirds on O'ahu we can very quickly come up with a strategy for what to do about that. And we do manage seabirds on O'ahu and we do manage seabirds on the offshore islands. Can we move this along in the interest of time? I'm not saying don't ask questions.

JACOBI: The only other question I had was the proposed mitigation on Kaua'i—is that something DOFAW is already doing?

SMITH: There is something started but if it doesn't continue to get funded we'll stop doing it. It's on a year to year basis based on funding.

JACOBI: So if they didn't show up it would stop, and then the fences would deteriorate, predators would get in, it would be increased take because actually the population is built up a little bit there?

BOGARDUS: Even the previous year's management of that site was coming from ABC or NFWF. I can't remember which.

JACOBI: So after their mitigation is finished, then who's going to pick it up after that? Or are we just extending the end another year or two?

BOGARDUS: The goal would be it would be picked up by either KSHCP or KIUC.

SMITH: We're hoping to continue this stuff, but it's off money. We're going on a year to year basis funding. That's the bottom line. There's lots of potential to fund it.

JACOBI: Generally I feel much more comfortable with the mitigation being something which is starting something new. Somebody could interpret this is the net benefit is to DOFAW because it is taking the money. My gut feeling is I much prefer to see mitigation that starts a new project such as we're going to build a new fence, get that started and hopefully DOFAW will take it on after that. I'm okay with having this go as is but I'm just telling you, in terms of mitigation to me, I would much prefer not to have it as just shifting money from one place to another.

SMITH: I just look at seabirds as a year to year deal. You get management this year and you get chicks, you don't get management next year and you get nothing.

Okay, anything else? Do we have any public comments or testimony? Looks like we have none. Do we want to entertain a motion? Where we're at right now is we can vote on this item. They've presented, we've asked questions, there's no other further testimony.

BRITA WOECK: Can I have five minutes with my team?

SMITH: Okay, let's take a lunch break and we'll come back and vote after lunch.

BREAK

SMITH: Any other public testimony? Hearing none, we've had discussion at the committee level, so we're going to let the applicants address the discussions we've had, and we'll entertain a motion.

BRITA WOECK: I just want to start by saying we appreciate all the thoughtful input you all provided today. I think it's going to make our HCP a very strong document. We appreciate your expertise. I wanted to bring forward a few things that we're willing to do based on the

input we've received today that I think are really reasonable and I think are going to enhance what we have in there now.

The first thing is we're willing to commit to a specific adaptive management action for our tier 5 and 6 triggers. We'll specify that we're willing to commit to pilot testing and installing new deterrent technology, whether that's UV or acoustic or otherwise. And based on Loyal's suggestion we'll include some language in there that still allows us the flexibility that if there is something better that we should do at this site, we have the option of doing that, so we don't lose the chance to take the best available science.

BOGARDUS: With the engagement of the agencies.

BRITA WOECK: Yes. So we can commit to doing that. We'll clarify the language in the petrel section to reflect the newer studies and fix the statement about genetic diversity. I think that's a fairly straightforward text clarification that we can make.

SMITH: And can I recommend one more thing, that you soften that language to reflect the chance that they may be here, but still acknowledging that there aren't any documented colonies on O'ahu.

BRITA WOECK: Yeah, we can do that. And then the third thing that we would like to do is prepare a brief addendum to tier 5 to specify the success criteria and monitoring that we would implement if we were being asked to implement one of the projects tomorrow. We'll include a bit of language in there that still indicates that if it seems like we need to modify it just to make it stronger we can do that, but we can get specific in terms of metrics and just honing it in on a particular project.

With these changes is the committee willing to approve the HCP with these measures as conditions? With the understanding that somebody, whether that's on the agency side or maybe a member of the ESRC, can confirm that we've made those changes.

WINTER: I have a question. I want to make sure I understand the population estimates, the 2,000 to 9,200? I'm not sure I'm understanding the modelling behind that. Can you walk us through that one more time please?

MATT STELMACH: We used two means to assess what a likely population would be. One would be the percent forest cover. We know that it's a proxy for bat habitat. They use forests to some degree for foraging and as necessary for roosting. And then the other means was modelling based on occupancy data and estimates of occupancy and excluding areas we think would be unlikely for occupancy, which would be urban habitats. So two different methods which came up with overlapping estimate ranges so we can use the best available science to determine likely range and population size.

WINTER: What were those two ranges that overlapped?

MATT STELMACH: It's in Section 6.3.7.

MEHRHOFF: It's roughly 2,000 to 7,200 and 2,500 to 9,200.

MATT STELMACH: That's correct.

SMITH: Any other questions. Motion?

ITEM 5. [ESRC vote to recommend to the Department and Board of Land and Natural Resources to approve, amend, or reject the Kawaihoa Wind Power HCP Draft Amendment](#)

SPAIN: So, I might need clarity from somebody, because basically they have three choices, right? We approve, we recommend amendments, or we can reject.

SMITH: You could approve with amendments.

SPAIN: I'm just recollecting what we did with Auwahi, it was approve with the recommended amendments. So I could make a motion for approval with the amendments that were brought up, the three, and that would be the motion. To approve the HCP including the three amendments that were just brought up.

SMITH: It was commit to specific adaptive management actions, clarify language on petrels, and tier 5 addendum success criteria.

BOGARDUS: With those amendments to be reviewed and approved by an ESRC member.

SMITH: The ESRC or the agencies?

SPAIN: Well, we would want confirmation that it happened.

SMITH: If they made a new draft with those amendments would we be good?

MEHRHOFF: Not for me. I think the take is too high. I'm okay with up to and including tier 4, but not 5 and 6.

SPAIN: I'm offering up a motion. It's up for discussion. So that the motion I'm putting forward would be to prove with the amendments as discussed with the review of the agencies that they add it in to the document.

SMITH: Call for the question?

BOGARDUS: Second.

SMITH: Any discussion?

JACOBI: I'm also uncomfortable with the take level at the higher tiers. I'm still thinking in terms of how we would vote on that. I appreciate the amendments that are proposed and the changes that you've talked about. So I just wanted to say that.

SMITH: Anything else?

WINTER: Earlier I asked for—it was a different species—but I asked for the cumulative number of bat takes for all the wind projects on O'ahu and we know that number right?

MEHRHOFF: 307 was the number I think.

WINTER: We have 220 from Kawaiiloa, and two or three others, and they add up to 307?

MEHRHOFF: For Kahuku it's 32, and for Na Pua Makani it's 51. That's total over all those permit periods. 15.35 bats per year average, if you look at them over 20 years.

JACOBI: If we're going to vote affirmative to the motion as is, we'd want to have the expectation that there will be a very clear effort on the part of the applicant/permittee to make sure that the ESRC is very closely involved in looking at, as things get towards the trigger sections and the actions that are connected to those trigger actions, as well as the monitoring. I do feel uncomfortable in terms of the population estimates. I realize that somebody needs to come up population estimates. I don't think there's really any foundation for those. I don't think that multiplying the number of acres gives you a bat. It doesn't make any sense to me. I do want to make sure we're not in a situation where approval happens, and then nothing really happens that's substantial. I have the expectation of a real strong commitment there will be follow through on all the issues and the adaptive management clause is properly advised.

WINTER: Would that be encompassed in those amendments?

JACOBI: No, the amendments they proposed I thought were reasonable. If we vote yes, it's with that really high expectation of that follow through, that's all.

SMITH: Move for the question. All in favor?

SMITH, BOGARDUS, JACOBI: Aye.

SPAIN: In Robert's Rules, if there needs to be a consideration of an addition to the motion is that possible, or the vote's done?

JACOBI: We can have another motion if it doesn't.

SMITH: That's why I was asking if that was an addition to the motion.

SPAIN: So if yours is an addition in terms of making sure...

JACOBI: No it was just a statement in terms of my expectation. It's encompassed in the proposals that they put together in the end.

SMITH: Would you like to amend your motion?

SPAIN: No, I'll keep it at the same. And I'm voting in favor. Aye.

SMITH: So that's four ayes. All opposed?

MEHRHOFF RAISES HAND.

SMITH: Abstain?

WINTER: I want to abstain.

SMITH: Okay. Four ayes, one nay, and one abstain. Thank you very much.

SPAIN: We're not happy. I think all of us are extremely challenged by the number of bats that are being talked about here. We're very much hopeful that the deterrents will be successful and you will stay within tier 4. This is just super difficult.

JACOBI: It is a challenge and the ones that are on the table are not the only ones. We know that there are some other ones coming down the line and that's going to be a real challenge in terms of how do you add on to this.

BOGARDUS: At the end of the day I do want to thank these guys for being responsive to our comments and for implementing deterrents in a way that allowed us to reduce the take from 265 to 220. That's a huge chunk.

SPAIN: For the record, for those of us in the at-large seats, we need the bat white paper guidance updated. It's super difficult to sit here. I'm reading it, it's saying 40 acres, and we're being drawn into 20 acres. But at the same time, we need the agencies to be pushing this stuff through and getting it done, so we can be sitting on something that's feasible for us.

WINTER: What's our timeline for that?

MERHOFF: Last May.

SPAIN: There was a draft May 2018.

JACOBI: I think it needs to be at least a reasonable draft available when we do the workshop. It's not going to be final before the workshop because the workshop is going to help inform it. But I think we need to have at least this draft ready to be able to be brought into the workshop.

SMITH: Okay let's take a five-minute break to switch over to a presentation from Auwahi.

BREAK

ITEM 6. [ESRC review of Auwahi Wind Farm HCP Amendment dated July 15, 2019](#)

MARIE VANZANDT: Yeah, thank you everyone for the opportunity for us to be here today. I only have ten slides. So I'm hoping I can work through the slides and we can hold questions and we're happy to go back as needed. So I guess last month we were in a similar situation as Kawaihoa. We were here seeking a recommendation for approval. At the time, we had a document that was supported by the Fish and Wildlife Service and DOFAW staff, but members of the committee felt that it still was lacking in some areas related to 195D. So a motion was made to amend the document and subsequently we some great conversation, and recommendations were made on how to improve the document acknowledging that not all the requests were going to be addressed. So we feel confident that the updated draft sent over on July 17th complies with 195D and most importantly is going to contribute to the recovery of the species. So the document that was circulated over to you is supported by Fish and Wildlife Service and DOFAW. It was reviewed with them last week and this is going to be the document that is published in the Federal Register. I'd say after careful consideration of the different requests that were made and the conversations that we had last month. We made the following updates. We believe that we've addressed a lot of your concerns. In summary, we have made a commitment to native outplantings. We've added this interim adaptive management plan which includes a commitment to implementing deterrents and then we expanded on this mitigation net benefit section. I think we have had a lot of really good conversation over the course of the day and the updates that were made to this net benefits section include acknowledgement of the bat guidance recommendation and how our project fits into those guidance recommendations.

Then lastly we incorporated a new research project. So several members of the committee expressed concern that our document as it stood did not provide a firm commitment to using native plants in the hedgerows. So to respond to that we amended the language to clarify and affirm that commitment that we had. So now it says hedgerows will be planted with fast-growing native trees and understory species. Secondly, when we came before you last month, we did not have a formal adaptive management plan because the bat behavior studies at the facility were not complete. We didn't have those clear actions identified yet specific to our facility. So several concerns were raised about not having this formal plan yet. We have a section about how we will address adaptive management but not the plan. So to address these concerns we took the various commitments that are within the adaptive management section

and then built off of that to build this formal adaptive management plan, which is now Appendix K in the document. The plan includes the mandatory check ins that we discussed were important. It also calls out the specific actions if baseline minimization is not sufficient. And then the adaptive management plan has the opportunity to be updated annually and the first update is going to occur in April of 2020 when those bat behavior studies will be finalized. So I think Loyal and others wanted to see that we were tracking the take and the minimization measures through these regular check ins. We want to assure the ESRC that, yes, we are evaluating both of these things continually. So within the adaptive management plan, there are these established regular check ins. These include the immediate, the semi-annual and the annual evaluations which you guys are a part of in our annual review presentation. So we also have the scheduled evaluations every 2-5 years where we evaluate if the adaptive management actions are working and if more are necessary.

So again going back to specific actions. So members wanted to see actions identified if low wind speed curtailment at 6.9 m/s is not sufficient. So the results of USGS and the Natural Power thermal and acoustic studies are preliminary, but we are beginning to see trends. So in order to identify actions today, we looked at that preliminary data and here are some of the trends that are coming out of that. First, we see that 90% of bat activity is occurring during those first six hours of the night. We see that 84% of the fatalities are occurring during the May through October time frame. Then a trend is emerging that turbines 1-4 have the highest number of fatalities. So using that information that we have today we identified informed curtailment strategies. So this is sort of the order of implementation that these strategies will be implemented. So first, the idea would be that using this information we would temporarily redistribute curtailment nights at the times of highest fatalities. Second, action taken is the spatial redistribution of curtailment nights. So spatially moving curtailment nights up to turbines 1 through 4. Again, using this powerful tool has been demonstrated effective at 6.9 m/s. And then lastly we have made a strong commitment that if these measures don't work we are committed to using deterrent technology. As discussed on the last slide, we're interested in the results that are coming out of Kawaiiloa and we're optimistic that this deterrent technology is going to be effective in Hawai'i and not negatively impact other wildlife. And so the adaptive management plan identifies when deterrents must be implemented but most importantly they could be installed voluntarily at any time.

So our favorite topic, the ESRC bat guidance. I think we had lengthy discussion on how the mitigation proposed fits into this guidance. There was discussion on how updates to the guidance need to occur but the guidance is still applicable. So in response to that, we've updated the net benefit section of the document acknowledging the guidance and describing how we exceed it. The guidance recommends this \$50,000 per bat. It then identifies three distinct mitigation options. It identifies the land acquisition, it identifies the research, and then it identifies habitat management. Instead of choosing one of those options we proposed a hybrid of all three of those proposing a matrix of bat foraging habitat.

So lastly, I think around this net benefit discussion some members perceived a gap between the mitigation that we proposed and the requirement under 195D to have a net benefit. Discussion

was had on potentially including additional research to bridge that gap. And so to address those concerns, we've added in this occupancy study to be conducted by WEST on the leeward side of Haleakalā. It's using the very same methods that are being conducted right now on O'ahu. This is a one year study to understand baseline conditions across the leeward side of Haleakalā. We expect that using the standardized and repeatable methods that we're going to have further information to inform bat behavior on the leeward side and inform the future and ongoing mitigation. So I think we're excited about this study. Multiple landowners across the landscape have agreed to participate. We haven't gotten any pushback in terms of land access and permits and we're well on our way to get the study up and going. In conclusion, this has been a collaborative effort with DOFAW and Fish and Wildlife Service and then again incorporating your feedback throughout this process. We feel confident that the document meets now the requirements within Chapter 195D. It also includes the mitigation measures identified as priority for recovery of the Hawaiian Hoary Bat both on the state side and the federal side. You know, there's over 750,000 acres of ranchland and over a million acres of ag land in the state. And so this project has application to ranchlands and management statewide. So we're here respectfully requesting a recommendation for approval with these edits made and changes.

SMITH: Okay, we'll open it up to questions.

MEHRHOFF: First question I had is actually for you Dave. Usually when we get the notes from your office on the meetings for the applicants, like staff input and discussions on what happened in the deliberations with the applicant and stuff like that. We haven't been getting those for a couple meetings now. Can we expect those?

SMITH: Sure.

MEHRHOFF: Because they would be good to have to see what they think should've been added in. Because they talk quarterly, if not monthly or daily or weekly, right? We don't get to do that. So it just makes a little bit easier for us to figure out what's been discussed. Thanks. Anyway, I'm with you on the first set of tiers and stuff like that and your addition of the WEST study. I think it's good and it pushes it all up there. I still have concerns about the subsequent tiers and going over to Kamehame Nui forest of 20 acres because that's still I think light. So I think 40 acres is more appropriate there and I will continue to repeat that time and time again.

For the adaptive management, I have a couple concerns on that. First one is you're still working at every five year intervals, and I still don't think that that's very good. I like the approach of talking if you have a problem over two years or something like that. And one of the reasons that I have problems is if you have three check-in points where you're going to be doing your adaptive management formal thresholds, then each one, you say you're going to do one of the adaptive management options that you got there. Well, there's only three until the end of the permit. So that means we get to deterrents when we're in 2030, right? So it seems like there's not enough time with the five year intervals to do that. You are saying there's a two year period and when you hit that you reassess that and we go forward when you hit those things. So I would suggest looking at the rates and trying to come up with a more rapid response even if

you look at averages over two or three years or whatever. I just don't like the every five years. I think that that's not very good and it's unclear to me because I found it in two different places. One place where you are going to do your threshold level or baseline take. I don't know which one it is. They're always confusing when I don't have it right in front of me. Where you were looking at the immediate year before, so if it's like in 2020 you look at 2019 data and another one is said you were doing the entire sequence of all take that occurred from day one all the way up. So kind of two different places and two different techniques. I don't know which one's the right one.

MATT STELMACH: We would include all data.

MEHRHOFF: Okay, so what place? In there you got it where it's only going to be the previous years and that was extremely problematic because if the first four years there's take and the fifth year there wasn't then you would not be including that in your baseline. So that one seemed like that probably shouldn't be in there, but I wrote it down and then saw it again later.

MATT STELMACH: We have specified in the HCP that we would include data through the preceding year just as a milestone. We wanted to be clear about what data would be included. It would be from the start of monitoring through the December of the preceding year and then use all that data to evaluate.

MEHRHOFF: Okay the way it read was that was the only thing you were using for your threshold in that particular point and that was like red flags all over the place, right? So if you're running it through the whole time and you're putting everything based upon the Evidence of Absence, even your baseline and your threshold are both using the same thing. Maybe it was in the previous draft. It looked like one was using based on the 140 estimated take and the other one was based upon what you got from Evidence of Absence, which is only the direct take and doesn't include the indirect take. Where as the other one was direct and indirect. So I read it now looks like they're both set on the direct table. Is that correct?

MATT STELMACH: Yes.

MEHRHOFF: So that was one of the concerns that we had. So biggest thing for the adaptive management is I think those triggers are just too far apart. I would put them closer together.

SMITH: Could you give a specific recommendation?

MEHRHOFF: I'd use a two year average. Three years maybe to start, then you'd go to your two year average.

MARIE VANZANDT: So we did work with Fish and Wildlife, with Diane specifically, to sort of look at the annual variability that happens at the site and modeled several different scenarios on what would be an appropriate trigger time frame. We looked at two years and because of the variability we wouldn't be able to capture whether the minimization measures were actually

working or not. And so the recommendation was the two to five years. The two years is sort of like your short-term quick check trigger, which we will be looking at in 2020 then subsequently two years after. So if adaptive management is triggered then we will continue every two years to be looking at whether the minimization measures are working.

MEHRHOFF: That's not the way I read it when I was going through it. It looked like it was going to be to do one at two years afterwards and then you wouldn't be doing it again.

MARIE VANZANDT: It's two years until we can say that our adaptive management measures are successful.

MATT STELMACH: It's every two years, essentially until we are confident that the permit authorization will not be exceeded.

MARIE VANZANDT: Also with the adaptive management plan. This was sort of based on what we know today. We have uncertainty around deterrents. The adaptive management plan is going to be updated annually and so as we gain more certainty and deterrent technology and its effectiveness in Hawai'i, on an annual basis, the order in which we do the measures could be changed. So you guys have input on what that adaptive management plan and the new measures will look like and how they should be ordered.

MEHRHOFF: So again, sorry to take so much time on the adaptive management stuff but I'm still not always clear. So let's say that we trigger in 2020. So then you're going to implement an adaptive management action. Two years later if you're still not below your threshold you implement another adaptive management after two years. And then another one after six years.

MARIE VANZANDT: But based on the conversations with Diane and you know working through the model we need enough time to be able to evaluate whether the measure is working. Otherwise, we always have a knee-jerk reaction of we need to do this instead of taking a careful look at how this measure is affecting the take rates.

MEHRHOFF: So I don't disagree with that. You said that was a two year period. Yep. So I'm not following why you wouldn't do your overall trigger at say two years or three years.

MATT STELMACH: The reason they were spaced further initially is that we do these regular evaluations. So we have a good understanding of it. The fatality rate is on a minimum twice a year and if it's more frequently than that there would be indications if there is a problem in the interim period and that can be corrected by the project. These are set as protections for the state to ensure that the total authorization will not be exceeded.

MEHRHOFF: Right, but I don't see. It's still not clicking with me. Yeah, seems like if you do them every two years you get the same thing only you catch it quicker. I shouldn't say you can catch

it quicker. You can catch it anytime you want to because you can do it every month if you would like.

MARIE VANZANDT: And again we are. We would be continually evaluating.

MEHRHOFF: But what I'm looking for is the triggers for when you're not here. The second generation of people who sit in your chair and they say they only have to do it every five years. You may be doing it... fine. But I think from the perspective of me sitting here, I'd like a little more assurance for that adaptive management plan being able to be triggered as soon as possible rather than waiting for five years. I'm still having a philosophical difference on what that is. We just heard from Kawailoa they were going to do it and they were looking at the Evidence of Absence for that. That's what they chose. You don't have to choose the same thing. It just seems like that's just too long a period and too late for a trigger. Because you're only really looking at the final tier right? The threshold level for the absolute triggers, you're not looking at the earlier tier triggers for this. You're tracking them based on the HCP. You're talking about tracking them to see whether you're on track but not the threshold for adaptive management with mandatory changes kicking in except for the overall take authorization of 129. I guess it is for Evidence of Absence, right?

MARIE VANZANDT: Correct.

MEHRHOFF: Okay. So I just think that that's what I'd rather see: more hard triggers earlier in some of the earlier tiers. It seems like for the final one, which is really important, you'd wanna do it more than every five years to catch it the first time. I'm not sure how many questions versus statements that was but again I do applaud for you saying you're putting deterrents as one of those actions.

MARIE VANZANDT: Yeah, I would say at worst case it would be within four years, but we have the option to implement it sooner.

MEHRHOFF: Yeah, you have done it sooner so I'm not debating that with you. On the baseline fatality rate are you not using Evidence of Absence, on both the baseline fatality rate and threshold value?

MATT STELMCH: Well baseline fatality rate is calculated by Evidence of Absence. And the threshold value is a comparison which is what we would need to stay under.

MEHRHOFF: Can you please show on a map which turbine is 1 and which one is 8?

MARIE VANZANDT: The northern most is 1 and the southern most turbine is 8. When we went to our site visit we were at turbine 2 up at the top. So it goes down to the coast that one closest to the coast is 8.

MEHRHOFF: We talked before about the activity monitoring.

MARIE VANZANDT: We have four acoustic and four thermal monitors. We are doing a study right now with Natural Power and USGS on bat behavior at the site.

MEHRHOFF: And your commitment is just to continue with four? Or if we come up with a monitoring scheme for the wind projects to monitor for the populations or activity you guys are okay with doing that.

MARIE VANZANDT: I think we want to work with you guys in developing that and understanding it and yeah, we are we're committed to being at the table and trying to understand what that is.

MEHRHOFF: Typically, you only have four with the research project which I don't think will be enough. And then tying back to the same question I mentioned earlier for Kawailoa. You guys are doing 6.9 m/s, which is all so new for Hawai'i. So you guys are okay with providing annual updates. I get to ask you another question on insect traps. So I think that when USGS did the insect studies they used both malaise traps and light traps. The HCP just talks about doing malaise traps?

MATT STELMACH: We had initially identified malaise traps as they are common in insect sampling and they run independently. Light trapping requires more monitoring. So we had targeted malaise traps as a non-invasive and systematic means of assessing insect populations.

MEHRHOFF: Because folks I talked to thought that the light traps would just be important to pick up beetles. I have two more questions. First one is H.T. Harvey's study that they did kind of with the core use areas of 1,000 acres per bat versus like 63. So you haven't mentioned that one. I know that there's maybe some issues of how accurate that might be. Not because their study wasn't accurate but how you can get representative populations from that large of a core use area. I would've thought that should've been mentioned since it's on Maui.

MARIE VANZANDT: It was partly because we just saw that H.T. Harvey in the fall and our document has sort of been in this final document mode with limited minimal changes. So that's a bit where that is, you know, I'd say we have the latest literature as of October and at the time that wasn't available in terms of presentation.

MEHRHOFF: The last one and then I'm going to turn it over to Jim; that is the only power analysis for your monitoring at the mitigation site where you're hoping to be able to show a change in activity level bats of 50% or more with a power of 0.5. That's low. That's it from me, thank you.

MARIE VANZANDT: I would say our ongoing black box issue is that we don't know what the occupancy rate will be. We don't know what that baseline occupancy rate will be and so it's difficult for us to make strong statements about what the change will be. We have committed

to reporting what the power will be. So it could be higher but that's where that 0.5 is coming from.

MEHRHOFF: But the 0.5 is what you might be using to reduce down your monitoring stations in order to get to that. That was my concern.

JACOBI: That gets to what your sampling effort is going to be and I would shoot higher than that. That means reporting what you get even if you have a very robust dispersal of sampling and large numbers, you still may be getting 0.5 or less. So reporting what it is and I would say 0.5 is not adequate to say anything positive. So I share that concern. I would be surprised if you were anywhere above 0.5 with a lot of things dealing with bats. Monitoring is such an important thing there and having an adequate sample is very important and tough to get. But if we're going to have any understanding in terms of what a response is for you to figure out how to put an effort into, at least get a good approximation of what's happening. Hopefully, we can scale down the effort from there. So putting more up front is important to come back and we're having challenges with bats because the variance is huge and what are we sampling? The signal you're getting is not necessarily one bat signal. These are things we need to dive into a whole lot more with the guidance, but more importantly the workshop to be able to get those kinds of issues and it needs to be a really important part of not just the adaptive strategy, but of just how do we continue to enhance our monitoring effort so that we can actually make sure we're not making type 2 errors.

The other thing I'm concerned about in terms of the monitoring is being able to detect whether there is a response to the management that's happening. For example, are water features really making a difference or does it just mean that you're detecting them there because they just come to the water features, but it doesn't really mean a larger population. It's how to parse out those pieces. I think it is important to make sure that you're really committed to trying to do a monitoring effort that will do whatever is possible to try and get at that response variable.

MARIE VANZANDT: I would say we've proposed to use multiple tools: thermal insect monitoring and acoustic monitoring. The goal is to get at those same questions as well.

JACOBI: So it may take more effort than you're initially trying. I'd like to be able to feel confident that there's going to be a commitment to trying to enhance that as necessary.

SMITH: Is there anything in that current research matrix of things going on that would lead to enhance monitoring methods?

JACOBI: Right now, there's two things that are looked at. One is trying to do a direct measure and the other one is an indirect measure. I'll do the indirect one first. That's where the suite of tools as was tested in that one research project up at Kawaihoa that was talked about, was there was a suite of thermal, acoustic, and insect. It was to try and come up with a multi-state index that will allow you to be able to look at a true trend. The insect component is really one more in terms of is a response in a thing which is a direct link to potentially influencing bat

population which is an increased availability of food and realizing that's going to drop it down seasonally. So that's one set of tools there. The other one which folks in our shop are working on is similar to the approach we're taking with the bird sampling, using thermal tools to try and come up with actually doing counts analogous to bird counts. Then using that to come up with what your actual density is as opposed to just an occupancy of calls or presence and it's got some promise. One of the projects that has been proposed previously was using a control population on one of the islands of the Northern Marianas, not a Hawaiian species, but a similar tree type of bat. Where there is an opportunity to really have a good handle on the population because it's a cave nester and you can have a population count from those known caves that are coming out by comparing that to the data that you're getting through this sampling. Then making a calibration to sharpen that tool in terms of what your counts are relative to the population. Marcos is now thinking that actually is possible even here on the main islands using a Bayesian approach to look at how many individuals are detected in the thermal sample. Then have enough stations to put that into actual density and then a population for that area. So I think there's some possibilities; we're just not there yet. Then there's the drone sampling. There's some challenges with that. But again Marcos has been talking with the WEST folks and we're trying to see whether we could sort of agree together on that. So I think we're making some advances. So it's ongoing. It's still again limited funding to be able to do it. We're funding it from other sources.

SMITH: What's the prognosis on that?

JACOBI: Stay tuned for the bat workshop. I can't speak on that because it's been a while since I've talked to Marcos about it, but it sounds like it was a promising methodology. And in terms of feasibility the challenge there is not just the collecting tool but it's also the the interpretation of the data. That's the thing which the collaboration with the WEST folks in terms of an AI type of approach to autonomously pull out those detections is it was hoped to be developed. So it's going there but it still is not a large-scale thing that can be applied. For example, it has been discussed in terms of trying to deploy that on one of the potential mitigation areas in the Kahuku section of Hawai'i Volcanoes National Park, one which is tied into Pakini Nui and Lalamilo. We have talked to the Park folks about their restoration program and incorporating this into a design across that large restoration area to look at trends in bat populations.

SPAIN: I appreciate you switched to using native species when looking at the 195D.

WINTER: My major concern is the study on core use areas by Dave Johnston wasn't incorporated. Feels like cherry picking.

MEHRHOFF: I think it should be at least discussed, I agree. You say you thought you had a final back in October before he presented the stuff to us, right? So I understand that. I'm not sure what to do about that. But I understand that.

JACOBI: Is there any reason that cannot be incorporated into your final draft?

MARIE VANZANDT: So the question is that we recognize that study?

JACOBI: Will it change any critical parts of the actions? Just having it in the document but not changing any of their approaches or actions and whether that would be adequate to “address” the issue or whether it's a more fundamental component that needs to be developed more before the project goes forward. I mean, that's where I'm not clear what both you and Loyal are saying? I think it's important that you do clarified that part of it.

WINTER: From the standpoint of the ESRC we're supposed to be using the best available science. This is available science that we've known about for ages. So I can't ignore it. I think we need justification from the applicant on why not to include it in the document.

JACOBI: Just a justification as to why they didn't include it into their calculations?

SPAIN: Did we bring this up as part of our request for amendments for the applicant?

MARIE VANZANDT: I have pictures of the whiteboard if we need them. Yeah, we went through. Michelle did a great exercise on the whiteboard and it was not an item that came up on our white board discussion. Kawika, you are right that you did talk about cherry picking data, but this particular study and the need to include the study was not discussed.

MEHRHOFF: So the abstract, they say 3000 hectares. Current USFWS guidelines recommend 16 hectares, which is 40 acres of forested habitat to support one bat based on core use areas. That's why our data has substantial implications for management decisions and demonstrates the need for caution.

MARIE VANZANDT: I would say in our defense that is based off of a very small sample size and the data that Frank showed a range of core use areas. You know with such a small sample size it's hard to tell how it's comparable with that study. But I do see that it is new literature that could be referenced in the document, but it is hard to say how it fits into our greater understanding without understanding the methodology and the comparison between current work that has been established.

MEHRHOFF: They had 16 bats.

MARIE VANZANDT: What was presented at the ESRC meeting was a sample size of four.

MATT STELMACH: I express Jim's concern about ability to publish data. I acknowledge that they did that research and they've done the presentation but if we apply that to the population estimate exercise you get a very unreasonably small population size; speaking to Michelle's point that it's probably not mutually exclusive and that we haven't seen that in that area.

JACOBI: I think it's a bigger issue than that. Let's say they gave the presentation to the ESRC committee at our next meeting and they published it and it was peer-reviewed and so forth. So

there's new information getting something like this. Is there any way that that new information would be in any way be incorporated into some of your management strategies?

BOGARDUS: There's a nexus to include it for fleshing out of future tiers.

JACOBI: And that might be where it is and you know because it would be good to have a reference to this on a pathway showing you know, your logic as to why maybe it's not substantiated for whatever the reason, but we're aware of it. So it's in your document. So if it's just to check that reference is actually in there, that's one thing. But again, we all know that we're going to get more information over time and hopefully that's going to improve what we do and then make some of our tasks easier, and make some of our tasks harder. So the challenge we have with the HCPs once they get signed off and approved is how much wiggle room is in there to change actions around. If it's within the cap of your financial obligation, that's one thing; if it requires more, how does that come into play? So I think that's the bigger issue that I've got as new information comes in and this is an example of new information that may be potentially very important to informing our decisions on management actions or mitigations.

BOGARDUS: That's the adaptive management process right? After four years we have a lot more information. I agree with you they presented this but we don't have it published. But I think it is appropriate to make reference to it and we did it in the programmatic EIS by reference. What that means for management or mitigation we don't know yet because we don't have the report yet and it's one year's worth of data that needs to be put in context. But there's going to be another study that comes out next week because Corrina's finally graduating. So the information is coming. There's a million things that we're expecting on bats in the next coming years. These plans have been written in a way that hopefully won't exclude this information as it comes in. What we do with 3,000 hectares. I'm not sure.

MEHRHOFF: Incorporating it there is good because now we have a reference which acknowledges that yes we understood it and it's there and this is how we went forward.

SMITH: The expectation is the adaptive management will take into account these things.

JACOBI: So again, it comes back in terms of being supportive of this proposal, is the members have confidence that those issues are going to be addressed as new information comes up and so forth that we will be working together to try and do the best we can with these facts. I think that's a key part of what we need to have.

BOGARDUS: Following up on Loyal's point about the interim adaptive management plan. Are there any textual changes that we need to make in order to clarify the two year piece? I'm not saying change the strategy, I'm saying just to clarify the language so that when people read it they're coming to the same conclusion about that.

MEHRHOFF: I'm still unsure about a five year waiting period.

BOGARDUS: I don't think there is a five year wait period because it's happening every year.

MEHRHOFF: No it's not. Scheduled evaluations on the one time trigger the adaptive management actions.

BOGARDUS: So you guys are doing an annual evaluation but you wouldn't trigger an adaptive management thing until it had been five years?

MARIE VANZANDT: So our first scheduled evaluation we're going to look at how 6.9 m/s is working during those three months of the year. Right now at the end of this year we'll have two years' worth of data. So in 2020 we will look at how our baseline fatality rate compares to the threshold value. And if we are on track to stay within our permanent take then we would be fine. If our minimization measures at 6.9 m/s are not working, and everything that we've seen shows that they are working, then if they're not working then we would have to implement an action. It's sort of the hold our feet to the fire. We would have to complete an action. That action would then be evaluated in two years in 2022 because we need enough time similar to the 6.9 m/s for three months to capture that annual variability and see if that measure is actually working. If that measure is not working then again two years later we would have another adaptive management measure that would be implemented. In the background every year we're looking at new minimization measures that are coming with latest literature. We had some great chats with Loyal offline about the latest and greatest, how they apply to our site, and that adaptive management plan will be updated annually with your guys' input and our annual review. We'll discuss, okay, at this point if we trigger, what actions would we take? What would be the order? What is your guys' recommendation on those sort of things? And so that's where it's every five years. But if the measures don't work, it's every two years.

MEHRHOFF: Right, if you can get past 2020, then in 2021, 2022, 2023, 2024, you won't pull that extra adaptive management trigger. You'll wait till 2025 to do the next review.

BOGARDUS: So in the scenario they'd do the evaluation in 2020 and would say that 6.9 m/s is good and everything is going the way they anticipated. In 2021 through 2024 they're looking at things on an annual basis, it seems like they're on track. Well, okay in 2022 they start going off track. In 2023 that track is continuing, you're saying they would wait 2025.

MEHRHOFF: I'm saying they could.

MARIE VANZANDT: I don't think we would. I think it's again, you know, there's points where you hold your feet to the fire and there's points where we are being proactive and I think time and time again, we've shown that we are proactive in the actions that we take. Implementing 5 m/s without a permit, implementing 6.9 m/s without a permit, investigating deterrent technologies right now. So I would say there's points where you're worried Loyal when I'm gone and George is gone, who is our project biologist and then there's a point where you know, where we hold out feet to the fire.

MEHRHOFF: I will say that that has happened to me more than once in the past where people have moved out and then go back to what's actually in the words of the HCP.

MARIE VANZANDT: But it is our permitted take and so if we were to take all of the bats in the first ten years and then no bats the last five years that would still be within the permitted take. We don't get an annual take request. And I think that's where it's difficult because our site has annual fluctuations.

MEHRHOFF: That's why I like triggers.

SMITH: Well, that's why you want the check in right? So you're able to address that quick enough in five years.

MEHRHOFF: Yeah, but again I have been on this train before and it comes down to what's written in there and what's required and I agree that people have good intentions and want to do that stuff, but that's what's written. So that's what you have to do your evaluation on as to whether it's effective. I think that's too long a wait when you're talking about 140 bats.

JACOBI: I think what we're saying and what is said up there are two different things. It could be the same thing and I don't understand why there's even need for those dates in there. Those time steps don't seem to be meaningful because you're saying you're doing a constant evaluation and so forth. It seems just more like a semantic thing, more of a communication thing. If you just deleted those numbers and don't have that in your schedule and just basically explain what you just did, that's all you need and Loyal will go away.

MEHRHOFF: I would say in the two to three year range I'm okay with that, but I would also like you to tie it into one of those things at least at interim levels. This is what we were doing first, although, we would change it as we had the previous discussion this morning in consultation with those guys, you know to switch around your spatial or temporal stuff with the two agencies. I'm perfectly okay with that. I just think if you put them in and say this is the trigger. We're going to look at it every two to three years. If you still do the every two year thing like you'd said, this is what we're going to do first, second, third but you changed that in consultation with the agencies then Loyal does go away and is quite happy. Because I think that then sets up adaptive management assurances that you want in this sort of HCP when you're talking about such large numbers of bats.

SMITH: So you mentioned there was a trigger for at what point you would go from just using low wind speed curtailment up to deterrents. What was the trigger for that?

MARIE VANZANDT: So again, we built an adaptive management plan off of what we know today because that was the request. Like based on what we know right now from our bat behavior studies, what we know about deterrent technology in Hawai'i, what would be your action come

April 2020 or January 2020? Deterrents is on that list as action 3 right now because we're still waiting for information in Hawai'i. And so action number 3 would be triggered in four years.

SMITH: So you'd consider it in 2020 and trigger it in 2022?

BOGARDUS: It would trigger right away with the first thing on that list which is a redistribution of nights. Then in two years if that wasn't working it would trigger the second thing on the list, which was a spatial redistribution of stuff. Then if that still didn't work then they would move to deterrents. But if they had technology between now and that four year period then it might reorder those three things. Where you might a different thing in that list.

MARIE VANZANDT: Well, Fish and Wildlife Service and DOFAW have input on the annual review of the adaptive management plan and the proposed actions, the order of those actions, and those are discussed with the ESRC members.

SMITH: So the minimization triggers you would discuss on an annual basis with the agencies and do a cost-benefit to see at what point it makes sense to...

BOGARDUS: I don't think we have quite enough statistical information to say this is the trend.

MARIE VANZANDT: Which it sounds like from the Kawailoa work that the deterrents first month is good. We can hope that they work.

MEHRHOFF: So I think with the Mid-America one. I think it was a two year thing where they have to be over their limit to trigger adaptive management.

MARIE VANZANDT: So I would say with the Mid-America. It is in a draft. It's been in a perpetual draft since 2015. I would say it is something that industry has not agreed to yet because it does have repercussions. So it is a proposed by Fish and Wildlife Service as a way to accomplish things. It's very similar using baseline threshold rates as what we proposed uses a similar paper statistically that was set up on how to define triggers. But it is an HCP that has not been implemented yet. And that people have not agreed with how it's being proposed.

MEHRHOFF: Right but it's a good example of a hard trigger and what a hard action is.

MATT STELMCH: They also soften it with the possibility of reversion. Like on an annual basis, review if it's efficient and then if those minimizations implemented are beyond what would be required.

MARIE VANZANDT: I think the reversion trigger is something that we agreed as a group wasn't appropriate for use here. Again, they they start at 5 m/s and then incrementally increase their low wind speed curtailment as opposed to in this project we've been in operation for seven years. And so our goal is to go to the best that we can do. The maximum extent which is that

6.9. m/s. And then see how we can use that tool effectively and redistribute that 6.9 m/s tool across the site and the time as much as possible.

MEHRHOFF: Yeah what you're doing as far as those three steps, I think it is okay. Given what you've already implemented. I don't have a problem with that. It's just I would make this happen more quickly and more clearly; a definitive that there's going to be a decision made more frequently than five years. As long as you're saying one, two, and three then that lays it out. That is automatically tied to a hard trigger. So I'm okay with that. The third one is deterrents, which is pretty straightforward.

BOGARDUS: I'm going to propose a possible solution. The one, two, and three works. I'm also thinking that 2020, 2025 or 2030 just over complicates the situation already. We're already doing the review once a year anyway. It's not committing you to implement it on the first year but it's going to be an evaluation every year which you're already doing. Why not just remove those three dates and just say we're doing the review every year while implementing adaptive management as necessary following one, two, three. Then after we've got an adaptive management measure we'll check it back every two years to see if it's having the intended effect.

MARIE VANZANDT: So I guess this whole setup of the five and two year evaluation was worked up with USFWS with Diane in a modeling exercise to determine what would be the appropriate time frame with the variability that's at our site like you've sort of seen. One year we'll have one fatality, the next year in a worst case have seven fatalities. And so trying to capture that variability is where we came up with this two year and five year sort of hard trigger evaluation so that we can determine that. I feel like this was a thoughtful process and I'm hesitant to say let's take those out.

JACOBI: Are you doing anything different at the five year intervals than you're doing at your two year intervals? You're not doing anything different?

MATT STELMCH: So if in 2020 everything was on track we would wait until 2025 to determine if additional... that's like a hard trigger with the requirement of additional minimization measures.

JACOBI: My understanding was that you would be constantly evaluating how things are going anyway, so there's nothing different. You're not going to wait until 2025 to do something different. You're going to be doing that anyway, so that 2025 is just not necessary. It's already in the sequence, but it's not because it's an odd year.

MARIE VANZANDT: So I guess maybe what we could do is we could compare this to Kawailoa. Because I feel like that's where the confusion is coming from or Diane could come back and talk about how it's unnecessary.

MEHRHOFF: Kawailoa is doing it on an annual basis.

MARIE VANZANDT: But they are not hard triggers annually.

MEHRHOFF: They are hard triggers annually.

MATT STELMACH: It sounds like the situation that you're primarily concerned with is if the fatality rate is okay in 2020, but between 2020 and 2025, there's a problem, right? The indications are that after seven years of monitoring that the fatality rate will stay within the proposed fatality rate. Unless there's some dramatic change to bat behavior and bat activity at the site we have seven years of monitoring data to suggest that's the case.

MEHRHOFF: I just am really uncomfortable with five years. I keep saying that.

JACOBI: Is five years necessary Diane?

DIANE SETHER: Yeah, but it depends on how much variability there is. The problem with the three different tests is that two years is kind of the bare minimum and if we have an example where they found zero bats in one of those years then the next year they found five the test would say it isn't working. So they would implement something else. The problem is maybe it was working because there your average is actually 2.5, right? We'd look at it annually and every two years, but we'll definitely know within five years whether that particular minimization works or a new addition of adaptive management is having an effect.

JACOBI: But you don't know when the five years is going to coincide, 2020, 2025, 2030 because it depends on when you take your action.

DIANE SETHER: We'll definitely have to run the model in 2020 because we'll have two years of 6.9 m/s and if it looks good, that's great. But what about you know the following year if we start to see a difference there, it doesn't mean that they wouldn't necessarily implement one of these changes. It's not a finite date. Think of it as a rolling average, right? It's in five year cycles.

JACOBI: If you weren't doing this because you're committed to doing this on a regular basis and somebody else is in there and they say it's 2020 or 2021 we don't have to worry about it until 2025, we're just going to do something else. That's the concern that's the application and point being you're not going to be doing that. So this is misleading because it sort of gives you the false impression.

DIANE SETHER: I can see where you're concerned and the problem would be let's say we're just going to use one year or two years of data. If we did have those extremes then as the agencies could say hey, you got to put the deterrents in right now because you had a bad year. Because that one bad year is going to screw up such a small two year margin. We wouldn't necessarily have to have those dates in there.

BOGARDUS: Why can't we just say a five year rolling average?

MERHOFF: It's already the whole strain so one bad year is going to...

DIANE SETHER: It does because you've added a new thing. The problem is your prior distribution. Your prior distribution is going to influence this so we have to make sure that our window is large enough to accurately assess.

MEHRHOFF: Your window is the whole history. As they said they were using the Evidence of Absence for the whole history.

DIANE SETHER: Yes, the whole history for the take but when we're looking at the three tests of whether minimization or a new action has an effect we specify how many years of data that go into that. Because you don't want to include your whole prior distribution in there because it could erase any effect of the new action.

MEHRHOFF: Honestly, I'm not worried about that. I'm worried about the total take. I'm not worried about what's working and what's not working per say. I'm looking at the total take.

DIANE SETHER: Right, and all of the years go into informing that.

MEHRHOFF: That's what I'm interested in. So I guess it's a matter of priorities or whatever, but that to me is the most important thing, is trying to bring your take down.

DIANE SETHER: You're correct and it comes down to that that baseline fatality.

MEHRHOFF: Right I understand what you're saying. If you're trying to parse out the effectiveness of that change, which is admirable and would be good to do but not in my mind at the expense of knocking down or making sure that you're minimizing the take.

BOGARDUS: The monitoring for the evaluation piece after the implementation of adaptive management is fine. The question is if nothing's going wrong and therefore, no adaptive management is implemented then at what point in the annual review process would we say we have enough data to say that adaptive management is needed? Does it need to be in a five year schedule? We can't say rolling average because we're evaluating all the data up until that point.

DIANE SETHER: But the analysis actually on that would be based on whether you're exceeding that baseline because we always have the baseline there even though you have all the years of data. It will also give you a baseline fatality rate. And so we can look at that current baseline fatality rate and then project out and say no we're okay. We're not going to overshoot here.

MARIE VANZANDT: I would say Diane worked closely with us. Diane, in your opinion do you feel comfortable with what is proposed within our HCP that will guarantee that we stay within our permitted take based on the modeling that you have done and the minimization measures that have been proposed?

DIANE SETHER: Let's say in 2020, it looks that higher curtailment didn't work. Am I confident that you would never overshoot the end result? It would depend on what the technologies are, right, because unless you can completely shut down at night there's a chance that every project might be overshoot. But we have faith that technologies are in development and that this HCP does provide the adaptive management to prevent that. Those other HCPs are long gone. I mean these have come a long way with the monitoring and with the adaptive management triggers. So I do have confidence that they will do everything they can and implement everything they can to not overshoot. I also think that these projections are realistic and very conservative on the side of the species. So as we get more years under our belt that uncertainty gets smaller and those projections start to come down. So I do have confidence. I guess the answer is yes with the codicil of provided some stochastic bat explosion doesn't occur.

MARINE VANZANDT: I think that's where we have different approaches to how adaptive management and this tool is utilized overall within 195D of what is required, that we stay within our permitted take, that we mitigate, and that we minimize to the maximum extent practicable. All those elements remain within the HCP and have been agreed on by both DOWFAW and Fish and Wildlife Service that they're there. How we use the adaptive management tool, we each have our own interpretation of how that should be done.

JACOBI: What you're saying doesn't give me confidence.

MARINE VANZANDT: I guess what I'm saying is is this something that is holding up our HCP or is this just a disagreement on how adaptive management should be implemented?

JACOBI: I guess I don't see those as different things. I think it's just on one hand, I thought your description of how you're doing the evaluations and when you do an action you see how it works for a couple of years before you actually modify that action there and that makes total sense to me. What doesn't make sense to me is the language that says you're going to have scheduled evaluations every five years, which isn't what you're saying. You're saying you're doing it on a regular basis and have a two year window that you may try and change that thing there. Which is very different from what was said there and what was said in Section 7.4.1.5. So just clarifying that because what is said here is very different from what you're saying there. It would be nice to have what you're saying in terms of how your evaluation process and how that triggers things in that two year wait time to see change is what you say here because this is confusing.

MARINE VANZANDT: So you want hard triggers every two years?

JACOBIL: I don't think so.

SMITH: I think we're overthinking this.

MARINE VANZANDT: That's why I'm trying to understand what the request is.

JACOBI: Because you're not talking about hard triggers, you're talking about triggers where we see something wrong we need to figure out how to respond to it. That makes sense.

BOGARDUS: I think it's as simple as doing what we're already doing.

MARINE VANZANDT: So are you looking at Appendix K?

JACOBI: No, I'm looking at 7.4.1.5.

MEHRHOFF: I'll make it easier. I'm asking for every three years. Every three years a hard trigger and review to look and see whether it's triggered and then I'm okay.

MARINE VANZANDT: So I would say you just approved an HCP that only had two times that were triggered. Additional minimization measures were only triggered every two years in the HCP that you just approved as a group to give context.

MEHRHOFF: I had problems with those other tiers in the triggering as well, but it was a moot point for me because I was only looking for one tier. So the other tiers I would have the same comments on. So you are correct in pointing out that I'm being inconsistent and I admit to that. I was inconsistent because I only had the one tier I was worried about and I didn't have to go through some of the things we've had to on this one. But you're right. That one went forward with a different set of concerns.

SMITH: Sounds like from an agency standpoint, it's really an annual review and the five year gives us enough confidence. If we went to three years we wouldn't have as much confidence. That sounds like where the agencies are.

BOGARDUS: I'll read it from the HCP: "Auwahi Wind coordinates annually and semi-annually with DOFAW and USFWS and provides reports as described in section 7.3. Additionally, Auwahi provides the agencies updated take estimates after each fatality observed in post-construction monitoring. This schedule of take estimation and calculation is based on fatality rate and allows the project to track closely the baseline fatality rate between scheduled evaluations." Then it gets into this 2020, 2025, and 2030 thing. It's above and beyond the annual review. "The timing of scheduled evaluations will provide sufficient data to evaluate the effectiveness of minimization measures. The baseline fatality rate is key to determining if the adaptive management is necessary and will be the basis for implementing the adaptive management plan. Auwahi will calculate the baseline fatality rate and compare them to the threshold value at scheduled evaluations in 2020, 2025, and 2030 to determine if the adaptive management actions are required." They're already doing that in the annual evaluations anyway as cited in the paragraph above. What do we want to do?

SMITH: Anything else?

JACOBI: I do not feel uncomfortable. We're sort of missing each other. I don't want this to affect the overall decision.

SMITH: Seems like the check in is much more often than the five years.

JACOBI: Exactly, that's why I don't understand the need to have those five year intervals in there since they don't do anything.

MEHRHOFF: There is! Those five year intervals are when the decision is made whether or not to do those additional adaptive management actions if you haven't done them before.

SMITH: But we're still doing annual check ins.

MEHRHOFF: Checking in is not the same.

SMITH: I think the expectation of agencies is that we will look at all the data and look for rolling trends and suggest changes.

JACOBI: I thought that was part of the annual review process anyway. That being said, I do recognize we don't want to change on an annual basis just to be reactive because that may take off in a different direction.

SMITH: Again, it goes back to the statistics because we're working with such small numbers. One off doesn't necessarily mean anything.

JACOBI: But again, I guess my understanding is you've got your finger on the pulse basically all the time. You're watching the things are happening. You see something that's not looking right when you do your annual review. You may wait another year to see if that's confirmed or not. If it's not working regardless of what year it is it has nothing to do with those trigger dates. And you say if we had to do something different. We're going to do something differently and watch it for a couple years and see whether it does it but you're totally off of your schedule there because you're never going to come back to that five year interval. Then that five year comes up and you don't do anything different when you get to 2025 if you're already sort of off that cycle. You're still evaluating on a regular basis. So that's where I'm not seeing what the value of those is because you're constantly looking at whether we need to do adaptive management but you're putting a bit of a buffer in there, which is roughly a two year buffer as opposed to five year buffer. So that's why I'm confused in terms of the difference between those.

SMITH: Well two years if you actually did something and you analyzed it for two years. So if we didn't do anything it would be a hard trigger in five years, but an annual check in.

JACOBI: But a hard trigger in five years if something is looking like it needs to be done. There's no obligation unless you jump into the next tier for something else.

SMITH: You're saying well you could have an annual check in but do nothing until five years, is that your concern? So you can see a problem with your trends in year one, two, and three but you don't have to do anything, right?

MEHRHOFF: Yes, will they do it? Probably. But do they have to do it? Do their successors have to do it? That's the issue.

JACOBI: We're on the same page there. It's just the confusion in terms of whether there's consistency in how its implemented and we've got confidence that you'll implement it the right way, but will that be interpreted differently by the next people taking over your position?

MARINE VANZANDT: I would say the immediate semi-annual and annual evaluations are exactly what you have talked about Jim. That sort of collaborative, we're working together. And that is what that process is, that immediate semi-annual and annual evaluations. And then this comes from conversations previously with the ESRC of when are you going to implement deterrents? We want to know exactly when you would implement deterrents. That's where these sort of hard trigger sort of items are coming in as opposed to the collaborative ongoing.

MEHRHOFF. That's correct. So you kind of characterize that well, it's when those certain hard actions would occur. My concern here is when it happens to you is the clock going to run out. This is your third thing down so you have at least four to six years before you get to that.

JACOBI: I think we're saying the same thing.

MEHRHOFF: No, we're not.

JACOBI: I think the group here is saying the same thing, it's just more in terms of whether it's interpreted differently in the future.

SMITH: Okay. I've got a request for a recess for five minutes.

BREAK

SMITH: Are there any other issues? Any other questions or comments from the committee that need to be worked out?

MEHRHOFF: My only two issues are that 40 acres for the last two tiers and the adaptive management stuff we were talking about.

SMITH: Anybody from the public? Okay then anything from the applicant?

MARINE VANZANDT: Thank you guys. It's good to work through it. It's always a working session with you. I think definitely to address Kawika's concern and just a general concern about incorporating the latest and greatest literature, we will incorporate a reference to the H.T.

Harvey study that's going on and how it fits into this broader picture for the document. Kawika, if you have any specifics on how exactly you'd like it incorporated maybe pass it on to the staff, but we'll share that reference and where it's located in the document for you and for the rest of the group as well. Then with the 2025 versus 2030 issue, I feel like in conversation we're on this on a similar page minus Loyal. I know you'd like to see it every three years. And so I think what we are proposing to do is to clarify the language around that 2020, 2025, and 2030. I know some suggestions have been to just completely remove it, but I don't want to completely remove it, but I do want to just clarify the language around 2020, 2025, and the two year evaluations. I think at this time this is what we can propose to make changes immediately.

JACOBI: Is there any reason you wouldn't change it to Loyal's suggestion of every three years?

MARINE VANZANDT: Not having run sort of a modeling exercise on the spot associated with the three years. I would be hesitant to commit to it right now. Just not knowing what it looks like.

JACOBI: But you're still committed to looking at things on an annual basis anyway.

MARINE VANZANDT: Correct.

JACOBI: That's where I'm still not sure what the difference is.

ITEM 7. [ESRC vote to recommend to the Department and Board of Land and Natural Resources to approve, amend, or reject the Auwahi Wind Farm HCP Draft Amendment](#)

SMITH: Well, we'll be checking in every year. We can continue to talk about this for a long time. So is there anything else? Do I have a motion?

BOGARDUS: Motion to approve with the reference incorporation for the H.T. Harvey study and the textual clarification of the management dates.

SMITH: Do we have a second?

SPAIN: I would just add that I'm comfortable with staff approving and sharing that with the ESRC members so that we don't need to come back and re-vote on it. So I second that.

SMITH: Any other discussion. All in favor?

SPAIN, JACOBI, SMITH, BOGARDUS, WINTER: Aye.

SMITH: Okay, five ayes. Opposed?

MEHRHOFF: Opposed.

SMITH: Okay, motion carries.

ITEM 8. *Adjournment*

23 July 2019

Endangered Species Recovery Committee
Hawaii State Department of Land and Natural Resources

Ladies and Gentlemen:

An ornithological colleague recently asked me if I thought there were breeding colonies of 'Ua'u and 'A'o on O'ahu. My response was that I think it is highly likely. Breeding colonies of 'Ua'u have been confirmed on all the main Hawaiian Islands except O'ahu and Kaho'olawe. 'A'o colonies are confirmed on Kaua'i and Hawai'i and probably exist on Moloka'i. Suitable breeding habitat for these two species certainly exists on O'ahu, but is probably more difficult of access than on any other Main Hawaiian Island. Having heard this topic is of interest to the ESRC, I decided to share my thoughts with you.

As you will know Dr. Lindsay Young has collected recordings of both species in the mountains of O'ahu. Although her group has not yet been able to confirm the existence of burrows (they were recently prevented from attempting this because their helicopter crashed), in addition to the acoustic recordings, there exists sufficient data to strongly indicate there actually are colonies. Let me explain.

Breeding individuals of these species fly directly out to sea and return directly to their burrows to and from pelagic foraging trips. Thus, individuals documented in a particular locality are almost certainly on their way to or from a colony. It is possible that some of the O'ahu records (both specimen and acoustic records) are of "prospecting" birds looking for a suitable place to nest. When "prospecting" seabirds fly inland they do not do so aimlessly. They are most likely responding to the presence of nesting conspecifics that they see, hear or smell (they have excellent olfactory ability).

Specimen records of these species from the Bishop Museum database were provided to me by Molly Hagerman of the Department of Zoology at the Museum. Here is a short summary of what she found: There are 223 subfossil and 4 contemporary specimen records of 'Ua'u from O'ahu and 7 subfossil and 18 contemporary specimen records of 'A'o from O'ahu. This number of specimen records, particularly the subfossil records, comprises a preponderance of evidence that breeding colonies have and may still exist on O'ahu. I can provide the data she gave me if you are interested.

You will note that I have used phrases such as "highly likely," "probably," "strongly indicate," "almost certainly," and "possible." This may prompt to you think that "proof" of the existence of breeding colonies on O'ahu does not exist. Nevertheless, considerable evidence supports the

conclusion they do. Certainly, the specimen records are proof that individuals of these species are found on O`ahu.

These seabirds species are Endangered, which requires that both individuals of the species and the habitats on which they depend be protected.

Finally, I am compelled to observed that, using the methods of Western science, it is impossible to “prove” something does not exist.

Sincerely and with Aloha,

Sheila Conant, Ph.D.
Professor Emerita and former Chair
Department of Biology
University of Hawai`i at Mānoa

Addendum to 23 July 2019 letter from Sheila Conant to ESRC

I just learned the following from Dr. Lindsay Young in an email:

- There was a live Hawaiian petrel that came down in Waikiki last year with a brood patch (indicates bird was incubating an egg or brooding a chick).
- There have been two recent Hawaiian Petrel takes at windfarms on Oahu; the second was last year.
- Sound recordings for both species have increased, and Hawaiian Petrel ground calls have been recorded.