

MINUTES  
FOR MEETING OF THE  
ENDANGERED SPECIES RECOVERY COMMITTEE

DATE: March 31, 2015  
TIME: 9:00 am – 5:00 pm  
PLACE: Hawai‘i Department of Land and Natural Resources  
Kalanimoku Building; 1151 Punchbowl Street;  
Room 322C; Honolulu, HI 96813

The following were in attendance:

**MEMBERS:** Dr. Scott Fretz (DLNR); Kristi Young (USFWS); Dr. James Jacobi (USGS); Dr. John Harrison (At-Large); and Dr. Patrick Hart (At-Large).

**ABSENT:** Kim Burnett (UH Environmental Center)

**STAFF:** DOFAW: Edith Adkins, Lisa Hadway, Hans Sin, David Penn, John Vetter, Joey Mellow, Jason Omick, Maggie Sporck-Koehler, Afsheen Siddiqi, Angela Amlin, Kanalu Sproat, Elliott Parsons, Taylor Warner. USFWS: Jodi Charrier, Diane Sether, Dawn Bruns.

**COUNSEL:** None.

**OTHERS:** Rhiannon Chandler-‘Āao (UH Manoa law school), Loyal Mehrhoff, Mililani Browning (Kamehameha Schools), Theresa Menard, Dave Cowan (SunEdison), Mitch Craig (SunEdison), Sarah Scheel (SunEdison), Alicia Oller (TetraTech), Leilani Pulmano (TetraTech), Keoki Wallace (TetraTech), Laura Nagy (TetraTech), Tom Snetsinger (TetraTech), Mike Cutbirth (Champlin Wind), Dan Purcell, Elizabeth Rago.

**ITEM 1.** Chair Fretz called the meeting of the Endangered Species Recovery Committee (hereinafter referred to as the “ESRC” or “Committee” to order at 9:07 a.m.

Committee Members and meeting attendees introduced themselves

**ITEM 2.** Approval of Minutes: May 13, 2014 Endangered Species Recovery Committee Meeting  
December 16, 2014 Endangered Species Recovery Committee Meeting

May minutes. Fretz and Jacobi clarified that there would be a separate guidance document put together that would summarize the minutes.

**Jacobi moved to approve, Young seconded the motion. Approved unanimously.**

December minutes. Fretz asked how mortalities at DKIST were determined to not be take, committee had not made that determination (minutes, page 3). Fretz said that if we cannot be

certain either way, we should not make the statement that we are certain it's not take. Amlin stated that it had been determined by staff that the mortalities were not take based on review of video, burrow surveys, and consultation with seabird experts within both USFWS and DOFAW and it was determined that it could not conclusively be considered take. Fretz asked if minutes could be amended to say, "Staff recommendation is that no take has occurred from project activities." Fretz and Young stated that they had non-substantive (e.g., grammatical/spelling) edits that would be sent directly to staff.

**Young moved to approve, Jacobi seconded. Unanimously approved as amended.**

**ITEM 3. Briefing and update from Division of Forestry and Wildlife (DOFAW) staff and request for comments on the Draft Habitat Conservation Plan and Incidental Take License:** North Kona Game Management Habitat Conservation Plan on the island of Hawai'i. Update on Blackburn's sphinx moth and take estimates of fifteen endangered plant species.

- i. Consensus to release draft HCP for public review.

Adkins provided an overview of the status of the North Kona Game Mammal HCP currently being development to cover take of listed plants and the Blackburn's sphinx moth (BSM) in the Pu'u Wa'awa'a (PWW) Forest Reserve and the Pu'u Anahulu Game Management Area (GMA) in North Kona, on the island of Hawai'i.

Jacobi asked Adkins if having the animals on the land is not considered a covered activity. Adkins responded, yes. The presence of animals is not necessarily a "Covered Activity" it is the management of the ungulates that is a covered activity. Hart asked Adkins if none of these animals were being managed, then there would be no need for this HCP? Adkins confirmed.

Jacobi inquired about the take area for tree tobacco on fuel breaks and roads, and if the assumption is that the tree tobacco distribution will not spread. Adkins responded yes, if we continue to maintain the fuel breaks and roads in a certain way that the tree tobacco will not spread. The protocol is to clear (cut and treat) every two months so the tree tobacco cannot grow taller than 1 meter in height. Hart asked if the tree tobacco is killed or if you cut it down and it re-sprouts. Adkins replied yes, we cut and spray them. Some of the larger trees re-sprout. The goal is to remove tree tobacco permanently from the fuel break. Hart asked if the tree tobacco spreads from seeds. Adkins responded they will sprout very quickly from seeds. The seeds are very small and are moved around very easily by wind, trucks, and animals.

Jacobi asked why you are not planning or expecting tree tobacco to expand throughout the plan area? Adkins responded, we understand that tree tobacco distribution could and is expected to potentially expand; we will not be taking BSM on tree tobacco that has expanded off of the roads. She added that it is hard to estimate how tree tobacco distribution is going to change over time.

Young asked if the only take you are considering the take of BSM is by clearing of roads and fuel breaks, or if there is take from animals grazing on tree tobacco. Adkins responded, yes the only take is fire break/road maintenance and there is no evidence of grazing from cattle or goats on tree tobacco.

Jacobi commented on the BSM mitigation 5:1 ratio recommended by US Fish and Wildlife; he stated that he didn't recall having a discussion on the 5:1 ratio at the ESRC before. Fretz responded that he thinks this 5:1 ratio is situation specific. Bruns commented that this ratio is BSM-specific referring to a protocol incorporated into a Maui HCP. In this HCP, the 5:1 ratio was used for tree tobacco and Aiea. Young added that the 5:1 ratio is for restoring native plants verses nonnative plants.

Fretz asked if BSM would be monitored on outplanted host plants. Adkins replied yes, that is part of our monitoring plan, and staff have seen BSM using Aiea outplants at Pu'u Wa'awa'a.

Fretz questioned is there a target to measure success? Adkins replied, no. Hart asked how do you know when you are there? Fretz questioned if there is so much tree tobacco around, is it possible that it is preferred by BSM? Does it take a long time for them to colonize Aiea? Adkins responded that there is a need for a post-doctoral position to answer many of these questions such as, if BSM use *Nicotiana* species as larvae will they use Aiea a native host plant? There is a lot of unknown information about BSM.

Fretz inquired about the translocation of BSM, and if it would speed up colonization of BSM on Aiea. Adkins responded those are all questions proposed for a post-doctorate: looking at BSM host preference or whether you can move BSM around at all. Young inquired if moving things around in it in its self is a form of take, there is a chance of mortality (eggs being crushed/ larvae dropping off plant). Adkins responded that is why we are not proposing any movement of BSM within the HCP, but it is something that could be looked into. Jacobi commented that it is something with tremendous potential for BSM survival. Young stated its better option than them being crushed, but it is still a form of take. Fretz inquired to Young if that is then considered a double take. Young replied yes, you are killing them outright if you don't move them. Jacobi stated that it makes some sort of sense to reduce the amount of take if applicable. Adkins replied that this had been discussed before, however in terms of fuel break maintenance it is not feasible to check all trees prior to clearing and move BSM. If someone comes across a 5<sup>th</sup> instar they can just take a branch off and tie it off onto another tree. Yes, it could potentially lead to take but if you didn't do anything it would certainly lead to take.

Fretz inquired if translocating BSM to Aiea would speed up colonization, or are BSM just randomly using the resources across the landscape. Adkins responded that it seems to be random. Early on we tried to look at the distribution of BSM with models but we didn't have enough data, it was really complicated. It seems random in why BSM would choose one patch over another.

Hart added that it seems that BSM are much more abundant now than Aiea and questioned how much damage they are causing to the Aiea. Adkins responded that she had seen an Aiea outplant fairly denuded, presumably by BSM, so we don't want to translocate BSM when the Aiea is too young. Adkins raised the question of how old or mature does Aiea have to be in order to support BSM.

Fretz asked whether Aiea or tree tobacco is a better host plant. Jacobi commented, tree tobacco is there and is not going anywhere. Fretz inquired if the number of known BSM host

plant species is really low. Adkins responded yes it is low, it is has been seen on eggplant and some other Solanaceous species.

Jacobi referred back to the 5:1 ratio, inquiring what 5:1 meant, five of what? Adkins responded 5 acres of degraded habitat, in our case the roads. Jacobi questioned, what is the five being replaced with and what condition? Adkins replied that we have not yet defined that beyond restoration areas that include Aiea. Jacobi asked if we have an idea of how much area is needed of Aiea to support a specific number of BSM. Fretz inquired what the density of Aiea per acre is. Jacobi commented that some kind of ecological thread is needed; for example, this is how many trees you will need and how many moths that will be supported. Adkins replied, we don't have that information, we cannot say that one larvae equals how many Aiea to support it. Jacobi agreed that this is kind of a fuzzy issue right now.

Fretz referred back to the original question of the density of Aiea per acre, clarifying that it is not moths per acre but plants per acre. Adkins questioned how you translate moths into Aiea. Jacobi replied, somehow you want to relate that. Fretz commented that there needs to be some type of target. Jacobi stated that these are the kind of details that need to be cleared up. Fretz added the idea is not to make a mono-crop of Aiea at these locations; you want to have a diverse area that serves as a natural habitat for other species as well. Fretz continued that 250 trees in the ground doesn't always support that. Adkins commented that not all 250 will survive, the goal is to have 50 survive. Hart stated that 50 Aiea per acre surviving would leave plenty of room for other species.

Adkins provided background on the plant modeling in the HCP.

Jacobi asked Adkins if she could further explain the 1 per 10 meter squared distribution, if you have five plants that are clustered and how that translates. Adkins replied that was a product of how the data was collected and it is what Jon Price recommended at the time.

Jacobi stated that through this process there take could be underestimated for some species. Basically any plant point outside of a fenced area is going to be counted as a take. Anything outside of a fenced area is direct incidental take, as opposed to the loss of the regeneration of that plant that could then be taken additionally on top of that. It's a take of one, which is a proxy for a 10 meter square, which you are saying is one. Adkins replied perhaps we could go back and talk to Jon Price about some sort of correction factor. Jacobi stated, basically you are saying here is what the number is, but it isn't really what the number is, it is more than that. Then you cannot simply calculate what your take is. Somehow you need to tighten that up a little more. He continued, the take action you are looking at is starting when this plan is accepted. Take has been going on here for some time. There are other species that are impacted in this area such as *Hibiscadelphus hualalaiensis* which was also impacted by ungulates. Adkins responded that predates the HCP planning process. Jacobi responded, it certainly does, but, it doesn't predate the action of having animals managed on the landscape there. Adkins replied, you have to make a cut off somewhere, our cut off is when we started the HCP planning process. Jacobi stated that he understands, and this is where you have to be really clear on that. The challenge is that we are talking about an HCP that has been going on

for almost 15 years, and an action that has been going on for more than 15 years. This is a challenging HCP because of that.

Fretz commented that as a process it combines the planning and the implementation of the action, and the monitoring. All three of those are all components of the take and of the program. Jacobi stated it is not a critique; it is just hard to get our brains around. Fretz added that from a practical or biological perspective, that the direction of the error is likely to be because there are fewer of these species now due to degradation. The question is, is that okay if we are overestimating? Assuming the estimation is accurate. Adkins responded, potentially, if you took those values and said this is the take if it starts today, these values are probably a lot higher. Jacobi reiterated that the take has been going on for decades. Adkins agreed, but stated that it has been going on for hundreds of years, way before the DOFAW management came in. Jacobi commented that he was referring to just since it has been a managed hunting area.

Fretz stated that the relevant time frame is these past 15 years. The snapshot is supposed to occur and provide an accurate representation of the day the HCP is approved. Fretz proposed a question, is there any reason to believe any of these species have significantly increased in number so that the take value the day the HCP is approved is considerably higher than the estimate? Jacobi stated this not a simple HCP, it is a very complex one. What we do with one HCP has effects on other HCPs that come down the line too.

Harrison asked if fire prevention was being considered. That has an amount of take, and consequently you are preventing that impact, then you are increasing the population on a steady basis even in the process while the HCP is being made. Adkins replied that it is tricky to figure out our time point.

Hart commented, I think the take would be occurring at the same level even if the management wasn't occurring. These animals are pretty dense across the landscape, regardless of management. This HCP process is assuming that all take is occurring because of game management, which isn't exactly true either. Fretz added just because you are doing management, it does not mean you are increasing the game mammals. Maybe by increasing the bag limits and the take of the animals at the same time as you are increasing the management. Jacobi stated that in his mind, the take action is the maintenance of a sustained yield game population of ungulates on the landscape. That is what the take is as opposed to the management actions done in support of that. So there is a broader picture than just the game guzzlers on the land. We could use some clarification on what the take is. Because here is where we go into other directions, such as what is the mitigation for take.

Jacobi inquired, with USFWS there is a revised version of the Hawai'i Rare Plants Restoration Group (HRPRG) guidelines. Does the HCP change with the changing guidelines? Adkins responded, we are just using this as a guideline. Jacobi commented, to be clear in what a population of individuals means, and how that translates to mature, reproducing. It is not just a numbers game of how many pots we put out. Adkins agreed. Young clarified that the USFWS has been using the 2012 draft guidelines, it is not finalized but it is still the most recent information.

Jacobi clarified that stabilization is what the target is for a project like this with an HCP. There are different levels of population requirements depending on the kinds of actions. There are five different recipes, including stabilization, recovery, down-listing, and delisting of species. Adkins agreed, but stated that we don't necessarily have criteria that we need to stabilize. We are responsible for take, and responsible for replacement of take. Jacobi asked if that was the guideline. Adkins replied, yes, we are going above and beyond. Jacobi agreed.

Young commented that there are a few species where the take estimate is exceeding the model projection. She asked if there is an assumption that all individuals of some species will be taken. For example, Uhiuhi. Jacobi asked if anything outside of a fence is considered take. Adkins confirmed. Adkins replied that in the model projection there are 103 Uhiuhi, but we don't necessarily know that those are truly there, that is just based on the model. So yes, we are taking some of the known surveyed individuals, because of that, the take estimate will be higher than the model projection. We are taking some of those known surveyed plants because some known individuals will not be in planned fences. Young asked if any of the existing Uhiuhi is in any of the planned or proposed conservation units. Adkins replied that there are wild individuals in Uhiuhi unit two and three and outplanted individuals in Uhiuhi unit one.

Adkins showed a table where the "avoidance and minimization column" shows the units where there are *in situ* populations. And not all of those units are necessarily already fenced. If you look on the map; some of them are blue, and some of them are red. The red are already installed fences, and the blue are proposed fences.

Jacobi asked if the take estimate is above and beyond the population number, is the intention to make sure there are populations that equal at least the take estimate as an offset? For some species, it is going to be only the three populations because the take is less than that the success criteria. But for other species it is going to be greater than that. For example, a species that required 25 as being the base number and you had three populations, that's 75, and the take would be 150. You are still saying you are going to be making sure that there are 150 mature plants distributed throughout the populations just for that, also another component for the net benefit, and for the regeneration. Adkins confirmed.

Young stated there is the concern that there are some species for which the current and known individuals are not in either the current or proposed fenced areas. Thus allowing the take of all of the existing individuals, which means we are completely relying on the ability to reproduce and out plant them in other places. Fretz questioned to what degree is that happening and what species. Adkins replied that the example here is Uhiuhi. We are certainly fencing some of those individuals makai of the highway. The existing Uhiuhi is located in some of our highest degraded habitat, so we are not planning any large exclosures in that habitat. That is why the take estimate is as high as it is. We have had success in outplanting the Uhiuhi and have planned on outplanting them as much as possible out of the degraded habitat, thus planting them above the highway and into better habitat units. Down below the highway is degraded; it is not an area where we should focus our conservation efforts. Right now we have individual fences around quite a few of them, and some smaller units planned, but in terms of larger fenced units down there it is not feasible.

Hart asked if they regenerate within the small individual fences. Adkins replied that she had never seen any. There is a 1 acre fence around an Uhiuhi makai of the highway that has been fenced since 1995, but there has been no regeneration. Jacobi asked if there is a chance of achieving the goals laid out in the HCP. Adkins replied that in that specific habitat, you are talking about 99% fountain grass cover, a'ava lava rock, and a few sticks. Jacobi asked if regeneration of Uhiuhi in the fenced areas above the highway is occurring. Adkins responded she did not believe Uhiuhi regeneration had been seen in any of the conservation units. there is flowering of outplants, but have never observed any recruitment. Hart asked about the influence of this year's rain and Young asked if growing and outplanting Uhiuhi had been successful. Adkins responded yes, they are showing a lot of promise in the Hauaina unit with three to four year old trees flowering. Same with *Zanthoxylum dipetalum*, there are 10 year old trees that are outplants flowering and producing fruits. Adkins stated that she thinks it is doable and that none of these total plant goals are out of the question.

Young (referring to a map of proposed fence lines), stated that Adkins had said no fencing of anything makai of the road. Adkins responded that there is a proposed unit below the highway which encloses some of the makai Uhiuhi. There are also a few units scattered through the makai area. For the Uhiuhi trees that are known, that are not included in larger units, the plan is to individually enclose them. The same goes for any Aiea or other covered species that are outside the planned fenced units. So they can be fenced, and protected as propagule sources over time. Hart agreed, at least to try conserving the genetics of these individuals.

Jacobi inquired as to rare plant locations, asking if he could see them to see how they relate to the entire project. Fretz asked if Jacobi was requesting exact locations of each individual plant. Jacobi stated that is one of the things he was having a problem with in terms of relating some of the maps to some of the locations. Fretz stated this could be a question for an executive session with the Attorney General (AG). Adkins agreed, it makes it tricky if you cannot see where the plants are. Fretz asked Adkins, if it puts the plants at risk to put them on the map, and that is why she has not made them public at this point. Adkins confirmed. Fretz stated that he could ask the AG's office if the ESRC can go into executive session with this information. Jacobi responded, yes, that might be the way to do it. Jacobi stated he really wants to understand where things are and how they relate for individual species, instead of taking an interpretation of what it really is. He stated that he deals with sensitive data all the time and understands that it is a challenging issue. Fretz confirmed that he would consult the AG's office. Sin suggested using large polygons instead of points for the maps. Jacobi replied that could be useful in terms of ESRC input.

Jacobi asked (referring to a figure stating that 8.5 percent of the total HCP land area would be fenced), if the 8.5 percent includes the PWW Wildlife Sanctuary, which is a huge piece of land. Adkins confirmed and stated that the PWW Wildlife Sanctuary is about 4,000 acres. Jacobi stated that the PWW Wildlife Sanctuary is very different habitat than the rest of the area where most of the covered species are found, there aren't many covered species in there. If you were to take out that unit it would be something like 2 percent or even less. Adkins responded that, excluding the PWW wildlife sanctuary, 4.5 percent of the land area would be in new enclosures. Fretz stated that he thought that the management plan included the

sanctuary as a conservation unit. Adkins replied that it does, but it is a current unit. Jacobi stated it would cut the number basically by half. Adkins said, roughly, yes. The forest bird sanctuary is a place where covered species can be outplanted. Because it is so big it can also cover a lot of different habitat, moist in some areas but drier on the outskirts, it is useful in that regard.

Jacobi responded that the PWW management plan approved these zones to be fenced, and asked if that something which is changeable, or is that something which is already done? If the ESRC were to say something different relative to exclosures, is that possible? Hadway responded that when the management plan was approved by the Board (of Land and Natural Resources), it was very clear that the units were conceptual. There has not been an EA done for that plan. So in terms of adding additional acreage, it isn't out of the question, particularly as it relates to the need for endangered species protection. It was very clear in that management plan, that we were just looking at general acreages. When it say 1,662 acres that is actually give or take. Jacobi stated that it sounds solid, but that being said, think there are two ways of people looking at this. One way is through the administrative process and what we are doing here in terms of whether it is changeable. The other is in the community context; where people may be thinking that the PWW plan is in place and that is how we are going to be moving ahead. The court of public opinion can be a flash point too. Jacobi stated that he has some concerns in terms of being able to get from "here to there" with simply just this process. Hadway responded that in the PWW management plan there was very little focus on Pu'u Anahulu. So when you look at this number, it actually includes the 100,000 acres of Pu'u Anahulu.

Adkins added that it is stated in the HCP that those are placeholders, and some rendition of the units proposed in the HCP have been around for quite some time because they harbor the best area of habitat. Jacobi replied that he understands that several of those fences have been built. Adkins confirmed.

Fretz asked if the advisory council that was connected to the original plan is still active in the HCP planning, and if there will be an EA for this. Adkins replied yes, there are EA placeholders in the document for most of the units. But the Henahena, Halapepe, and the Cone unit's fence footprints are firm. The archaeology surveys for them are done, and they are the next units slated to go in. For the other units, it will take time to find funding and so we have not gone to that level.

Dan Purcell, member of the public, asked Adkins what the concern was regarding the location of the plants, and what didn't she feel comfortable talking about and need an executive session for. Fretz replied that (Hawai'i Revised Statue) 195D provides for confidentiality of the exact location of endangered species on private land until the document becomes public. Fretz said that the other issue he wants to look at with the AG is the frustrating ability to protect a species, the concern is that if the exact location of the species is known, then there could be vandalism and the species could be harmed. That would constitute the frustration of our abilities to protect and managed those species. Those are the legal implications. Jacobi added that vandalism is a documented problem with other species locations here in Hawai'i and elsewhere. Fretz continued, therefore it has been standard for us

to not reveal that type of information. Purcell asked, it is standard, but does that mean it is right? Fretz replied that the legal question in my mind is whether it frustrates DOFAW's ability to protect those species if their location is revealed and they become harmed. Jacobi stated that there is similar precedent in other agencies.

**Fretz called for a break and to reconvene at 10:50am.**

Jacobi asked if there was a vision for what the areas managed for listed species and associated plants communities would look like and if there are targets in terms of the composition, structure, and density of the different species. He further stated, that botanical gardens with fences are undesirable, and where you basically toss everything in the unit and let it sort its self out, that is not a natural community, so is there a vision in terms of what it should look like? Adkins asked if we have a picture of what a dry forest looked like 200 years ago. Jacobi responded that we don't have a clear picture, but we could put logic in to what it could be. We can come up with a target so we know when we are there, or if we are going in the right direction. Rather than just tossing stuff in there and seeing what happens. That may be a last resort as an approach, but still it is good to have a design of where you are going. Adkins agreed, and stated that there is a lot of flexibility built into the HCP. There is a list of appropriate units for any given species, so that there are options. Jacobi that, at some point a decision has to be made, and asked what it would be based on.

Adkins responded that likely it will be dependent on what fences will become available as they go in. We might try to plant in one unit and if that doesn't work, then we try something else. There is no target, and we do not want to get caught up, for example if we are not meeting a specific goal because we don't have "X" amount of species in one unit, or "X" number of species in this other unit. Jacobi agreed and reiterated that he is trying to come up with a way to measure. It is not the number of individuals in the ground, it matters what kind of organization is there to avoid potential problems. A simple way to do it would be to plant botanical gardens; however your focus is not just planted individuals. You are looking at a self-sustaining natural ecosystem. Try to come up with some sort of better picture of what that is, and include it in the HCP stating this is a starting point and put it on the timeline and incorporate it into the adaptive management plan. From the perspective of the committee looking at this HCP on an annual basis, how do we measure this? It is not just based on the number of plants in the ground. Adkins replied, that is really valuable feedback.

Young asked if Adkins has overlaid this map of fencing units with the map of ecosystems and different microclimates. This could help to get a sense of if the different ecosystems represented in this area are adequately covered, or what we think was represented historically. Adkins said, yes, I have done that exercise and it is a good way of looking at it. I can certainly break down some numbers as to what exclosures fall into a certain ecosystem. Young responded, focusing on an ecosystem and see if they are in appropriate places, are you are adequately covering all ecosystems represented. Then you figure how to build those resilient systems and decide if we actually are putting in enough areas to be protected.

Fretz asked if non-covered species would be outplanted as well. Jacobi commented that is an important aspect of the plan, dry forest ecosystems are not based upon the density of rare

species. This is going to be part of the matrix, which is important. Young responded that is kind of getting into botanical garden versus a functioning ecosystem. Hart asked if that was currently happening, outplanting species such as Lama. Adkins responded she did not recall Lama off the top of her head, but there are a lot of non-covered species being planted, including locally rare and common species. Hart said he had seen some Wiliwili planting. Adkins responded yes, Wiliwili is being planted, and Koa in Waihou. We are not just focusing on covered species; but trying to build structure. We don't have specific guidelines in the HCP but we do have it written in that that diversity is a part of building these units. It is not just about putting "X" amount of plants in the ground and we are done. I don't know how long it would take to get to a point where it is a self-sustaining system, or if that is at all possible.

Jacobi stated that there is already a precedent for this with USFWS and the Army there in Section 7. They are working to stabilize populations relative to some of their actions in different areas. I think that is similar to what we are talking about here in terms of approach, how to measure it and so forth. It is do able and we have a lot of tools. This would have broader implications that go way beyond PWW.. Hart commented, you are not adding this into the HCP specifically but deal with it adaptively as time goes on. Jacobi responded yes, but have it as part of the foundation, address it in the plan. Adkins asked, in terms of the HCP what we are really held to is the success of the covered species, right? Jacobi replied, in terms of the black and white, yes. We want the grey too.

Hart commented that it would improve survival if the covered species have some type of shade by other species in the dry community too. Adkins responded, yes absolutely and that is a part of the outplanting regime as it is right now. It is not just concentrating on the threatened and endangered species. Young asked if the focus is ultimately a self-sustaining population or a self-sustaining unit. A botanical garden is going to require management. Hadway responded that given there is a fair amount of research in this specific area of dry forest restoration that is going to drive what is possible. Dry forest restoration is by far the most challenging, and the expectations have to be well grounded. Jacobi responded it is just making sure that the document does not come off as being a numbers game. Adkins added, legally it is a numbers game. Fretz added that it includes monitoring and research. Jacobi replied, you don't monitor without targets you have to have a direction in where you are going.

Adkins provided background on the implementation phases of project.

Jacobi inquired about re-surveying for species after fences going in, saying that there potentially will be another phase of mitigation. Adkins confirmed. Jacobi suggested that in year one a monitoring plan be developed and make that a specific goal: At least a monitoring plan draft in year one and a final draft by year two. Therefore you can come back for review and get input from outside but also from the committee too. Adkins agreed and stated that one reason why a lot of time has not been spent on the monitoring plan is because it is hard to do until you are actually on the ground.

Jacobi asked about a strategy for rodent and slug control (part of Phase 2). Adkins replied, that a strategy is not in place yet, and will be species specific

Jacobi inquired if Phase 3 would include replacing some of the original fences. Adkins responded, potentially yes. Young inquired about the enclosure management, asking is the plan is to completely remove all of the non-natives within the planned enclosures. Adkins responded, correct, it is just not possible. Young clarified, basically you are going to keep clear the areas around individual plants? Adkins stated that by adding other species in like Koa, the expectation is to reduce the grass cover through shading while building up canopy cover. Adkins stated, I don't know if we will ever have a situation where we can just walk away from a unit, it is not likely.

Hart inquired to what extant weed control affects the regeneration of seedlings around the native species. Adkins responded that is something to definitely think about. In certain areas they are hand pulling weeds to keep the areas around the keiki plants clear. Hart stated that a quick survey of the area for regeneration will be needed before any spraying. Jacobi commented that it depends on what herbicide you use. Hadway agreed it is variable, but stated within fountain grass typically the seedlings will survive. Adkins said if we can keep the area clear, then there is a better chance of regeneration even if we have fountain grass. If you are hand pulling there is the possibility of damaging the regeneration.

Jacobi commented on concerns he had with the slide describing Phase 2. During this time you plan to continue to finish the avoidance and mitigation fences? If you wait 15 years some of these species could be lost by that time. Does this mean that these fences are mitigation meaning that they are not surrounding any *in situ* populations? Adkins confirmed those are the fence units in the priority that are lowest on the list, as just mitigation units. Jacobi stated that he noticed that the first step in mitigation is to protect all *in situ* individuals. Does that include individuals that are far flung? Are you going to put small fences around them, or are those just considered gone? Adkins responded, those plants outside fenced units fall under our take. Anything that is outside a fenced unit, regardless of if it has a small fence around it, is on our take list. Jacobi replied so all that is *in situ* is within a fence; you will need to clarify that.

Young commented on individual fences around each plant. The purpose is to maintain the genetic diversity of that plant. Jacobi agreed, but stated that is no the plan for all plants not within fences. Adkins replied that the goal is to fence as many as possible, some fences are just not effective. Fencing eight trees is \$5,000, which not cost effective. Some of the Uhiuhi makai of the highway have been down there a very long time, they kind of look the same, and they've looked the same for the past 20 years. Putting a fence around them, even a small one, is not necessarily going to do anything. She continued, that it is case specific, there are certain areas that we may not be fencing right now but individual fences may be incorporated into a larger fence later. Jacobi asked if propagules could be collected for genetic variability in the population.

Adkins provided background information on the HCP budget.

Fretz inquired why the budget was not attached with the HCP. Adkins responded that she will re-send the budget out to the ESRC members. The budget for the life of the project is 30 million. Jacobi asked if the state has to put up a bond for the total and questioned the high cost of the project and what kind of assurances the state would be able to provide. Fretz stated that this is a legal issue and the AG is being consulted.

Fretz inquired if the budget had been reviewed/approved by DOFAW's administrator. Hadway replied that this is a draft document and there have been lots of discussions on how to handle this and where money might come from. Given what is happening with DOFAW budget review in the Legislature, it is challenging. Fretz inquired if other options, like charging tag fees, had been considered. Jacobi commented that 30 million for 25 years is a reasonable budget. Adkins restated that it is a draft budget, and at this point it is unclear if it will cover everything that needs to be done. Fretz and Jacobi stated that the outcome is the important aspect, not the dollar figure. Fretz commented that it will require a crew of 10 people to meet the measures of success, and that costs whatever it costs.

Jacobi replied that the measures of success are really what you should be looking at. That's really where it is success or failure and the measure of response. He further stated this seems like a pretty good budget, pretty inexpensive to accomplish this plan. It would be good if the committee could see the budget, and look at specific parts in terms of how to do it, and try to look into other creative ways to bring in other resources, such as more university research.

Hadway commented that it is important to remember that this place is far more than just a hunting unit to the state. This is the unit with the experimental forest, it is going to be the site of the National Ecological Observatory Network, and there are all kinds of outreach opportunities. So there are ways to leverage this, and the US Forest Service is an important partner there, along with the university resources. Jacobi agreed.

Young commented that in that context, the crew is also going to be doing a lot of monitoring, not just going out there planting things. Adkins agreed, and stated another thing in the plan is a volunteer coordinator; outreach is something that DOFAW really wants. Right now DOFAW just does not have the staff to manage weekend trips or time to deal with volunteer coordination.

Jacobi asked for more details on the plant propagation program and the greenhouse. Adkins replied that currently the plan is that the covered species will be propagated in the Volcano Rare Plant Facility. Working with the Forest Service there is now a greenhouse onsite. DOFAW is also in the process of hiring a greenhouse technician. Volcano Rare Plant Facility propagates the plants, although they have limited space. The goal is to be able to acclimate them by bringing them over and up potting them, and have a middle ground to getting the plants ready and bigger before they go into the ground. Jacobi added that he would like to see a phyto-sanitation program plan, so we know that it is being looked at. Adkins replied that plant phyto-sanitation is an appendix that is under construction currently.

Jacobi stated that he hoped this will be a real model for other HCP's; the HCPs dealt with so far have been relatively simple. This HCP is very complex with many different pieces and is an extremely challenging situation. Adkins agreed, and stated the HCP area is approximately

the size of Moloka'i. In terms of different habitat types and different plant species, it is a huge place to manage.

Young asked if every covered species is currently in propagation or it is known that we can propagate them. Adkins responded yes, but some species are more limited. For instance, *Haplostachys* seed was collected and the viability is not great. However, it is in propagation and also Pohakuloa training Area is outplanting them. Jacobi inquired about *Portulaca*. Adkins replied that apparently it is working, and the Forest Service has outplantings at PWW.

Hart commented that having NEON out there is going to be really important for financial resources and technicians. They should be hiring pretty soon, and their goal is parallel to the goals of this HCP. Jacobi responded that they will not be putting money into fencing, but in terms of the infrastructure and in terms of environmental monitoring and research they will be a good resource.

Adkins concluded the presentation.

Jacobi inquired, when is year one? If the ESRC were to come through with today's input, if it came to the vote whether to send it to the board and then it was approved by the board. Are you ready to jump on this? Do you think you can get going right away? Adkins replied, yes, we are already working. Henahena unit is slated to go within the next 6 months.

Fretz stated that the cycle for legislation and constructing budgets comes around in about October or September, so perhaps that would be a good benchmark for a budget. Adkins replied that the document would still have to go through the public process. Hadway commented that there is nothing stopping us from making a request. PWW is important, and there has been significant investment in that place. For example the water system: having an infrastructure for water is going to be critical for any restoration activities. DOFAW already has started that and it has been on going over the last several years. So come next legislative session we could ask for a specific allotment. There has certainly been funding efforts that are ongoing and have been targeting activities that fit this HCP.

Fretz inquired what the timing is on getting to the board. Jacobi suggested coming back to the committee first.

Adkins mentioned the possibility of a site visit. Jacobi replied that would be really useful. Young stated to the ESRC members; according to the agenda the action item here it is consensus to release it to the public. This is not just an informational discussion, we need to make a determination today whether the HCP is ready to go or if the committee has further comments to make changes.

Fretz restated what DOFAW wants to know is if the committee has amendments that need to go in the HCP before it goes out to public review, or if the HCP can go out to public review as it is. If there are amendments to the HCP they can be put in by the staff and then the HCP will go out to public review before it comes back to the committee

Harrison inquired about the timing of the draft EA. Adkins replied, the draft EA is pretty much complete we are just waiting on if there are any major changes in the HCP because it is

based off of the HCP. The idea is that the EA and HCP go up concurrently, they are both very close.

Jacobi asked for testimony from the public to the committee on this topic.

Mehrhoff, member of the public, provided some comments and suggestions. One is following up on what Jacobi said earlier on painting your vision of what your mitigation sites are going to look like. Not just a planted garden of things, but reproducing seeds that produce an F2 generation, this should be the overall goal. Paint that picture of what inside the fences will look like and outside the fences. State and federal is different for your HCP but the feds are going to eventually come and look at the non-covered species and impacts on those, looking in areas that are going to be important from a recovery perspective. *Hibiscadelphus hualalaiensis* and *Silene lanceolata* I think of those two if this HCP includes recovery of those species then you are going to have an issue, at least on the federal side. I suggest looking at those non covered species and then also your covered species from the federal perspective is – is this precluding recovery? Do you have a stabilization goal? I think it would be useful to provide columns or tables that look at the percentage of the known individuals you are going to lose with this proposal. Add more information on the Uhiuhi because that stands out, you are talking about losing 70 percent of the existing Uhiuhi in PWW. You need to spell that out and explain why you are willing to do that and why the production of what you are going to do is going to be beneficial. Expand the rodent predation control section. If your goal is a reproducing population, you are not getting that without rat control. Also you should be cautious about releasing exact plant locations. You might want to look at whether a five acre site is really going to be beneficial in terms of long term mitigation – are you really avoiding take with a five acre site? Completing 300 acres a year for fencing seems light. The ESRC may also need to consider what to do if there is a failure to fund, is there a fallback?

Purcell, member of the public, commented, this is an issue with the county of Hawai'i and it is difficult for a member of the public to get any quality information from this meeting. These meetings are not accessible. A knowledgeable and informed public helps all of us make better decisions. Take videos of these meetings and put them online for people to get up to speed on these very important topics.

Fretz concluded public participation and went on to deliberation.

Jacobi asked for a few points of clarification: are there any other potential species that could be listed that you are concerned about? And how would you deal with that if something like that came along? Would you just add them on? The areas outside the fenced areas in PWW will be declared a GMA? Fretz replied half of the HCP area is already a GMA. Jacobi stated he was referring to the PWW area particularly. Hadway replied that it will stay forest reserve because splitting up fenced units as forest reserve versus outside the fenced unit as being a GMA would be really challenging. The area that is considered forest reserve right now and not GMA will likely remain forest reserve. The difference will be what management guidelines are on those pieces. Jacobi replied, a part of it is that there is a lot of confusion in terms of GMA, permitted hunting areas; they are still managed the same way. It gets very

confusing for the general public and those of us from the management of resources perspectives. Fretz stated that DOFAW is trying to be clearer about those designations, so areas like NARS and Wildlife Sanctuaries would be the highest level of protection. Areas like GMAs will specifically be for game management, and Forest Reserves will be multiple uses. There will be situations like this where there are conservation units and areas that are managed for game within forest reserves. Work needs to be done to make it clearer.

Jacobi asked if, based on input from the ESRC and public, is there anything that Adkins felt really need to be modified in the HCP before it goes to the Board. Adkins replied that based on the conversation about the modeling it would be worth re-visiting with Jon Price to talk about detection issues versus the actual survey value. Looking at that a little more closely, because it may be that the mitigation values are above and beyond what the survey value is. Along with the appendix staff is currently drafting for phyto-sanitation.

Jacobi inquired if the draft that goes to the board will have a budget in it Adkins responded, yes. Jacobi replied he would like to see that.

Fretz stated, the question is that we have comments from the committee and others that suggest amendments or at least things need to be considered. So what we want to know is if the committee is okay to release this HCP for public comment and add those public comments to the comments that they have gotten here. The revision that comes back to the committee at some point is the version the committee will refer to the board for approval. My question for the committee is, are you good with that process at this point? Or is there anyone on the committee who rejects that. Saying that they want to see an amendment get done now before it goes out to the public, if so speak up and what is that amendment.

Young responded that she has a few more questions to go over. Additional information on the propagation of species and showing that all of these species are in propagation now, with the success rate and the rate of outplantings of these plants. Adkins replied, yes we do have covered species in propagation, we are monitoring and following their success and have papers we are working on. There is a table that shows what species are in propagation, how successful they are, and there is work being done on outplanting success rates for each species. Young replied, for some of these species the existing known population is going to be taken, leaving a very heavy reliance on propagation for the continuation of the species. So it is weighing the risk, and being able to understand that risk better would help. The size of the exclosures and what in reality is actually needed for the conservation of some of these species. Has there been modeling done that looks at what is an adequate exclosure size for some of these species? How much habitat is really needed in this area? This type of info would be very valuable in this HCP before it goes to the public.

Hadway commented, with the practical reality of being someone who has worked on the ground out there, you can model till your heart's content, but if you fence 300 acres of pure fountain grass, your fire hazard issues are going too far outweigh the benefit of the increased acreage of protected habitat. We have to be very realistic about what the existing habitat is. We have several incidents where we thought we would fence a 800 acre unit or a 1,500 acre unit, but as soon as you looked at the quality of the 1,500 acre unit your risk of fire shot up

incredibly. So we reduced the size of those, and that is the functional reality of what it is like on the ground out there.

Harrison asked if that isn't something that has already been taken into account. The risk of credible catastrophe and essentially setting up and establishing a goal that recognizes the on the ground reality of where things could go wrong. Hadway continued, the variability in the lava flows is also really important out there. If you switch from an a'a flow to a pahoehoe flow, even though you are falling within that habitat range, it could impede you from actually being able to restore. Adkins added, a lot of the units have been proposed for quite some time and they take into account the best remaining habitat in these areas. A model might show that we need a bigger space over here, but that area could be pure fountain grass and in terms of the HCP, why would we fence those areas when we could use better areas for mitigation.

Young replied, certainly your priority is the existing habitat, but the standard that USFWS is looking at is avoiding jeopardy in a conservation standard. We have to look at what is needed for the recovery of a species and to look at a potentially broader area. Understanding that at some point in the future, as we get a handle on managing these things and can manage larger and larger areas, then you can start to think about setting aside more areas. My concern is that I don't know at this point is if this is enough or not. Adkins replied, in terms of the HCP right now we used the best available biological data we have. So do we wait for the models to be completed in order to finish this HCP or do we potentially re-visit that in the future with a biological opinion? Young replied, yes, that is a question for DLNR if we come out with a consultation that requires something very different from what you are doing with the HCP, there is that risk too in terms of wasted effort. Fretz stated, we do not want that. We are trying to work concurrently with the Service on this issue. Are there some quantitative models that can be used to look at population viability based on these targets? Young commented, how much habitat is really needed for these different species is in some of the stuff that Fred Amidon has worked on with landscape modeling for a couple years now. Fretz asked when those data would be published. Young replied that he is working specifically at FWS's request on some of the species in the area right now. Timeline on when it will be finished is unclear.

Hart: is the Service working with people on the ground right now when they are building these models? Are they working with DLNR folks, such as Adkins, to assess the reality of these models? Adkins responded that she had not heard much about this effort. Hadway mentioned that PICCC was working on climate change models in West Hawai'i critical habitat as well. Young commented that the PICCC modeling has been included in the Service's models.

Jacobi commented, in terms of the process, we want to make sure that the EA or EIS, HCP proposal, and USFWS BO all are saying the same thing. That is critical. If there are concerns from the Service, that needs to be taken care of. We have a short time table, this needs to be made top priority so we can get moving on it and it does not hold us up. Jacobi stated that a lot of the exclosures for the different species do not overlap or include only a small portion of designated critical habitat. From the Service perspective is that going to be a road block we

run into with this? Young confirmed that it is an issue. Jacobi stated that needs to be resolved before the HCP is released.

Fretz stated that we need to look further down the road in the whole thirty year term. We have to come to an agreement that what goes into the HCP sets up adaptive management approaches. When are these models going to be ready? When are we going to stop and use what we have? More information is going to keep coming; it is the nature of working with these species. We need to do two things: reach a point where we say we are going to go with this document and set up an adaptive management process. The Division would not like to have an HCP that is implemented and five years down the road the Service goes through a Section 7 consultation and decides that it is going to add things to the HCP. Young inquired, so can the HCP be presented in focusing on that adaptive management and potentially planning more exclosures or other management activities in the future? If that's what new information five years down the line calls for. Fretz confirmed.

Jacobi stated that the things that could potentially derail a plan like this are budget, inability to implement, or the lack of overlap with critical habitat being a game stopper for some of these species. The Service needs to see if that is an issue or if it can be accommodated with the adaptive management. Young stated that the existing and proposed habitat have a lack of overlap. If those areas need to be considered or protected, is it too extreme for the HCP to add all that in to avoid adverse modification of critical habitat. Jacobi stated that with other HCPs there is a solid cap or a tiered cap in terms of mitigation actions that need to be done. Then adaptive management works through there, working with the committee and permittees and so forth. If it comes to doubling or quadrupling the effort, that is above and beyond what we have looked at with adaptive management.

Fretz inquired, how does it work when the Service consults with another government agency and writes a BO with a management plan that has a 30 year span, is there a review each year? Changes every year? Or does that entity have insurance of stability over that 30 year period? Young replied that it is all variable in terms of how much information you have. The Service consults on activities that have a significant adaptive management component, but we have to understand the sideboards of that adaptive management to analyze. If you are saying we are going to experimentally do this manipulation of the habitat for example. We need to understand if that does not work what other things could you try. Could you completely change the activity and do a 180 and go in the opposite direction of the species or is there a minor change to the action? We need to know that upfront in order to complete our analysis. Fretz replied that there are targets; as it is written now there will be three separate stable populations. Jacobi added plus the additional ones that are for net benefit and reproduction, so you actually have five in many cases. Adkins added, a minimum of five.

Fretz responded, okay so minimum of five, the stability is the key operating principle. That is the adaptive management: it is designed to hit those targets and it is not constrained by practical considerations like you pointed out earlier. Adaptive management is designed to hit those targets, so if you are finding that one of your five populations is not stable and keeps dying, you go create another one somewhere else. Young replied, within whatever limits it takes to try and figure out how do that

Fretz responded that is where we take the best available information we have at the time when we want the HCP approved and start with that, and then use modeling and monitoring to adapt. To go back to this thing about making sure the Section 7 and 195D have a single working document. We need to resolve that and I think that the acting field supervisor needs to talk with the administrator and go work on that and then come back to the ESRC. Jacobi agreed, it would be good to have that all in the same place when it goes out to public review. Then we will again all work together and release the three final documents saying the same thing. If the BO consultation is not underway right now it is important to get that officially going officially so it's done as quickly as possible. Fretz replied, there was a Section 7 consultation done already and it was conditional on a few things, one of them being getting the state HCP.

Young responded that she and Hadway had a lot of things to cover and it needs to be a priority. The biologists working on this consultation are currently trying to finish up another consultation and that will take a couple more months.

Jacobi responded, getting the public review at this point would be beneficial, unless there is a potential for getting something really different after consultation with FWS. Young replied that at this point it is unclear, and the Service is being cautious. Fretz commented, I would hope that those big changes would not be coming now from the USFWS because we have been working with you guys really closely all this time and we are using the best available science right now.

Hart commented, as someone not in DLNR or USFWS, just looking at this document I would have to say that it is ready to go to public review. I think it is a great document and it seems to be very close to being finished except for some minor edits in my perspective. I would never know that this USFWS Section 7 stuff is a potential problem with this HCP if it wasn't for you guys being in the room. I don't really see it as a function of what I am supposed to know as an ESRC member dealing with the biology of the plan. Adkins added, I think the public review is a concern, if we go out now and then say we have to fence another 600 acres. The public is watching they are very interested and they are waiting for this document to be done. So to go out once and then go out again if we are anticipating big changes is a concern.

Jacobi responded, my recommendation is that these two offices get together and decide if there are big changes. If you feel that there are not going to be major changes then I would say you make the determination that it is ready to go. Fretz commented, that is a good way to go because it allows the administrator to make the decision in the situation where you have to go out twice.

Jacobi stated this has been one of the more challenging HCPs that we have dealt with. This is a very complex one, so I think that the conservation measures that are underway and proposed are very important and timely. I am very sure the public comments (if it goes out right now) are going to highlight that the critical habitat lacks the overlap with the plan. Those are things which are resolvable. This is why I think we need to have a really good strong involvement in the biology and monitoring plan. I think it has some potential to do some really good. Rock considered this area to be one of the most important dryland forests

on the island, if not the in the state. It was proposed as a NAR in the 1970's when NARS first came along. It would be a very different picture if that were dealt as a NAR. I am happy with the conservation measures proposed and ongoing. How it fits as a HCP, we are never going to have an easy HCP this just gets on the right hand side of the real challenging ones. I think it is really important to make sure we are on the same page or at least in the same chapter before we go public. That is a call I am willing to see that you can work out.

Fretz asked, so the committee is fine with the Division making the decision on sending this out to the public. Does any committee member object to following that process?

Harrison stated, I think the committee is comfortable at the level of biological review that is present in the current document. We are also cognizant that there are some things that need to be resolved that may have some biological underpinnings and we are not aware of what they are until we see them. As far as the HCP document right now is concerned, we have discussed a level of comfort.

Fretz inquired, it sounds like the committee is saying to bring the HCP back to the committee if there are changes that are very different. Jacobi replied, yes exactly. This is not a decision step right here, this is input. Then it will go out for another round of review.

Fretz stated that the staff will plan a site visit and meanwhile DOFAW and FWS will talk and determine when it goes out to public review.

**MOTION: (Harrison/ Hart)**

**Consensus to release draft HCP for public review**

**CONDITIONALLY APPROVED: Pending DOFAW/USFWS consensus on Biological Opinion actions.**

**ITEM 4. Request for determination from the Endangered Species Recovery Committee on post-intensive downed wildlife monitoring protocols at SunEdison facilities on O'ahu and Maui:** SunEdison's proposal for interim monitoring protocols under four approved Habitat Conservation Plans: Kaheawa Pastures Wind Energy Generation Facility Habitat Conservation Plan, Maui; Kaheawa Wind Power II Wind Energy Generation Facility Habitat Conservation Plan, Maui; Kahuku Wind Power Habitat Conservation Plan, O'ahu; Kawailoa Wind Power Habitat Conservation Plan, O'ahu.

- i. Vote to approve, amend, or reject SunEdison interim monitoring protocol

Fretz introduced the agenda item, which was a request by SunEdison to change their monitoring protocol; SunEdison requested to eliminate monitoring, instead amending their ITL to reflect higher take numbers and then providing compensatory mitigation for the new higher estimated take. Fretz outlined the expected order of discussion, starting with an overview of the submittal, then allowing the applicant to follow-up before going to comments and committee discussion.

Siddiqi reminded the ESRC that in their last meeting they requested that SunEdison provide the details of their intensive monitoring as well as their estimation of take based on current monitoring protocols, and their proposals for future monitoring (intensive, reduced, none). SunEdison subsequently supplied the requested information, which DOFAW staff reviewed. Siddiqi said that DOFAW staff does not support the idea of no monitoring, but would like to see some level of monitoring that follows what's outlined in the HCP.

Craig then reviewed the information that SunEdison provided. He showed an image of Kawailoa to demonstrate the conditions at the site, where they intensively keep the vegetation mowed, and currently use dogs almost exclusively for searching. Craig said that the adaptive management language in the HCP allows for the monitoring intensity to change after the initial intensive period. The monitoring efforts in general have been thorough, progressive, expensive, and have been adapted to reflect new information learned from interactions with the agencies. Kawailoa, for example, started out manually searching 250 acres of land twice a week, essentially very thorough and intensive. Canine- assisted searches at Kawailoa and Kahuku started a couple of years ago, with vegetation management (mowing) a staple at those sites, and also the Maui sites with weedwackers and other tactics wherever possible. Intensive predator/scavenger control has been done at the O'ahu sites, and more recently at the Maui sites, in order to increase carcass retention (CARE) time. SunEdison feels they have done more than the expected amount of searcher efficiency (SEEF) and CARE trials, and on Maui they finished a year of independent SEEF and CARE and trials in order to assess prior efforts and compare them to what would be done by a completely independent research effort of SEEF and CARE trials.

Craig added that the HCP allows for changing the monitoring protocol, such as some kind of intensive but intermittent monitoring. Craig reiterated that SunEdison is proposing to do more mitigation in-lieu of monitoring. He asked whether the ESRC would be comfortable with that, or if there is still a need for another type of monitoring. He stated that the other option SunEdison proposed would be intermittent intensive monitoring; essentially every 5th year using the current protocols. SunEdison has worked with Manuela Huso and Dan Dalthorp to try to nail down the best way to use the "Evidence of Absence" fatality estimator they've been developing. The process uses the data from each year to create a probability of detection based on search efficiency, search area, presence of predators, and how frequently you do searches. The software has the advantage of looking at many years and giving a better estimate. When no monitoring is done, then detection probability is zero which creates a larger estimate long-term. SunEdison asked the ESRC to determine what type of monitoring they would be comfortable with in the future. It would affect the actual take estimate, which in turn would affect the actual mitigation being done. SunEdison's proposal was to do the least amount of monitoring and the most amount of mitigation.

Question was asked if SunEdison's expectation was to use the same dollar for dollar figure, so all the money devoted to monitoring searches and SEEF/CARE trials would go directly to mitigation, or is it a smaller amount? Craig replied that there are certainly different ways to do it. The one way he suggested is to use the estimator to create a future estimate with different scenarios, which would yield a larger take estimate due to the absence of

monitoring. Essentially, whatever it costs to do that extra mitigation (over what SunEdison is currently spending) is what the extra cost would be. It is conceivable that SunEdison could calculate the savings from monitoring and apply that or a portion of that instead to mitigation. Monitoring it costs money, so you get less mitigation with the remaining money, it's a tradeoff.

Fretz asked for clarification, can the estimator yield a site-by-site estimate and variance, so that at Kahuku for example, where there are 3 years of data which can be used, will they take the high end of the 80% confidence interval and that becomes the new projected take? Craig replied yes. Fretz asked if that would be higher than the current take permitted in the HCP, such that it will require an amendment. Craig replied that Kahuku is a bit different, because in the first year there was a take of three bats, and no low wind-speed curtailment. Three bats exceeded the annual take limit, so they instituted low wind-speed curtailment, and as a result the subsequent year's take was one third of that (i.e., one bat). In other words, if it is assumed that the take level from low-speed curtailment is what we will continue to see in the future, then Kahuku (for example) would likely not need an amendment. Other sites might need one. Fretz noted that the curtailment confounds the information, since it made such a big difference in the take and might really affect the variance. Jacobi said that if the projection uses only post-curtailment data, it would give a really small sample size of one year. Craig confirmed that at this point, the effect of low-wind speed curtailment hasn't been used separately to estimate future take. They simply say they searched for 3 years and found four bats; those numbers are then used to project for the remaining 17 years (which will have curtailment). However, Craig added that SunEdison would like to eliminate the first year's take of three bats from the data used to estimate future take, instead inputting only the take observed post-curtailment. Fretz asked if it is safe to assume that curtailment will continue into the future, and Craig replied of course, that's a given, absolutely. Curtailment is part of the management system, is now an automatic function. Fretz then made a request to make sure that the curtailment verification is stated in the annual reports.

Craig continued that in general, if using the 80% confidence level, then they have exceeded permitted take. If they use the 50% level, it could be site dependent; for example at Kahuku if only post-curtailment take is input, then the estimate won't likely exceed the permitted take. Fretz asked statistically, if you take the data from one year and develop a variance for that year, isn't that just a sample size of one? Craig clarified that it's 2 years. Fretz questioned whether developing a 20-year variance based on only 2 years could be considered statistically robust. Craig agreed that is an important question, and asked if ESRC would want them to do more mitigation, with little or no more monitoring? Fretz replied that it would have to be a whole lot more mitigation.

Jacobi expressed concern that doing much more mitigation than in the original plan is then a deviation from the original plan, does that restrict the options? Fretz said it does not, because the ESRC was not asking SunEdison to do something, instead SunEdison is proposing it and asking for permission. And the HCPs allow for adaptive management.

Fretz and Jacobi both inquired about the difference in estimated take if the data was used for all 3 years as opposed to the past 2 (post-curtailement), when projected out for the full permit term, what do the results look like? Craig replied if you use the observed take of four bats over 3 years, then in only a few years we would be exceeding the permit. That data is over double the take we've seen since curtailment. At Kahuku right now (with current monitoring) the projection for 3 years is eight bats. If instead SunEdison does only 3 years of intensive monitoring in the future, the projected take at this rate would be 61, which is about double the permitted take. It hasn't yet been approved to calculate this using only data from the low-wind-speed curtailment. At KWP1 we have a take estimate from 9 years with no curtailment, and now curtailment at 5/5.5 m/s, so we are suggesting that the take estimate should be reduced based on that action.

Jacobi asked what was the longest period of data with curtailment for any of the sites. Craig replied that Kawaihoa and KWP2 have always been curtailed. What SunEdison really wanted to discuss is discontinuing monitoring, and the most mitigation (estimate) we would consider. Or they could do some sort of intermittent intensive monitoring: full plot size, vegetation management, scavenger/predator control, SEEF and CARE trials, etc. Jacobi asked if we are referring to all covered species or just bats? Craig said we monitor for all species whenever we do searching, the reason bats always come to the front is that they are the most difficult to find, the carcasses doesn't last as long. Nēnē, petrels, and shearwaters all last a long time, and are easier to find, so can get 70-75% searcher efficiency. It's dependent on the species passing through any given area, but the data we have right now for Kawaihoa is the most robust, and the data we have for Kahuku for bats is also very robust. It's good but not as robust at Maui.

Fretz clarified; we are talking about KWP 1&2, Kahuku, and Kawaihoa. Each one's HCP says you will do intensive monitoring until the data warrant less intensive monitoring. Are you asking for this new idea to apply to all four, or do you feel that one or two of them may have better data and might warrant a switch? Craig responded that the places where the conditions are more difficult create less robust data with more variance. So the mitigation is going to be higher per animal at KWP 1 & 2 than at Kahuku or Kawaihoa, not because the searching on Maui was poor, but because the searcher efficiency was lower, and because of the increased potential for having missed things.

Young repeated Fretz's question: Are the applicants asking that all four of the wind farms make this switch? Or can we contemplate a switch at some locations and not others? Fretz said he understands that it depends on the variance for each site to determine if appropriate to switch monitoring protocols. Fretz asked what are the estimated take numbers for each, with 80% confidence. Craig showed a chart, from which Fretz noted that the KWP 1 bat take would go up to 27. Craig clarified that this is just the current estimate, not the 20-year estimate Fretz asked to be provided with the new requested 20 year take estimate that is the upper 80% confidence for each site, since that is what SunEdison is asking the ESRC to change the ITLs to reflect. Fretz asked to see a table with all of those figures in it. The ESRC also wanted to see the difference between the take estimates with no monitoring at all versus when the applicant monitors under different scenarios, because that's the premium that

SunEdison proposed to go forward with in order to not monitor. If SunEdison goes forward with monitoring but on a reduced level (as opposed to no monitoring), then there will be a lower estimate of take, and therefore less mitigation. At least initially, unless future monitoring suggests otherwise.

Fretz added that the committee recognizes and appreciates the idea that more mitigation can be done in lieu of monitoring, but the ESRC has an obligation to make sure that decisions are made using a solid estimate.

Harrison cautioned that the statistics are problematic because the events are not only rare but hugely variable year-to-year, added to poor knowledge of the bat population with no reliable population estimate. Those issues prevent the committee from evaluating the estimated take numbers in any kind of context as far as the overall population impact is concerned. This is a situation where we don't know very much, but have seen a lot of inter-annual variation that we can't explain. We don't know that if we go with intensive monitoring every five years, those might coincide with very high years or very low years, we don't have any way to know or evaluate which it is. Jacobi added that the other assumption being made is that the conditions in the future throughout the permit will be the same as there are right now, whether there is an actual change there or not.

SunEdison expressed that the point was to air the options. There is uncertainty and variance with all options, including with annual monitoring. Since the ESRC's goal is the greatest net benefit to the species, an alternative way of dealing with uncertainty is to over-rate it, so that you're encompassing the high end of possible mitigation. Jacobi stated that he agrees and understands what Craig is saying. The ongoing challenge though is that we really don't know how to mitigate for bats. We don't have a formula for that. It's still a guess, and even if we double that guess it's still just a guess. Making a decision right now might be premature prior to the workshop discussions.

Fretz asked SunEdison if, although they've presented the idea of using the 80% estimate and ceasing all monitoring, is there another option of doing monitoring every five years. Craig replied yes, that's an option for which we have also estimated the numbers. Jacobi cautioned that monitoring every 5 years may not necessarily be representative of a five year set of averages, since we don't know if it will be a good or bad year. We could have a very misleading graph or miss a trend. We need to figure out how to address the inter-annual variation. That could be built in to the estimation model, but only if you have a longer term of data to analyze. You're still making an assumption that the baseline is constant, than conditions are staying the same over time. Fretz asked what is that period of time that would yield more reliable inputs for the model? 20 years? It was suggested to examine fisheries statistics, because they similarly have a great deal of variation.

Fretz asked if they proposed to pool years across sites, which can't be done unless there is no significant difference. Craig replied that at KWP1, for example, there are nine years of data. KWP1 & 2 are essentially on the same hillside, and could be considered the same place. Fretz said that even if that were true for bats, it wouldn't work with Nēnē, for example.

Craig showed a table of observed and estimated take for Hawaiian petrels, Nēnē, and bats at all four SunEdison sites. It was noted that the range for bats at KWP1 is 0-4 bats per year for nine years, so perhaps the variation is not that extreme, since there's not numerically a big difference. Craig agreed that the numbers are so small that a 1 or 2 change will be radical, very significant. He noted that at Kawailoa the numbers are pretty consistent almost on a monthly basis. Higher take yields lower variation. Another issue of uncertainty is how many bats there are. It was once thought there weren't any on O'ahu, but now the more we look, the more we find them. The population on the Big Island is considered to be stable based on USGS's 5-year study. The more info we get on bats, the more ubiquitous they seem to be, and more widely distributed. We have baseline bat detection data at all our sites, and yet at Kawailoa it hasn't changed much in over 2 ½ years, even though we've removed 22 bats from that population. And in the estimation process we aren't using the mean number to mitigate for, we are choosing the 80% to mitigate for. That's a conservative estimate.

The discussion moved to other ways to conduct monitoring that aren't full-on intensive year after year. Subsampling on an annual basis, looking at the densest part of the fatality distribution., etc. Jacobi added that there's a lot to be said for subsampling and good statistical design; a good protocol is needed if being done at a reduced scope. Sample size must meet the needs of statistics or the variance will go up, and for consistency the monitoring team needs to stay accurate over time, rather than train up a new team every five years. Sampling could be scaled down while remaining valid if it is done carefully.

A question was asked about the observed variance at individual turbines, and whether SunEdison could design a sampling program that would increase the probability of observing take and yet reduce the overall cost of the monitoring program, while still preserving the ability to gather data on a relatively consistent basis, which would then give a lot more rigor and power. Craig asked if it is worth all the money SunEdison will be spending to find these things out? Are the bats so critically endangered that we need to have this detail of information, or can we mitigate at a higher more conservative level, and assume that we will be counting for the variation? It was pointed out that statistics are all about certainty, and they will have much lower certainty if they reduce monitoring. SunEdison is asking to account for the uncertainty of not monitoring by mitigating more which will do more for the bats. More mitigation is more net benefit. Our goal is to benefit the species. Jacobi said, we don't know a good way to measure benefit for bats. Young agreed, stating that even doing twice the mitigation, we don't know what we will get out of it. Perhaps monitoring more, and having that information, might be more valuable than uncertain mitigation. Craig said those unknowns shouldn't necessarily be dictating how much monitoring we have to do. But focusing on research would give better information to address these questions that simply counting bat carcasses.

Hart supported the idea, but felt they should separate Kawailoa from the others in this consideration since it has been an outlier in terms of numbers of bats taken. Hart said he'd rather see the money focused on directed research to answer these questions, rather than paying people to go out and find/count dead bats just to make our estimate slightly more

accurate. Harrison added that part of the research could include trying to nail down what it is about Kawaihoa that's so different, and why particular individual turbines have been an issue. Hart stated that there's a huge amount of research that could be supported with this money that would really improve what is known about bats and how to avoid impacts.

Young discussed the annual variability and trend data, and the issues of staff retraining if switching to intensive monitoring in intervals, but acknowledged that it could be valuable as long as they deal with those issues. Hart noted that he felt the 5-year intensive monitoring still should be kept in. Young agreed that USFWS would be uncomfortable with forgoing any future monitoring period for the life of the permit. Fretz added that he doesn't support no-monitoring, and was not sure at this time if he could support the five-year concept. We need guiding principles for how we would spend this kind of money and what our priorities need to be. We still aren't even sure how much money we are talking about, or what projects could be supported with it, or what the species benefit would be. Hart asked, aren't we just trying to agree on the concept and then work on the details? Fretz replied that he still wants to see that table with the numbers.

Jacobi stated that we aren't just talking about bats, we're talking about other bird species too. And a lot depends on which years we are looking at. For example, at KWP1 Nēnē, if you do your estimate based on 2006-2010, you'll come up with a different answer than if you look at 2011-2015. Something has changed there, and we don't know what that is or how to factor that in. Fretz noted that it could be changes in how monitoring was done, to which Craig replied that they certainly have gotten better at it, and started to do better vegetation management around the 2013 time period. The first 3-5 years there were very difficult because of the site characteristics.

It was noted that if the goal was to capture a range of numbers, they've done it; captured variability. And there's been some meteorological data that shows that it's been an odd 18-24 months, to say the least. So this dataset has captured some odd periods, and now is representative of the good range of variation. Jacobi said he would tend to agree with that more if those high numbers were better dispersed through that monitoring period, but again maybe that's because the monitoring has changed. Craig replied that we aren't varying by 5-10 per year, more like 1-3 per year. It's not a huge amount. Kawaihoa is a unique case of variance for bats.

Craig noted that 2015 at Kawaihoa is expected to be higher than 2014. They have taken eight so far, and may have another three or so, which would give us 11 instead of nine. Fretz asked, if that one will have to be amended anyway what are you asking? So if Kahuku, for example, you do this calculation and you come up with a number that's within your allowed limit, you don't have to amend, and you've already done the mitigation for it. Craig clarified that they've done the first tier mitigation. There's another tier to go. Fretz asked if that 80% number associated with reduced the monitoring bumps you into the second tier, are you just saying that you're just going to provide the second tier? Or are you proposing even more money? How much and to do what? Craig stated that at Kahuku, the numbers are small to begin with, so the difference between no monitoring and intensive monitoring is not going to

be large. If you do an example of Kawailoa, where you do intensive monitoring and your 20-year take could be, say, 275 bats.

Craig showed a slide of take estimates from Huso and Dalthorp. The slide showed the variation in data outcomes with different monitoring options, with projected take estimates for 20 years. In sites with many years' data and low variation, there was not much difference between 2 years of intense monitoring and no monitoring. However at KWP 2, where there's only 2 ½ years to go on, the numbers/variance are wide because the search efficiency is low there. Slides showed other predictions at different confidence levels, with the various options for monitoring.

Fretz asked for clarification on what "low level" monitoring means. Craig clarified "Low-level monitoring" as 1) searching half the carcass distribution area (not the same as half the radius) closest to the turbine where there is the highest likelihood of encounter, and 2) searching once a week instead of the current twice a week.

Craig showed the slides for the estimated take for petrels and Nēnē at the different sites given the different monitoring protocols. Young and staff noted that the proposed numbers on the slide don't reflect ones that have been discussed and agreed upon, but are just an example.

In response to a question from Hart, Craig clarified monitoring for all species is concurrent, so any monitoring scheme approved will be for both birds and bats. They've been using the cost savings for bats as an example, but we are talking across the board. Fretz noted that the costs to mitigate versus the cost to monitor is still being figured out, and could really change the economics of the proposal. Craig replied that they may still decide the cost to mitigate might be too high to be worth it. The locations of mitigation will have different costs depending on the site, the portion and cost that goes toward research, etc. The first objective is to accomplish the most effective net conservation benefit. After that, as an applicant, you're looking for the most cost effective mitigation. Or some combination of monitoring and mitigation.

Fretz asked if the committee had any questions for SunEdison on the technical issues being presented. There were no additional questions. He then noted public testimony that had been received and supplied for the committee to read and opened up the floor for comments from public participants.

Chandler-ʻĀao public testimony: To follow up the written testimony, I really do appreciate what you've done in terms of your intensive monitoring, which has given us more data than we had. I can appreciate the argument that there were once no bats on O'ahu but now the data clearly proves they are here. I worry only that maybe if this continues then there will be no bats on O'ahu. If we decide that we don't need to look anymore... I understand the importance of alternative energy to our state, and I know this puts you between a rock and a hard place, but I don't think that you should ask for permission to altogether cease monitoring. I'm from Maui, and 43 bats is a big deal to me. The bats are not just numbers to the people whose native culture evolved here, they are stories, and relatives, and ʻAumakua.

So I don't favor anything that doesn't treat them with extremely high value. I don't want to be around in my lifetime for us to realize that the last Hawaiian bat just died. Let's be as careful as possible, while at the same time not stifling the industry. I know there are budgets and things to meet, but if we can get these two objectives to meet halfway, that would be great.

Another question from audience asked why there was no standard deviation shown on the chart, and how they account for undercounting scavengers. Craig explained CARE trials with the carcasses, checking daily, and noting persistence and/or scavenging. The standard deviation is incorporated into the upper end confidence number. Fretz affirmed that the committee has spent a lot of time on those questions, it's a technical concern that applies to almost every HCP they evaluate, (incorporating searching and search efficiency variance).

Browning asked if the monitoring for water birds is done the same way. Craig stated that mitigation for the waterbirds is spelled out. And any monitoring covers all species; we note everything we find. There will be no change to waterbird mitigation.

Menard stated, I studied bats for my masters degree. I had been told that there were no bats on O'ahu, but I saw them from my lanai in Pupukea. That's how I got on the front page of the Advertiser when bats were rediscovered on O'ahu. But now I am both happy and sad to see these numbers, because it's great that the bats are there, but wow these take numbers are high, which is sad because I want wind farms to work.

Another audience member said, ethically I'm wondering if the committee is taking into consideration the potential precedent that this decision might pose, given the likely additional wind farms coming along. And I'm worried that this will set a precedent that there will be no more monitoring down the road. So committee, are you ok with no more monitoring; are you ok with them overestimating and having a mitigation plan at that level? Fretz replied that since we are currently deliberating, we will know that answer soon. The committee will be making a determination about the continuation of monitoring (unless we defer the decision). Jacobi added that setting precedent is a key consideration in all our decisions

Another audience member added, as a native Hawaiian, I want to support what the young lady from Maui (Chandler-'Īao) said about the cultural importance of these animals.

Fretz thanked the public for the comments, and opened for additional comments from staff.

Sether clarified for the committee's awareness, that each time SunEdison changes their monitoring design, such as decreasing the search area, that change triggers the need to do another round of SEEF and CARE to show what the predation rates are for that interval. Fretz added, at any time that in turn could trigger another tier or need for amendment of take levels. Sether stated that these new estimations will require amendments for all of the permits and HCPs, if there was a low year on a future year of monitoring, it could change but there's no refunds. Craig replied that Sether is referring to something discussed in the past, the idea of a low-level monitoring that didn't include anything else (i.e., SEEF, CARE). But any

monitoring SunEdison does will always include the supporting information. And remember that this is an estimation. It uses only the numbers that we have. So if we have poor numbers, our estimation is not as good.

Fretz said it was he felt it was not appropriate to stop the monitoring all together. At this time he wouldn't even support going down to just one out of every five years, although he was open to hearing what the rest of the committee felt about it. He stated he was leaning towards continuing intensive monitoring for now. Young asked if the committee was meant to choose to continue intensive monitoring, or continue some sort of modified monitoring. When asked about the timeline/term of current intensive monitoring, Craig said that soon all the sites will have completed at least their initial 3 years intensive monitoring periods, so they felt it ok to ask to switch to the lower intensity monitoring.

Fretz asked when SunEdison wanted to implement the proposed changes. Craig replied that if the ESRC approves either no more monitoring forever or for 5 years, then tomorrow we will stop monitoring at KWP 1. Kahuku is finished with the initial intensive monitoring, so we would be the new regime (based on the decision) today. KWP 2 would begin in July. Kawailoa would begin in November. Fretz clarified that the change for each site is subject to review and approval by the committee. It's not all or none. Sether added that it needs to be approved by the wildlife agencies, as well as reviewed by the ESRC. Fretz felt that his agency (DLNR) will make approval decisions based on the recommendations of the ESRC.

Jacobi stated his recommendation that monitoring continue on an annual basis. But he added a willingness to work with the applicant to modify sampling design so that it can still be intensive but of a narrower, focused, easier to implement scope. Jacobi felt the need to 1) continue an annual accounting of trends and temporal variability, and 2) to allow the upkeep of trained staff. He also said he was uncomfortable with the assumption that throughout the life of the project conditions will stay the same as they are in the beginning. We do have documented changes in terms of climatic environmental variables (such as rainfall), climate change trends have been noted. Those variables may have an impact. Craig confirmed that Manuela Huso (also USGS) echoed that opinion, and she had said to search a smaller area that you can search well, and use that to extrapolate your estimate. Statistical design is paramount.

Fretz said that while it seems like a lot of years, statistically it's not. He doesn't want to skip a year of monitoring and getting data. Young said that in general she is comfortable with the five-year idea, but wants to know that SunEdison is confident that the staff training, efficiency and accuracy will be up to good standards before actually doing the monitoring. Craig replied that we've done it four times now, so we feel confident that we can repeat the same effort. We know what it takes to do that type of monitoring, the conditions we need to create, the trials we need to do, so I don't feel that will be an obstacle. Although I agree it will be a big deal to get it up and running each time.

Harrison stated that this is a little like adaptive management; there's a lot of experience looking at what we've learned so far from the monitoring program. You guys could build on

that, and very efficiently focus your efforts and sampling without losing the annual signal that is so statistically important. I'd also like to see the focused sampling effort done in conjunction with both your statistician and researchers who can help to convey the information in the most useful and valid way.

Young asked, of doing a small sample size on an annual basis, or a larger sample size on a five year basis, which is more statistically useful and/or doable? Jacobi added that sample size can be viewed two ways: how many times you do it and at what interval/frequency, but also how many places you look. Our recommendation is that you can reduce the number of places you look, but at least sample on an annual basis to capture the trends. That way we can catch the variability in what is happening year after year over the permit term. As opposed to doing a large scale effort less often. Fretz asked Young to clarify if USFWS supported monitoring every five years accompanied by a take estimation based on the upper 80% confidence interval based on the data, from which SunEdison would then kick in the additional mitigation associated with that new estimate, and amend their permits to reflect that level. Young confirmed.

Jacobi asked if the estimate would be reset based on the data that comes in at each sampling interval? How would the results of interval monitoring information be used? Young said that any type of monitoring should be adapted based on the current information. But the numbers being proposed are getting more reasonable.

Craig pointed out that a key aspect of the different types of monitoring proposals is that each has a different estimate. If they are going to be estimating on an ongoing basis, they don't want to be mitigating for 20 years in advance, instead they would ask to mitigate in portions.

Fretz noted an apparent difference of opinion among the members. Young and Hart seem more inclined to support the proposed intensive monitoring one year out of every five years idea. Hart confirmed that he felt it's best for the bats to put more money into mitigation as opposed to these trials that result in lower estimates of take than what are in the models proposed to mitigate for. Purely from the point of helping bats and promoting bat research, he felt it preferable to go with the intensive every five years.

Fretz and Jacobi were inclined to continue monitoring every year but to make it more efficient through sub-sampling or more effective sampling. Harrison agreed that there is an advantage in yearly monitoring of some kind. And it's not just bats, but also for all the birds. And because all of the factors leading to a single estimate indicate a variance level that's just immense.

Fretz said he would be willing to look at this again in a year or two when there is more information.

Cowan asked how many years of data the committee need to feel more comfortable with the inter-annual variability? We can do more monitoring and we will have greater precision and a lower estimate, but we also will end up doing less for the bats at the end of the day. More

searching, more certainty, more precision, a lower number. It will be costly and yet result in less mitigation. Fretz said just to be clear, you will always mitigate for more than you take to provide a net recovery benefit. That's always the goal.

Fretz repeated that there seemed to be a difference of opinion among the members. Two of them are inclined to stop annual monitoring and monitoring only every 5 years. Three of the members would prefer to have the some level of monitoring continue annually for now. Recognizing that the HCP does allow for this kind of flexibility at any time, this topic could be brought to the committee again in the future.

Jacobi expressed lingering questions of how curtailment data would continue to be incorporated, as well as changes in baseline conditions, and the need for continued data collection. Cowan asked if it would change the perspective or point of view if they separated the projects. At KWP 1 they've been searching for almost 10 years, it could be considered separately. Can the ESRC evaluate them all project by project? Fretz agreed that KWPv1 has the most years of data, and also shows a big, abrupt change. It makes sense to take that one out, with its 9-10 years of data, and look at that one separately. That would make a difference. Jacobi agreed that would be really useful, as well as a good discussion of the data and results. Fretz also noted the attractiveness of coming up with a huge number for take, then going out and doing something great for bats, but he worried that the committee would making a commitment to a level of take that there's not much confidence in. It's a false confidence number if it's based on only a few years.

Young said it seems we've moved away from the "no-monitoring." She asked what happens if they can't agree. Fretz noted that there was a request before them that they have to respond to; approve, reject, or amend. Jacobi proposed amending to say the ESRC would like to continue to work with SunEdison to explore alternative strategies for an annual but reduced scope monitoring scheme that would still give us the robustness we seek. He recommend amending the request to explore the options for a reduced annual monitoring scheme that would be less monitoring than current but still give us the kind of precision we would like to have. With input from the upcoming workshop.

Young felt that those at the table were in agreement with the lower annual monitoring.

**MOTION: (Harrison/ Jacobi)**

**ESRC encourage the applicant to work with the statistical experts and researchers to develop an alternative more efficient and focused monitoring strategy which still meets the committees expressed preference for continuation of annual monitoring**

**APPROVED: Unanimously.**

**ITEM 5. Request for comments on the Draft Habitat Conservation Plan and Incidental Take License for the Na Pua Makani Wind Energy Project in Kahuku on the North Shore of O'ahu.**

Siddiqi introduced the agenda item: Na Pua Makani is proposing to construct a windfarm on the North Shore of O'ahu. She reviewed the previous day's site visit, which included both portions of the project on DLNR land and private land. She reminded the participants that the draft HCP up for discussion was published on the OEQC website and was currently open for public comments. DOFAW staff had a few concerns about the HCP, including increasing the bat mitigation to include not just the removal of feral pigs but all feral ungulates. DOFAW was also concerned about the using a generational time of 8 years when calculating for mitigation for bats, and also staff would like to see more quantifiable measures of success for bat mitigation.

Fretz said that those comments were included in the submittal package that the committee was given prior to the meeting. He introduced Alicia Oller who would speak for the Na Pua Makani wind farm HCP application and give a brief presentation, after which the meeting would open for committee and public comments.

Oller introduced staff associated with the project and reviewed the contents of the draft HCP, which she said had been worked on for a year and a half in consultation with agency staff.

She reviewed the map of the proposed locations on both DLNR and Malaekahana-owned land. The turbine model has not been selected but it should be between 1.7 and 3.3 MW, the MBTH (maximum blade tip height) will be 512 ft, and one permanent met tower. Most likely there will be a variety of turbine heights and types to accommodate site constraints and setbacks. For the purposes of estimating take for the HCP, they looked at the tallest turbine to estimate impacts. Commercial operation is expected for December 2016, having permits in place by the end of 2015. The HCP accounts for eight covered species similar to other existing North Shore HCPs, but with the addition of Nēnē as a result of the recent arrivals into the Campbell wildlife refuge.

Oller briefly described the take estimates and mitigation proposed for each species per the draft HCP. Bat take estimated (including 70% reduction based on existing curtailment research, Arnett et al, mainland paper) of 34 bats, but with a second tier of up to 51 bats to account for uncertainty. Mitigation a combination of habitat restoration and research.

Newell's shearwaters: low impact expected, take request is 4 adults, 2 chicks. Mitigation is funds towards the National Fish and Wildlife Foundation (NFWF). Based on the new O'ahu

Nēnē, and potential future incoming birds, the take estimate is 11 birds. Proposed mitigation includes fencing, traps, predator control.

There is a low expected impact to waterbirds, but the birds do occur at the James Campbell Wildlife Refuge adjacent to the site. Therefore take requested includes 4 each of Hawaiian duck and stilt, and 8 each for coot and moorhen. Mitigation is to support management at Hamakua Marsh including installation of a fence, supporting apart-time biologist for education/outreach, and placement of additional signage.

Pueo is a state-listed species with low expected impact (none observed during the avian point counts). Take requested is 4 adults, 4 chicks. Mitigation is contribution of funds to the DOFAW Endangered Species Trust Fund.

Harrison asked for clarification about the Nēnē take estimates based on the existing Maui populations. Oller replied that they examined the existing take of windfarms on Maui and projected the potential Nēnē population for O'ahu, factoring in five year increments to allow for both increase of existing initial population and the arrival of additional birds. It's a reasonable conservative estimate.

Hart asked about the issue of seabirds and 'Iwa (great frigate bird) strikes that had been brought up by community members, and how the applicant planned to address it. Oller replied that Iwa are an MBTA (Migratory Bird Treaty Act) species, so will be discussed in the NEPA document. We have not included it in the HCP because they aren't an ESA (Endangered Species Act) listed species.

Fretz said we do need to find a way to deal with them, because it's illegal to take them but we can't issue a license to take them. Can we have staff work on a conservation measure for take of those species in this document? Is there any precedent under federal law for some kind of mitigation consultation for non-listed MBTA species, which then keeps applicants from being prosecuted for take? Young replied that on the mainland they are working on MBTA take issues. It can be dealt with, but possibly not by this committee. She offered to connect DOFAW to her staff Jenny Hoskins who works on those issues for the Service.

Oller pointed out that the conservation measures in the HCP will also benefit MBTA species as well. Fretz said that simply means you mean you're just going to kill less of them. He asked for them to identify the conservation measures in the HCP that will also contribute to the conservation of those species. It was decided that MBTA discussions would continue later with staff. Fretz emphasized that this comments has come up both from the ESRC members and the public.

Oller then described post-construction monitoring, standard intensive monitoring for years 1-3, then years 10-11. This includes documentation of fatalities, SEEF and CARE trials. They will search all turbines out to 50% of the MBTH where possible, which will maximize the searchability of the area where you would expect the bats to be found. The search area will extend out to 75% MBTH where topography and vegetation would allow. The interim monitoring would occur in other years, searching all turbines, and it would be a more focused search area with a reduced search frequency.

A member of the public asked if any portion of the project would be in a 100year flood area, and what effect that may have on the bird habitat. She said she lives across the way and in the 100year flood plain, which is a concern because of the need to preserve habitat for wildlife. Malaekahana stream runs through the area and is the source for the flooding. Oller says they have assessed the streams and wetlands, and have worked with the engineer to avoid the stream channels, so construction will not impact those areas. Also, during construction, we will manage construction impacts to stormwater to ensure no impacts.

Craig noted that the projected take in the HCP is based on Kahuku's take number, and then applying a reduction based on curtailment, but our taken number already includes curtailment. Also, regarding the search interval, the experience at Kahuku is that the mongoose scavenging pressure is intense. They started out with searching 2x/week, but carcass persistence was so short that we had to increase to 3x/week until predator control efforts started to be more effective.

Public participant asked what constitutes an unsearchable area as seen on the map. Snetsinger replied that some topography doesn't allow for safe or effective vegetation management, so those areas cannot be searched effectively. They also have to factor in human safety, which can limit the searchable areas.

Fretz asked how much area was planned to be cleared around each turbine. Oller clarified that they would clear an area from the base out to 50% of the maximum blade tip height. From the 50% to 75% distance they don't plan to manage the vegetation in that area. The completeness of vegetation clearing was expected to vary by terrain. In the DLNR parcel, for example, the terrain makes it very difficult to control the vegetation. On the Malaekahana side, they are limited by the agricultural uses of the other parcels, and are working with the landowner to work with that. Finding that balance is really only an issue on a couple of turbines.

Young asked regarding SEEF, was there a point at which the non-searchable portions are too high to really get any useful estimate of take. Jacobi followed with a question about whether the searchability of each area was taken into account when siting the towers, or was that it not even considered? Oller replied that the primary factors considered in siting the towers were wind resources, constructability, archaeological features, wetlands, property setbacks, and other concerns. The siting and search area proposed is what they feel is a good balance to fall within 50% of the total area. Bruns said that there will be enough data to feed into the estimator even with the smaller search area. It will be factored in. Nagy added that it's a density weighted distribution, so the area closer in to the turbine has a much greater impact on the estimate because that's where more carcasses are likely to be found. The outer areas have much less importance for the estimator and would be weighted lower. The searches are focusing in the higher weighted area.

Young asked if the 50% area would be fully cleared, or if there were constraints. Oller replied that while there may be some hindrances to clearing all the ideal search area, any un-cleared patches of vegetation will be documented and taken into account when running the estimator program. For example, a 15% slope is the threshold deemed feasible for both mechanical clearing and searcher safety.

Jacobi asked how they came up with their mitigation targets, to which Oller replied that for bats they used the guidance provided by agency staff for forest restoration (40 acres per pair), which has also been used in other HCPs. For research they looked at other HCPs and also consulted Frank Bonaccorso of USGS for general project ideas and associated costs. For waterbirds they looked at previous work done by DLNR as mitigation in the Hamakua area. The fence would keep birds from getting run over by cars, and keep dogs from coming in. The also would provide a half-time biologist for 2 years to assist with public education.

Fretz asked for clarity on the ideas at Poamoho (bat mitigation site), since it wasn't clear what the habitat looked like or what the management would accomplish, and how that could translate into more bats. In the past the focus has been on creating new bat habitat with forest restoration, whereas the Poamoho site seems to be pretty intact to begin with, so how is the benefit being calculated. Nagy said the idea came from conversations with Mary Ikagawa (Ko'olau Mountains Watershed Partnership) and Marigold Zoll (DLNR), who were concerned about pigs and other invasives in the area and felt that fencing would improve the habitat in order for it to truly function as a native forest, which staff indicated was required for Hawaiian hoary bats. They felt that if the area were not managed it would continue to degrade. The maps for the area were presented, and noted to be found in Appendix E of the HCP. Fretz reiterated the concern that preserving habitat is hard to measure in terms of actual benefit for bats. Oller reminded the group that a detector had been placed to verify the presence of bats in the area. Monitoring for bat activity will continue.

Jacobi asked how take was being estimated. Snetsinger replied that the numbers were estimated partly based on the Kahuku data with curtailment, recognizing that their efficiency had improved over the years, so they estimated conservatively for this project. Conversations with staff will continue, so there may be an updated estimate reflected in the final version. Fretz questioned how/why they calculated estimated bat take with curtailment. Snetsinger clarified that the 70% is the take reduction benefit from the proposed curtailment; it reduces the take by 70%. Nagy stated that the reduction is based on observed results from mainland studies using differing levels of curtailment, and a variety of bat species, although the driver of bat fatalities on the mainland is hoary bats.

Fretz asked about the need to amend Kahuku's take estimate, and if the numbers proposed for this one are possibly too low. Charrier stated that a lot has evolved with the use of fatality estimation models in the last year and even the last month, and she believes Na Pua Makani is in the ballpark, but that Kahuku's take is a bit higher, and Kahuku has preconstruction design for searchability and has implemented intense predator control, and uses dogs, so they have a high probability of detection. She is concerned that without a similar probability, then uncertainty will go up, and take would increase. Right now, based on Kahuku, if they copied the protocols identically then Na Pua Makani's take estimates would be in the ballpark, if maybe a little low. Craig clarified that the Kahuku estimates are based on all 3 years of data, including the first year when there was no curtailment, so in reality the curtailed numbers will be much lower than what it currently is based on since the high take of the first, non-curtailed year was dropped significantly once curtailment was implemented. Oller emphasized the need to maximize searchability.

Fretz asked about the duration of the take tiers. Oller stated that Tier 1 is 8 years, Tier 2 is 4 years. Is this based on a bat's lifespan? Fretz asked staff to clarify their concerns with the bat mitigation. Amlin stated that the issue was with the justification presented for reducing the number of years of management, where in the past there has been a longer commitment from the applicants. The acreage is larger, so the decision is not based on bat-years but rather it is more efficient to provide the funding for a larger area in a shorter amount of time than a smaller area for a longer amount of time. The justification would make more sense if written that way. Rather than 80% of a bat's life.

Nagy reminded the group that the take numbers were discussed many time with DOFAW and FWS agency staff along the way, and the results in the draft reflect those discussions.

Fretz asked about the bat research which was mentioned to be flexible, but in HCP Section 6.1.1.1 there are detailed specifics on genetic studies for population size and other research studies, and he was unsure if those were research priorities that the ESRC had vetted. He wanted to wait until after the April 2015 bat workshop for the committee to discuss research priority. Oller said that these were research priorities provided by Frank Bonaccorso, and Fretz clarified those were Bonaccorso's priorities and did not necessarily reflect the committees views.

Fretz suggested that the measures of success were vague, and said they could easily be more measurable and on target, such as Nēnē and waterbird, where they could measure/document higher survival, change in reproductive success. Snetsinger replied that for the Nēnē, the best we can do is protect the nesting habitat for the four existing Nēnē on O'ahu. The rest was to be taken care of by USFWS per their suggestion. The measure of success is the contribution of funds. Fretz replied that simply spending dollars is not a measure of success. Oller said they are going based on the guidance that they received. The Nēnē numbers in O'ahu make it difficult to predict a reasonable probability that the project is resulting in benefit. Maybe when there are more birds it might be possible. Hart suggested that for Hamakua waterbirds it will be easier and that the half-time biologist should be able to collect data on this.

Fretz said that simply providing funds for predator control at the Nēnē pen is not an adequate measure; they have to document that those efforts result in a great number of birds to account for the take requested. He was unsure that this is a project that the committee should support, as asked the committee if they were ok with proliferating Nēnē on O'ahu. Young said that FWS is. Fretz said the presumably right now the issue is that predators could impact the goslings, Na Pua Makani is going to put in a fence and do predator control, and then document reproductive success. Reproductive success of 2.5 per pair in a protected area is doing well, so why don't you use a metric like that. Nagy said that it comes down to sample size, we only have one nest of Nēnē. Snetsinger pointed out the odds of them using that particular site again, we can't have a measure of success if we don't know where they're going to be nesting. Fretz said if you take four birds you have to replace four birds. Snetsinger said that they are not implementing the predator control, they are just providing the materials. Fretz said no, you are responsible for production of more than 11 adults, if that's what the requested take is. If the contractor you choose fails that's between you and them, you're still responsible to this committee to produce those birds. Nagy said it sounded like more discussions with staff were needed. Fretz said that measures of success should be biological, and while bats and some other species are challenging, Nēnē and waterbirds can be measured in a biological currency, and should be measured that way. Harrison said that Jason Misaki (DOFAW) has data for Hamakua, so that should be an area where you can get some good numbers and make projections. Nagy said that they do have the number of dead birds found, but it's not adjusted for anything, so they've done some conservative estimation to try and overcome the challenges of using that data to come up with a clear metric of change. Harrison said that Misaki could help fill in a sufficient number of demographics that

could be used to come up with a more specific target. Craig said that the information is being recorded as part of SunEdison's mitigation.

Fretz asked if the committee had any further advice or questions for the applicants.

Young wanted to review the post-construction monitoring; the proposed 3 years of intensive monitoring followed by a lighter version of monitoring, followed by an additional two years of intensive monitoring and back to the interim operation monitoring. Young asked about how that affects the overall probability of carcass detection (g-value). Bruns said it's difficult to assess take levels overall if we don't know the g-value. She added that we should know enough about the site to get a handle on the g-value. If they aren't going to have the same large cleared areas as Kahuku and Kawailoa, then it makes the prediction harder.

Jacobi felt the obligation for monitoring should be identical to the other windfarms, accounting for site/terrain differences), so he feels they should use those same protocols until a point is reached where the committee can reevaluate. Sether pointed out that in the less intense interim monitoring, something small like a bat with short carcass retention the g-value gets lower, so that increases the uncertainty when you have less intense monitoring. Jacobi concurred.

Young clarified that the applicant is proposing 3 years intense monitoring, followed by a period of light monitoring, then 2 years of intense, and then at some point this can potentially be reconsidered. Jacobi felt that they ESRC should be consulted prior to the applicant switching to lighter monitoring; the ESRC should evaluate whether it was appropriate to switch, not just switch because it was in the plan. Bruns wanted a definition of "intense", identifying the G for those first 3 years.

Fretz asked about management plans that would be written at a later time, like Poamoho. He asked the committee if they were ok with that, as he felt that her could have used more details. Jacobi stated that he would like to wait until after the bat workshop, after which he would like to see this fleshed out properly. Jacobi agreed that it is important to have those details worked out. Oller pointed out that there is a Poamoho management plan in the appendices, and that part of the mitigation funding would be going toward development of a more detailed management plan. Jacobi reiterated the concern that while this is important work to do, it may not necessarily be the best thing to do to benefit bats.

Fretz asked if there were any other comments or input from the public. There were none. He adjourned the meeting at 3:45pm.