

ENDANGERED SPECIES RECOVERY COMMITTEE (ESRC) MEETING

July 17, 2018 MEETING MINUTES

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

MEMBERS: Scott Fretz (DLNR), Gordon Tribble (USGS), Loyal Mehrhoff (At-Large), Lisa Spain (At-Large), Kim Burnett (UH), Michelle Bogardus (USFWS), Kawika Winter (At-Large)

STAFF: DOFAW: Katherine Cullison, Glenn Metzler, Lainie Berry

USFWS: Diane Sether

OTHERS: Nelson Masang, Jr., Jessica Idle, Mitchell Craig, Brita Woeck, Matt Stelmach, Adam Young, Alicia Oller, Marilyn Teague, George Akau, Dave Johnston, Maxx Phillips, Paul Conry, Elizabeth O'Sullivan, Sean Moura, Micah Brodsky, Danielle Jayewardene, Ron Duke, Dave Johnston, Jaap Eijzenga, Stephanie Nagai, Rob Curulla

AGENDA

ITEM 1. 9:00 am Call to order.

ITEM 2. Announcements.

Upcoming ESRC meeting scheduled for August 30, 2018.

VOTE TO APPROVE: Kaua'i site visit August 22, 2018 will be a limited meeting and closed to the public due to dangerous conditions at the site.

ITEM 3. Approval of Minutes: April 26, 2018 ESRC Meeting.

Minutes deferred until staff fix minor typos.

ITEM 4. Review and Discussion of Hawaiian Hoary Bat ESRC Task Force Interim Report.

FRETZ: Let's move on to Item 4. If you recall, the Committee has formed a Bat Task Force and assigned that Bat Task Force to review the 2014 Bat Guidance Paper and make recommendations back to this Committee on any revisions that would be prudent for this document. The Bat Task Force has met four times, and has provided an interim report to seek feedback from the ESRC halfway through the process. That's what's in this interim report here that we're going to go over.

The purpose of the Bat Task Force is to meet and discuss topics/sections of the White Paper, and once a consensus is achieved Glenn integrates that topic into the paper. The document is in a working draft form. The Bat Task Force will ultimately provide a draft revised White Paper to the ESRC for consideration and approval.

Before we start the discussion, we will ask for any public comments so that we can incorporate those into the discussion. Then after we will ask for public comments again.

TRIBBLE: It will be helpful for the public to specify where in the document the comments are pertaining to.

MITCHELL CRAIG: Some of the comments have come in as part of the Federal PEIS scoping meetings; are we allowed to discuss those comments if they are not yet public?

FRETZ: I don't see an issue with you working that into your comments as it pertains to this topic.

BRITA WOECK: Can we also submit written comments after the meeting?

FRETZ: Yes, we accept written comments at any time.

MITCHELL CRAIG: Can we provide comments on specific items as discussed by the Committee?

FRETZ: I planned to go through the report as a whole first, but let's see as we go if we should comment on each item.

ALICIA OLLER: After all this is complete, will the draft document then be posted for final public comment?

FRETZ: It would be prudent to allow the public to comment on the revised guidance, so the ESRC can take the comments into consideration when considering whether to approve it.

Item 1. The report is saying that Habitat Conservation Plans (HCPs) really need to show how the basic requirements of the HCP regulations have been met.

TRIBBLE: Item 1a: In order to ascertain "reasonable certainty"—this term is straight from the law, so how is that to be interpreted?

FRETZ: This did come up, and the Bat Task Force has approached this issue by exploring the limitations of population models and what they can and cannot tell us. It is a challenge that each member must judge for themselves. The Bat Task Force spent considerable time working on this, but we didn't finish it yet, so in the next report, or the document itself, it will contain more detail on that.

TRIBBLE: So you have a path forward?

FRETZ: Yes.

BOGARDUS: I have two specific comments. One is that in the paragraphs above we talk about the "recommendations" but Item 1 is the requirements under 195D, so I suggest moving Item 1 up to the "requirements" section, rather than in the "recommendations" section.

Second, I recommend adding in the part about assurances of funding. It's in 195D but not in this list, and it's a big issue that applicants struggle with, so it's better to put it in than leave it out of the document.

FRETZ: So let's try this now, item by item... Are there any public comments on this item?

MITCHELL CRAIG: Regarding "reasonable certainty": how was this addressed when the original HCPs were done? There wasn't much certainty about the populations or the take at that time. We didn't have certainty then, and we don't now.

MEHRHOFF: With the earlier HCPs, back then the expected take was low, and so the impact wasn't considered to be as big a problem. We didn't know then what we know now.

MITCHELL CRAIG: At one of the sites, it was difficult to prove even the level of take that was approved...

FRETZ: It's been challenging. The level of take influences the degree of certainty and in some cases it may exceed it.

FRETZ: Item 2 identifies the provisions in the HCP for avoidance and minimization. It's recommending that a range of alternatives be considered that involve curtailment or other approaches, with substantive reasoning about why those alternatives were considered and rejected.

SPAIN: There's not a lot of incentive to research deterrents, but this is important to look at more closely.

FRETZ: We did not put deterrents in here because we continue to work on it. A section on deterrents is being worked on, has had extensive discussion, and will be in the final document in avoidance and minimization recommendations.

WINTER: Are deterrents a priority under mitigation research?

BOGARDUS: We want to encourage deterrents and incentivize them, but research into them can't be used to offset take on the Federal ESA side. Some deterrents are showing to be more reliable for some species than for other species.

FRETZ: That doesn't mean that can't be done as part of minimization and avoidance, but whether an applicant could get credit for it will depend on the law. We're working on it for this document.

TRIBBLE: If there is projected take that has to be mitigated, this take could be reduced with deterrents.

BOGARDUS: Under Federal ESA, if an applicant commits to a certain amount of mitigation which is based on a certain amount of take, then the applicant has to complete that mitigation, even if their take ends up being less than the permitted amount, unless the applicant amends the permit down to a lesser amount of take before the mitigation is completed. So if deterrents are introduced halfway through the permit term, without amending the permit, the applicant must complete the entire mitigation for the higher take level, even if take ends up being reduced by the introduction of the deterrents. If there was reliable data that showed that deterrents would result in a lower level of take applied for with a new HCP, then yes, the Federal side could permit the lower take upfront.

TRIBBLE: Thank you.

FRETZ: The challenge is there are no off-the-shelf deterrents available for purchase right now.

WINTER: Should Section 2a say “shall” rather than “should”?

FRETZ: This is a guidance paper, and not the statute or rule, so it cannot more stringent than the statute.

FRETZ: Public comment on Item 2?

MITCHELL CRAIG: I would like to understand more fully the difference between the Federal and State ESAs. Federal law says to offset to the maximum extent practical, whereas the State says to “fully offset”, so State law is much more strict regarding mitigating take. The Federal law has more flexibility.

BOGARDUS: The Federal law says to minimize and mitigate to the “maximum extent practical”, which has a legal definition and process which triggers it. The onus is on the applicant to show that.

KATHERINE CULLISON: 195D says the applicant to the maximum extent practical shall minimize and mitigate the impacts of the take.

DAVE JOHNSTON: For wording, it says curtailment at higher wind speeds, it sounds like at high wind speeds, you’re going to curtail, so maybe swap the word “higher” for “increased”. Otherwise it sounds like you’re promoting curtailment at very high winds. Another comment, if you increase the curtailment cut-in speed, it does reduce HHB fatalities, but it’s not always the case. I just want to caution the group that curtailment does not always lead to the level of take reduction you are assuming. There are studies in which HHB were hit at very high winds, so it made no difference to fatalities.

MEHRHOFF: I’ve only seen one study that where it made no difference.

DAVE JOHNSTON: That’s my point. Generally it’s true, but this bat is different from those on the mainland, so don’t always assume that curtailment will reduce fatalities.

MITCHELL CRAIG: There are very few studies that examine the statistical difference between low level curtailment and high level curtailment in the same study, which might be the most important type of study to look at. There are only three that I found. Two of them showed no difference. It just shows that there is a lot of variation even around the difference levels. There is a study that shows that just feathering blades, without curtailment, reduces fatalities. And in a study on 6.4 m/s curtailment, we don’t know how much of that benefit was from the 5-6.5 m/s range, or at 5 m/s or lower. At what point was the gain in reducing fatalities achieved? It’s not correct to predict an unequivocal regression. The difference from 5.5-6.5 m/s might be a change of 10% because of the portion of activity level represented. While curtailment may be the tool we have to use because there are no other options, it doesn’t necessarily mean it’s the tool that’s going to solve the issue.

MARILYN TEAGUE: The maximum extent practical of minimization and mitigation in the Federal ESA is intended to be presented as a package, so for consistency, I think there is value to applying it as a whole in this document as well.

MITCHELL CRAIG: If you look at the percentage values of all reductions in the data, the highest reported is an 83 or 84% reduction. There’s not enough information to show more benefit. We have detectors at

nacelle height that can show whether there will be any effect by increasing curtailment; that information should be taken into account when predicting the true expected reduction from curtailment.

FRETZ: Item 3 deals with analyzing the cumulative impacts of mitigation. An important point in the State law is there is a need to do this island by island, even by project area, so this deals with the need to assess this in some way.

BOGARDUS: Yes, we might want to clarify that.

BURNETT: And island by island is not cumulative...

FRETZ: USFWS requires analysis for cumulative take for the whole state?

BOGARDUS: Yes, we include island analysis in our jeopardy analysis, but in general we examine the species as a population in the whole state. We're seeking a combined program analysis for all the projects doing HCPs or seeking HCP amendments, to address that issue.

FRETZ: Again, this is another section the Bat Task Force is still working on, but we wanted to solicit comments at this interim stage.

BOGARDUS: On Item 2c, what was the intent of the Bat Task Force doing analysis with and without mitigation? We always asked for an analysis of the value of mitigation to assure it offsets take, which is different from a full analysis with or without mitigation.

FRETZ: We'll go back and check that to make sure the intent of that is clear.

WINTER: Is there an analysis by which the committee can assess all the synergistic impacts of combined projects on the species?

FRETZ: State law does discuss cumulative impacts to the entire range of the species, plus the project area. So assessment of cumulative impacts is required by State law, as with Federal law, to be analyzed and addressed in the HCP. That is what we're trying to achieve with this document.

BOGARDUS: When we are talking about cumulative impacts, in general we are talking about the cumulative impacts to the species up until this point in time. Now we are trying to incorporate potential, expected, or likely future impacts in the foreseeable future. It's not necessarily part of the legal cumulative effects analysis, but it is something we are trying to address in our analysis and I suggest the Bat Task Force look at a consistent approach to that too.

FRETZ: We can include RFPs that we know about, but not necessarily conceptual things for the government renewable energy goal.

BOGARDUS: USFWS has sent a letter to HECO asking for more involvement when the applicants submit their projects, rather than after the power purchase agreements. That may be something the ESRC wants to consider as well.

FRETZ: I agree, we need to find out how much of the renewable energy plan is wind power.

MEHRHOFF: I don't think we should limit ourselves to five years of RFPs, because then we miss other potential projects, but we weren't able to come up with a number of what was expected beyond that five year window.

FRETZ: Public comments on Item 3?

BRITA WOECK: Will the document include a summary of the science related to wind projects and bats? If we don't have a centralized source of information, we may have multiple interpretations of the ongoing science, or the potential for cherry-picking pieces of information that are important.

FRETZ: Are you recommending that?

BRITA WOECK: Yes.

BOGARDUS: USFWS made a similar recommendation as we didn't want different analyses in different documents, because we could end up with different end points.

FRETZ: For the record, you would like to have a set of references that are being used to develop the guidance and analysis.

BRITA WOECK: Yes, so that we can all be aware of what is being used for evaluation, what is the latest research, and what information is considered obsolete.

SPAIN: How do we define the latest research? A presentation from Frank Bonaccorso to the ESRC? Or published documents? There could be results from the newest ongoing research that is highly relevant but hasn't been published yet, so we should define what best available science is and how we use that.

WINTER: Is there a legal definition for best available science?

TRIBBLE: USGS can release raw data, but anything interpreted must go through peer review. Releasing raw data can be problematic because when the final report comes out, the numbers may have changed. I'd be loath to titrate out information in piecemeal fashion before it has been interpreted through peer review, and cause more confusion.

MEHRHOFF: We struggle with the White Paper on how to be more definitive or more flexible. Curtailment, for example: we might think there is a relationship with fatalities, but we can't predict the amount of benefit. Applicants can look at the data, see what is reasonable, and make a proposal. We'd rather say this is the process we want people to follow in developing their proposals, rather than define a set measure, because the state of the science is constantly changing.

BOGARDUS: This leads into adaptive management.

ALICIA OLLER: This guidance seems to focus on wind energy. It doesn't discuss non-wind sources of take that could be cumulative, but maybe it should.

FRETZ: Thank you for bringing that up. The Bat Task Force decided to propose to the ESRC that this guidance only cover wind sources of take, because it will narrow the focus of this document.

FRETZ: Item 4 concerns determining take, how it is calculated, modeled, and attributed, either for projecting take or how take has been incurred, identifying the use of the evidence of absence model at the 80% probability level as the preferred model to calculate take, some guidance on the use of the value of the rho factor, and incidental and indirect take.

BOGARDUS: I understand the intent of including birds, but for simplicity's sake we should say calculating the direct take "for bats". Birds can be calculated differently.

FRETZ: We want to make sure that the values plugged into the model are substantiated.

BURNETT: Is rho the only parameter that you have concerns about? Because that one is more subjective?

BOGARDUS: We had a lot of internal discussion at USFWS; do we apply a rho value if we don't know what an appropriate rho value is, and there isn't a good way to evaluate whether it was right or not? Can we have enough confidence in a rho in order to apply it? By which criteria would we evaluate the rho value? There is also a difference between how the rho value would be applied to a new project and an existing project.

MEHRHOFF: We struggle with rho or discount value. It makes sense for minimization of overall take level, or deterrents; it's like a discount rate. But how to look operationally within the software, if you make changes several years into a project?

FRETZ: If we can come up with some guidance for what are the limits of using rho in the model, it would be useful, as long as it can be substantiated in some way.

TRIBBLE: Would it be helpful when evaluating proposals to ask the applicants to do their calculations with and without the rho value, to justify what supports the use of that rho value, if used?

MITCHELL CRAIG: There isn't a clear way to show just how much to reduce take, including using the evidence of absence model. And because so few bats are found, it's really hard to prove anything you do to reduce take has an effect, especially in the short term; it could take years to show a statistical difference, and a marginal effect may never yield a clearly observable result.

BOGARDUS: Item 4d, the pre-operational monitoring of bat activity: it may be good to come up with a standardized recommendation for pre-operational monitoring, since there's so much variation.

MEHRHOFF: In the past we weren't sure we wanted to put that into this document; that could be a separate document. But it might be something we want to consider. It might help us better understand the cumulative impacts across sites.

TRIBBLE: It should include recommendations for duration, and altitude migration.

BOGARDUS: The level of activity at a site is often not a good indicator of future fatality, but still we should look at it as it is important in other aspects.

FRETZ: Are there public comments on Item 4?

MATT STELMACH: The discussion about 50% or 80%, since 50% was recommended by the statisticians who wrote the software, why are you using 80%?

FRETZ: I can add that to be addressed in the document. Would anybody like to recall our reasoning on that?

BOGARDUS: My recollection is 50% is the statistically most likely number, but under both Federal and State ESA laws we are required to err on the side of the species and using 50% it is still reasonable to assume take has been exceeded. 80% is a conservative approach. Even using 80% it would still be 20% likely that the take has been exceeded.

MATT STELMACH: Why 80% and not another number? 51%? 75%? 60%?

BOGARDUS: It will be in the meeting notes, but I recall it was part of the discussion.

FRETZ: I agree it's a good point. We'll get it in the guidance document.

MITCHELL CRAIG: My recollection is that a USFWS person simply said, let's go with 80% to be conservative.

FRETZ: If you are asking us to justify and explain why we are using 80%, it will be done. If in the future you want to justify why it should be 79%, for example, you can provide that comment to us.

MARILYN TEAGUE: Since this is a recommendation, not rule making or policy, can other numbers be in HCPs?

FRETZ: Yes, you can put 79% in your draft if you want to justify that.

BRITA WOECK: Can post-construction monitoring be added to Item 4d? For HCP amendments that's the most important information we use.

MARILYN TEAGUE: In 4e and 4f, can this say to use the most current standard protocols that had been published at the time the original HCP was approved, so we don't have to amend in the future if a new method increases our take estimation? Otherwise the HCP, including mitigation and funding assurances, is based on numbers that are moving targets.

MEHRHOFF: That will depend on the adaptive management in the HCP.

MARILYN TEAGUE: I don't know that our adaptive management addresses incidental findings and indirect take.

ALICIA OLLER: Right now we follow the guidance for how to calculate indirect take and incidental findings. If the changes in how take is assessed change from those original HCPs, that changes those calculations.

MEHRHOFF: We'll take a look at this again, and I understand what you're saying, but I think if there's a new way to calculate take, we're going to want to use that, rather than an old, outdated protocol.

MARILYN TEAGUE: If we're 10 years into a 15 year permit and the new method of calculating take means my estimate take has suddenly tripled, then we could be at risk of exceeding our permit.

KATHERINE CULLISON: We want estimated take to be based on best available science at the time, not less understood science from 10 years ago.

MARILYN TEAGUE: It should be set at the time the HCP or amendment is approved; that's what we've build our estimates on, our mitigation projects on, our financial assurances on.

MATT STELMACH: Shouldn't total take estimate also be adjusted if you're adjusting the way take is calculated?

MEHRHOFF: Your permitted take wouldn't change.

MARILYN TEAGUE: With other laws, like the Clean Air Act, projects are grandfathered in to the science available at the project's inception until the expected life of the project is reached.

BOGARDUS: It is part of changed circumstances for the amendments, so we can look at this there. I understand your comment about grandfathering, but under the Federal ESA, if there is new information about the status of the species, for example, that is always grounds for reevaluating the permit or HCP.

GLENN METZLER: For indirect take, could we say if there's a published, peer reviewed document that changes some criteria for the bat, then the indirect take calculation can be changed?

FRETZ: We can do that, but we also have to consider if this falls under changed circumstances or "no surprises".

BOGARDUS: In the Federal ESA, "no surprises" only applies to mitigation for a take level.

DIANE SETHER: Software should be evidence of absence or other software approved by the wildlife agencies.

FRETZ: The next section lays out guidance on fatality monitoring. Issues are recommendations on canine assisted searches, search zones, specifics on conducting trials using a non-biased method, acoustic monitoring on the nacelle throughout the period, fatality reports, and the types of data that should be included. Committee, are you good with that? Okay.

Public comments?

DAVE JOHNSTON: For 5d, in my work in California: in the past two years we started using scent dogs, and we went from detecting seven bats in the last 30 years to 43 bats recovered in the first five days. The persistence of bats there is very long partly due to the project sites cutting the surrounding grass very low. You might consider standardizing protocol for fatality monitoring. And for activity monitoring, the recent USGS research showed that when comparing video monitoring to acoustic monitoring, you only have an 8% chance of detecting the same bat acoustically that you do on video, even with very expensive, sensitive microphones. At that location, there was a greater chance of detecting bats with fatality monitoring than with acoustic monitoring. While I see value in pre-construction monitoring, I don't see much value in nacelle acoustic detectors when the USGS report shows there is a small chance of detecting bats this way that we know are there as evidenced on video.

TRIBBLE: You're not saying there shouldn't be monitoring, but you're saying acoustic monitoring shouldn't be the only method?

DAVE JOHNSTON: Yes, you should understand that acoustic monitors only detect a small percentage of bat passes. It may be more valuable to spend more resources on video or fatality monitoring.

WINTER: I'm not sure that comparing mainland migratory hoary bats and their periods of echolocation can be compared to the Hawaiian Hoary Bat.

DAVE JOHNSTON: The Gorresen et al. study I am referring to does identify that the acoustic monitoring only had an 8% chance of detecting the Hawaiian Hoary Bat. It was conducted on O'ahu.

TRIBBLE: Video is not without its challenges.

DAVE JOHNSTON: Yes, and it is expensive and I'm not suggesting the projects all switch to video monitoring. But it is a more accurate detection method.

BRITA WOECK: I don't think video monitoring should be a requirement unless it's specific in the document how it relates to compliance.

FRETZ: So monitoring on site as it relates to bat occupancy trends, you wouldn't recommend it be done on the nacelles?

MARILYN TEAGUE: I think there's value getting data at the nacelle level, and other levels. But just because there's value in that data doesn't mean it's part of the permit process and should be part of the permit issuance criteria.

FRETZ: If we wanted to know what the bat occupancy trends were at that wind site, what would you suggest that you would do?

BOGARDUS: The long term acoustic monitoring at the sites generally hasn't been tied to the fatality monitoring, and that is the question before us now. 5a describes identifying a clear, consistent pattern of Hawaiian Hoary Bat activity, and the applicant's concern is how this ties to their compliance. So is the goal here to identify long term bat activity at a specific site, in which case the monitoring method doesn't matter as long as it's consistent, or is the goal to compare bat activity between sites, in which case all sites should employ the same monitoring technique so we can compare data?

MEHRHOFF: The Bat Task Force was looking at that from both of those perspectives. Looking at the local population to determine if there was variance in bat population that was tied to fatalities, at individual sites and between sites.

BOGARDUS: As you approve take at a wind farm, is that resulting in localized extirpation, or is there something going on in the population so bats are continually moving into that site, and how is that related to monitoring activity levels in that area?

DAVE JOHNSTON: It's a reasonable goal to assess the occupancy of a species in a given area. But you can't determine population from acoustic monitoring data; it's not accurate enough.

FRETZ: I agree, and this conversation will be ongoing, because another reason to conduct acoustic monitoring is to determine the efficacy of mitigation to improve habitat for bats. If the monitoring is ineffective, we'll find out nothing.

DAVE JOHNSTON: I'm a strong proponent of monitoring bat use before, during, and after restoration at a mitigation site.

FRETZ: How is that different from wind turbine site monitoring?

DAVE JOHNSTON: The monitoring techniques are often ineffective. An acoustic monitor at the ground by the turbine is not going to detect many bats.

FRETZ: Agreed.

BOGARDUS: It should be clear why long term activity monitoring at the wind farm sites is being requested.

ALICIA OLLER: Is that considered credit for mitigation, or minimization?

FRETZ: It might make you more certain of the project impacts in the area. It's being worked on in a section for integration into this document.

WINTER: It might also help determine efficacy of deterrents.

BOGARDUS: For adaptive management, we have to know what the monitoring is to determine if the trigger for adaptive management has been met.

FRETZ: Other comments?

MATT STELMACH: Item 5e suggests the effect of wind on directionality in the fall zones, but in my analysis I haven't been able to find any statistical correlation between wind direction and the fall direction. Is there additional literature on this?

DIANE SETHER: There is a data set that examines that which I can provide to you from Texas.

MITCHELL CRAIG: We also should consider the strength of trade winds and the impact on bat fatalities.

MEHRHOFF: So we should also look at wind speed as well as wind direction.

DIANE SETHER: USFWS does not look at the effect of wind in Hawai'i because we don't have a data set available that looks at the effect of wind at any of the sites here.

MITCHELL CRAIG: The calculation doesn't include wind factors, but when Matt plotted out the fall out distribution of bird fatalities, they were predominantly on the southwest side of the turbines, which is the opposite side of where the wind hits on the northeast. The limitation is of not enough data, and not knowing when the take occurred.

FRETZ: We'll take a look at this and be clear if we're not using wind direction.

MAXX PHILLIPS: Wind speed is in the literature and should be considered, based on the newest data that bats fall further from turbines at higher wind speeds.

GEORGE AKAU: Will the downed wildlife protocol be revised as part of this process?

BOGARDUS: That's a separate process, so if you have concerns or questions on that document you can work with staff.

GLENN METZLER: The newest downed wildlife protocol was just revised based on input from DOFAW and USFWS staff and others.

FRETZ: To be clear, injured wildlife that is rescued is also take, not just fatalities.

BOGARDUS: For new projects, there is the opportunity to engineer the site design to increase the detectability of take, for instance, grass height or searchable range, so a recommendation for that should be included in this document.

MEHRHOFF: Assuming there's not some value of that habitat to other species.

BOGARDUS: Agreed.

FRETZ: Item 6 is mitigation in general and Item 7 covers specifics on mitigation. The Bat Task Force wants to include further details than what's currently in the guidance on some topics: mitigation should identify a strategy based on biological goals and objectives; preferred mitigation for bats is habitat management or habitat acquisition, and that should occur on the island where take is occurring; mitigation should be adaptive; an effective monitoring program should be included; and habitat management as mitigation should not be done using an in lieu fee approach. The \$50,000 in lieu fee was attached to specific research tasks to be done. The Bat Task Force is recommending that habitat management as mitigation be based on biological goals and objectives, not a set dollar amount.

TRIBBLE: I like the idea of habitat management or acquisition in areas that would allow bats to flourish in numbers that exceed the take associated with a project, but I don't know that we have the tools to identify a type of habitat as supporting "x" number of bats, and state that if the applicant takes certain actions on that habitat, it would support "x" more number of bats.

FRETZ: Is there more research that should get done before habitat management be done?

BOGARDUS: The annual reviews of the HCPs and the ongoing research is useful to see what the research that is ongoing is showing, although the research is still in the early stages. The ESRC will have to make some decisions however, before that research yields some answers.

TRIBBLE: Do any of the early mitigation projects, even at a 50% confidence interval, demonstrate that bats have been produced?

BOGARDUS: I think we can say some have increased bat activity.

MEHRHOFF: The Bat Task Force has been looking at how to increase the bat population by looking at research projects, and what type of mitigation would be appropriate. Another issue is when appropriate mitigation cannot be identified on an island, and there is large take, do you increase the amount of mitigation or require a decrease in fatalities? That is why we're looking heavily at avoidance and minimization like deterrents. It's a balancing act.

BOGARDUS: If the applicant is uncertain about the success of mitigation, then the onus goes back to minimization.

BOGARDUS: Regarding mitigation occurring on the island of take, for other species USFWS has allowed mitigation to occur within Maui Nui for take within Maui Nui, as populations travel between those islands. My understanding is bats are flying between those islands.

MEHRHOFF: 195D must still be met.

TRIBBLE: My recommendation to the Bat Task Force may be that as better information becomes available, that will be incorporated into the guidance as how to mitigate effectively.

FRETZ: For future mitigation projects.

BOGARDUS: Again, this can be incorporated into adaptive management but some of this is protected by “no surprises”.

TRIBBLE: These mitigation projects unfold over time, and asking to change mitigation already acted upon, such as location, or trees already planted, would be beyond the scope of what’s reasonable. But for example, we catch bats in corridors. That may be because that’s an easy place to capture bats, or it may be because bats use corridors to feed in. So the outcome of that determination would affect whether open corridors or a closed canopy forest would be preferable mitigation.

DAVE JOHNSTON: My research has shown that closed canopy forests have low bat activity, even when roads pass under them, as there are less insects. In areas with more habitat heterogeneity, even urban areas with exotic vegetation, bats are found in higher densities. Also, while a native ‘ōhi‘a forest with multiple forest layers is desirable, it will take many years to achieve. Habitat heterogeneity, in terms of multiple types of structure—grasses, trees, shrubs, different heights and spaces in between—is more important than forest presence. The bat can roost in many species of trees.

BOGARDUS: You also found high numbers of bats in gulches and wet areas?

DAVE JOHNSTON: Yes.

BOGARDUS: The preliminary research we do have shows that flat forest cover might not be as good at producing bats as a matrix of habitats.

FRETZ: In the absence of information, we set a goal that restoration should be a natural forest with natural levels of species richness, diversity, structure, and composition, as close as practicable. That is the current estimate of suitable habitat. Do we change that based on these observations of other aspects of habitat that may be suitable?

WINTER: Heterogeneity is important, particularly fringe habitat adjacent to wetlands or streams. Fencing, on the other hand, is expensive and I’m not sure that pigs have impacts on bats, so I have questions on why that’s included. It also appears to my reading the recommendations are to a climax forest?

MEHRHOFF: We were thinking of native forest as a preference, but not necessarily climax forest.

SPAIN: I think there are too many variables to state preference that particularly, knowing what some sites are like that support bats, such as the Laupāhoehoe NAR.

TRIBBLE: That site has been successful for catching bats, but that’s also because there’s a road abutting the forest, so the high catchability of bats at Laupāhoehoe NAR may not reflect their true density. From a value standpoint, a native forest ecosystem is great, but from a biological standpoint, I don’t think native forest is required for bats. Bats do well at macadamia nut orchards as well, not that I’m advocating that.

BOGARDUS: Agreed, but for biosecurity, we want native planting.

MEHRHOFF: If native forest can be provided for habitat, that's preferable because it provides more habitat for other species as well.

FRETZ: So perhaps the guidance is too narrow; there is other habitat that might be more or just as suitable for the bat. So how do we write that guidance so that mitigation can be presented that includes artificial reservoirs, some native forest corridors, or pastures, for instance, in highly degraded areas? How do we objectively assess that?

WINTER: The document could be revised to say "ecotones" instead of habitat types. Or "native ecotones".

MEHRHOFF: If mitigation were to be sited in a forest reserve, for example, or a site with other endangered species, there might be a clash there in terms of the use of the land.

FRETZ: What about acreage of percentage of native canopy? The guidance right now states 40 acres of 100% native canopy per bat. If we modify the document to stay "ecotones with native features" are we going to 90%, or 10% canopy?

BOGARDUS: Items 7 and 8 make several references to habitats that support bats. We need to say what phase of the bat life history we're trying to support. Breeding and roosting habitat is not the same thing as feeding or sheltering habitat. To Scott's point, if you take a habitat that is not supporting breeding bats and turn it into somewhere that could support breeding bats, it's easier to demonstrate the relative value of that mitigation. If we state a preference of a forest over a field, we're stating a preference for a 20-year timeline, which is a concern.

WINTER: Turning field to forest might create breeding habitat but take away foraging habitat.

TRIBBLE: We need to know what is limiting bat populations.

FRETZ: For this section, let's collate our comments and give specific recommendations on suitable habitat.

SPAIN: In habitat management of mitigation sites, land ownership, jurisdiction, and the structure of management actions need to be clear, and this can be difficult to obtain and execute, especially at completely degraded sites. We should be careful not to narrow the habitat requirements so far that we further restrict the available mitigation sites. In the habitat acquisition section, it is clear the protection must be in perpetuity, but the habitat management section doesn't address the underlying land ownership.

FRETZ: Should we request in the habitat management section that there should be a conservation easement on restored private lands in perpetuity, so that the mitigation remains in perpetuity?

BOGARDUS: On the Federal side, for habitat management the mitigation must remain until the success criteria has been met. Setting up an agreement with a private landowner for perpetuity might be beyond what most landowners in Hawai'i will agree to.

FRETZ: So 100 years?

BOGARDUS: For other species the USFWS says it is for the term of the permit or until the success criteria is reached. For bats, I might argue that habitat management should be in place from the time

the habitat starts supporting the bats for 20 years, or whatever time period it may be. A conservation easement for perpetuity for the take of individuals is extreme. If we were talking about take of habitat that would be appropriate.

FRETZ: The term of the permits is usually 20 years. The time it takes for habitat to start supporting bats might be longer than that. So we've narrowed it down to between the permit term and perpetuity. The recommendation might be a conservation easement in perpetuity, or in lieu of that, a clear demonstration of how the habitat will be managed and protected until the success criteria is met.

SPAIN: For mitigation that occurs on State land, having assurances that the land is protected in the long term is important too.

WINTER: For the question of percentage canopy, would you be comfortable with 100% native habitat, instead of a canopy measure? For instance, habitat could be a mix of wetland and canopy cover.

FRETZ: Yes, in areas that aren't roosting habitat, if the applicant explains why it provides good bat habitat. It may not need to be 100% native; corridors and firebreaks aren't native habitat.

MEHRHOFF: In forest reserves or areas of landscape-level conservation, the corridors will likely be roads or firebreaks. Another consideration is the cost of mitigation on private lands to the landowner, versus the cost of mitigation on State or Federal lands, which is often already purchased, and thus acts almost like a subsidy. We might want to consider recommending greater acreage of mitigation on State or Federal lands than would be required on private lands.

BOGARDUS: 7d needs some technical editing, but I agree with the concepts.

FRETZ: Public comments on Item 6 and 7?

DAVE JOHNSTON: I appreciate that the Bat Task Force is opening up the definition of what this document will achieve. Think of the needed habitat as all of the parts of the life cycle present, not just roosting, foraging, wetland, etc., otherwise the species won't occur in a location. I'm a strong supporter of native plants and habitats, but if your goal is to recover the species and create a robust bat population, consider other options, not just native habitat, particularly on private lands. Fast-growing tree species that could create roosting habitat faster, or adding water features. Also, there's a huge difference between activity monitoring and monitoring the success of a mitigation site. Measuring habitat use is a challenge because bats use huge areas and don't roost and remain in one place. The metric by which you measure mitigation success should be the creation of more habitat which could support bats, rather than relying on detection monitoring.

FRETZ: What kind of monitoring data would you need to have confidence that mitigation targets were achieved? A mitigation plan proposal in an HCP will be stronger if there was a clear commitment to monitoring the data that will demonstrate success.

DAVE JOHNSTON: The inherent problem with occupancy modelling is estimating a population from that data. There isn't an easy solution. And measuring a difference in occupancy might take ten or 20 years.

MITCHELL CRAIG: I think the guidance on habitat preferences should remain general until the ongoing research shows us what those habitats should be, at which time more specific recommendations could be made. Also, I don't think that public versus private land ownership should be a consideration in

mitigation. The consideration should be, can bats be created at a site, or not. To associate different “costs” with public land versus private land will sway site selection and should be the applicant’s decision. This document should lay out what should be done to create bats, and it’s up to the applicant to choose how much they spend to achieve that outcome. Another comment is wind farm sites are likely to apply to renew their permits as long as they can keep generating wind power, so this document should outline how long mitigation efforts under the old permit should be continued, to delineate between mitigation required under a renewed permit. And if a wind site replaces turbines during an existing 20 year permit term with turbines of different height or blade sweep, a new EIS and take assessment might be needed.

UNKNOWN VOICE: The State is trying to acquire and manage up to 30% of the watersheds. These are probably good bat habitat. Are there mitigation opportunities for applicants to collaborate with watershed councils conducting restoration efforts?

TRIBBLE: Some of the mitigation plans have involved working with watershed partnerships.

FRETZ: Yes, that is not precluded.

MAXX PHILLIPS: For 7f and 7g, I would like that all monitoring data be made public to assist with scientific progress and to help alleviate the public’s distrust in the process.

MATT STELMACH: Before discounting non-natives’ suitability I would suggest consulting the weed risk assessment score. Some non-native species may meet the bat’s needs and achieve success criteria faster. Also, for the 40 acres per bat recommendation, I would argue that a bend distribution or the actual median would be more appropriate than using the central measure of tendency.

FRETZ: 40 acres is a working number for the time being, so I’m open to new information or approaches.

MARIYN TEAGUE: Please revisit the 40 acres per bat. I would also encourage the use of biological goals rather than cost in the discussion on public versus private lands. Using \$50,000 per bat is difficult in an HCP to justify the results. And for restoring water features, bats seem to even like stock ponds, so be open to artificial water features as potential habitat to support bats.

MAXX PHILLIPS: Also consider whether the area was traditionally occupied by bats.

GEORGE AKAU: While most of the discussion is converting agricultural lands to forests, some studies show agricultural land is important for foraging. I would also suggest factoring in the heterogeneity of the landscape when considering the 40 acres per bat standard.

FRETZ: The Bat Task Force recognizes land acquisition as a great option for mitigation and recommends it, but had a considerable discussion about criteria. Currently habitat proposed for acquisition should be documented as presently supporting bats and that the land is under a threat that would eliminate the bats, such as development. There should be a characterization of the amount of habitat being acquired—the 40 acres per bat. C is the permanency of the acquisition; d discusses the conditions of the habitat use in the future, for example, timber. Comments?

TRIBBLE: What if an applicant acquired a parcel of land and for timber, say, logged it in sections during the non-popping season so openness was obtained?

FRETZ: The intention of this section was that the acquired land should not be used in ways non-compatible with bats.

TRIBBLE: It would have to provide a net benefit over existing habitat.

MEHRHOFF: This section discusses acquisition of land that is already suitable habitat for bats but is threatened with loss, not the improvement of degraded lands for mitigation.

FRETZ: It is a good point though that some activities, such as timber harvest, might be done in a way that could enhance, rather than degrade, a habitat.

BOGARDUS: In d, what does “degrade” mean?

MEHRHOFF: Degrade habitat suitability for bats.

BOGARDUS: Hypothetical: applicant takes 100 bats. First 50 bats, mitigation plan is land acquisition of a habitat that has bats on it. For the next 50 bats, could the applicant restore that habitat to a higher level?

FRETZ: It’s complicated and will depend on individual acquisition.

MEHRHOFF: In that scenario, the assumption is that the acquisition wasn’t great habitat, so the acquisition may not mitigate at the 40 acres per bat measure.

TRIBBLE: The onus would be on the applicant to make a credible case that they could double the density of bats on the parcel with restoration.

FRETZ: It is problematic to assume the habitat is half as good as it could be. The degraded portion may have spaces and corridors and be good for foraging, say.

FRETZ: Public comments?

MAXX PHILLIPS: What happens to the applicants if you don’t see any bats after many years? If this land that is acquired doesn’t make more bats, then what? Or if you’re saving what would have been lost, what is the baseline monitoring required ahead of time to determine if the property is suitable to acquire?

FRETZ: Land acquisition makes the case that there are bats already on the property that is under threat of development, so protection of those existing bats is what is credited at the time of acquisition. It’s hard to see how monitoring would trigger removal of the acquisition credit. The removal of the threat is the mitigation. We can expand the guidelines on baseline monitoring to show occupancy of bats.

BOGARDUS: In some instances applicants have had a hard time accessing the property to conduct baseline monitoring before the acquisition is complete, but we do need some proof that the parcel is occupied by bats.

UNKNOWN VOICE: I also recommend adding to the document that some timber harvesting may be good for bat habitat due to the creation of roosting habitat.

FRETZ: The White Paper is going to have a section on research for mitigation, but it’s not yet complete.

WINTER: The research for this species extends past the islands that have wind turbines, so I suggest research as mitigation not be limited to the island that the take is occurring on.

FRETZ: Yes, that was part of the consideration.

BOGARDUS: Be aware that research as compensatory mitigation will continue to be a challenge for USFWS.

FRETZ: We do not have a report on tiers. The Bat Task Force talked about tiers for hours, but is not ready to put them in the guidance. We don't yet have a consensus on the guidance.

FRETZ: Public comments on tiers?

MITCHELL CRAIG: Mitigation projects are very expensive and by their nature will occur in big chunks. It's beneficial to the applicants to have a way to adjust their mitigation in the long term. One of the comments at the scoping meeting was that wind farms just want to save money. Yes, wind farms want to save money, but not at the expense of bat mitigation. It behooves everyone for the wind farms to pay for what they have to, but not what they don't; tiers allow for this.

FRETZ: There was an ESRC meeting on tiers, so email Glenn Metzler if you would like the date of that meeting and the minutes to see that discussion.

BOGARDUS: The benefit of tiers is that it incentivizes applicants to use adaptive management and deterrents to avoid take reaching a higher tier. Did the Bat Task Force discuss other ways to incentive minimization and avoidance?

FRETZ: I don't think we have disagreements on the concepts. The question is are tiers the right tool?

MEHRHOFF: We did discuss the possibility in the future of credit for deterrents and other methods of minimizing existing take authorizations.

FRETZ: The last section is adaptive management: clearly defined triggers, monitoring of take rate, mitigation monitoring, the responses planned for each trigger, and how curtailment, as an example of one type of response, will be used.

BOGARDUS: It should be added that the mitigation monitoring regime should be sensitive and frequent enough to determine if a trigger is being approached.

MEHRHOFF: Also the compliance monitoring.

MARILYN TEAGUE: I encourage the use of flexible language for the inclusion of bat deterrent technology that is up and coming so that the applicant wouldn't have to amend the permit, or double mitigate, for example. An incentive might be a streamlined process for the implementation of deterrents, for instance, in place of low wind speed curtailment, if they are proven to be just as effective.

FRETZ: How do you determine what deterrent research to do?

MARILYN TEAGUE: We're a member of the AWWI, the American Wind Wildlife Institute, which has a deterrent technology task force that supports grants to organizations that are testing technology, and partners with the NREL, National Renewable Energy Laboratory's, National Wind Technology Center, which is testing UV light deterrents.

BRITA WOECK: I would also encourage flexibility and acknowledgment in the adaptive management section to accommodate new technology. Last week Kawaiiloa Wind had NRG Systems install a deterrent unit on one of the turbines to conduct a proof of concept test this summer. NRG Systems is the company closest to having a commercially available unit and is testing on the mainland. That will continue through 2018 and ideally will refine the technology. We know we don't have enough fatalities in Hawai'i to conduct a larger test, but we'll be providing a data point from Hawai'i and will also do thermal tests.

FRETZ: Is there something government can do to encourage the adoption of these techniques sooner, if we are to meet our renewable energy goals?

MARILYN TEAGUE: This was discussed at a recent AWWI and NREL meeting: how do we get these near ready technologies to market? Industry said things like needing to know deterrents work on their brand of turbines, that the maintenance costs are reasonable, that it won't invalidate long term service agreements. We're at the stage of practical commercial considerations. DOE has supported a lot of this with research grants, though we don't see as much of this in Hawai'i because the wind farms are too small to show true correlations with research.

MEHRHOFF: I'm less concerned with incorporating this into future HCPs, and more concerned with how existing wind farms that have already invested in their mitigation package are incentivized to add deterrents on top of that.

BRITA WOECK: Tiers, because as you approach a trigger, you evaluate your avoidance and minimization in combination with mitigation planning.

FRETZ: Then why are additional tiers needed? Why not put in an application just for the first tier? You would have a plan to not exceed that take.

MARILYN TEAGUE: The uncertainty. Obtaining lenders, accounting for the length of the project, etc.

BOGARDUS: USFWS is not able to permit that.

UNKNOWN VOICE: We're working with AWWI for deterrents for raptors and eagles with a DOE grant; this is the only one installed in the U.S. and it will take years before we know if it's effective.

UNKNOWN VOICE: We're also involved in offshore wind turbines with DOE. The conundrum for research is that most projects do not curtail on the mainland, so there are more fatalities to model, compared to here.

FRETZ: We've come to the end of the agenda. The Bat Task Force is expecting to bring back the next report with a draft guidance document with even more substantive issues for comments and revisions.

BOGARDUS: There is quite a bit of outdated or extraneous detail in the old Bat White Paper.

FRETZ: Yes, it's practically being rewritten.

BOGARDUS: We should be aware of the existing timelines of the HCP and HCP amendment applications out for review.

FRETZ: This document will reflect ESRC comments, so it could be incorporated into the revisions that occur at the same time public comments and other revisions are considered by the applicants. We'll keep pushing the Bat Task Force in moving along on this, but I think we're 90% on the substance of the document. It does need technical editing.

MEHRHOFF: There's a lot the Bat Task Force agrees on, except for tiers, and the rho value. Those are controversial and will take more time for the Bat Task Force to go through. But we got a lot of great feedback today from everyone.

FRETZ: Any last thoughts? No? Then let's adjourn.

ITEM 5. **Adjournment.**