NOT APPROVED

# ENDANGERED SPECIES RECOVERY COMMITTEE

## 13 MAY 2014 MEETING MINUTES

Hawaii Department of Land and Natural Resources
Kalanimoku Building; 1151 Punchbowl Street; Room 322B; Honolulu, HI 96813

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| **MEMBERS:** | Dr. J. Scott Fretz (DLNR); Dr. Steve Miller (USFWS); Dr. Jim Jacobi (USGS); Dr. Gordon Tribble (USGS); Dr. David Penn (UH Environmental Center); and Dr. Patrick J. Hart (At-large). |
| **ABSENT:** | Dr. John Harrison (At-large) |
| **STAFF:** | DOFAW: Angela Amlin; Afsheen Siddiqi; Randall Kennedy; Greg Mansker; USFWS: Jay Nelson |
| **COUNSEL:** | None. |
| **PARTICIPANTS:** | USFWS: Donna Ball; Marie Bruegmann.<br>DOFAW: Dr. Elliott Parsons; Lara Reynolds; Lyman Perry; Dr. Maggie Sporck.<br>PEPP: Joan Yoshioka; Susan Ching.<br>US Army: Dr. Lauren Weisenberger; Matthew Keir. |
| **OTHERS:** | Reginald David (Rana Biological Consulting, Inc.); Nāmaka Whitehead (Kamehameha Schools); Puaʻala Pascua (Kamehameha Schools); Eric Guinther (AECOS, Inc.); Dan Purcell. |

**ITEM 1. Call to order.**

Chairperson Dr. J. Scott Fretz, called the meeting of the Endangered Species Recovery Committee (hereafter referred to as the "ESRC" or "Committee") to order at 9:04 AM.

ITEM 1.a. Meeting Participants and Committee Members introduced themselves followed by DOFAW staff and public present.

ITEM 1.b. Fretz introduced the need for this workshop as a way to address technical issues with plants pertaining to Habitat Conservation Plans (HCPs) and/or Safe Harbor Agreements (SHAs). The staff and the Committee would like to have these issues covered in more detail so that they have more guidelines and principals to work with when these issues come up in the future. The workshop will not address specific HCPs or SHAs but will use real examples. The assumption is that the

participants have a basic understanding of HCPs, SHAs, and the state's endangered species law.

Fretz reviewed state and federal endangered species regulations. Both prohibit take of endangered species but allow for permits/licenses to be issued for incidental take under certain conditions specified in the laws. Two important differences are that the state law prohibits take of listed plants everywhere and the state law requires a net recovery benefit for any incidental take license (ITL) that is issued through an HCP or SHA.

Fretz asked if there were any questions. There were none.

**ITEM 2. DOFAW staff overview of two current state Habitat Conservation Plans and a Safe Harbor Agreement:**

Siddiqi pointed out there is a philosophical difference between an HCP and SHA though both can result in the issuance of an ITL. An HCP is usually developed because of a proposed activity that is likely to impact endangered species whereas an SHA is a partnership that the state and the landowner goes into to provide some kind of benefit to endangered species. Siddiqi provided an overview of the HCP and SHA frameworks.

Bruegmann asked if there is any difference in landowner assurances between HCPs and SHAs. Siddiqi responded that an SHA allows the landowner to go back to baseline conditions after the Agreement is over. Fretz asked for clarification if the question was in regards to financial assurances. Bruegmann stated that yes, the financial assurances or other assurances that the license holder would not have to do more than what was written into the agreements. Fretz stated that financial assurances are required and are virtually identical in the state and federal process. There are 'no surprises' sections in the laws that provide assurances as well, and in this case adaptive management can get tricky. The license holder is obligated to carry out HCP requirements, and a certain amount of adaptive management is built into that, but new burdens cannot be placed on the license holder that were not foreseen when the HCP or SHA was signed.

Siddiqi presented two approved HCPs covering plant take in the state of Hawaii. The Habitat Conservation Plan for *Abutilon menziesii i*n Kapolei (2004), on the island of Oahu has a permit term of 16 years and the Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*) Habitat Conservation Plan Kenai Industrial Park Project (2014) has a permit term of 10 years. Siddiqi provided an overview of the project impacts, baseline, mitigation, and adaptive management under these HCPs.

Siddiqi then presented a SHA from the state of California, *SHA between Pacific Gas and Electric* (PG&E) *and the U.S. Fish and Wildlife Service for Serpentine Endemic Species Located on Tulare Hill in Santa Clara County, California (2008)* which included one species of butterfly and two endangered plant species. Siddiqi provided an overview of baseline, mitigation, and adaptive management under the SHA.

Fretz asked if there were any questions or comments from the public. There were none.

Fretz asked for comments from the committee. Fretz asked for the purpose of PG&E doing an SHA. Siddiqi stated that it is possible that PG&E entered into a SHA because endangered species were already present in the area that they were working. Jacobi added that there may be a need to do more work in the area in the future, and an established baseline would provide assurances. Jacobi also stated there is a bit of confusion on when incidental take is going to occur in an HCP versus an SHA. In an HCP the take is occurring now, whereas under the SHA the take will occur sometime in the future, but there is a grey area as to when it starts. Fretz said they enhance that area for endangered species, and in the future the SHA allows them to go back to where they were at the time the SHA was signed.

Bruegmann asked if the examples had any description on the amount of area that needed to be protected under the mitigation. Ball said the SHA identified 10% of the total area for a particular species. Bruegmann said that if it is SHA then they can bring the whole area back to baseline at the end of the agreement. Fretz said yes, unless the SHA was written differently. A participant asked why the SHA example included a species with a zero baseline; was it that they expected that species to appear on the property after management? Fretz said yes, that was the idea. Jacobi stated that, in his understanding, when SHAs first came to be, they were intended not just to give armored protection for someone to do something in the future, but because they were motivated to increase endangered species presence on their property, as opposed to setting a baseline that the landowner can go back to. Jacobi was uncomfortable with the latter approach, but acknowledged that it does happen.

Miller explained that there was also a biological rationale behind SHAs. In terms of species recovery, the hope is that by increasing the number of individuals living on a landscape for some period of time under an SHA, they will propagate outside of that area and be able to establish in other areas where they can persist. Then, after reducing the number of individuals back to baseline, a net conservation gain can still be retained because of the number of individuals living outside of that area still persisting, if it happens. There is no provision in an SHA

to assure that it will happen, but that is the biological rationale behind it. Bruegmann stated that this makes more sense with species that move as opposed to plants that move generationally. Fretz said that is consistent with the State's view of SHAs thus far. For example, with nēnē, the State had a landowner that was willing to use their land for recovery, and the State wanted to remove the disincentive for having endangered species on the property by permitting future incidental take of those species. Bruegmann asked if the state has the option to go in and capture the animals if the landowner decides to bulldoze the site. Fretz responded yes, they wouldn't be allowed to have lethal take of the birds. Jacobi also clarified that this only covers incidental take. Miller stated that one critical point to keep in mind is if the species that is under the SHA only exists on that particular piece of land, then you can't take it back to baseline. If there are 10 individuals on a piece of land and that is all there are anywhere, and you do an SHA and increase the population to 1,000, you can't take it back to 10 because that would essentially preclude the species' recovery and the Service couldn't approve a SHA that would allow that to happen. The Service has to go through an internal Section 7 consultation and jeopardy analysis before an SHA is finalized, and a jeopardy determination would result in denying issuance of the SHA. But, if the species is propagated outside of the SHA area, and enough individuals are maintained outside of the area that going back to baseline does not preclude recovery of the species, an SHA is possible. When undergoing a SHA the current status of the species, the range, the numbers of populations with the SHA area and outside of it and determining whether or not taking it back to baseline precludes the recovery of the species as a whole need to be looked at ver carefully. Sporck asked if, when the landowner wants to go back to baseline, it would preclude the recovery of the species, would the landowner not be allowed to take it back to baseline? If so, prior to the landowner signing the agreement they would have to know that it is possible that they may not be able to go back to baseline. Miller responded, yes that would be the safe way to go and you would have to be real upfront and open about this with the landowner.

Jacobi commented that HCPs and SHAs are similar in some ways but are very different in others. Under an HCP, there is an action and there is an obligation to make sure there is appropriate mitigation, net benefit, and there is a strong incentive for good monitoring and baseline determination. SHAs are a different thing altogether, because there are a couple of different situations. SHAs with a zero baseline generally take the approach that any additional production is positive, which could work. But even in a zero-baseline situation there are potential problems, such as creating a population sink. In a non-zero baseline situation, a whole lot of issues in terms of determining the baseline, taking things

down to baseline, determining where are you relative to baseline, or looking at trends over time can be difficult. The straight science answer is to design a monitoring and assessment program to determine baseline with variance to compare to the future. In some cases, that is a lot of work, especially with very rare species, and can be an extremely expensive proposition. Jacobi feels this is the real challenge with SHAs; understanding the development of a scientific program in determining the baseline, monitoring, change, trends and what the net benefit is versus the obligations of the license holder. How do we get to get to a point where we are not creating a negative situation where we don't have enough data to really understand what is going on before it is too late. This workshop will hopefully help to determine where that line is.

Penn stated that perhaps the programmatic approach, such as the SHA established in Molokai, could help. Penn asked for the status of that agreement. Fretz responded that even though it was done in the past, based on more recent advice from the Attorney General's office, it is unclear if the state can do programmatic agreements under State law. What can be done are multi-landowner agreements, and sometimes there is not much difference between the two.

Kennedy stated that a few years ago the watershed partnerships looked into doing a multi landowner SHA, which was driven by the funding available at that time. For many reasons that Jacobi described, the SHA was not further pursued, but it was questioned whether this should be pursued again. Fretz commented that the situation has not changed. SHAs are hard to do, cost money, and are technically complicated. In circumstances where incidental take is not expected or the landowner has no intention of going back to baseline, then the landowner usually chooses not to pursue a SHA. Kennedy stated that the funding incentive also went away.

Fretz asked if there was anything else on Item 1 or 2. There were no additional comments.

**ITEM 3.** Population Baseline Determinations.

ITEM 3.a. **Population Estimates. Certain plant species-specific characteristics (e.g., growth form) can make it difficult to accurately estimate population numbers.** Determine if other factors besides number of individual plants can be used to define baseline for Safe Harbor Agreements and Habitat Conservation Plans.

Fretz introduced Item 3, quantifying the number of plants in the area when the situation is such that distinguishing between individuals of the species is not possible, inappropriate, or not that useful.

Amlin reiterated the importance of determining baselines and addressed what to do when species-specific characteristics such as growth pattern make it difficult to do so. Amlin presented two cases. The first example provided was the Hawaii endemic fern *Asplenium peruvianum* var. *insulare* which spreads via rhizomes making it difficult to assess how many individuals are growing in an area. The second example presented was *Vicia menziesii*, a vine where several stems can shoot off from one individual. How should it be determined how many individuals an HCP applicant should be mitigating for, or what should the baseline be for a SHA? In some cases such as mosses, vines, or ferns, would it make sense to approach these questions with a range, percent of area covered, or measure total cover? Amlin presented options to address this baseline question in both SHAs and HCPs. Three options presented were: 1) use baseline population number ranges to account for error/variability; 2) use a single number (*e.g.*, range midpoint or lowest number in range for SHAs or highest number in range for HCPs); or 3) use percent cover per area measured or total area covered. These examples were presented as a starting point for discussion and are not to limit other possibilities that may arise during the discussion.

Fretz asked for clarification for the difference between the HCP and SHA baseline determination. Amlin clarified that the only difference was in the use of a single number as determined by the lowest versus highest number in a range estimate. The SHA would use the lowest in the range and the HCP would use the highest, accounting for the difference in the nature of the agreements.

It was noted that annual plants would also be difficult to estimate due to the variability of the species and the differences in presence due to weather conditions. Amlin stated that seasonality would need to be considered to take into account those differences. Bruegmann stated that *Sanicula* can remain dormant below ground for a year. *Sanicula* is characterized by a large underground structure that sometimes shoots out leaves and flowers above ground, while other times it will not, but is still alive.

Bruegmann asked if the goal is to have a set of guidelines at the end of the meeting. Fretz said that the agenda is ambitious, but he believes that realizing guidelines on some of the agenda items may be possible. Fretz asked the Committee to also weigh in on what type of guidelines are needed. The Committee should also weigh in on what the appropriate product should be from the meeting that will be most useful in the future.

Jacobi suggested coming up with a list of ways to do this for different morphotypes. Build in flexibility to tailor different approaches for each species. He stated that this meeting is more about coming up with guidelines on how to

approach these issues, rather than developing a specific detailed set of protocols on how to sample plants/vegetation. When a specific project is being proposed, then we should come up with protocols. Fretz stated that we are in the preliminary stages of this discussion and we don't really know the outcomes, so we should revisit this question of protocols at regular intervals.

Miller discussed the differences in coming up with baselines for different species based on the rarity of the species. If it's an extremely rare species, it might be important to invest a lot in knowing how many individuals are out there. Do they represent vegetative units of a single individual? Are they unique individuals? On the other hand, if it is a more abundant species, then a simpler technique may be used where less attention is paid to actual numbers of individuals present.

Ball stated the species analysis that has to be done will weigh heavily on whether a high level of count is required or whether a range is sufficient. The land owner cooperating in the SHA needs to show net benefit over time. From that perspective we need to consider what is fair for the landowner, especially for species that are extremely rare as opposed to those that are better represented. Miller agreed that when going back to a baseline it is critical to know what the baseline really was for a rare species. For a less rare species there is more flexibility.

Jacobi expressed concern that all species should have a good baseline with the same confidence for SHAs because things can change substantially over 25 years and having a good baseline is important. Jacobi stated he is uncomfortable with being inconsistent in coming up with baselines for different species based on their rarity. Miller agreed that it's important to have the same level of confidence in achieving a baseline for all species, but achieving that kind of confidence for all species is hard. He reiterated that it is more critical for very rare species and those may also require a substantially different sampling approach.

Ball questioned the percent area cover approach. Is it being looked at from the standpoint of the area that is being protected and managed for the same purpose? Is the same treatment going to be given to all species in the landscape? Is that how Option 3 works, or is it by species percent cover? This could be tricky for some populations because they could all be clustered in particular areas of the landscape.

Jacobi mentioned another dimension to Option 3 for a SHA is that there are two kinds of information that we are dealing with: locations - where the populations are present – and then within the locations one needs to consider how to look at the populations.

Miller stated that in determining what kind of approaches to take we need to think about what happens when it goes for a section 7 analysis. What if they say that they cannot make any sense of the information that is presented as percent cover. We should try to avoid the problem by knowing beforehand what kind of information the FWS would need to accomplish the analysis. If the FWS were to sign off on a SHA, it's a federal action, so they do have to consult on impacts. Fretz agreed that even though a plant SHA may or may not go through the federal ESA process, we do want to make sure we are consistent with the ESA policy.

Tribble asked if there is a way to deal with a reduction of a species present on a landowner's land, for example, from 1,000 to 500 individuals. What would be used to assess this decline, a recovery plan? Miller said that it would involve a Jeopardy analysis. If there is a recovery plan in existence then that would feed into this analysis. Bruegmann stated there is a process but no single answer because it will be species and site specific.

Yoshioka stated that from a PEPP perspective there are currently 235 taxa that fall under their purview, and a majority are T&E species. For some species it makes more sense to identify the population, such as ferns, rather than determine exactly how many individuals there are. The case where it is difficult to count the individuals is only a small number of taxa, with the exception of some ferns. *Tetramolopium lepidotum*, for example, would be difficult, there could be 15 or 500 in an area. For some of the vines, like *Vicia*, it is important to know the exact number of individuals and where they are located, because if a single stem is cut the whole plant would die. Since all species do not need individual counts, it is important to know what species we are dealing with first and then have a discussion on guidelines. This discussion could go broad and wide and have multiple layers of input.

A member of the public tasked about programs available for rooftops. Can rooftops be incorporated for planting? Do programs exist for large distribution facilities? Fretz responded, yes like anywhere else where a landowner wants to propagate or enhance a listed species in a particular manner, they might be interested in a SHA, but the committee would have to look at the net recovery benefit. Just because one is planting plants, does not necessarily provide a net benefit to the species.

Fretz stated that if all of a sudden the numbers increase, then the monitoring methodology may change. In the beginning, for example, you could do a full count if numbers were small but as numbers increase then one may have to change the methodology to a series of spot samples. A participant summarized important points she understood: the threshold for species rarity determination

could utilize PEPP or botanist's rare species lists. Additionally, the baseline data timeframe of information collected is important - perhaps getting a range of years for baseline data, initial surveying, and perhaps a range of 5-10 years of data to get the baseline. Jacobi agreed this is a challenge.

Fretz stated that for most listed plants you can count individuals and when that's the case that is what you should use. It was agreed that for certain plant species, due to reasons such as morphotype or not wanting to cause damage to the plant by walking through the area, that an individual count may not be possible. Jacobi provided an example at Hakalau National Wildlife Refuge, *Clermontia lindseyana* would be impossible to count the individuals. Yoshioka stated that the sampling methodology is critical. We should sample in a way to get a relatively accurate number. She asked what kind of sampling has been done in other SHAs in other states for T&E species elsewhere. There are thousands of individuals that could be included on a property. Amlin answered that this varies widely, and provided an example of a tiny plant in a backyard in California where baseline was determined by area of plant coverage, but reiterated this varies widely by state, by plant, and by size.

Jacobi said that a review of SHAs and HCPs around the country he worked on found that less than 25% had quantitative values attached to them. It is this way because it is challenging without  a good set of protocols to sample the different species.

Ball asked if there was a good sense of species that have a pretty high annual population variability? In the SHA, could you then use a range for species that exhibit high variability and could an approximation be used? Jacobi stated there is already some thought going into these issues by the PPRCC (Pacific Plants Recovery Coordinating Committee). The Committee could come up with a category for species with high variability and guidelines on how to approach these species and this would be very useful to have as long as people recognized that they are guidelines. The second part as to what kinds of measures we still need to get to, and would depend on the site.

Bruegman stated that the use of ranges is troubling. Conservation folks will go for the high end of the range and whoever wants to have an impact on the species will go for the low end of the range. Fretz asked what if it the range was a statistical estimate of a sample with a confidence interval, would that be acceptable? Brugeman agreed that a statistical estimation is different from a range. It was discussed that a range is a rough estimate but could be presented with statistical vigor. Jacobi stated that a range with a confidence interval or a single number are both acceptable measures for a baseline. Jacobi further stated that when one is

counting, the first time has no confidence interval. It is only if there are multiple counts because of seasonality or larger populations then a confidence interval comes into question. Jacobi again states that a range is only a rough estimate, and you cannot be sure how repeatable that range would be.

Jacobi summarized that the general agreement is that only two types of counting are acceptable: 1) either an estimate of what the population is with a confidence interval or 2) an actual count of the individuals.

Fretz brought the discussion back to the topic of different morphotypes and considering what would lead one to use different methods to count them. Parsons provided an example of plants that have a growth form of reproducing from runners as an example. One species in particular we only know individuals because we have been watching them, but we would never know otherwise and as was mentioned previously we would be having to trample the area in order to make a count. Perhaps in this case we would need to know area versus trying to count stems. Jacobi suggested that we need to think about the overall goal is a measure positive or negative change and identifying if there is a problem or if they are successful. It could therefore be determined in various ways, either with a total count or with a sample number of individuals or an area. All these are adequate as long as one is consistent and we sample in an appropriate way in order to make a future comparison with. Again there are two main dimensions that need to be assessed: one is number of locations and second what is happening within each location.

Miller stated that we have to also think about what is this baseline supposed to be doing. To answer that we have to know what the conservation goals are, because that is what defines how you measure the change. For example, you could want to look at the genetic structure of a species within the conditions of a SHA. Or perhaps how much land area is covered by a species, in which case you could go with a simple measure of percent cover. Once you decide what the conservation target is, then you can come up with a baseline to know when you achieve that conservation target.

Bruegmann stated that life stages come into play here. In many T&E species in Hawaii, a lot of the populations currently present consist of old adults. What if you don’t see a change in numbers, but an increase in younger plants in different life stages; this would be a conservation benefit. A participant stated that are we not considering the probability of extirpation of the species at a site. For example, in very low populations, if you have more younger plants without changing the baseline numbers you may have a higher probability of extirpation in the near future.

Jacobi stated that having a zero baseline is different from when there is something there. It is less of an opportunity for plants than birds. If it's a zero baseline, then all you have to think about is presence as a net benefit, if it's a non-zero baseline that is when these issues of counting come into play. That is the decision point in a process - if it's zero baseline then the focus is net benefit. If its non-zero baseline then it is a little more challenging.

Fretz summarized item 3.a. by reviewing a flow chart made by meeting participants that showed the group consensus. The chart provided two scenarios: 1) if plants could be counted, statistical confidence should be used and should take into consideration the genetic structure and dispersion of the species and 2) if plants could not be counted, then area estimation should be used. Jacobi pointed that location level (population units) is missing in the chart. Fretz said this would be addressed later. Fretz also stated in addition, how to determine that a species cannot be counted and instances where you can count individuals but that the numbers cannot accurately be estimated should be considered.

*Summary, Action Items, Deliverables:*

A flow chart was developed (Attachment II) depicting two scenarios:

I. If plants can be counted, then counts should be used taking into consideration:
   a. statistical confidence
   b. health and vigor
   c. genetic structure and molecular studies
   d. dispersion methods

II. If plants cannot be counted, for any of the following reasons, then an estimation of area of biomass should be used:
   a. rarity
   b. annual variability
   c. morphotype, reproductive mechanism
   d. practicality, feasibility

ITEM 3.b. **Plant life stages. Plant life cycle stages are often simplified for conservation purposes and grouped into three main categories: seedlings, immature, and reproductive individuals.** Determine the stage of the plant life cycle that should be counted towards a baseline (*i.e.*, dealing with seedlings and immature stages of plants).

Siddiqi introduced the topic and mentioned that the precedent has been to include the seed bank for Hawaii, referring to two examples of approved HCPs in Hawaii,

the *Abutilon menzeisii* HCP and the Kenai Industrial Park HCP. In the *A. menzeisii* HCP, no seedlings were present, but there were mature and juvenile plants that were present and counted. The seeds could be possibly reclaimed from the soil but the protocols were not set up and no numerical estimations were provided. For the Kenai HCP there were mature and flowering and early seeding plants present. Because the Kenai HCP plants were located in a harsh environment it was not likely that a seed bank could be collected form that area. Both HCP examples did not have seedlings present.

Jacobi pointed out that most important components of the populations are the adult plants and the plants that become adults. The other two stages are an indication that the process is working toward an established population. Seedlings are not pooled into the total count for the assessment by FWS. Bruegmann pointed out that counting the seedlings was hard because many do not survive and so they cannot be included. Jacobi said that seedlings cannot be consistently counted in any habitat. Fretz and Jacobi agreed that only the mature plants should be included as **“**compliance currency**”**.

Amlin put forward two potential options for SHAs: 1) to count the mature reproducing plants only; 2) to count mature and immature plants. For HCPs, count plants at all life stages including the seed bank based on the set precedent. She suggested that since the standard protocol was to exclude seedlings, they could reconsider the HCP option.

Jacobi and Bruegmann said that it is important to count the seedlings, just not for compliance, but questioned if it was practically possible to count the viable seedlings in a seed bank. Fretz said that it was not practical. Jacobi said it was possible but it would require a lot of work and may not be practical. Miller thought that it may be easy to determine if the seed bank was present but difficult to quantify the seed bank. Jacobi stated that another aspect is that different kinds of seeds were more viable than others and in many cases we are just learning this information or simply don’t know.

Jacobi summarized the discussion that the guideline should not include seeds. Everybody agreed on not counting the seed bank, but Bruegmann suggested that they should consider how they would mitigate for the loss of a seed bank in an HCP. Fretz provided an example of a parking lot proposal that would be built on land that has a seed bank. He asked if the agency would consider the loss of a seed bank as a take?

Miller thought that if the loss of the seed bank was critical for the recovery of the species, then it would be important. Fretz agreed that it could be an exception if the species was in Jeopardy or highly endangered then the loss of the seed bank

would be considered. Jacobi mentioned that in the case of seabirds, indirect take is considered in the take estimation including: 1) the known take, 2) the unknown take, and the 3) indirect take which is the reproductive potential. Fretz said that adults and juveniles were counted separately for birds, if an adult was taken for example then an adult was replaced, and the same for a juvenile. However he thought that the unknown future reproduction was not counted if an adult or juvenile was replaced.

Penn used the example presented earlier in California where if a mature reproducing individual was present, then there was a seed bank associated with it. But if the baseline was zero, and they knew the plant was previously extant, they then factored in a seed bank without any quantification involved. Jacobi asked if the baseline was zero for a plant, should the effort be made to determine whether a seed bank was present at that site?

Miller said that a program can be designed to do that kind of assessment, but there are practical limitations and the danger of Type 2 errors because they would first have to determine that there were no individuals and only seeds. A participant asked if a sample could not be taken to determine if there is a seed bank present. Jacobi said that it could be done but the agencies needed to weigh in on whether they had the capacity to do so. Miller said that presence or absence was different, but how would one quantify something like a seedbank. Jacobi & and Bruegmann thought that this could be done based on how valuable or rare the species were. If it was an extremely rare species being considered, it would be important to determine if there was a seed bank for the HCP.

Fretz summarized that taking seed banks into baseline consideration would be an exception and the circumstance of the exception would need to be explored. Bruegmann said that, for example, if there were only 234 individuals left of a species that would be considered an exception. Mansker stated that this issue would only be for those areas where there is development occurring, and it is unlikely that a seed bank exists for very rare plants in those areas. Parsons provided an example of the Ukiuki where the seeds are persistent and long-lived and may not come up for years, and other species like Halapepe that have short-lived seeds, therefore species should be considered.

Fretz said that a criteria could be determined that would have a small set of species that should be on the radar for seed banks. They would be rare PEPP species and those that have long-lived viable seeds. Bruegmann asked how many species do we know of that have long-lived viable seeds? Jacobi clarified that if a seed bank persisted for a year in the soil after the adult plants have died then it is considered viable, and there are only a handful of species that there is information

on. Jacobi recommended this be considered but noted that this was not very practical with regards to compliance issues.

Fretz introduced the next life stage - mature/immature plants. In plants, the survival of immature plants is so low, should you disregard them? Bruegmann said that this would depend on the species, but it is important to have a feel for more than just the impact to the mature individuals. For example, there could be a few mature plants that lasted for 25 - 30 years with no immatures around and therefore would not be considered a very functional population. It is important to get a feel for how many immatures are out there because it would indicate if the population would replace itself or if it would likely go extinct. Kier thought that it should just be a presence/absence assessment and would not need to be quantified.

Jacobi reiterated that the immature plants, other than seedlings, are going to be very important to count and tally. Bruegmann thought that for some species that had long life stages it would be important to count a couple of stages of maturity. Jacobi believed that immatures and seedlings were an indication of how viable outplanted populations were. Bruegmann asked to clarify the definition of mature plants and if it would be based on whether it was flowering, seeding, and reproducing plants. Jacobi said that flowering and fruiting was how they judged maturity. Kier mentioned that sometimes it is based on evaluations in the field where if plants looked like they could flower based on size, they would be counted as mature individuals. Miller mentioned that some flowering plants may not produce fruit due to lack of pollinators, but would still be considered mature plants. Jacobi said that a monitoring program could be developed that tracked everything, but this could take a lot of capacity to do and may not be workable for a landowner entering into a SHA.

Parsons raised the example of the Puʻu Waʻawaʻa HCP currently in development that had 12 - 13 plant species over a huge area, and a huge amount of sampling effort has occurred over the years. Parsons pointed out that some plants flowered after a couple of years of being outplanted and some did not flower and fruit for over 10 years, there was a large amount of variability. He said that although plants were present everywhere, they may not be reproducing at all. Parsons further added that net benefit could be evaluated by how many life stages are present in the population. Understanding the demography of a population would take intense long-term studies and how to get to a positive population growth rate is a really difficult question.

Fretz asked if baseline surveys had included immature plants and/or if this should be considered if the age structure is what is important for viable populations. Kier

thought that it was important to keep matures and immatures separate in consideration of take and replacement to be considered in the mitigative actions. Bruegmann stated that, for seedlings, counting presence/absence only but having separate counts for immatures and matures would be important. Fretz asked whether sub-adults need to be considered in mitigation for HCP or should they just focus on maintaining a self-sustaining population including the appropriate age structure of the population. Further, how much variability is required in the age structure for baseline? Jacobi stated that the demography is important to determine if the population is self-sustaining. Ball also stated that, in some cases, it would depend on the length of the agreement, how many mature/immature individuals are present, and how long it may take until the plants mature. Parsons and Perry stated that often sub-adults are not found within populations the rare plants.

Yoshioka stated that PEPP species are those taxa that have 50 or fewer individuals, and those individuals include mature and sub-adults. PEPP sometimes counts seedlings – not toward the baseline, but seedlings are noted as age structure is very important. Sub-adults are important for genetic material and important for the recovery for the species. Ball said that for PEPP species she could see the importance of counting sub-adults, but for all other species under HCPs and SHAs, should sub-adults be included for both? Yoshioka said that even splitting the sub-adults into two different categories might be appropriate for some species, excluding most forest plants species.

Fretz posed a question that if there is an inherently low survival of sub-adults in an example population of 10 adults and 20 sub-adults, then a target of 10 adults would be a clear mitigation target. Is a target of 20 sub-adults also a solid mitigation target or is there some variability in that? Kier stated that this is something that will vary depending on the life history of the plant; a plant may live for 2 years where another may live for 100 years. For those immatures that are 40 years old that haven't flowered yet, counting those would be very important compared to a species that can mature and die within 2 years.

Miller confirmed that the life history analysis of the plants would be included when the Jeopardy analysis is done. Jacobi asked if the life history analysis is done before they go public with the ESRC or after? Ball stated that it would be before. Jacobi clarified that the FWS would do a determination on each species to make sure that the action did not jeopardize the species' existence. Fretz discussed that under state law a similar analysis is conducted, and if issuance of the take license would cause Jeopardy for a plant species, it would not meet the net recovery benefit requirement. Bruegmann mentioned that net recovery benefit is different than the definition of Jeopardy.

Jacobi requested that when the SHA/HCP package comes before the ESRC that Jeopardy analysis report be provided in the package. Fretz stated that his understanding was that the FWS always did a Jeopardy analysis when they did a SHA or an HCP, and in the past it occurred at the same time that the ESRC was working on the document. Miller said it could be concurrent but it would be important to do it ahead of time.

Jacobi summarized the discussion and highlighted that we have resolved that everything gets counted/tallied and what is counted for the baseline and compliance side of things has been resolved. If a seedling is seen it is noted and counted, but in terms of baselines only mature and immature plants are counted. Yoshioka said that it should be noted that immatures can contribute as much to the recovery of the species as the matures. Jacobi asked if the HPPRCC could help with creating some of the guidelines for the issues that have been addressed today, such as which plants go in which category. Bruegmann said that she has done some of it and would like other experts to step up.

Fretz reiterated Jacobi's summary and asked if there were any other questions or comments. There were none.

*Summary, Action Items, Deliverables*

The conclusion under this item was that all ages/classes are accounted for in the following manner:

I. Seed bank. As a general rule, the seed bank would not be included; however, there would be certain exceptions including:
   a. Extremely rare (PEPP) species.
   b. Plants with long-lived viable seeds (*i.e.*, persists in the soil for 1+ years after the adult plants have died).
   c. Other species as deemed appropriate by the ESRC and local experts.

II. Seedlings. At the bare minimum presence/absence should be accounted for. A numerical count or area estimation (based on outcome of flow chart analysis in item 3.a.) would be preferable. However, seedlings are not included in the baseline.

III. Immatures. Always included in baseline.

IV. Mature adults. Always included in baseline.

It was proposed that the HPPRCC could assist with development of some of the guidelines, such as which plants go in which category, specifically I.b. and I.c. above.

ITEM 3.c. **Delineating population units. Plant population units may be separated geographically and possibly genetically and as such not exhibit cross-fertilization deeming them to be a discrete population.** Determine if baselines should delineate population units and if so, how are population units defined?

Amlin introduced the topic of whether to delineate between populations due to geographic or genetic separation on the same property, and if so how would population units be defined? She referred to an example SHA where 1,000 plants within 78 units were described. However, the SHA did not distinguish how many numbers of plants were in each unit, but rather how many units existed and how many total plants were present overall. In the Puʻu Waʻawaʻa HCP example, number of individuals across a certain number of units would be described. In those cases how should these be defined: 1) by the total number of plants in the total number of units; 2) total number of plants in each of those units; 3) defined by distance; or 4) total number of plants and not distinguish between the units. Additionally, the units may be separate at the beginning of the agreement but may merge together into one large unit over the next 20 - 30 years. How should this be accounted for in the course of determining the baseline?

Bruegmann said that FWS struggled a lot with this. It is almost impossible to define a biological population on the ground because of lack of data. She said that for Makua, a FWS staff member did a literature review on gene flow and found that typically 500 meters was taken as a guideline to distinguish between populations, therefore FWS doubled that distance to be conservative. However, if there was a physical barrier that would keep pollinators apart, then that distance could be shorter. A gulch species in three different valleys close together could be three separate populations. But three planted areas in a flat area would probably be considered one large population; or there are species like *Pritchardia* that has historically been one big widely spread population.

Bruegmann stated that the idea is to try and incorporate some biology into the decision and to also not put ‘all your eggs in one basket’, so in the case of a storm or fire, not all populations are lost. Jacobi stated that the intent is to make sure that the populations have viability over a large dispersed area. Bruegmann said that the research showed that they really need to protect the range of the species because the genetics are so different. For example, a small population in one isolated area could have the genes that could get the plant through climate change.

Miller said that it is quite possible to define populations using neutral genetic markers and standards for transmission of those neutral genetic markers. It’s not cheap but it can be done. Ecologically significant units can be established. It has

been done for certain species in the Waianaes and can be stepped down to management units. From those management units, using genetic markers, populations can be identified for management over the range of the species. This takes a lot of time and effort and money, but it can be done. It results in an excellent outcome in terms of managing the genetics of the species, the physical range of the species, and the population dynamics within all of that, but this is potentially cost prohibitive for a landowner entering into an SHA. A simple solution is to identify the range of the species and manage the population across that range. Jacobi stated that the bottom line is to make sure that an SHA does not make it worse for the species and that it is critical for the FWS and the State to define what those criteria are.

Miller said it comes back to net benefit to the species. It's not hard to come up with a net benefit if you are increasing the number of individuals on the landscape. He was also concerned about a Jeopardy analysis with a 10 or 20 year SHA. The difficulty is in projecting what the impact of going back to baseline is going to be on the species in 10 or 20 years. What assumptions should be made about the net benefit and how the species has benefitted in areas outside the SHA? This is a frustrating issue that the FWS is trying to deal with in.

Fretz asked for clarification on when a Jeopardy analysis would be required for a particular project. Miller said that anytime there is a federal action, they have to do a Section 7 consultation on what the impact of the federal action is. Bruegmann asked if the trigger for the Section 7 consultation was that FWS sits on the ESRC. Fretz clarified that sitting on the ESRC does not require a Section 7 consultation on an SHA or HCP that the State has done. For example, in the case of a private landowner who has no federal funds and wants to build something on private lands, the FWS will sit on the ESRC at the request of the State, but will not do a Section 7 consultation. Jacobi added that the ESRC will determine whether the biology is sound and the baseline determined for the mitigation actions is appropriate. Miller clarified that if the State wanted the FWS to sign off on an SHA then they would have to do a Section 7 consultation. Fretz thought that the applicant could legally claim that they don't need to comply with the Federal ESA as in the case of the Kenai HCP with regards to take of plants. Miller stated in that case the FWS would not be doing a SHA or HCP.

Fretz summarized two issues being discussed. First is the question of how the spatial distribution and numbers across the landscape, that may or may not fall within different populations, are represented in the baseline. In this case if spatial distribution is well documented and the dispersion is set as a target then this could be good approach. Fretz stated that the second item was less clear regarding the question of how the genetic differences in the landscape should be treated. So are

we stating that, in addition to setting the dispersion targets, additional genetic analysis on plants needs to be conducted? Or would the dispersion targets suffice? Jacobi expressed that for an SHA the genetic analysis would be too much. Fretz concurred and stated that for an HCP it seems to be as well. Miller stated that in a SHA the landscape is limited and a genetic analysis would not be required. Fretz further questioned with an example of an HCP for 13 species across 80,000 acres, would the applicant be required to do molecular genetics on all of those. Bruegmann said that would not be the case and it had never been done. Jacobi suggested that SHAs, HCPs, and Section 7 consultations are currently working independently and that they should all work together within the matrix of recovery. That would give the FWS, the State, and the Army the opportunity to combine resources such as looking at genetics and recovery options beyond just one project. To make a linkage between these different efforts makes them viable. Brugemann stated that just looking at genetics on one landowner's property is not going to provide much information in the whole scheme of things. Jacobi stated that there is a tremendous opportunity to do some of this work without burdening the permittee. Ball stated that there are a lot of plant facilities that exist and have genetic material and could be part of the tools that can be used for the recovery of the species. Miller stated that SHAs/HCPs could be used in identifying outplanting sites to arrive at a net benefit, and generating a seed store, or keeping a seed store fresh can be made part of the HCP process, which would constitute net benefit; such possibilities like this exist.

Kier stated the importance of determining how units should be delineated and how collections should take place. In his experience, he has observed that baseline determination can be slightly manipulated so that when there is an opportunity to combine population units, for example, then the baseline could drop in half. So if the merging of units occurs, he recommended that the populations should remain as two separate units.

Bruegmann said that maintaining dispersion across a landscape is simple for SHAs but for HCPs there could be a different issue because of the need to mitigate somewhere else and the importance in terms of how mitigation efforts are spaced. Bruegmann gave the example of *Abuitilon:* the establishment of populations at three other sites had to be mitigated for the take of the one population. The question of how the populations are spaced is important and needs to be delineated. If one population is being taken, where the other three areas are spaced and how those plants are spaced within the locations are also important. Some separation is important and it also reduces some of the gene flow. Fretz asked if this has to do with distributing risk. Bruegmann replied it was both risk and biology.

Fretz stated the item was thoroughly discussed and closed the item followed by a lunch break.

ITEM 3.d. **Out-planted and founder plants. Plants may be propagated outside of their natural environment (i.e. in a greenhouse setting) and out-planted back into the wild in appropriate habitat (or the best possible habitat available at the time) for various reasons. Out-planted plants may have lower survivorship due to inappropriate site selection (sometimes due to lack of availability of appropriate high quality sites) or low genetic variation that potentially limits long-term survival of the population.** Determine how to account for previous outplantings within a project area for an HCP or SHA, should those outplanted plants be included in baseline numbers along with founder plants? If including outplanted plants in baseline, determine at what point from the time of planting should they be included.

Fretz introduced the topic. Amlin presented the challenges of dealing with outplanted plants, including lower survivorship and different genetic makeup and variation than founder plants, and posed the question of whether and how outplants should be included in baselines. Amlin listed three options and provided examples of each: (1) include founder plants only and excluding outplants and their offspring due to inherent risks, (2) include founder plants and the mature reproducing offspring of outplanted plants, (3) include all plants present in baseline.

Jacobi asked if there is a FWS policy on this in place. Bruegmann stated there is no distinction. Sporck asked how FWS counts plants. Bruegmann said she only counts plants if they are mature. Sporck asked if the mature offspring of an outplanted plant would then be counted. Bruegmann said yes, but the iffier question is whether you count the outplanted individual when it is mature.

Amlin stated that in some cases we encounter situations where outplants and the mature offspring of those outplants may be present on the same site, but if monitoring conducted prior to baseline determination was not sufficient, we may be unable to distinguish between outplants and their offspring. Miller stated he did not believe that knowledge was that critical as long as you know how many outplants were present.

Jacobi asked how the Army counts plants. Keir responded that the reported number includes outplants. Keir clarified that all plants are counted separately, but the total number includes outplants plus wild plants.

Bruegmann stated there are additional issues, such as whether the plant has been planted in a place where you really want to establish a recovery population.

Bruegmann stated that she would not count the plants unless they are located in suitable habitat where it is expected that they would have occurred in the past.

Miller stated he would not count outplants as part of the baseline, and would only count those that naturally establish as a result of the outplanted individuals reproducing. Since prior to actually planting there is no way of knowing if the plant will survive, Miller stated that once the plant survives and produces offspring it then makes sense to include those offspring.

Bruegmann stated that, according to the Endangered Species Act, the plant is wild as soon as you put it in the ground.

It was asked whether you would then only count the offspring, or if you would count a reproducing outplant itself. Miller said that to keep it clear and simple he would only count the offspring. Yoshioka concurred and stated that PEPP identifies outplanted populations as experimental plantings. She further stated that in the early stages of outplanting you are often planting propagules of a single individual, so you are potentially creating an arbitrary and skewed population, so in order to equalize the population you introduce propagules from different founders. Yoshioka stated that she thought this approach would be favorable to landowners as well. Miller agreed, and stated that if outplants are planted and subsequently die after being included in the baseline, the landowner is then responsible for them.

Sporck asked what about older outplants that have been there for a number of years. Miller replied that parsing the outplant count complicates things for both the landowner and the biologists doing the monitoing. Bruegmann asked if the 35,000 reintroduced silverswords had been outplanted on private land, would the baseline then be considered zero since they are all outplanted first generation? Fretz stated that it is problematic to count them because it creates a huge disincentive for people to do recovery work and contribute to conservation, and suggested keeping that in mind and taking a broader view of experimental populations. Bruegmann asked where the recovery benefit comes in if the baseline can be taken back down to zero. Jacobi replied that the recovery benefit comes in the second generation. Miller pointed out that if an SHA was done for silversword, for example, the timeline of the life history of the species versus the timeline of the SHA needs to be taken into account to ensure conservation benefit.

Parsons asked if one would be liable for the take of outplants. Miller replied that if there is a federal nexus, yes. Bruegmann concurred and said that the ESA states that once they're in the ground they're wild. Jacobi asked if the FWS signing onto an SHA creates a federal nexus. Bruegmann and Miller were unsure. Jacobi asked alternatively, what would it take to get a designation of an experimental

population. Miller said it was only applicable to threatened species. Bruegmann stated that it would have to be done under ESA 4J, but has never been done for plants.

Fretz reiterated that it is difficult to find willing landowners to participate in SHAs when the process is so prolonged and difficult, and asked if it was possible to explore experimental designation under state law. Bruegmann said that with a federal nexus the ESA would still come into play. Fretz asked if there is any room for flexibility within the ESA process to leave outplants 1) out of the baseline for an SHA, 2) take under an HCP, or 3) take under Section 9. Miller replied that the take would count as a take. Bruegman agreed. Miller stated that he was unsure about the SHA baseline and said that question may need to be elevated to the Regional or Washington office.

Bruegman said that under the ESA you can set the baseline higher than the actual baseline but not lower. It's not much incentive for the landowner, but it would make sense if bringing it down to the baseline would put the population into jeopardy. Therefore setting the baseline higher would allow it to not go into jeopardy at the end of the agreement. The baseline could not be lower because of the constraints of the ESA.

Fretz said that they would need to explore more the issue of whether outplants are not counted in the baseline because they are experimental or are not seen as natural populations. He asked about how the issue of offspring of outplanted plants would be treated.

Jacobi thought that there was no ambiguity about the offspring as far as the FWS and ESA go and that they are counted. Bruegmann agreed with this. Jacobi said that the main issue is figuring out how much protection does the outplanted population deserve in the context of a SHA and a baseline. He stated this a complicated question and is not sure how much flexibility there is in the ESA for that and that might need to go up to Regional or Washington to be addressed.

Jacobi brings up a related question for HCPs, whether to consider outplants that are killed as a take. Would it be treated differently under an HCP because it is a current and not a future take? Fretz thought that under a SHA it would still penalize landowners for doing conservation work.

Jacobi stated that he is pretty sure that for the HCP for outplanted plants or animals, they would be given an incidental take number and it would be counted as an incidental take if their actions ended up killing or harming a certain percentage of the population. Miller clarified that a permitted take is incidental to an otherwise lawful action. Bruegmann mentioned that there is no incidental take

for plants, only for animals. Miller explained that a take analysis determines whether or not there is a federal action and whether under a federal action can those plants be taken. Miller said that the solution is to determine whether or not outplanted plants get counted in the baselines for SHA and should be determined at a higher level chain of command. Fretz stated that if the State decides to pursue that avenue it would likely take 2-3 months.

Fretz asked if permits have been issued by the state for people that are outplanting plants on their lands. Does that permit not create a legal framework that says that the outplanted plants are not a natural population but an experimental one? It was stated that it depended on what the permit says and what law the permit was written under, for example, science education and propagation permits. It was discussed if and how outplanted plants could come under a legal definition of experimental.

Bruegmann stated that the FWS doesn't give out permits for outplanting, they only give permits for recovery actions for the benefit of the recovery of the species. Fretz asked if the state permit states that it's for science, education, and research. Sporck explained that it is part of the permit but that the permits are open to interpretation and they should make some contribution to conservation.

Fretz asked if an entity applies for a permit to plant an experimental population, does that permit legally define that outplanted population as an experimental propagation. Fretz says that looking at the rules do allow them to issue permits for experimental plants. Bruegmann stated that then everybody would apply for an experimental permit and this would not contribute to net benefit for the species. Jacobi explained that even if they are planted as experimental plants the progeny that ensue will be considered as wild plants. Bruegmann says that it depends on how soon that progeny actually gets propagated. Fretz wanted clarification on if it is legally doable, Jacobi agrees that this needs to be figured out.

Miller said that if the state decides that it is an experimental plant, and there is subsequently a federal nexus, then federal law would view them as endangered species which would then supersede how the state viewed the outplanted populations. So one needs to be upfront with the landowner that the experimental status would only apply under state law and not under federal law.

Miller asks if there are pending projects that fall under this umbrella. Jacobi expressed that this was something that needs to be resolved quickly because there might be some projects that come under this umbrella and a decision would need to be made on how to proceed.

Fretz clarified the questions being discussed: 1) Do outplanted plants on count in the baseline? 2) For HCPs, if they are going to take the plants that they planted, will they count as a take and would it require mitigation based on that take? 3) If they plant the plants and drive a car and kill those plants would they be charged as a take?

Yoshioka said she understood that state law would consider any T&E species, whether it is outplanted or not, a take if the plants were killed.

Jacobi thought that the issue of outplanted plants had been addressed elsewhere, and asked if anyone knew how other states have dealt with them. Brugemann says that every state has very different endangered species laws. Keir stated that when the army counted some of their totals, they did include outplanted plants. The federal view is that if it is in the ground then it is counted as an endangered species.

Fretz stated that there might be similar situation with animals, they should consider reintroduction with endangered animals. Siddiqi gave an example of SHA including nene and stated that once the agreement was over, and if the landowner did not go back to baseline, the nene would be considered wild. If there was another agreement that came after that, then the nene would be included in the baseline.

Fretz used another example of permits given to zoos that hold endangered animals in captivity. HRS Chapter 195D has a section for this and it's different than incidental take. Also sections of ESA don't apply in these cases because the animals are held for educational purposes. Jacobi stated however that the permit had to be associated with recovery of an endangered species and is not given out otherwise. Bruegmann agreed. Jacobi stated that there was also a difference between permits for threatened and endangered species. Miller mentioned that making a decision on this could haunt them if there was later a federal nexus.

Fretz asked if there were any more questions or comments. Parsons asked when exactly the baseline starts. Fretz said that when an SHA is being developed, it would have a baseline determined and this would then be submitted to the ESRC for concurrence. The ESRC would be on record as agreeing with the baseline, but the SHA could still take years before it gets finalized. Till now, the ESRC has been OK with this, because the applicant is still actively working on the SHA. However, if it takes too long, then the baseline becomes questionable. Penn stated that it may not be questionable for the ESRC but it still had to be passed by the Board and go for public review. Jacobi stated that there should be a timeline as far as how long a baseline could be good for.

In terms of process, Miller asked who would write up the issue and forward it to them so they could forward it on further to get comments. Fretz responded that the staff would need to brief Marie Morin, Wildlife Program Manager, and talk to Lisa Hadway, DOFAW Administrator, if they want to pursue this further and then the State would need to designate staff to work with FWS staff. Jacobi asked if they don't pursue this, then what is then the default? Fretz stated that then the outplants would count. Jacobi agreed that the default is that outplants would count.

Fretz stated that maybe they should recognize that there are plants that you would not want to count because they are in the wrong place, they are not healthy, or they are not viable and not going to survive. Jacobi stated that the first one (plants being in the wrong place) is the one that they are definite on. The question on whether the plants are healthy or viable is a value judgment.

Whitehead questioned if seedlings would count. Amlin explained that they had addressed this in a previous item. Whitehead understood that it was said that immature outplants would not count till they became reproductively mature but that their offspring even if immature would count. Sporck said that the immatures could have just as much genetic value as the matures because you could take cuttings from them, and said that this was still up for discussion. Amlin said it was discussed that the mature producing offspring of outplanted plants would be counted but then through discussions it was realized that under the state statutes there might be more restrictions. Fretz said that they would all like to be more flexible but the law is a harsh reality that they are going to have to figure out.

Fretz suggested that they need to identify the conditions that the committee would consider as conditions when outplants would not be counted. Even if it's pushing the law, it is worth identifying those conditions and bringing it to the committee to do a follow up on that.

Miller said he did not think there was a lot of clarity in the Federal law on this issue because it concerned plants that were planted on private land. Bruegmann said that they could find out how this would apply if it was a federal entity. Miller asked if an SHA was established, and there was a subsequent Federal nexus, what would you do with those plants that were outplanted that were associated with that SHA? He was pretty sure that they would say that it counts for Jeopardy. Bruegmann agreed. Bruegmann reiterated that the FWS doesn't offer incidental take for plants. Bruegmann clarified again that if there was a federal nexus then they would have to consult on if there was Jeopardy to the species. If the analysis showed that the outplanted plants are necessary for the survival and recovery of the species, then the outplanted plants are counted as a take. If you lose those plants and it does not affect the population, then the take does not put that plant in

Jeopardy. Bruegmann stated that in Hawaii it would be hard to find plants that won't be affected by a take. Miller said that this is only for federal entities or federal nexus, for private landowners it's different, they can take them out and that's that.

Fretz stated that they want to find a way to provide more flexibility for the landowner. The state will follow up on this with their administrator and attorneys. Fretz asked if there are any more questions on this.

It was asked if outplanting was the only management plan for this? If there is a fence then could that be counted in the baseline? Miller stated that they may look at the baseline as a consequence of those actions. If the fence creates a lot of plant growth, then the baseline goes up.

Ball asked if you are conserving founder plants and if they are producing seeds and those seedlings go into the seed banks and are going to be put on other lands, then is there a way to show net benefit by the production of seed coming off the founders? It was stated that topic will be discussed in Item 6. Amlin said that Item 6 should be discussed ahead of Item 5 because it is more important.

Fretz stated that due to time the committee would discuss Item 4 and then Item 6 and then see how much time would be left for further discussion. Fretz moved on to Item 4.

*Summary, Action Items, Deliverables*

The initial consensus on this topic was that naturally established, mature reproducing offspring of outplants would be counted, but not the outplanted plants themselves. However, the point was raised that the state and federal statues do not distinguish between founders and outplants, a take of a listed species is still a take. It was stated that there is some lack of clarity of the federal side of this issue due to the fact that it concerns plants located on private land.
It was concluded that the state would follow up with the DOFAW Administrator, Lisa Hadway, and the Attorney General's office. Until further information indicates otherwise, the default conclusion is that outplanted plants would be be included in baselines.

**ITEM 4.** **Appropriate expectations for HCP and SHA applicants.** Decide what monitoring/ reporting frequency is reasonable to expect of private landowners implementing SHAs as compared to HCP license holders.

Siddiqi introduced the topic and stated that we would like to discuss/determine what the expectation is of the landowners who do work that is beneficial for

species under SHAs, versus the expectations under HCPs where a landowner is required to do mitigation for the take of a species related to their proposed activity. The previous example of a PG&E SHA in California had an annual monitoring aspect to it. Another SHA within a California a regional park covered take of an endemic orchid, and required monitoring once every year for the first 5 years, and then once every 5 years for the next 25 years, under a 30 year agreement.

A few options to consider regarding expectations under SHAs are: 1) annual monitoring requirement, or 2) annual monitoring for an initial period followed by less frequent monitoring for a long-term SHA agreement. For HCPs, monitoring would be required until the mitigation goal has been reached.

Fretz stated that under HRS Chapter 195D, we need to consider the annual reporting requirement which presumes that the annual report would include monitoring. Siddiqi said that the reporting occurs annually, but if there is no disturbance to the area then the area may not need to be monitored every year. Fretz clarified that hence we need to be determining if there is flexibility in certain cases to not require such strict annual monitoring. Amlin agreed and stated that this should be considered due to the challenge for smaller landowners entering into a SHA, especially if there haven't been any changes to the property. Miller stated that this would also depend on how critically endangered the species is.

Fretz said that the State and the Feds have done the monitoring for landowners in the case of koloa and nēnē covered under approved SHAs in Hawaii. Bruegmann asked if that was part of the agreed upon SHA. Siddiqi responded that it varied, in some of the SHAs it's the responsibility of the State to do the monitoring while in others the landowner is responsible for the monitoring component. Fretz said that monitoring can take a lot of effort and may require getting people trained,which could take a long time and could create a staffing issue.

Jacobi added that it is not just a question of frequency but also what kind of data is needed to evaluate that the species are doing better. Sometimes it may be a quick assessment without anything quantitative. Or you could do it once in 5 years and it is an intensive monitoring effort which could cost quite a lot. The question is, how often does an assessment need to occur to measure any anticipated negative changes to the species. Additionally, what is the expectation that a landowner needs to commit to in terms of capacity and what are the standards that the agencies want to hold the landowner to. Jacobi stated that frequency is one issue and can be dealt with under adaptive management. The intensity of the monitoring is another issue and we need a better feel for this.

Miller added that the monitoring needs to be linked with the baseline determination. We have to be able to determine changes from baseline condition and if that can be assessed adequately on an annual basis, or if less frequent monitoring would suffice.

Fretz added that the monitoring should be based on what is required to establish a net benefit. Sometimes it could be as simple as flying over the area, and other times more intense monitoring would be required. Therefore, the net benefit criteria for the species must be set first and then work backwards from there to determine monitoring. Establishing what a net benefit looks like for an SHA may be easier than it is for an HCP. Miller asked what the actual measures would be for determining net benefit. That measure would have to start at the baseline and work all the way up to the monitoring. Fretz stated that under an SHA one needs to ensure that things are at or above the baseline. Therefore, for a SHA the baseline is what is important to monitor whereas under an HCP, the net benefit is the target.

Jacobi stated that there are different ways to monitor based on the species that is being evaluated. For example, habitat monitoring may not be need to be done every year, and could instead be accomplished with photographic image acquisition every five years. On the other hand, monitoring for individuals would require: 1) presence evaluation; 2) location; and 3) population estimates. So monitoring could be a combination of these three at different intensities and, under adaptive management, the kind of monitoring or frequency could change depending on how the species is doing. One could come up with a formula for this design but with regard to thresholds, the concern would be to monitor that baseline is maintained.

Fretz said that a formula could be created, but what needs to be determined is the monitoring burden that is placed on the permittee for an SHA; this is the work of the agencies to determine. Miller stated that it is critical to determine the level of monitoring is really needed to show net benefit when establishing a baseline. Furthermore, it is not the intent of a SHA to require a landowner to undertake a rigorous scientific data collection or study.

Yoshioka discussed that from the recovery point of view the goal is very basic: to keep the plants alive and determine if there are any threats to their survival. So perhaps the burden may not be as high as we are thinking. The founder individuals in very rare plant populations, may need to be monitored more than annually because of their rarity. From the PEPP point of view, there is not a lot of staff to do a lot of monitoring; only 1-2 per island and they use the most effort for founders.

Parsons stated that even if the threats to the mature founders are reduced, some will likely still be lost. Jacobi stated that this is where adaptive management comes in, because individuals lost due to no fault of the landowners could trigger a change in the baseline. Fretz added that this is why monitoring actually protects the landowners.

Miller stated that the focus on baseline should be a minimum standard for monitoring in SHA for landowners: is it above or below the baseline. Bruegmann mentioned that a landowner still needs to assess if the population could potentially go below baseline and what could be causing that.

Jacobi would recommend the option of annual monitoring with the possibility of reducing it at a later time should the populations be doing well. Miller added that he would also emphasize that the monitoring should be to evaluate change from the baseline, and not trying to characterize the population. Additionally, include the option of partnering with other agencies that have an interest in that species.

Sporck asked who would be doing the monitoring in the SHA and what would keep the landowner from reporting if it goes below baseline. Fretz said that the agencies are supposed to have the capacity to enforce compliance, but the ability to do compliance monitoring is limited and is an ongoing issue. HRS Chapter 195D was changed previously to allow the agency to charge applicants for monitoring under a HCP, but this is not replicated for SHAs. It's hard to administer, but in principle the ability is there.

A member of the public asked, looking forward, who is able to monitor in a non-invasive way to do the monitoring using imagery, cutting-edge technology etc.? Jacobi said technology is constantly being upgraded, and there are several new tools that are being used to improve monitoring techniques.

Fretz asked if there are any more comments or questions on this issue before they move on.

Amlin summarized the discussion. The resolution on the issue is that: 1) the intensity of the effort is flexible, for example, someone goes out every year and takes a picture and does a more intensive monitoring every 5 years; 2) factoring the status of the species figures in the intensity; the more rare it is the more frequent the monitoring effort needs to be; 3) the monitoring should be sufficient to demonstrate that the change is positive or negative from the baseline; and 4) forming partnerships for SHA folks to tackle more involved monitoring efforts that do need to happen in the longer term should be encouraged.

Fretz stated that so far for every SHA that has been done, the agencies have jumped in and have been able to contribute to the monitoring. Amlin stated that as

more SHAs get established then the agencies may have limited capacity to be able to help. Fretz added that some of the watershed partnerships are huge and a lot of people are involved, so landowners may be able to take advantage of that.

Jacobi asked what degree of confidence would the agencies require when looking at monitoring results in annual reports . Miller stated that he is also grappling with what level of data gathering and analysis needs to be done to achieve that confidence. That threshold needs to be set by the agencies.

Fretz raised the issue that the amount of money it takes to monitor could be prohibitive. Miller stated that the confidence level has to be determined. Should the burden be on the applicant, permittee, or through some sort of partnership? Should the confidence level be 50 percent or 90 percent? Fretz said that you can set an ideal to have a 95% confidence, but it would not be practicable to implement that in reality. It would be ideal to be consistent across the board on all projects, but the reality is that you will strive to reach ideal to the greatest degree that is practicable.

Kier suggested that they could set up a more robust monitoring system at first, and then more focused monitoring later based on adaptive management through the term of the agreement. Jacobi suggested that for a non-zero baseline for SHAs license holder should at least be able to say that: 1) the plants are still present; and 2) they are found in the same dispersed locations. If they can count the individuals that is even better. This is something that we can do to be more consistent in how we approach this. The more detail the better, but a basic standard such as this makes sense. There should also be a qualitative way to assess the baseline.

Ball also mentioned that a lot will depend on the applicant and the land management practices that are occurring. Miller agreed and stated that the point is to inspire private landowners to participate in actions like SHAs that have potential for some positive feedback. If we go overboard with establishing a rigorous monitoring scheme, it won't happen. What is the most reasonable baseline and minimum monitoring that we can come up that makes sense and that the landowner will find reasonable. The point of engaging landowners is not about doing something that's scientifically credible, it's about engaging them in conservation. Tribble mentioned that perhaps the SHA should not be undertaken if it is not with scientific credibility. Miller agreed but stated that the purpose of a SHA is to engage a landowner in conservation, not in undertaking a scientific study; making it very simple for the landowners does not mean the data is not meaningful. It does not have to be quantitative to be meaningful.

Fretz agreed with Miller, further stating that you do want to monitor as best as you can for as many species as possible, allowing for flexibility in certain cases,

and figuring out what sorts of criteria are important to make exceptions. Practical considerations, such as the amount of effort and money required, are one of those grey areas. Miller stated that, from the landowner point of view, if it is a species that has a lot of conservation value for the State, FWS, and conservationists, then with the landowners permission the agencies could set up a monitoring system at no expense to the landowner and in this way allow for rigorous monitoring.. If, for example, Kamehameha Schools have land that has critical conservation value, then perhaps we would want to go in and help monitor those areas.

Bruegmann stated that at a minimum we should ensure that we are getting enough information to confirm this should qualify as an SHA, and is not actually having a negative impact to the species. Miller agreed that it is the bare minimum that they are looking for to establish change relative to the baseline.

Hart suggested that perhaps, for a landowner, periodic photos could be used for monitoring because it would be easy for them and a simple solution to that problem. He gave an example in the Marianas where people took periodic pictures of a situation where the native plant species overpowered invasives. Reynolds believed that taking photos could work for some species, but not for all, especially when dealing with T&E species.

Miller stated that the FWS is looking at using surrogate species to monitor the health of a habitat so it may not be necessary to look at all the species. On a broad scale there is a lot of skepticism whether this would work, but on a relatively small piece of land with a complex habitat it might work. This might be something worth looking into.

Fretz asked Amlin and Siddiqi if this was enough information for them to work with in terms of doing SHAs. They both agreed.

*Summary, Action Items, Deliverables*

It was discussed that it is not the intent of an SHA to require a landowner to undertake a rigorous scientific data collection or study. The focus on maintaining of baseline should be the minimum standard for monitoring for SHA landowners. The resolution on the issue was the following:

I. Monitoring should be sufficient to demonstrate that the population has either remained stable, increased, or decreased as compared to the baseline, and the plants are still found in the same locations.

II. The intensity of the effort can be flexible. For example, a simple photographic survey could be conducted annually and a more intensive monitoring effort could occur 5 years. Or start with annual monitoring

with the option to reduce monitoring efforts if the population continues to do well.

III. The status of the species should be a major factor in determining monitoring intensity; the rarer it is the more frequent monitoring needs to be.

IV. Partnerships should be formed where possible to tackle more involved monitoring efforts that may be beyond the capacity of an SHA landowner.

**ITEM 5.** **Appropriate triggers for adaptive management.** Maintenance and monitoring of baseline conditions are required under a Safe Harbor Agreement. Habitat Conservation Plans have success criteria to determine if mitigation is being met and is based on the monitoring and success of the species. Based on the variability of plant species such as life cycle and weather dependent presence, conclude what types of triggers are appropriate to trigger further monitoring or mitigation under adaptive management.

Amlin suggested moving on to Item 6 in the interest of time and more importance. The Committee and participants agreed to skip Item 5 and move on to Item 6.

**ITEM 6.** **Net-benefit and species recovery. Pursuant to HRS Chapter 195D-4, an Incidental Take License issued through a Habitat Conservation Plan should increase the likelihood that the species will survive and recover and the activity permitted and facilitated by the license (either through a HCP or SHA) should provide net environmental benefits.** Define net benefit as applicable to plant species, taking into consideration the factors discussed previously – growth patterns, life cycle, etc.

Amlin introduced the topic. Of the two Hawaii approved HCPs that exist for plants, the Kenai HCP provided a net benefit ratio of 30:1 (mitigation:take) for the covered species. Amlin posed the question of how to determine what is an adequate increase to provide net benefit, and what are the most important characteristics that need be assessed for plants. As previously stated, maintenance of baseline conditions in a SHA is already determined to be a net benefit. With regard to HCPs, should the take be offset and increased by some magnitude such as a percent increase or number of individuals or populations? How do we approach defining what amounts to a net benefit in the case of HCPs?

Jacobi mentioned that other things have been suggested for net benefit such as providing for research on basic data and ecology of the species. Amlin stated that in the case of HCPs for mitigation, research could go into the later tiers. Fretz clarified that it depended on the species in question. Miller reiterated that there is

some flexibility regarding research as mitigation. Amlin agreed if there was an applied research component that contributed to increasing the population.

Fretz cited the example of mitigation in an existing HCP requiring the establishment of three populations offsite. Jacobi clarified that the three populations was for mitigation and the net benefit was on top of that. Jacobi stated that five populations were recommended, but three was accepted. Bruegmann asked if there were specific target numbers for each population. Siddiqi stated yes, the requirement was for at least 80 in each population, with one population containing 120 mature flowering plants. Fretz asked if the Puʻu Waʻawaʻa example also used the three population approach. Parsons answered that he believes that between two and four populations were added, with appropriate dispersion across landscapes. A mitigation target may be two populations of 50 plants each, and the net benefit would be two populations of 25 individuals on top of the mitigation.

Fretz explained that the three examples provide thus far give examples of how the committee has been treating these issues. The 30:1 example was put forward by the applicant keeping in mind the starting point was only three plants.

Keir asked for the status of the mitigation of the *A. menziseii* HCP and what could we learn from that. Bruegmann stated that it is difficult to establish self-sustaining populations of these plants. Fretz stated that the numerical targets under the HCP have not thus far been met, but the populations continue to exist. Siddiqi said that the trouble appeared to be producing viable offspring. Kennedy mentioned that cutting off the irrigation after 10 - 15 years of maintaining the populations may also pose a challenge; hence the long term goal of ceasing irrigation has not been met.

Amlin said that there should be realistic goals. Bruegmann said considering the condition of the habitat is important. *A. menziseii* is very hard to conserve because its habitat is lowland dry areas, of which only about 5-10% of this habitat is still in existence. It's a conservation-reliant species, which could possibly require less effort, but potentially one could never walk away from it. Perry asked if after 15 years the water supply could be cut-off. Bruegmann stated that she hoped so.

Fretz stated that under the requirements of the HCP, three self-sustaining populations must be achieved and asked if the thought was that this would never be achieved, and if it was impossible to begin with. If that is the case, then perhaps the success criteria for upcoming projects such as this would require reconsideration of the targets. Could we identify particular species that we may want to reconsider the targets in the existing HCPs? Bruegmann said that in terms of looking at recovery and consideration for delisting of a species, we want a

situation where you don't need to intensively monitor for individual plants. Even though management of the habitat with fences and weeding exists, constantly planting and watering are not needed for the existing plants. It's always going to require more intense work in more degraded areas no matter what you do. The question is how much of that is the responsibility of the HCP applicant. Parsons believed that even if you cannot reach your goals, documentation of that is really good information.

Miller stated that these lowland plants are problematic in terms of climate change. For example, where *A. menziseii* exists now will likely not be present in 2080. The question is, should we be outplanting in the current habitat, or take into account climate change and start looking for new habitat that in 2080 will be suitable for the species? That presents a very big difference in terms of how one approaches the restoration process.

Bruegmann stated that knowing where these new areas are going to be in 2080 is also an assumption. Miller said that one can make a pretty good guess based on temperature and precipitation projections. To maintain lowland species, which will be affected by climate change, we need to be thinking ahead because climate change is not going to stop and needs to be incorporated in planning. If they do an SHA with somebody who has potential habitat for *A. menziseii* in 2100, then the area should be used to plant outplantings and be designated as an experimental population. This concept provides a possibility that could result in a more sustainable population in the future. It's not that they shouldn't be planted in their historic range, but there are other factors that need to be considered.

Ching mentioned that in terms of an HCP where are license is given for take yet applicants are not able to meet their targets, then perhaps not enough is being done. These species are a challenge to begin with and reaching a goal that is attainable is not enough. Rather, the target should be that species persist into the future. Ching recommended thinking hard about giving licenses for take in areas such as dry lowland that may be difficult to mitigate for, and stated it would be a disaster to lose a species like *A. menziseii* because the bar was not raised high enough for its conservation. Fretz asked Ching for her biological perspective on what could have been done; should they be planting them in different places? Ching believed that Mansker was doing a great job but that he had an uphill battle ahead of him; moreover the goals are increasingly harder to meet with climate change etc. These needed to be addressed in the habitat management section. Fretz agreed that this needed to be addressed upfront. How could they predict how hard it's going to be for these species to hit a net recovery benefit? Ching suggested not granting ITLs for species that have not been propagated, as well as for plants in areas such as lowland dry forest habitat where it is difficult to work.

Fretz asked if we knew enough about our listed plants that we could determine that the three populations strategy would not work for some plants and work for others. Parsons believed that this depends on the plants; for some plants in Pu‘u Wa‘awa‘a, fencing would work. For others, fencing and get ridding of invasive plants is essential, for others its fencing, getting rid of invasive species and treating certain pests. There are different layers one needs to get through and he guesses that they don’t know what all the layers are.

Fretz summarized that for some plants the target of establishing three wild populations is more doable, but in some species, this target would not work. Parsons agreed and stated that in his experience, they may have one species that does amazingly at so many sites, but for another species they can barely get it to grow. Fretz stated that the more unknown and difficult the species is, the more important applied research could be as mitigation to improve recovery prospects. Hart added that recruitment would also be difficult because there are so many variables involved for successful recruitment like pollinators, seed dispersers, and seed predators to deal with in addition to the other problems already mentioned. It’s a lot to ask for successful recruitment. Jacobi stated that this is where the annual review is important, the incidental take may not be because of the actions of the permittee, rather it may be because these plants are difficult to conserve anyway. In this instance, and under the unforeseen circumstance clauses, the baseline and some of the expectations could be changed.

Fretz asked if it would be useful to the committee and the staff to develop a baseline for the endangered plants that are currently being working with, acknowledging that there are a lot of endangered plants - 414. Yoshioka mentioned that it would differ from location to location, so it might be difficult to come up with the overall guidelines. She said that they have been outplanting for some species for more than 10 years, and that there are very few species that have naturally recruited in that period of time. That is the reality of doing restoration.

Fretz was looking for a useful tool for the committee to have. Kier said that they would be able to anticipate some of this based on what the species is dependent on and other factors such as the habitat status. A habitat assessment can be done to see if the species is intact, and defining what the controllable and uncontrollable threats may be. Rainfall was crucial for some species in the dry forest areas, so that is not anybody’s fault if that species was affected because there were no rains. Yoshioka said that a decision tree would be a useful tool.

Fretz said that we need someone assigned to create that. Amlin offered that the State is happy to help facilitate the process. Jacobi recommended that they involve the HPPRCC folks and others such as PEPP folks and Parsons that have

the botanical expertise. They could pull together a list of 1) if it is a T&E species, and then go down the line and create categories that would be very useful to help guide how to deal with things when they come to the ESRC table.

Fretz asked Amlin and Siddiqi if they could work with Bruegmann and others to begin an inquiry on whether it is feasible to create a decision tree and to determine if it will be useful and effective.

Penn clarified that what we are looking for is a useful way of synthesizing all the knowledge that can be applied systematically and thoroughly across all these applicants. Fretz agreed, and said this should be done on a species by species basis. Start with one species or two similar species and come to a decision process that arrives at a conclusion of whether the species could be recovered. Miller stated that such a framework exists species by species for T&E plants, which was the foundation for the army work. The initial work has already been done, but it can be refined.

Jacobi said that the more consistent they could be across all the projects the better. Keir mention that a greenhouse, storage, and seedling propagation component appeared to be missing and for species such as *A. menziseii* it's incredibly important especially with wild sites failing. Jacobi stated this was a component of the *A. menziseii* HCP, ,but certainly they could include this into the decision tree.

Ball asked how seed storage and getting seeds from landowners from founders and seedlings for propagation are accounted for in a SHA. And if in the future that action changes the game for that species by moving them toward recovery; is there a way to account for net benefit produced on an SHA property in another conservation project outside the SHA? Reynolds stated that the net benefit seems to already come into play if there is a clause that the seeds go into conservation. Then further down the line if the seeds go into outplanting and are used to refresh seed collections in storage. If you are trying to accumulate the number of net benefits, then maybe that's a different issue, but the net benefit already exists. Miller believed that it depends on what the intent of counting the net benefit is. If it's for the SHA, there may be a net benefit of putting these seeds into propagation. But that only will come into play when the landowner wants to reduce back to baseline, and when the seeds have been outplanted and are successfully growing in their new habitat. For example, a species such as *Vicia menziesii* you can never take that back to baseline till other populations have been established elsewhere. When that's achieved, then it opens the possibility of going back to baseline. That's where the net benefits come in with seed collection. For the HCPs, the permittee deals with net benefit laws and are required to offset their incidental take, but it doesn't seem that seed storage would count for net benefit.

Plants that are growing are counted for mitigation, not simply collecting and storing seeds. Although it is a benefit, it does not count toward mitigation.

Siddiqi questioned then that a landowner may not want to outplant those plants if they cannot go back to baseline. Ball asked how they may create more plants that have spread to adjacent lands, but they don't credit for the net benefit? Fretz stated that in the case of a SHA it could count toward being a recovery or net benefit. Where it gets tricky is when somebody wants to do an HCP. If the only benefit is storing seeds, this would be problematic because we don't get to see the benefit at a later date. Collecting and storing seeds does not mean that the plants are growing healthy somewhere. Bruegmann said that collection would only be a very small percentage of the benefit. Fretz reiterated that they should not think that seed collection is an endpoint.

Fretz asked if there was anything else on the seed storage question. There were none. Fretz suggested that they defer the final item.

*Summary, Action Items, Deliverables*

It was determined that maintenance of baseline conditions in a SHA constitutes net benefit.
For HCPs, it was proposed that a decision tree be created that could be used to assist in the determination of net benefit on a species-by-species basis. The tree would take into account both biological factors, such as rarity and habitat, and mitigation options such as the appropriateness of research, number of populations to be established, and propagation protocols.
The state offered to facilitate the process, and involve personnel from FWS, PEPP, and HPPRCC to develop this tool. The first step is for state staff to begin an inquiry by consulting Bruegmann and other botanists to determine whether it is actually feasible to create such a tree, and if it would be a useful and effective tool.

*Overall Summary*

Jacobi asked to go over all the action items. Fretz stated that each item had some product for the whole group to review.

Item 3a, the flow chart worked well.

For the other items, the staff could provide a one page summary to bring back to the group. Amlin stated that some of that may be contained in the same document. Jacobi said that it should be an overview and summary with the key points of the

discussion. Fretz says that this should be written with an eye to providing the Committee guidance when the next HCP hits the table.

Penn recommended it being visualized, such as using a process diagram plus the specific criteria discussed. Fretz recommended the staff call anyone at the meeting who can help with the process or with clarification. Jacobi agreed that the main action items will lead to a list of follow up actions. There are potential projects pending and upcoming so let's keep the momentum going. It seems one of the biggest topics is in regard to solicitation from the AG.

**ITEM 7.** Adjournment.

Jacobi asked if there was going to be a review meeting for some of the existing projects. Fretz says that the best time would be to do them in October when the reports come in. The next ESRC Meeting was set for July 2, 2014.

Fretz thanked all the members and participants for their attendance.
The meeting adjourned at 3:28 PM.

ENDANGERED SPECIES RECOVERY COMMITTEE

13 MAY 2014 MEETING MINUTES

Hawaii Department of Land and Natural Resources
Kalanimoku Building; 1151 Punchbowl Street; Room 322B; Honolulu, HI 96813

**ATTCHMENT I: Summary, Action Items, and Deliverables**

**ITEM 3.** Population Baseline Determinations.

ITEM 3.a. **Population Estimates. Certain plant species-specific characteristics (e.g., growth form) can make it difficult to accurately estimate population numbers.** Determine if other factors besides number of individual plants can be used to define baseline for Safe Harbor Agreements and Habitat Conservation Plans.

The deliverable summarizing the outcome of this discussion was a flowchart (Attachment II) depicting two scenarios:

I. If plants can be counted, then counts should be used taking into consideration:
   a. statistical confidence
   b. health and vigor
   c. genetic structure and molecular studies
   d. dispersion methods

II. If plants cannot be counted, for any of the following reasons, then an estimation of area of biomass should be used:
   a. rarity
   b. annual variability
   c. morphotype, reproductive mechanism
   d. practicality, feasibility

ITEM 3.b. **Plant life stages. Plant life cycle stages are often simplified for conservation purposes and grouped into three main categories: seedlings, immature, and reproductive individuals.** Determine the stage of the plant life cycle that should be counted towards a baseline (*i.e.*, dealing with seedlings and immature stages of plants).

The conclusion under this item was that all ages/classes are accounted for in the following manner:

I. Seed bank. As a general rule, the seed bank would not be included; however, there would be certain exceptions including:
   a. Extremely rare (PEPP) species.
   b. Plants with long-lived viable seeds (*i.e.*, persists in the soil for 1+ years after the adult plants have died).
   c. Other species as deemed appropriate by the ESRC and local experts.

II. Seedlings. At the bare minimum presence/absence should be accounted for. A numerical count or area estimation (based on outcome of flow chart analysis in item 3.a.) would be preferable. However, seedlings are not included in the baseline.

III. Immatures. Always included in baseline.

IV. Mature adults. Always included in baseline.

It was proposed that the HPPRCC could assist with development of some of the guidelines, such as which plants go in which category, specifically I.b. and I.c. above.

ITEM 3.c. **Delineating population units. Plant population units may be separated geographically and possibly genetically and as such not exhibit cross-fertilization deeming them to be a discrete population.** Determine if baselines should delineate population units and if so, how are population units defined?

Fretz summarized two issues being discussed. First is the question of how the spatial distribution and numbers across the landscape, that may or may not fall within different populations, are represented in the baseline. In this case if spatial distribution is well documented and the dispersion is set as a target then this could be good approach.

Fretz stated that the second item was less clear regarding the question of how the genetic differences in the landscape should be treated. It was agreed that for an SHA or an HCP genetic analysis would be too much.

ITEM 3.d. **Out-planted and founder plants. Plants may be propagated outside of their natural environment (i.e. in a greenhouse setting) and out-planted back into the wild in appropriate habitat (or the best possible habitat available at the time) for various reasons. Out-planted plants may have lower survivorship due to inappropriate site selection (sometimes due to lack of availability of appropriate high quality sites) or low genetic variation that potentially limits long-term survival of the population.** Determine how to account for previous outplantings within a project area for an HCP or SHA, should those outplanted plants be included in baseline numbers along with founder plants? If including

outplanted plants in baseline, determine at what point from the time of planting should they be included.

The initial consensus on this topic was that naturally established, mature reproducing offspring of outplants would be counted, but not the outplanted plants themselves. However, the point was raised that the state and federal statues do not distinguish between founders and outplants, a take of a listed species is still a take. It was stated that there is some lack of clarity of the federal side of this issue due to the fact that it concerns plants located on private land.

It was concluded that the state would follow up with the DOFAW Administrator, Lisa Hadway, and the Attorney General's office. Until further information indicates otherwise, the default conclusion is that outplanted plants would be be included in baselines.

**ITEM 4.** **Appropriate expectations for HCP and SHA applicants.** Decide what monitoring/ reporting frequency is reasonable to expect of private landowners implementing SHAs as compared to HCP license holders.

It was discussed that it is not the intent of an SHA to require a landowner to undertake a rigorous scientific data collection or study. The focus on maintaining of baseline should be the minimum standard for monitoring for SHA landowners.

The resolution on the issue was the following:

I. Monitoring should be sufficient to demonstrate that the population has either remained stable, increased, or decreased as compared to the baseline, and the plants are still found in the same locations.

II. The intensity of the effort can be flexible. For example, a simple photographic survey could be conducted annually and a more intensive monitoring effort could occur 5 years. Or start with annual monitoring with the option to reduce monitoring efforts if the population continues to do well.

III. The status of the species should be a major factor in determining monitoring intensity; the rarer it is the more frequent monitoring needs to be.

IV. Partnerships should be formed where possible to tackle more involved monitoring efforts that may be beyond the capacity of an SHA landowner.

**ITEM 5.** **Appropriate triggers for adaptive management.** Maintenance and monitoring of baseline conditions are required under a Safe Harbor Agreement. Habitat

Conservation Plans have success criteria to determine if mitigation is being met and is based on the monitoring and success of the species. Based on the variability of plant species such as life cycle and weather dependent presence, conclude what types of triggers are appropriate to trigger further monitoring or mitigation under adaptive management.

Not discussed due to time constraints.

**ITEM 6.** **Net-benefit and species recovery. Pursuant to HRS Chapter 195D-4, an Incidental Take License issued through a Habitat Conservation Plan should increase the likelihood that the species will survive and recover and the activity permitted and facilitated by the license (either through a HCP or SHA) should provide net environmental benefits.** Define net benefit as applicable to plant species, taking into consideration the factors discussed previously – growth patterns, life cycle, etc.

It was determined that maintenance of baseline conditions in a SHA constitutes net benefit.

For HCPs, it was proposed that a decision tree be created that could be used to assist in the determination of net benefit on a species-by-species basis. The tree would take into account both biological factors, such as rarity and habitat, and mitigation options such as the appropriateness of research, number of populations to be established, and propagation protocols.

The state offered to facilitate the process, and involve personnel from FWS, PEPP, and HPPRCC to develop this tool. The first step is for state staff to begin an inquiry by consulting Bruegmann and other botanists to determine whether it is actually feasible to create such a tree, and if it would be a useful and effective tool.

**ATTCHMENT II:**
**Item 3.a. Flow Chart - Draft**