

CLIMATE ACTION AND RESILIENCE COMMITTEE

Council of the County of Maui

MINUTES

February 25, 2020

Council Chamber, 8th Floor

CONVENE: 9:01 a.m.

PRESENT: VOTING MEMBERS:

Councilmember Kelly Takaya King, Chair

Councilmember Shane M. Sinenci, Vice-Chair (out at 11:56 a.m.)

Councilmember Tasha Kama (in at 9:11 a.m.; out at 10:24 a.m.; in at 11:46 a.m.)

Councilmember Alice Lee (out at 9:19 a.m.; in at 9:42 a.m.)

Councilmember Tamara Paltin (out at 10:33 a.m.; in at 10:35 a.m.)

Councilmember Keani N.W. Rawlins-Fernandez (in at 9:34 a.m.)

EXCUSED: Councilmember Riki Hokama

STAFF: Kasie Apo Takayama, Legislative Analyst
Stacey Vinoray, Committee Secretary

Zhantell Lindo, Council Aide, Molokai Council Office (via telephone conference bridge)

Denise Fernandez, Council Aide, Lanai Council Office (via telephone conference bridge)

Kate Griffiths, Executive Assistant to Councilmember Kelly Takaya King

Don Atay, Executive Assistant to Councilmember Sinenci

ADMIN.: Stephanie Chun, Deputy Corporation Counsel, Department of the Corporation Counsel

PRESENTERS: Michael Smith, President, REGENiTECH LLC
Rob Weltman, President, Sierra Club Maui
Amy Hodges, Programs and Operations Manager, Maui Nui Marine Resource Council
Tamara Sherrill, Executive Director, Maui Nui Botanical Gardens
Christopher Warren, Avian Conservation /Restoration and Data Management Technician, Maui Forest Bird Recovery Project
Dr. Kim Falinski, Marine Science Advisor, The Nature Conservancy

OTHERS: Jason Schwartz

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Phyllis Robinson
Rita Ryan, Chapter Director, Climate Reality Project Hawaii
Jasee Law
Patricia Gardner, Minister, We Are One Ministries
Elbee Hatfield

(25) additional attendees

PRESS: *Akaku: Maui Community Television, Inc.*

CHAIR KING: . . .*(gavel)*. . . Is the February 25, 2020, regular meeting of the Climate Action and Resilience Committee. My name is Kelly King, I'm the Chair. And today we have with us, Member Shane Sinenci, who's our Vice-Chair.

VICE-CHAIR SINENCI: Thank you, aloha kakahiaka, Chair.

CHAIR KING: Aloha kakahiaka. We have Chair, Alice Lee. Thank you for being here.

COUNCILMEMBER LEE: Good morning. Good morning, Madam Chair. From China we say ni hao.

CHAIR KING: Ni hao.

COUNCILMEMBER LEE: Yeah.

CHAIR KING: And we have from the Westside, Member Tamara Paltin.

COUNCILMEMBER PALTIN: Aloha kakahiaka, Chair.

CHAIR KING: Aloha kakahiaka. Okay we have two members who are on their way, they'll be a little bit late today but I'm going to go ahead and get started because we have some very special guests today. And if I could have everyone silence their cell phones and any other noise-making devices you might have. Starting with me. Okay. We have . . . I think on their way are Committee Members Keani Rawlins-Fernandez and Tasha Kama. So, today I'd like to introduce our Staff. We have with us, Stephanie Chun, from Corp Counsel.

MS. CHUN: Good morning.

CHAIR KING: Thank you for being here. And welcome to Corp Counsel --

MS. CHUN: Thank you.

CHAIR KING: --newest member. We have our Staff members, Kasie Apo Takayama, our Legislative Analyst, and our Secretary, Stacey Vinoray. Thank you for being here. And thank you for all your help in getting this meeting together. And then I also am going

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to just briefly introduce our guest speakers today, and then we'll do additional introductions as we do the second panel. But with us today is Michael Smith, who's the president of REGENITECH LLC, thank you for being here. Good morning. And Rob Weltman, the president of the Sierra Club. Aloha, if you press the button . . . you can, it needs to be green to be on. In our audience who will be speaking later on on their projects that pertain to climate action are Amy Hodges, programs and operations manager of the Maui Nui Marine Resource Counsel. Tamara Sherrill, Executive Director of the Maui Nui Botanical Gardens. Christopher Warren, Avian Conservation/Restoration, Data Management Technician for the Maui Forest Bird Recovery Project. Kim Falinski, Marine Science Advisor of The Nature Conservancy. Emily Fielding, Maui Marine Program Manager of The Nature Conservancy. And Eric Conklin, director of marine science of The Nature Conservancy. So, thank you everyone for being here. We have also established contact with our District Offices, Mavis Oliveira-Medeiros, of the Hana Office. Denise Fernandez, of Lanai Office and Zhantell Lindo, of Molokai Office. And, Members, we have two items on the agenda today. We have CAR-3, on carbon sequestration and we have two presentations on carbon sequestration through agricultural means. And then we have CAR-1(4), which is an overview of current and political grantees relating to climate action and resiliency. So, that's our pre-budget overview of some of the actions and projects that are taking place in our County that are being funded by the County Council.

. . . BEGIN PUBLIC TESTIMONY. . .

CHAIR KING: All right, we're going to begin with public testimony and . . . public testimony for those who maybe new is limited to the items on the agenda today. It's . . . please sign up with Staff out in the lobby if you chose to testify or with the District Staff if you're on Molokai, Lanai, or in Hana. And in accordance with the Rules of the Council each testify will be given three minutes to testify. The light goes on green and then when it turns yellow you have 30 seconds left and when it's red your three minutes is up, and we'll ask you to conclude. Okay. So, Ms. Takayama Apo, can you . . . did I say that right? I always get your name . . . Apo Takayama. Can you introduce our first testifier?

MS. APO TAKAYAMA: Thank you, Chair. The first testifier is Jason Schwartz, to be followed by Phyllis Robinson.

MR. SCHWARTZ: Good morning, Chair.

CHAIR KING: Good morning.

MR. SCHWARTZ: Hi, Council guys and gals and audience. You know I feel comfortable talking and I have a show that I run, and I can see you guys personally. But I thought it important to come out because I've . . . with Michael Smith here who's presenting today for a couple of weeks and I've seen things and seen him talking to scientists and looking at this island. And I hope that we take this very seriously. I think this is a game changer. And it's also a potential profit center, it changes the way we all deal with really big problems. So, thank you for taking this into consideration today.

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CHAIR KING: Okay. Thank you. And thank you for your help in getting Mr. Smith to return to Maui for this presentation. I appreciate it.

MR. SCHWARTZ: Well, my pleasure. And there's a group of us, but we're a growing group. We've been really getting traction with farmers as we've been close to them. And they're seeing that the value of this is really very high. Thank you, guys. Any questions for me?

CHAIR KING: Okay. Thank you, Mr. Schwartz.

MR. SCHWARTZ: Thank you.

CHAIR KING: Next testifier.

MS. APO TAKAYAMA: Chair, the last person signed up to testify in our District Offices and in the Council Chambers is Phyllis Robinson.

MS. ROBINSON: Good morning, Chair.

CHAIR KING: Good morning.

MS. ROBINSON: Good morning, Councilors. Good morning, folks in the audience. I'm delighted to be here today because I grow farmers and we grow farmers in regenerative agriculture. And we've graduated 62 apprentices from our program, and we've got 26 . . . actually 33 more. And we really believe deeply that soil can play a major role in climate change. And I wanted to quote Jenny Pell who wrote an article for the . . . the *Maui Weekly* and it goes like this, "Regenerative agriculture is a system of farming principles and practices that increases biodiversity, enriches soils, improves watersheds, protects reefs, provides for pollinators and enhances ecosystem services. It captures carbon . . ." and this is really important to our speaker today, Michael Smith. "It captures carbon in soil and biomass and is a globally recognized keystone solution to reverse climate change. It also increases yields, reduces external input costs such as chemicals and fertilizers, and is increasingly more resilient to climate instability and creates higher health and vitality for farming communities." So, I believe that cleaning up our soil and making our soil vibrant, we will be contributing significantly to climate change. And not just mitigation but hopefully reversing it. Thank you.

CHAIR KING: Thank you so much, Ms. Robinson. We have a question for you from Councilmember Paltin.

COUNCILMEMBER PALTIN: Thank you, Chair. Thank you, Ms. Robinson, for being here and all the good works that you're doing. So, I just was wondering those 62 farm apprentice mentorships all are proficient now or the alumni at getting soil to this state?

MS. ROBINSON: We hope so. We did do a survey this year of our graduates and we found that 78 percent of our graduates are still farming. And they're farming using these

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principles and we get testimonies and testimonials and . . . and it's wonderful. So, anytime any of our Council would like to . . . would like to hear those testimonials I'd be happy to provide that for you.

COUNCILMEMBER PALTIN: Can I just follow up?

CHAIR KING: Sure. Go ahead.

COUNCILMEMBER PALTIN: And then the other 22 percent are they in working to support it from the not farming standpoint or are they just . . .

MS. ROBINSON: No. They're just not . . . they're not able to farm right now. They're, you know, dealing with health issues or family issues and they're . . . or they've left. Some of our apprentices actually have gone to Big Island. Some of our first group, they actually moved to Big Island. But they're still doing agriculture over there. But I haven't been able to really track down to see exactly what they were . . . what they're doing on Big Island, so.

COUNCILMEMBER PALTIN: So, in the future of your recruitment is there anything aimed at keeping our farmers here on Maui County?

MS. ROBINSON: Oh, yes. Yes. In fact our . . . we really tightened up our application process this year. And if anyone even eludes to . . . that they're not sure that they're going to stay here we don't take them. Yeah. They have to be committed to living here and farming here.

COUNCILMEMBER PALTIN: Thank you.

MS. ROBINSON: You're welcome, Tamara.

CHAIR KING: Thank you, Member Paltin. I think actually that's a pretty good attrition rate because that's probably a lower attrition rate than people that go to school for four years and decide they don't want to work in their field of study. So, that's just a kind of a natural thing that happens. But I want to thank you for your testimony because you actually gave a better intro to this first panel than I could ever do on the importance of regenerative agriculture to climate action. Thank you for --

MS. ROBINSON: Your welcome, Chair.

CHAIR KING: --that, Phyllis. You're welcome.

MS. ROBINSON: I appreciate it. Thank you.

CHAIR KING: Any other questions for our testifier? If not, we'd like to welcome, Member Tasha Kama. Thank you for being here.

COUNCILMEMBER KAMA: Good morning, Chair.

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CHAIR KING: Good morning.

COUNCILMEMBER KAMA: Thank you.

CHAIR KING: Okay, next testifier.

MS. APO TAKAYAMA: Thank you, Chair. The last person signed up to testify in the Chamber is Rita Ryan.

CHAIR KING: And have we checked in with our District Offices?

MS. APO TAKAYAMA: We don't have any testifiers signed up in our District Offices.

CHAIR KING: Okay. Thank you.

MS. RYAN: Aloha, Climate Action and Resilience Committee. Woohoo. We have one. I love saying that. I just wanted to say a few brief words about carbon sequestration and drawdown. So, I think that the . . . oh, I'm with the Hawaii Chapter of the Climate Reality Project. I think that what we need to do is a multi-directional approach to, you know, conquer the climate crisis. Carbon drawdown is a very, very important part of that, because that deals with the carbon we've already put in the atmosphere. So, every single one of us has a carbon footprint and it's still up there, right, from our whole life. So, by planting trees we can take the carbon that we've already put up there and get it back in the ground where it belongs, where it came from and where it belongs. There's other . . . outside of regenerative agriculture there's other techniques that we can do. There's biochar in the soil that helps things grow better, there's a lot of things we can do to get that carbon back into the soil. But, planting trees here on Maui is absolutely essential if we're ever going to become carbon neutral. So, we are cutting trees down faster than we're planting them, and I know a lot of non-native species are feeling the axe. We need to replace those trees with lots of other trees, because it takes many, many years for a tree to grow to the point where it can pull down enough carbon out of the soil replacing . . . you know, like the old eucalyptus, that sort of thing. So, I want the Committee to support the efforts of planting trees on Maui, not only on October 30th . . . is it October 30th? Not only on October 30th but everyday going forward. As long as we have a climate crisis we need carbon re-sequestration. Thank you.

CHAIR KING: Thank you, Ms. Ryan. Any questions. Okay. I have a quick question, when you made the statement that we're cutting trees down faster than we can plant them. Is that nationwide, global, or are you talking specifically about Maui?

MS. RYAN: I'm talking about Maui because we're doing a lot of removal of invasives, which is a good thing, old growth eucalyptus. Because . . . and replanting them with natives, but it takes a lot . . . many, many years for those natives to grow up to the point where they're bringing down as much carbon as say one eucalyptus tree. So, if you look at the rate of carbon drawdown that we're losing versus the rate that we're bringing it down with new growth, we're still not neutral.

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CHAIR KING: Okay.

MS. RYAN: Yeah.

CHAIR KING: Thank you. Thanks for that explanation. Any other questions, Members? Okay.
Thank you for your testimony. Ms. Apo Takayama?

MS. APO TAKAYAMA: Chair, I believe we have one more testifier.

CHAIR KING: Okay.

MR. LAW: Good morning. My name is Jasee Law.

CHAIR KING: Good morning.

MR. LAW: I guess you guys know the devil is out there destroying the world. So, I'm going to distract him. You guys sneak behind him and plant some trees and clean up after him. Okay. Aloha.

CHAIR KING: Aloha. Thank you.

MR. LAW: Or her.

CHAIR KING: Okay . . . is there anybody else who would like to testify who hasn't signed up yet? If not . . . oh. We do have somebody. Would you like to come down. You can sign up after. Please give us your name and who . . . if you're representing an organization.

MS. GARDNER: My name is Patricia Maria Gardner. And I'm representing We Are One Ministries that I'm located here on Maui as a Minister. And a few months ago I watched the video The Need to Grow. And I was absolutely amazed and inspired and excited about it. So, it was . . . I immediately purchased it and I wanted to support this project that Michael Smith, is doing. He's been doing it in Montana very successfully and he has created a whole system that rejuvenates the soil, it rejuvenates the land, it revitalizes everything. And for him to be here on Maui is a real honor that he would want to be here with his project, I will say. And I want to support him in every way that I can for Maui to be a representative of this project. But also let it be setting the tone that it can go all around the world. Because this is . . . this is a project that we've hoped for, we've prayed for, we want to live in harmony with the land. Harmony with people, eat food that really rejuvenates our body and replenishes the soil that is so completely depleted. That can begin to rejuvenate not only Maui but each . . . gradually extend out into the world. Because the oceans, the earth if we just look around . . . we just look around and see what is happening to our planet. It is definitely a time to wake up. And to be in our truth, to really honor our truth. And it is in my opinion that Michael Smith's project is the answer to many of those prayers. So, I thank you for hearing my words.

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CHAIR KING: Thank you, Ms. Gardner. Any questions from the Councilmembers? Okay. Thank you so much for being here. And if you could do me a favor and sign up in the lobby just so we have your contact information.

MS. GARDNER: Okay. Absolutely.

CHAIR KING: That would be great.

MS. GARDNER: Thank you.

CHAIR KING: I would appreciate that. Thank you. Okay. Anybody else wishing to testify? Come on down. You can sign up after.

MR. HATFIELD: Thank you, Chair and Council people. I just wanted to . . .

CHAIR KING: Can you give us your name and . . .

MR. HATFIELD: My name is Elbee. And I want to confirm about this movie, The Need to Grow. We've had Michael Smith here now and an opportunity to create this system and the multiple systems that he has on Maui. The movie I think is being shown in like a 150 countries and translated into six languages. So, we have the opportunity to grab him before somebody else does. And we can have a showcase here and we can make an ecotourism development out of it and really bring more people here from all over the world to show the example. And really set a standard for what can be done. So, I think we need to take this very seriously. Thank you.

CHAIR KING: Okay. Thank you. Any questions? Can you give us your name one more time? I didn't catch that.

MR. HATFIELD: Elbee.

CHAIR KING: Elbee?

MR. HATFIELD: E-L-B-E-E.

CHAIR KING: E-L-B-E . . . okay. Thank you so much. Okay. Any other testifiers? If not, any . . . any objections to closing testimony at this time?

COUNCILMEMBERS: No objections.

CHAIR KING: Okay. All right.

. . .END OF PUBLIC TESTIMONY. . .

CHAIR KING: We'll go ahead and close testimony and go on to our first item.

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CAR-3: CARBON SEQUESTRATION (CC 20-10)

CHAIR KING: Which is CAR-3, we have two resource people for this presentation, Michael Smith, the President of REGENiTECH, and Rob Weltman, the President of the Sierra Club Maui. So, folks, I just wanted to open with . . . I mean we had a great opening remarks from Ms. Phyllis Robinson, about the importance of regenerative ag. And I wanted to add that National Geographic has noted that "increasing the Earth's forest by an area the size of the United States would cut the atmosphere carbon dioxide by 25 percent. This has been . . . this has the potential to erase nearly 100 years of carbon emissions, assuming that we continue to protect existing forest and faze out fossil fuels. Michael Smith is not only the President of REGENiTECH, but he is also a principal developer of the green powerhouse featured in The Need to Grow." And you heard testimony about that film. "It's a film that focuses on carbon sequestration, soil regeneration and the importance of localized food production in order to restore the earth. Rob Weltman is the president of the Sierra Club Maui, in efforts to work towards carbon sequestration, they are involved in a project that's proposing and coordinating a massive community tree planting mission within Maui County." If there are no objections your Chair would like to designate the panel members as resource persons in accordance with rule 18(A) of the Rules of the Council.

COUNCILMEMBERS: No objections.

CHAIR KING: Okay. And then we will go into . . . first Michael Smith, your presentation.

. . . BEGIN PRESENTATION. . .

MR. SMITH: . . .(inaudible). . .

CHAIR KING: Oh. You need to push the button and then when the green light goes . . . it's on now.

MR. SMITH: Okay. Hello. You hear me? Thank you, Council.

CHAIR KING: Okay. I think we're pulling that up on the screen.

MR. SMITH: And for being . . . allowing me to do this presentation. This is an awesome opportunity. Such a lovely island that we have, and we want to try and preserve it. And so, just to give you a little background, you know, I'm more of a technologist than I am a biologist. I've been working with very reputable biochemists, scientists, people that has helped support my work. So, this is not just me. My background is more in the process and engineering area, computer science, artificial intelligence and that area. And so, the impetus behind this project was to come up with a system that mimicked or emulated what is already happening in nature and to accelerate it to some degree. So, I've always been very much interested in the sustainable energy and regenerative agriculture from the time I was in high school. But in the meantime, you know, I had

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to go off and do engineering projects to stay alive. So, when I had the opportunity to return to Montana and to work on this project it was such a blessing. It felt to me like it was the most important thing I could do. You'll see on this picture we have some buffalo, that was a good example of regenerative agriculture. For many centuries we had buffalo roaming the prairies before we started to exterminate them, they were able to reintroduce nutrients back into the soil. As well as keep the soil . . . you know, down and you know . . . just pound in the new nutrients. And so, regenerating the soil was one of the things that happened with the buffalo. And as you'll see in my presentation I've named some of the components after some of these natural processes. So, that's the impetus behind this picture. I'm not going to test you on this, but this is one of the technical schematics of the system that shows how the various components are interlinked. You will see some of these components already out there. We have biodigesters or bioreactors, we have thermal chemical reactors or pyrolysis devices. There are photobioreactors, places to grow algae. But one of the things that we decided to do was, how can we link these together so that the output of one system can become the input of another. And by doing this we tried to model a system where there was no waste generated by this system. The effluent from one process becomes the nutrient for another process. The inputs are essentially solar energy, cellulosic biomass which is another form of solar energy, and carbon dioxide is also included in this process. So, there is the basic outline, there's also an energy conversion component where we can generate some electricity from the . . . from the fuels that are generated by the process. This is a picture of the Dragon. This is one of the thermochemical reactor, we call it the Dragon, it produces a lot of heat, it actually generates a lot of fuel. It also has an effluent, which is carbon dioxide. So, it's very important that we have some sort of heat in Montana because we have . . . we're growing algae in a very closed environment up there and we want to maintain temperatures that are subtropical. This is the . . . what we call the Buffalo, this is the component that replaces the ruminants that I showed you earlier. It's a multi-tank, a multi-process bioreactor system. I'll go into a little more detail of how that works later. I apologize to begin with, there is a little science here, but I don't go too deep into the science. So, the different bacteria in the process that can accelerate the . . . the breakdown of materials ten to twenty-fold depending upon how we treat the materials. And normally we're not processes thing like . . . things like food waste or manure those types of things because we really want our process to be relatively clean for organic agricultural inputs. You know, we don't want to take waste that has biological compounds like antibiotics or . . . you know, antibiotics or the hormones or whatever they do in cattle. So, a lot of times you'll see those things winding up into organic amendment. We primarily use algae as our input, and we use some biochar as another component. The photobioreactor, this is a picture of the inside, some of the use . . . of you that saw the documentary probably saw the interior of this. This is the newly constructed system; it has about a quarter of an acre of vertical growing space on the interior. So, you can use that for agriculture, we were growing pineapples and bananas in Montana just from the waste heat, some of the solar energy and some of the geothermal that's included in the system. So, we've got several systems that are integrated in there. We use natural earth-based geothermal, we're not talking about, you know, lava, you know, based geothermal just, you know, ground source temperatures. And we use the solar energy of course to offset. In February when the temperatures are in the 20's or near zero, we hit 90°degrees Fahrenheit in this structure.

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And then we have to start dissipating heat, so there's a lot of processes for managing and dissipating heat. So, it's a little more sophisticated than a greenhouse. We call it a device, it's a very intelligent device that manages its energy very well. Here's a shot of the interior with the . . . the paddle wheels that keep the algae up in suspension and we have to keep the algae in the light so it can do photosynthesis. It's one of its main nutrients is carbon dioxide, carbon dioxide it's consumption is quite efficient. This material . . . the cells can divide, say three times in a day. So, if you start out with 1 gram one day you'll have 8 grams the next day. You can think of that on a very large scale, it's a very fast growing . . . I tell people if it were your lawn you'd be mowing it three times a day and people get disturbed by that. Anyway, the . . . so the carbon dioxide is being sequestered in this biofilter, it's the effluent that comes off the Dragon, it's a very important part of it. The . . . here's a shot of the system at the lumber mill, so our citing for this system is to take waste from the production of lumber. And as we come around from this view you'll see the landfill behind, that's probably 50 to 100 years of landfill material accumulated there. If it sits there like that it becomes a net-emitter of carbon dioxide rather than a, you know, a source. So, the Dragon itself is . . . we take that biomass waste and when we convert it into biochar . . . get that back into the ground, it's going to be sequestered for hundreds or thousands of years. Depending upon . . . because it's a very form . . . stable form of carbon. And it also provides a place for the microbial populations to grow, we'll go into a little more of that later. So, this is about the algae, we're growing blue-green algae in the system. It's very high nutrient for humans as well as plants. It's not all of the material in the algae is bioavailable to plants, that's the reason why we have the Buffalo. The Buffalo breaks it down, pulls the proteins apart, makes amino acids that the plants can then take up directly. So, here's a little bit . . . it just so happens that one of the blue-green algae that we grow is spirulina, which a lot of you probably know from your power bars and various nutrient supplements. But it's high in iron and vitamins and other things that are also helpful in the growth of plants. So, the bioreactor, the Buffalo is a multistage system, it has actually three stages shown in this diagram. There are three tanks, lower tanks there that are the same stage as . . . they're all in the same stage. But the idea is that it passes from one tank to another, to another. The first stage has enzymes that tend to break down the organic polymers into organic monomers that the plants can use and so that's that stage there. The rest of this is amazing because the amino acids are produced in there but we're also producing humic substances. Things like humic and fulvic acids which some of you who are into agriculture know are very important for plants. And we're doing it at a very high rate. So, there's some of the fuel that is produced coming off of the bioreactors, this is . . . notice how blue that flame is, that's . . . we're producing hydrogen and methane as a waste byproduct that comes off the production of the bio stimulants that we're using in the process. Here's a little bit of a breakdown of some of the . . . the amino acids, this is not very meaningful to a lot of us but for a lot of people into plant pathology they understand that these are the precursors to some of the growth hormones that plants use. I'll show you some of their effects on plants later in the documentary. This one, proline, is also used to boost the plant's immune system. So we've seen an amazing effect, we can reduce the amount of pesticides we use by increasing the plant's immunity and both environmental and biological resistance to, you know, pests and invaders. This is a picture of humic acid, don't worry about memorizing it it's a little complex. The other humic substance that

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we produce is something called fulvic acid, this is a very powerful key later that is capable of bringing in nutrients directly into the plant's mitochondria. So, it can actually deliver nutrients to the plant's energy center without the plant using its energy to produce the micronutrients. Here's a schematic of the Dragon, the thermochemical reactor, it's designed . . . it's a countercurrent flow process. So, biomass comes in one side and as it goes through the system that the material becomes warmer, and warmer and finally it's about a thousand degrees in the lower section. At that point we're cracking off a lot of fuels and the fuels can be sent to a generator to generate power. So, we use the power that we generate to maintain the process. In the facility that we built there was only one wire coming into it, it was a telephone wire so that we could control it remotely via our telephones and whatnot. So, the waste heat that comes off of this goes into some of the bioreactor tanks in order to keep the bacteria and the algae at the right temperatures. And so, some of the feedstocks, this is very common in Montana there are people that do a lot of logging and sometimes they leave this waste behind, we call it Slash. They typically pile it up and then they burn it and then of course it becomes yet another emitter of carbon dioxide. We can gather that material and pyrolyze it, turn it into biochar. Here's some eucalyptus, you guys are all familiar with this. This invasive species here, we can be using that as a feedstock for the Dragon. Here's paulownia, we understand this is a very fast-growing plant, you can use it for lumber production and any of the waste material it comes off can be used in fuel and biochar soil amendment production. Cane grass, people say well does it have to be wood, no it does not have to be wood. Anything that's cellulosic can go into that material. We're looking more at the structure . . . the cellular structure of the plant for the quality of the biochar. And there are things like macadamia nut shells, this type of material can go in and produce biochar as well. So, what's the big deal about biochar, it's all about surface area. It's not just carbon, there's, it's carbon with structure and that structure has becomes . . . these little pores become homes for microbes. By the way this image that you're looking at right here is about 30 microns in diameter, your hair is 50 microns in diameter. So, it's very effective right down to two microns which is, you know, pretty tiny. So, the . . . all of those little pores becomes homes for microbes that can actually feed your plants. I have a really great photo here that is . . . not this one . . . but this one here. That is a mycorrhizal spore, mycorrhizas the . . . one of the mycelium that actually is an interface between your plant roots and the nutrients that are in the soil. This is showing the little hyphae, the tendrils that are coming off of that spore going into the biochar and it's now becoming . . . it's pumping the nutrients to the plants. So, it creates this wonderful symbiotic relationship with the plants and the biochar and the microbes in the soil to sustain the activity. So, we've designed the system so that we can actually produce these products and market them and sell them. And this is not an infomercial, this is, you know, really about how can we make a system that can sustain itself that it can actually generate a profit at the same time. We're doing some good for the planet and the atmosphere. Don't want people to walk away with the idea that we're just taking algae and combining it with biochar. There are two lysing process, lysing means to cut. So we have a hydrolysis and we have pyrolysis, cutting with water and we're cutting with fire. So, we take biological components we break them down into their essential elements and then we recombine them to create these byproducts that we've talked about. Here's an example of a foliar application of a plant, on the left it was nearly dead and then on the right you can see a 24-hour response to its

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regeneration. This was a little confusing to us at first, we were trying to figure out why is it . . . why does it have such an amazing response? Well, it's because of those amino acids, it can take those in directly and it's not using its energy to repair itself it's actually taking them in and doing the regeneration. You can notice some of the flowers that are in the left hand side they're almost dead, on the other side . . . it's really hard to bring a flower back when it's gone that far.

CHAIR KING: And that's 24 hours?

MR. SMITH: Yeah. That was 24 hours. This is a . . . in . . . from Moab, Utah a gentleman who is treating his lawn over the course of the summer. The same water and, you know, that it received. But this other one only received two foliar application over the course of the summer, and he noticed a significant difference in the quality of the soil as he regenerated it. A simple hydroponic soybean test, we saw double the number of soybean pods on the plants. Again this is a foliar application. This is cannabis or hemp, on the left that plant has something called iron chlorosis, not enough iron. And typically a person will think that it needs more nutrients, so they'll start dumping nutrients on it and they wind up killing the plant, and they'll think well it's already gone. So, after four applications over a period of two weeks you can see the plant's . . . same plant on the right-hand side there, and then a few weeks later there it is in bloom. The strengthening of the immune system that I mentioned, I caught this photo a little late, the plant on the left was watered with just water. Same nutrients, same soil. The plant on the right . . . as the one on the right it was watered with about a 6 percent solution of regenesis. So, the one on the left was attacked by white flies and a few weeks later that's what happened. It wasn't until that plant was completely decimated that the plant . . . the white flies moved over to attack the other plant. So, rooting, this is another application for the materials in a root drench. We've noticed that different concentrations of the regenesis in the plant roots accelerates the growth of the root. The . . . on the left-hand side that's water, that's your . . . our control. And on the right-hand side that's a hundred percent. So, we figure somewhere around the 15 percent concentration would have been optimal for this rooting. So, if you're into cloning plants a lot of the times, you know, you want to take a cutting, you want to get a root system quickly and then get it into the ground. So, there's another example of rooting with stevia on the left, regenesis . . . soaked in regenesis and the other one just in water for rooting. And then here's a breakdown of the commercial lure to putting one of these systems in. I actually reformatted this for the electricity here. We have about a three to six cent rate in Montana. Now, I'm not really trying to push this as an energy or power system but it's one of the byproducts that comes off, so we have electricity. There's carbon sequestration that we can do, the amount of carbon that we get back into the soil, this does not take in the secondary effects of the amount of carbon that's drawn down by the plants that are growing and the regenerated soil. That's just the biochar, and then the raw biochar there's a, you know, global market price that's about the cost of it. This is the most valuable component here; this is the bio-stimulant that come off of the project. So, there we have . . . you can see a daily production of the materials if we can penetrate the market, that's the big if, we have to actually move these into the marketplace in order to achieve that number. So, the ability to create this system we've broken it down, we know how to build these modules, fabricate them.

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We can probably get a system up in about six or seven months from the time we begin planning, you know, so there's a diagram of that. So, the proposal is, you know, how do we build a system here. We would really love to incorporate it with some regenerative farming and an educational project. We've worked with universities in Montana, we have constant visitors from grade school all the way up to university. We just need land, about an acre. We need some biomass anywhere from two to six tons a day and some finance.

CHAIR KING: Okay. Thank you. And can you speak to . . . what this proposal, as far as carbon sequestration and, you know, how that . . . how effective --

MR. SMITH: Yeah.

CHAIR KING: --it is and the size of that?

MR. SMITH: Sure. Any . . . well, it's pretty broad when we come down to soil regeneration there might be others in the audience that could be better . . . speak better to the amount of carbon that's a good draw down and so I might defer to them at some point. But the amount of carbon that we get back into the ground obviously it's going to regenerate the soil, rather than the soil . . . the ground becoming a net emitter of carbon dioxide, which is what's happening as we destroy the soil. The more we regenerate the soil the more it's going to draw down. I can't really give you a ton . . . per ton beyond what I gave you in the last slide or last few slides. But that's pretty much it, a major way of sucking down carbon dioxide.

. . .END PRESENTATION. . .

CHAIR KING: Okay. Great. Thank you so much for that presentation and I'm going to at this point open it up for questions from the Councilmembers before we move on to our next presentation. Councilmembers . . . starting with . . . we'll start . . . oh, I want to welcome, Vice-Chair Keani Rawlins-Fernandez, thank you for joining us.

COUNCILMEMBER RAWLINS-FERNANDEZ: Aloha kakahiaaka, Chair.

CHAIR KING: Aloha. Mr. Sinenci?

VICE-CHAIR SINENCI: Thank you, Chair. Just had a question about the biochar, is that one of . . . one component of the process or you said pyro --

MR. SMITH: Yes, pyrolysis.

VICE-CHAIR SINENCI: --pyrolysis. So, you're actually taking waste material and . . .

MR. SMITH: Converting it into high-grade carbon. Our Dragon, the pyrolysis device that I mentioned . . . I'm sorry about going through that so quickly but there was a lot of information there and this is one of those things that you just can't, you know, do in a

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few sentences. The pyrolysis is essentially taking waste biomass, we're doing that at a lumber mill, they generate maybe 50 tons a day. So, this would be a very small amount of carbon that we would sequester if we can only do six tons a day. But that's one of the byproducts that comes off and then we recombine that with other materials to make a better soil amendment out of it.

VICE-CHAIR SINENCI: Okay. I was just thinking one of our, the problems we have specifically in East Maui is, you know, we're getting 30 new types of invasive species on the island. Our biosecurity is . . . we don't have very much . . . the State doesn't support a lot of biosecurity coming into the State. And so, one of our problems is the African tulip trees. We've got a seed that just flies all over the place and then it just decimates our whole watershed. So, I'm thinking, you know, as far as providing that biomass for this process we have a lot of, you know, invasive species in the watershed that could --

MR. SMITH: Absolutely.

VICE-CHAIR SINENCI: --technically support this process.

MR. SMITH: Yeah. Yes, we've looked at a variety of species. We've processed hemp . . . waste from hemp after it's been extracted. We've processed all kinds of weeds and different materials. The quality of the biochar varies from species to species because it's really that structure that's important, but if it's a woody sort of a stalk or it has a woody structure to it --

VICE-CHAIR SINENCI: Yes.

MR. SMITH: --it actually makes very good biochar.

VICE-CHAIR SINENCI: Okay. All right. Thank you, Chair. I'll yield for now.

CHAIR KING: Okay. Thank you for that question. Chair Lee?

COUNCILMEMBER LEE: Thank you. I was just wondering if you could break down the \$4 million?

MR. SMITH: Yeah. The \$4 million is essentially . . . we have the device, which is the photobioreactor, that building that actually grows the algae, that needs to be a sealed environment. We have geothermal embedded in that for cooling and we have the solar collection. So, the devices, probably the cost of construction of that is right around \$1.5 million. Right. Then there's ancillary systems that are yet another million, which are the controls and the materials for the bioreactors that process the algae that's roughly another \$1 million. And then the Dragon, that could be variable. We could . . . that would be about the remainder of the process there. Okay.

CHAIR KING: Thank you for that question. And do you have an estimated return that you've --

MR. SMITH: Yeah.

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CHAIR KING: --been able to realize from your Montana, as far as how long you would . . . it takes to recover that 4 million with the product sales?

MR. SMITH: Yeah. That's right here.

CHAIR KING: Okay.

MR. SMITH: Right. So, we're looking at roughly . . . if we can move all of this product. Now this . . . these are, this is gross revenue; this is not profit. So, keep in mind that there are some operating expenses involved in that. But we're looking at about 4.5 million when the system is operating at capacity. Provided we can penetrate the market for moving the materials.

CHAIR KING: Okay. And then that . . . I'm not sure . . . that product is that something that you would . . . we would, if it was produced here we would be able to ship outside of here or is it considered an ag product?

MR. SMITH: Well, that's what . . . well --

CHAIR KING: Is that part of the . . .

MR. SMITH: --we go state by state --

CHAIR KING: Okay.

MR. SMITH: --on the registration. So far we're in California, Montana, Utah, Colorado, Oregon, and Washington. So, we've taken the product, we've been through all of the OMRI, the Organic Materials Review Institute certification. So, we're listed, so organic farmers can use this product. As far as shipping it, the whole idea of putting these systems locally is so that whenever we get an order from Hawaii, you know, we don't want to ship it from Montana, we want to ship it from here. So, we would work with you on the distribution, the marketing and the sales of products.

CHAIR KING: Okay.

MR. SMITH: Locally produced and then, you know --

CHAIR KING: Okay, I like that.

MR. SMITH: --it's a way of supporting the economy as well.

CHAIR KING: Community based. And so, the size that you're proposing is a reasonable size to be able to distribute the product within the State of Hawaii?

MR. SMITH: Absolutely.

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CHAIR KING: Okay. Okay, thank you. Vice-Chair Rawlins-Fernandez?

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo, Chair. And aloha, Mr. Weltman and Mr. Smith. Mahalo for your fascinating presentation. So, the \$4 million is that a one-time initial cost to get this started or is it like an annual cost of 4 million?

MR. SMITH: Well, normally what we do is we would . . . because we want to amortize our investment in the technology, we charge one time 250,000 licensing fee for the technology. Then we would probably work with you to take some of the revenue if we're helping with distribution and sales and that's how we would make up the remainder of it. But our incentive is to keep that system operating at full capacity. So, as we develop new technology we would like to make sure that we have a nice support arrangement with the systems. So, we think that we can fund it off of a royalty that would come off the sale of the product.

CHAIR KING: Okay. But --

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo.

CHAIR KING: --that is a . . . that is the one-time cost of getting this facility up and going?

MR. SMITH: Oh, yeah it would be.

CHAIR KING: That was the question.

MR. SMITH: Unless for example, if we come up with a better Dragon and we want to do an upgrade. It's like I say, it's to our benefit to make sure that you're . . . you have the best and most efficient equipment available.

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo. Mahalo --

CHAIR KING: Okay.

COUNCILMEMBER RAWLINS-FERNANDEZ: --for clarification.

CHAIR KING: Thank you.

COUNCILMEMBER RAWLINS-FERNANDEZ: The question . . . so on the screen are those plastic bottles?

MR. SMITH: They are plastic bottles and then my apology for that. I really am trying . . . I do have a plan to move away from that. Okay. So, that was one of the things. And if we do large production then we wouldn't have these small bottles that we're producing. So, we have large totes and we have different ways of distributing. I didn't want to go in to all of the marketing and distribution and that, but . . .

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo. Mahalo, Chair.

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CHAIR KING: Great question, thank you. Okay, Member Paltin?

COUNCILMEMBER PALTIN: Thank you, Chair. Thank you, Mr. Smith, for your presentation. My first question is are you going to give a copy of the presentation on the Granicus?

MR. SMITH: I believe I provided one to the Council.

COUNCILMEMBER PALTIN: Okay. I got to update the agenda.

MR. SMITH: Yeah.

CHAIR KING: And also possibly we can send all the Councilmembers a link to the film?

MR. SMITH: Yes, we can.

CHAIR KING: Okay.

COUNCILMEMBER PALTIN: And then the power that you were talking about it generating is that . . . like could it be considered a firm electrical power source?

MR. SMITH: I would believe . . . some people have spoken to us about using it as firming . . . our system for firming. Because, you know, it's not like the wind or the sun, you know, the energy is stored in the biomass. It's prestored, so there's that aspect of it. But we're not really focused that much on the energy, the power part of it at this time but it could be used as a firming source.

COUNCILMEMBER PALTIN: And if it were . . . just at the energy part of it do you then store the energy in batteries, or would it go directly to something to use?

MR. SMITH: Well, that's . . . that would be a choice that we have. We can actually . . . if we want to do something called peak shifting. Where we take . . . where there's not a high demand, we store that in batteries and then when the demand goes up we can convert that back into . . . into power to, you know, compensate. But yes, I've been working with a battery company that is . . . it's got some really amazing technology. We want to incorporate that into the system to stabilize the power. So, if the system goes down, you know, you have power for, you know, so many hours before, you know, you need to have the system go back up again.

COUNCILMEMBER PALTIN: So, and then my other question was like the proposal, is that a proposal for this fiscal year budget or . . .

MR. SMITH: I'm just throwing that out there. I mean this is something that I think if we want to do this here that's about what it's going to cost. It could be a little bit more, I'm not sure what the cost of labor is here. We want to do as much of the fabricating and manufacturing here as we can, certain parts of it will have to be done on the mainland.

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But if we can incorporate this into a jobs program I think that would be fantastic. Why not do several of them here.

COUNCILMEMBER PALTIN: So, realistically what you're saying is anybody watching right now that sets up a Kickstarter and has an acre could do this and . . .

MR. SMITH: Yeah. That's a . . . that's a wonderful idea. You know, if we can kick start it or if we --

COUNCILMEMBER PALTIN: Indiegogo.

MR. SMITH: --have some wealthy individuals that want to support a project like this, I would say that's another way to go. I'm not asking for State funds or any of that, I'm just trying to present a project, a proposal to build a system here.

COUNCILMEMBER PALTIN: Makes me wish I had an acre and \$4 million.

CHAIR KING: I contributed to a product called the Last Straw, which was a reusable straw. And they were trying to raise 250,000 on a Kickstarter program. They raised 1.5 million in two months. So, you know, you never know. Thank you for that question. Member Kama, any questions?

COUNCILMEMBER KAMA: Yes. Thank you, Chair. So, how many people would be employed by this system?

MR. SMITH: That is a good question. It could range from; I would say 15 to 30. It depends on, you know, various levels of skill. If the Dragon is running continuously you need somebody to feed it. So, there's that process. And if it's running around the clock then yeah, somebody . . . I'm thinking three people pretty much on site at all times. But you've got packaging, bottling, various other things they could do.

COUNCILMEMBER KAMA: So, it could potentially be a 24/7 operation?

MR. SMITH: It could be, yes. You might have to have it operating in shifts.

COUNCILMEMBER KAMA: Okay. And so you mentioned something about stimulating . . . you needed to be able to stimulate the market.

MR. SMITH: Yeah.

COUNCILMEMBER KAMA: So, can you explain what you meant by that and how much stimulation is Maui going to need to be able to use that?

MR. SMITH: I used the words penetration because we know the market for organics is big. If we look at the fastest growing sector in agriculture it is organic food production at this time. So, as we put these new methods of growing out to people, they're used to buying the old commercial chemical fertilizers. And so, we have to kind of . . . there's a little

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bit of reeducation. We do have the documentary which has been phenomenal for our sales. Since that hit the market we're getting requests from all around the world, but we can only ship within the continental United States at this time. It doesn't make any sense for us to put a one quart plastic bottle into the mail and mail it over to Hawaii. Although we have done that just for tests, we did that for a gentleman there. So, yes we do need to invest a little bit in the marketing and commercialization of the product.

COUNCILMEMBER KAMA: So, is that included in your cost estimate?

MR. SMITH: Yeah, it is. That's . . . we would take some of that money and build into the proposal estimate.

COUNCILMEMBER KAMA: So, I really like this idea about not wasting and that you keep using things. And what you're not going to be using you're going to reuse or you're going to recycle but somehow.

MR. SMITH: Yeah.

COUNCILMEMBER KAMA: So, are you familiar with the Native Hawaiian and their history of their uses and their lands and things like that?

MR. SMITH: I'm more familiar with the mainland, the natives in the US --

COUNCILMEMBER KAMA: Okay.

MR. SMITH: --in the mainland.

COUNCILMEMBER KAMA: I saw that in the Buffalo.

MR. SMITH: Yeah.

COUNCILMEMBER KAMA: Yeah.

MR. SMITH: So, and we've worked with some indigenous people. We actually went through a very intense feasibility study with First Nations in Alberta. And they wanted to do a system that was . . . that was sustainable. They love the concept of recycling and --

COUNCILMEMBER KAMA: Yeah.

MR. SMITH: --living close to . . .

COUNCILMEMBER KAMA: Yeah. Because that's closer to how they . . . they live --

MR. SMITH: Yeah.

COUNCILMEMBER KAMA: --then what we living today.

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MR. SMITH: Yeah. That's kind of been my inspiration, you know, from the beginning is how can we . . . how can we empower the indigenous ideas and principles as much as possible.

COUNCILMEMBER KAMA: So, who are the other indigenous tribes that you're working with or have worked with?

MR. SMITH: Well, we've . . . we're actually working with the Kootenai Salish in Montana. We have the Blackfeet over on the East Side and then there are the Horse Lake Nation that's up in Alberta. Where there are a number of them that we have not actually started engaged . . . we haven't engaged with yet. But yes we want to . . . we definitely want to. It was funny because you saw the shape of the --

COUNCILMEMBER KAMA: Yes.

MR. SMITH: --photobioreactor. It looked very much like a teepee.

COUNCILMEMBER KAMA: Yeah, I saw that.

MR. SMITH: And one of the gentleman, he was a Cree and he came, and he said I think I can sell this to my people. And I said how so, and he said well the man with the biggest teepee has the most wives.

COUNCILMEMBER KAMA: And we do have one acre. Thank you. Thank you, Chair.

CHAIR KING: Okay. Thank you. Thank you, Members. Do you have another question, Ms. Paltin?

COUNCILMEMBER PALTIN: Yeah, sorry. I just got the writing part of the . . .

CHAIR KING: Okay.

COUNCILMEMBER PALTIN: But my question was when you grow the algae --

MR. SMITH: Yeah.

COUNCILMEMBER PALTIN: --would it be okay to use the R-1 water and how much water do you need for this project?

MR. SMITH: Yeah. And so most of the water we use is just recovered water. This system actually recovers about 80 percent of the water. I didn't go into all of the process details because I want you all to stay awake during the presentation, right. So, the . . . but we can take brackish water, it, you know, we stay away from water that has too much salinity in it because we're growing freshwater algae. The algae is noninvasive, we actually work with whatever the local species is available here. So, we didn't want to import something and then have a problem with it. If it grows fast and it displaces another algae then we want that algae because we know --

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COUNCILMEMBER PALTIN: Gorilla ogo.

MR. SMITH: --it's pulling down carbon dioxide and it's doing some great stuff and it's making proteins and sugars. So . . .

COUNCILMEMBER PALTIN: So, you guys can take out like say the invasive Gorilla ogo and then give it to you and . . .

MR. SMITH: Yeah. We also . . . and I didn't put this in the documentary as well, but we do take a little bit of waste from breweries as a nutrient supplement and we put that in there as well.

COUNCILMEMBER PALTIN: So, what is the full volume of water that you need?

MR. SMITH: Well, we take . . . each one of those ponds that you saw at the very beginning . . . let me back it up just a hair and I'll see if I can show you the . . . there we go, that one there. So, each one of these sections . . . there are 8 of them, those are about 1,200 gallons a piece. So, one of those gets harvested every day. And then about 80 percent of that water gets recovered, so we clarify it using biochar which is an amazing thing. It's another way we . . . as you know activated charcoal is a good way to filter your water. But biochar is about a third as effective as activated charcoal, so we use about three times the amount. So, as we filter the algae through the biochar we actually collect it and that goes into our bioreactor. So, that we're also boosting the carbon in the liquids that we're producing. But 80 percent of that water comes back in to the raceway and we recycle it. But we use . . . we collect water off the building. So, the shape of it is such that we have a . . . we call it the moat, that goes around the outside so as it rains we collect that water it goes in to underground cisterns. And then that water goes in to replacing the roughly 500 gallons a day. That's about all we need to recover in order to keep the process, for this scale, to keep working.

CHAIR KING: Okay, Members, I'd like to try to wrap this up and go to our next presentation and if we have time afterwards we can come back . . . circle back to Mr. Smith for additional questions. But thank you so much for your presentation and actually you're generating a lot of hope as well. So, I appreciate the . . . I appreciate all the folks that are here too to hear the presentations. And we'll go next to Mr. Rob Weltman from the Sierra Club. And you can tell us about the newest carbon sequestration project. And so, Members, the intent of the presentation was not to propose a \$4 million budget item but it may be something . . . I've been working with some of the folks around this idea, so it maybe something we may want to consider. You know, a grant as a portion of getting this started. One of the things that's been coming up in the volunteer working group meetings is that we want Maui to be the example of regenerative agriculture and carbon sequestration. And we want to be able to showcase what we're doing here, which is going to be important to not just our tourism industry but our health of our environment. So, Mr. Rob Weltman, take it away.

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. . . BEGIN PRESENTATION. . .

MR. WELTMAN: . . . *(spoke in Hawaiian)*. . . So, I'm Rob Weltman, chairperson of the Sierra Club Maui group. And I'm here today to talk about a project which is broader than my organization, many, many organizations involved. And it's called the La Hooulu Pae Moku or ReTree Hawaii, it started late last year. First question, it's maybe obvious after introduction by Councilmember King as well as other people have spoken so far. What does tree planting have to do with climate action and resilience. And I could tell you about that a little bit more, but I know that Greta Thunberg and George Monbiot will do that. Some of you have already seen this video I'm sure but it's well worth seeing more than one time.

MS. THUNBERG (from video): This is not a drill. My name is Greta Thunberg. We are living . . .

MR. WELTMAN: I think it's having some trouble catching up there.

CHAIR KING: Sounds like we're having some buffering problems. Okay.

MS. THUNBERG (from video): This is not a drill. My name is Greta Thunberg. We are living in the beginning of the mass extinction. Our climate is breaking down . . .

CHAIR KING: Is it not going to work? Okay, I think we're going to have to skip pass the video because I don't think it's going to work.

MR. WELTMAN: Okay. I'll just summarize. I can't do it as well as Greta and George though. But basically what they're saying is that we're faced with, obviously as you all know, the existential challenge of our lifetimes and of many lifetimes to come. And the main thing we have to do is stop making things worse by taking fossil fuels out of the ground and using them for transportation and energy production. If we don't do that then there's nothing else we can do that will mitigate the climate crisis. However, there's already way too much carbon dioxide and other greenhouse gasses in the atmosphere, and with everything we do there will still be . . . be more continued to be produced. And so, we have to do other things to mitigate that. There are new technologies in the works to take carbon out of the atmosphere, but they are pretty far in the future. And I would consider them mostly science fiction at this point. However, we do have a technology which is well known, has been around for millions of years and works really well and it's . . . as George says it's self-maintaining once you get it started and that's a tree. So, by planting lots of trees and other plants . . . because it's not just trees. Trees have the special advantage that they're long lived and so once you get them in the ground and self-providing then they can suck carbon out of the air for decades or even hundreds of years, but other plants do too. So, I just wanted to underline that planting trees is not a replacement for the other things that we absolutely have to do. If you look at Hawaii compared to the rest of the United States or to the world, we have some similarities and some differences. We have energy production in common with much of the United States. However, we have a fairly smaller . . . relatively smaller portion of contribution to greenhouse gasses from energy production because we don't have as much coal and oil as other parts of the United States and the world do. Over 40 percent of the

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greenhouse gasses produced in Hawaii are from ground transportations, that's something we really have to do to change. We also have to make . . . have to change the way we live, using less plastic and other petroleum products and switching to other things which are reusable. And among other things reducing the, our reliance on shipping and air transportation for basic needs because those are major, major contributions to greenhouse gasses. So, those are big things where public policy I think will be the determining factor because I don't think it's going to happen by itself. Those are things where the County and State have to say these are the changes that have to happen in order for us to maintain our environment. Everyone can contribute in smaller ways but I'm not going to go into that right now. So, what is ReTree Hawaii and the La Hooulu Pae Moku. We have these goals defined, it's not just putting trees in the ground, but we also want to use this campaign to reach everyone in Hawaii with information about the climate crisis, the tree planting event and what needs to be done. We also have a goal to plant a very large number of trees in every region of every major island. And to energize and accelerate the climate crisis work by getting this out and getting more people involved in all parts of the State. And we also hope that this will lead to future activities to mitigate climate change through the relationships that we've established through this work. This is not just a matter of let's just plant a whole bunch of plants in one area or plant whatever we can plant. We want to make sure that the plants the we put in the ground survive because it's not . . . this is not a PR project, it's not a demonstration project, this is something which the future of Maui and of Hawaii depend on. We want to . . . to achieve that, we want to plant primarily in places which already have a history of planting, there's irrigation or they know how to do it, they know how to bring in volunteers. We want to promote native plants wherever possible. However, there's a lot of places where that's just not feasible or where there's a history of other kinds of plants, which as long as they're not native we think will still contribute to the future environment, which is beneficial to Maui, the people of Maui and also contributes to mitigating climate change. Trees as I mentioned has a special place in our hearts because they last a long time, but as several people have talked about earlier today, hemp and algae and other plants are also very good at sucking carbon out of the atmosphere. Another guiding principle is that we're not telling anyone what to plant, where to plant, how many to plant. That is up to each site that offers a hosting opportunity and we will help them get the volunteers to get them in the ground. We'll help them with funding if necessary to acquire plants, but each site is responsible for how many plants, what kind of plant, where to put them, how many volunteers they can take. So, what does that mean, what am I talking about in terms of hosting sites for planting. Obviously conservation areas and those are the easy ones because they already know how to put plants in the ground, they know how to coordinate volunteers, they know how to keep plants alive. Those are things like the watershed partnerships, the Coral Reef Alliance, the Auwahi Forest Recovery Project and many, many more. And we already have signups from pretty much all of them. Also schools, if the schools I've visited on Maui, with a few exceptions, are really lacking in shade. They're really lacking in trees; they have huge lawn areas but no place where kids can sit and . . . sit and do their homework in under shade. And I think that they're prime targets for planting because they already have irrigation. We have parks, open space areas which at this point a lot of our open space areas are pretty desolate. We acquired them but we're not doing much with them. Hotels and resorts can expand and deepen their plantings.

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Along roadways, many business have room for planting and also we're offering an opportunity for homes and I'll talk a little bit more about that. So, why are we choosing one day and why are we choosing October 30th rather than just saying let's just go plant and talk about for all future time? Well, we think that by focusing on one day we can get the biggest impact, people will pay attention to this, it'll be noticed everywhere. And it'll be easiest to put pressure on companies and schools and other organizations to really get involved if it's a single day. And also so why just . . . why October 30th, well we want it to be a day that's just before the rainy season as much as we now have rainy seasons, we didn't really have much of a rainy season in Kihei this year, but because . . . that offers the greatest opportunity for the plants to survive if there's rain just after that. We didn't want to plant it during the rainy season because then we won't get as many volunteers. Why did we choose a Friday, because Fridays are best for schools and companies to set aside a team event or give some time off to participate in this event. And finally it has to be a day which is a good day for planting according to the Hawaiian moon calendar, which it is, October 30th is the second day of the four Hawaiian full moon days. So, where are we at. Well, we have a website Retree-Hawaii.org, and on this website you can find on the front page a list of the many supporting organizations. And these are conservation organizations as well as some schools and many other organizations that want to help organize and get the word out about the planting day. So, the main types of participants in this tree planting day are on one hand sites that can host planting. And then on the other hand volunteers who want to go plant, and those volunteers can be both teams of volunteers from companies or from schools and also individuals. However, we also want to make it possible for people who can't participate in one way or the other way, to also be a part of this event by planting at home and then reporting in to this site with the pictures and report on the number of plants they planted. And then we can count those to the number of plants put in to the ground on October 30th. So, on this page you can see there's a section for people and organizations who have a site where planting had happened, a section for people who want to volunteer to plant, and then a section for people who have planted at home and are not part of the first two. As I mentioned earlier, each site decides what things they want to plant, how many of each and how well they are organized to accept volunteers, how many volunteers they can accept on that day. When they sign up they also . . . besides information about their site and about the day they also pledge how many plants they plan to put in the ground on that day. If you're interested in planting you can go to the site and see a list of all the sites that have signed up so far. And this list contains the names and locations and descriptions and a few other pieces of information about them. And then you can click on one of those to go get some detailed information. But you can also go to a map and the map shows you where sites are. We think this will be attractive because a lot of people will want to go plant near where they live or where they work. If you're a volunteer you can go there once you've chosen a site and see the information about that site and then provide a very small amount of information about yourself so that the site can keep in touch with you and so we can keep in touch with you. And on this page you can also say that whether you're representing yourself or a team or a school. At this point we're primarily trying to get lots of organizations, public, private, schools to sign up as hosting sites. And then leading up to Earth Day which is going to be a big day because it's the 50th anniversary of the first Earth Day on April 22nd. And that's when we'll start our major

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campaign with outreach to all of Hawaii to sign up as volunteers on October 30th. So, among the things that's happening on Earth Day is that the Governor will speak, and he'll talk about the campaign and the planting day. Mayor Victorino on Maui will also speak on Earth Day at the UH campus and make a proclamation in support of ReTree Hawaii. We expect that by then we'll also have public support from the other Hawaii mayors, but we don't have that yet. And of course we would like to get support from the County Council on Maui as well as the other counties. Between Earth Day and October 30th we're going to have a continuous campaign through all the media that we can use, both the conventional newspapers, radios, TV, as well as social media. As well as reaching out through all the organizations that we're . . . are participating and supporting about the need for climate action and also to get volunteers to sign up. So, how about plants. Well, we expect that half or maybe more of the organizations participating will provide their own plants. And that's true of the conservation organizations as well as the State and also the County agencies. And this is for many reasons. They already have nurseries; they already have a history and a program of planting. And for the conservation organizations they also are very keen on preserving binetic [sic] or biological diversity by not mixing seeds from different parts of the island or different parts of the islands. So, they collect seeds in their own area and they either grow those seeds in their own nurseries or they outsource that work to a native nursery or Hoolawa Farms on Maui. And then they pick up the seedlings and plant them themselves. And we think that also that would be true for the resorts because they also have their own sources for plants and they also have money and we also think that many churches and business will be able to do that. However, some organizations, particularly the schools, they are short on money, they're short on nurseries, and they're short on planting programs and we intend to help them with plants. So, what do we need money for in this campaign, well plants are as we see at the main expense. And also there will be some money for this outreach campaign, much less than the cost of the plants. We also will help with tools and some in cases sites can do more planting if they have more four-wheel drive vehicles because that's the only way to get to their sites, so we'll also provide support for rental . . . one-day rental of some four-wheel drive vehicles. We also have some costs for fiscal sponsorship, so we need a fiscal sponsor to accept donations and grants. We have applied for a grant in aid and we expect that to cover the bulk of the costs. We also have a Department of Environmental Management grant . . . or budget request for \$25,000. And we have one major private donor and a few more that are in the works. This is an overview of the budget as submitted to the State for the grant-in-aid request and all this is in the presentation which you have access to. Of course this is very rough and kind of speculative kind of early on. It just shows that the bulk of the costs are in the plants and also that we're expecting that in this . . . by this computation half of the plants will be provided by those who are planting, which means an in-kind . . . is counted as an in-kind donation in this budget. So, why is this not happening already or why . . . where are the problems that we're facing so far. Well, at this point in our work we have support and site commitments from all the populated islands, and we have a lot of progress in sites signed up on Maui. But we do not yet have organizers on the ground on the other islands, we have some people helping us, but we don't really have the kind of activity that we need on the other islands yet. And we have . . . we actually don't have any these funds that we've applied for committed to yet, so they're all in the works and some of them is actually a very long

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approval cycle. So, if we don't get these funding particularly and if the GIA request is not approved or if it's only partially approved then we'll need to compensate for it . . . *(inaudible)*. . . by other funds. One supporting factor there for the GIA request is that State representative for South Maui, Tina Wildberger, has committed to pushing for that and helping us get that through. . . . *(computer sound is heard)* . . . So, now the sound worked, how about that.

CHAIR KING: Is that the sound of digging.

MR. WELTMAN: So, that was my presentation. So, I'm open for questions.

. . .END PRESENTATION. . .

CHAIR KING: Okay. Thank you, Mr. Weltman. We have one member who has to leave for a doctor's appointment in about five minutes, so we'll start with Pro Temp Tasha Kama for questions.

COUNCILMEMBER KAMA: Thank you, Chair. I just had one, Mr. Weltman. So, is it your intent to just ask for funding from only DEM and not necessarily, you know, through the budget cycle that we have?

CHAIR KING: Mr. Weltman?

MR. WELTMAN: Thank you for that question. No, that budget request was actually initiated from the Department of Environmental Management.

COUNCILMEMBER KAMA: Yeah.

MR. WELTMAN: So, we haven't yet looked at whether other types of funding might be available from the County.

COUNCILMEMBER KAMA: Thank you. Thank you, Chair.

CHAIR KING: Okay, thank you. I'll just go down the line here. Member Paltin?

COUNCILMEMBER PALTIN: Thank you, Chair. And thank you, Mr. Weltman, for your presentation. I like the idea; I know they're doing a lot of great things out at Puu Kukui in my backyard. I was wondering if it doesn't become a Statewide thing, like are you prepared to just continue on with just Maui County?

MR. WELTMAN: Thank you for the question. And it already is a Statewide thing. We have committed sites on . . . we have a number on Hawaii island, and we have a couple on Oahu, and I expect there will be more. And then we have the Governor's commitment as well. So, it is happening. It just may not happen quite as much as we had hoped for on the other islands. So, it is.

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COUNCILMEMBER PALTIN: Oh. It is going to happen but it's not . . . Maui's not no ka oi.

MR. WELTMAN: Maui's no ka oi. No changing that.

COUNCILMEMBER PALTIN: And then is the Sierra Club members doing something specifically to prepare extra plants, like are they growing seedlings right now to contribute?

MR. WELTMAN: Sierra Club is not doing any planting and our role in this at this point is primarily organizational in . . . in getting the structure, the framework in place. And then contacting all these organizations all around the State and bringing volunteers together with site hosts. So, I do expect that the Sierra Club members and in particular Sierra Club supporters will be very much involved in the run up to the day and also in the planting on the day itself.

COUNCILMEMBER PALTIN: We did one when Hokulea came out to Puu Kukui and the way it was then was super-fast because there was pre-dug holes. Are you guys pre-digging the holes or people are digging their own holes?

MR. WELTMAN: So, that would be up to each site how they organize this. And some sites are only going to be planting maybe 50 or 100 plants. And so maybe it's no big deal, it depends on how many volunteers they have. So, one option of course is that if they can take a lot of volunteers and then part of what they do is dig holes on that day. Another option is that they dig them in advance and then can do all the planting on that day. The planting at the Puu Kukui when Hokulea arrived is really, really inspiring. I think that's probably the biggest single-day planting that's ever happened in Hawaii's history. And I'm hoping that Kamehameha Schools, which were the one who were the . . . was the volunteers that day, and also Puu Kukui will be a big part of this . . . this event as well.

COUNCILMEMBER PALTIN: Thank you.

CHAIR KING: Thank you, Member Paltin. And, Mr. Weltman, Sierra Club is not able to be its own fiscal sponsor for this? You know, you mentioned that you were looking for a fiscal sponsor.

MR. WELTMAN: That's correct. Sierra Club is a 501(C)(4) organization and from our discussions with various organizations involved in this, including many who have experience with fundraising, we need a 501(C)(3) fiscal sponsor.

CHAIR KING: Okay. All right. Thank you. Vice-Chair Rawlins-Fernandez?

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo, Chair. . . .*(spoken in foreign language)*. . . sorry I roll my R's too much, I know Swedish doesn't. Do you know a Camilo Mora?

MR. WELTMAN: Yes, I do.

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COUNCILMEMBER RAWLINS-FERNANDEZ: He's part of the carbon neutrality project at UH Manoa. He gave a presentation at the Molokai Climate Resiliency Summit last year. And so they're working on something similar to this. Have you spoke with him at all about this project?

MR. WELTMAN: Yes, yes I have. I've spoken to him a couple of times. So, Camilo Mora, his project has a different direction in that he . . . he is planting on his own primarily at the university with university students. And then planting them at one or two single sites and the last planting at Gunstock Ranch and then he also has a site at the Palehua on Oahu. So, his focus is on doing massive planting, really, really massive planting at a single site or one or two sites. And there are challenges with that. He had to postpone the second planting because the property owner pulled out and the second site did not achieve its goals. And the first planting, when I talked to him which is a month or two after half the plants had died and I believe by now perhaps most of the plants have died. So, that is kind of a brute force approach and it . . . it has its value and it is very impressive, I'm in awe. But it's not the approach we're following because we want to plant everywhere, we want to plant where sites are prepared to keep the plants alive. And also to couple this with . . . with education around climate change and how everyone can participate in that. I'd hope to have Camilo do his next planting on the same day on October 30th. But he had already planned for a day in November. So, he will be doing that day in November. And actually just to . . . if I can, a slight detour here is that there are some sites we've talked to who already had . . . far progressed plans to plant on other day. Because of either Arbor Day or other long-term plans and in some cases they've adjusted and to October 30th and other cases we'll say okay we'll just say they're part of this event even though they couldn't plant on the day itself. So, I'm hoping we can combine this . . . combine the PR around all this and consider them to be part of the same action. And his . . . I didn't give the numbers but when we submitted the GIA request I had to provide numbers for our concrete goals, specific goals. And my goals are 1,000 sites across the State, 10,000 volunteers and 100,000 plants in the ground. And it happens that Camilo Mora's goal is pretty much the same, 10,000 volunteers, 100,000 plants but just in one or two sites.

COUNCILMEMBER RAWLINS-FERNANDEZ: Mahalo. I think . . . so, his daughter is helping him with that project and they presented on their funding plan, right. So, having a website and allowing people from all over the world to pitch in if they're unable to make it and it helps to offset the cost for all the grants that you listed. So, I thought that was a good a strategy. Also I'm really happy to hear that in your plan you've considered the management so that trees can reach maturity because I did participate in the Hokulea planting and I don't know what the survival rate of that ended up being. So, I think, you know, ensuring that, you know, of the 100,000 trees that are planted as many as possible that can survive. And I know one of the threats is ungulates, deer eating them. So, if we could plant in areas that are fenced or protected from animals eating them, I think that would be ideal.

MR. WELTMAN: Yes, and that has come up with, especially with the DLNR on Maui when I talked to them that they're opening to planting anywhere as long as animals can't get to it. So, they're only willing to plant in fenced-in areas. So, with one branch of the DLNR

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we have an area . . . a six-acre area selected in the, you know, in Polipoli area. And actually similarly for the County as well, it needs to be in an area which is protected.

COUNCILMEMBER RAWLINS-FERNANDEZ: . . .*(inaudible)*. . .

CHAIR KING: Thank you for that question. And I know from being in agriculture that if you're on leased land especially it's really hard to get permission to plant trees because it looked at as 30-40 year, you know, proposition. So, it's hard to get a lease for any land for that long and so that's why most farmers aren't planting trees because they can't get 30-year leases on, you know, on that kind of land. So, anyway, Chair Lee, no questions? Member Sinenci?

VICE-CHAIR SINENCI: Thank you, Mr. Weltman, for your presentation. So, you're looking at 100,000 trees being planted on October 30th.

MR. WELTMAN: That's correct.

VICE-CHAIR SINENCI: Okay. I just one concern, have you put in effect maybe some preventative measures, the spread of invasive species, particularly the little red fire ants. I mean that's a problem in our neck of the woods. So, when transporting seedlings throughout the island that would be maybe one cautionary . . . of just, you know, 'cause those it's hard to detect the little red fire ants. So, maybe that would be something that you put on the website. On the website those places that have been selected for plant areas, are those mostly private places, farms, have you looked . . . seen where those people have . . . wanting to plant those areas? Are they just a variety of . . . I mean are people just saying hey, come to my yard and plant some trees?

MR. WELTMAN: Thank you for the questions. So, yes I agree that's a valid concern about transporting material and spreading invasive species. We have some material on the website now with advice to plant . . . on planting for people who are not familiar with or don't already have a plan. But adding guidance on avoiding invasive species, both plants and animals, that's a good idea. At this point we have a mix. We have a mostly conservation organizations on the website.

VICE-CHAIR SINENCI: Oh. Okay.

MR. WELTMAN: And that's to be expected because they are fast moving because they know exactly what to do. They've been doing this for . . . in many cases for decades. And it's easy for them to say we plant anyway okay we'll just do some extra planting on October 30th. And we're starting to get more and more of the other type of schools and farms and hotels, resorts. But, so in terms of volume . . . I mean number of sites; I do expect the majority to not be conservation sites but at this point they are mostly conservation sites, and once we get going.

VICE-CHAIR SINENCI: Okay. Thank you. And then real quick, I support the idea and looking forward to be able to go home and start my seedlings. You know, just some ideas about helping out, the County offers grants through the OED office so maybe we

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could . . . Chair, we could maybe require or encourage that some of our applicants provide seedlings or, you know, those that . . . the farm . . . farm programs or garden programs that we . . . that we support. Also, you know, I love the idea of including the children at local schools and, you know, if we can keep those plastic bottles out of the dump . . . I mean we could easily use those as containers for a new seedling. So, I appreciate the effort, mahalo.

CHAIR KING: Mahalo, Mr. Sinenci.

MR. WELTMAN: Okay, just one comment then on schools. The schools we expect will participate in primarily one of two ways. I mentioned that a lot of schools could really use some trees. And there may be some opposition to planting trees just because of the maintenance costs and issues. But the schools could really use some trees. The other way of participating is . . . is fieldtrips, such as the Hokulea planting day.

CHAIR KING: Thank you. And have you worked with . . . with the existing nurseries that are growing, you know, native or endemic trees that might want to donate partially mature or mature trees?

MR. WELTMAN: So, I've talked to Native Nursery, Native Nursery is one of the two nurseries that grow native plants on Maui at any scale. Native Nursery and Hoolawa Farms, Anna Palomino, and I've not asked them for donation. And I haven't done that because I think it would be a major effort for them to produce all the plants that will be requested of them for this event. I do expect that they'll contribute at a smaller scale, but they just acquired a neighboring property, so they told me that they'll be able to double their production this year, which is a good thing.

CHAIR KING: Okay. Great. Okay, thank you so much, gentlemen, for those two very informative and inspiring presentations. And, Members, I just want to kind of go back to the . . . the statistic I cited earlier by National Geographic and point out that the caveat to that amount of suitable land area is . . . diminishes as global temperatures rise. So, the . . . you know, highlights the climate emergency that we're in and the urgency for some of these actions. And the opportunity that agriculture allows us to look at mitigations to climate change. So, I'm . . . I'm very grateful to have these ideas on the table and to be working on them and having them progress and we'll hopefully address some of the issues in the Budget Session. But, so right now I'd like to take a break and after the break we'll hear from some of our existing non-profit organizations that are in our grant. That we're already giving grant money to and the work that they're doing as it pertains to climate action and that's our second item of the day. So, in recess until 10:45, Members, come back at 10:45 please. Thank you. . . .(gavel). . .

RECESS: 10:38 a.m.

RECONVENE: 10:48 a.m.

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CHAIR KING: . . .*(gavel)*. . . Okay, Members, back in session, we're reconvening the Climate Action and Resilience Committee on February 25, 2020. And . . . now . . . oh I forgot to . . . any objections to deferring the first item?

COUNCILMEMBERS: No objections.

COUNCILMEMBERS VOICED NO OBJECTIONS. (Excused: RH, KRF, SS)

ACTION: DEFER PENDING FURTHER DISCUSSION.

CAR-1(4) OVERVIEW OF CURRENT AND POTENTIAL GRANTEES RELATING TO CLIMATE ACTION AND RESILIENCY (RULE 7B)

CHAIR KING: Okay. All right. And we're on to the second item the CAR-1(4) Overview of Current and Potential Grantees Relating to Climate Action and Resiliency. And this is a precursor to our Budget Session. So, we have four representatives of four different organizations at the County, currently funds through our various channels of environmental funding. And this is . . . this panel was coordinated by Makalea, who's our environmental coordinator under the Office of Economic Development. So, thank you . . . I don't think she's here today but thank you to her. And the panel is made up of current and potential Maui County grantees who focus their work around projects related to climate action and resiliency. In each of their capacities the panel members we have before us today have specialized knowledge and expertise within their organization's topic matter. So, if there are no objections I would like to designate the panel members as resource persons in accordance with Rule 18-A of the Rules of the Council.

COUNCILMEMBERS: No objections.

CHAIR KING: Okay. Thank you, Members. So, today we have as resource people, Amy Hodges, programs and operations manager of Maui Nui Marine Resource Council. Good morning, Ms. Hodges.

MS. HODGES: Good morning.

CHAIR KING: Tamara Sherrill, executive director of Maui Nui Botanical Gardens.

MS. SHERRILL: Good morning.

CHAIR KING: Good morning, thank you for being here. Christopher Warren, who's with the avian conservation/restoration and data management technician section of the Maui Forest Bird Recovery Project. Thank you for being here, Mr. Warren. And we have Kim Falinski, with The Nature Conservancy and she is the marine science advisor and . . . I had two other people with you, but I think they're just with you in spirit today. Okay. So, four organizations and we'll go ahead and get started with Ms. Hodges. Thank you for being here.

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. . .BEGIN PRESENTATION. . . ***(Maui Nui Marine Resource Council)***

MS. HODGES: Thank you. Okay, green light. Thank you so much, thank you for having me here today. Again my names Amy Hodges, programs and operations manager with Maui Nui Marine Resource Council. MNMRC or the Maui Nui Marine Resource Council is a 501(C)(3) nonprofit here on Maui focused on clean water, healthy reefs and abundant native fish populations. So, we do lean more towards the environmental side of things. We're really fortunate and grateful to be a recipient of OED funding for the past few years and the current year as well and intend to apply for the coming year. This is a slide provided to all of us by Makalea from OED just to connect our projects to the purpose of this committee meeting today. Again we do . . . our organization does lean towards the environmental side of things and this slide is from the CDC based on human health factors related to climate change, which is more than just sea-level rise. But we do recognize that here on Maui . . . especially and in Hawaii that our environment is of course a part of our health of our lifestyle here. So, closely related. I have put some circles on things that . . . on this slide that I think relate to our programs. Environmental Degradation, a healthy environment is the main driver of our economy and way of life here on Maui. Severe Weather, dry or hot or windy or more extreme rain events in the windy season, this threatens our environments, homes and business and larger, heavier rains can wash sediment down into our coastal waters. It's a worsening cycle. Water and Food Supply Impacts, that would be decreasing fish stocks, ocean acidification, bleaching events to our coral. Degraded Living Conditions and Social Inequities, decrease in harvesting for marine resources on which our residents really upon. Air Pollution and Increasing Allergies, this one as you'll see are some of our projects this year and the year after address wild fires and of course when we have these big smoke events . . . unfortunately as we can see on Kahoolawe right now these large wild fire events result in smoky air. And Water Quality Impacts--this is the big one for us--with algae blooms which degrade our coral resources, warming ocean temps, sea-level rise results in coastal erosion and sedimentation. So, that's where we're going to tie into on our projects. So, the first one I wanted to talk about . . . and you might have seen the news recently, but this is a new project for us that came to life officially last month is the Oyster Bioremediation Project. And oysters are nature's filters, they remove algae and sediment from the water column along with a host of nutrients and chemical compounds. Excess algae blooms often result from excess nutrients entering the water, from stormwater runoff. Clean water is better for coral and for human health. And the moral of the story with the oyster project is if the oysters are alive they're cleaning the water, so people often ask us well how do you know if it's working, how do you quantify how much they've removed, how much, you know, pollutants from the water column have they removed. Well you can, there are ways to do that but at the end of the day if they're alive they're cleaning the water. So, a couple oyster stats for you. One Pacific oyster, which is the species we are currently are using, one oyster can filter 50 gallons of water a day and that's in, you know, pretty decent conditions. Of course that's variable. But that's like 50 jugs of milk filled with water or think of like a 55-gallon drum, that's one oyster filtering that each day. And another thing coming off our last

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carbon presentation, but they do uptake carbon to produce their shells, about 12 percent of their shells is made up of carbon.

CHAIR KING: I'm sorry, Ms. Hodges. Did you have a problem hearing?

VICE-CHAIR SINENCI: Are you taking questions throughout the presentation?

CHAIR KING: We'll take questions after.

VICE-CHAIR SINENCI: Afterwards. Okay, thank you.

CHAIR KING: After the . . .

MS. HODGES: Okay. Yeah. And then this is our official installation of the first 500 oysters that we installed at Maalaea Harbor, which is our pilot project site, this was on January 31st. This is us installing them. We have 500 oysters . . . just a pilot to see if they'll survive before we put a bunch of them in the harbor. Like, let's just try a few and see how they do. It's been almost a month, really happy to report that they're almost . . . almost 100 percent still alive. Like, doing really, really well. So . . . yay. I mean I guess I would have said something if they'd all died right off the bat like oh geez, what's in the water. But they are alive and they're gaining weight, it means they're cleaning the water, they're taking stuff out. So, very soon we'll be ramping up the numbers significantly in the harbor that we'll put in there. But we just did a few . . . like six cages of them. They're suspended in cages. We can get into the project details later if you have more questions. But I got a few things to hit on here. So, that's something that we will be pursuing in the next probably one to two years of grant funding as well. We'll be ramping up these numbers of oysters for the harbor. Speaking of Maalaea Harbor, something that we did in the past year was called Cockroach Corals and I know that's like kind of a sad name for corals. But we think of these corals in the harbor as like survivors . . . like how are they surviving in there. They're getting a little bit of every kind of punishment upon them every day. But there's a really cool reef in there, really nice coral species, some endangered or threatened species. So, we had some students from UH Manoa Kewalo Marine Lab came over and took tiny little permitted samples of the corals there and they're doing DNA analysis to see what's so special about these coral. How can they survive and maybe they're the answer in climate change coming as we're losing other species of corals. Maybe these are the ones that we out plant, maybe these are the ones that we learn from, you know, why are they so resilient. So, that is again in Maalaea Harbor. And they did that study all along the West Coast of Maui and we approached them and said hey, can you tack in Maalaea Harbor to your study and they said yeah, sure. So, looking upslope . . . that was the makai section in Maalaea and then we looked upslope, we said well, these are all great solutions to helping clean up the water but why don't we stop the water from getting dirty in the first place. So, we looked to mauka and this is the Pohakea Watershed and unfortunately, you know, this is Maalaea, the fire that was there last October burned about 4,100 acres. It's a super prone area to fire, here's a couple more photos. And of course when the fires come through we lose our vegetation, results in erosion, comes downhill, sediment comes into our water and that's what we want to avoid. We're concerned about Maalaea

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because it's a really important part of our life here on Maui. It's a center economic hub for us, the people who live on the Westside, if they want to, you know, get to a hospital. If that highways on fire it's closed, right. Main communication lines go through there, the Internet lines for West Maui all wrap through there. It's really important area to us, so not just from an environmental standpoint but for those of us living day to day on Maui. These are not my images, I want to give credit to the Hawaii Wild Fire Management Organization but I did want to share . . . this is from a recent publication they released on vegetation and fuel loads on Maui. But this is a map of . . . on the bottom left there is a map of fires. Fires are projected to increase with climate change. It's going to get windier, hotter, dryer, more fires. You can see Maalaea's super prone to that. And then the top-right image is a survey they did of those of us who attended this workshop that they held and said, you know, put a dot on the map where are you are worried about, what's important to you on Maui. Of course people want to circle the whole island, but they said if you have only two dots to place on this map where would you put them. And those are the areas of high concern are the blue, bluey-purple-reds. And of course you can see it's where people live but it's also access points, it's where infrastructure is, it's where important environmental resources are. So, we're like yeah okay let's work in Maalaea. Let's have less fire in Maalaea. So, that's where we decided to commission the Pohakea Watershed Stormwater Management Plan, that was in 2019, end of 2018, early 2019 by Maui Environmental Consulting. That was done by Michael Reyes and Wesley Crile, who's formally with the County. They commissioned or they authored this plan for us and in it was some fire break ideas, other shovel ready kind actionable items that we can do to help decrease the impact of stormwater in that watershed. It's not a watershed plan like through the DOH, it's just a list of potential issues in the area and ways that you could go about addressing them. And so, we're using that plan to help implement, installing, and improving fire breaks in this watershed. So, that's the green, the blue, and the red lines there kind of bordering what would be the watershed. So, we'll be doing that in 2020, 2021 and possibly 2022, hopefully done by 2021 is the plan installing fire breaks there. And along with that would come, after firebreaks and fuel breaks, vegetation buffers would come strategic plantings to help prevent any erosion that might result from creating firebreaks. I should look at my notes. The other thing that was in the Pohakea Watershed Stormwater Management Plan was a water quality monitoring plan for the area. And that included this drainage map here, these are all the drainages that empty into Maalaea Harbor and Maalaea Bay. So, we will be doing water quality monitoring there. Yeah. Just a lot of diversions, channelized culverts, things that we can work on, that we can be better about. And all of these kind of create fast highways to transport pollutants from stormwater into the coastal waters. So, here's one of those culverts in those drainages. This is called a head cut, this is another project of ours this year. We'll be monitoring these head cuts. So, unfortunately, I'll give you some more pictures of this. And this is the culvert that goes right under the Honoapiilani Highway there, so if you were to look mauka and down you'd see this. There's Wes standing in the head cut which is when . . . basically a force of stream water comes down and gets to the culvert and it's too small or the volume's too big or the velocity's too fast and just kind of backs up and eats away at the soil there, it's called a head cut. Evidence of a recent flow with Wes. So, one of our projects this year will be monitoring the head cuts, installing some simple monitoring devices so you can start to quantify how much soil is being lost in

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these storm events. And then you can start making case for head cut repair which is . . . unfortunately usually . . .

CHAIR KING: Is that an old picture? Or is that where Wes went to after he left OCS?

MS. HODGES: No, I'm sorry, this is from . . . this is also from the Pohakea plan. So, this is not . . . he didn't defect from you to this. This is from before.

CHAIR KING: Just to let you know we have about five more minutes for your presentation.

MS. HODGES: Oh, I'm so sorry.

CHAIR KING: So, if you could . . .

MS. HODGES: Okay. I'll blast through. Anyway here's what happens when the stormwater comes through this brown water in Maalaea Harbor and here's us monitoring it with a probe attached to a kayak. You can tow it around, a little map from that, it continuously collects data as fast as you want it to. We also have the probe attached to the back of a boat and are doing circumnavigation around the island. We hope to do this again in the coming year, wet season and dry season, looking for sources of freshwater input. Freshwater a lot of the times, whether, you know, coming from man or groundwater sources, you know, delivers land-based pollution into our coastal waters. So, where is it coming from, what's happening. I'm not going to get into this Hui O Ka Wai Ola program because, Dr. Kim Falinski, will be discussing it soon but the other part of our water quality monitoring with MNMRC is this program. It's volunteer based; 41 sites are being monitored every 3 weeks from leeward Maui. There's our awesome volunteers. So, those are some of our on the ground implementation mitigation projects but in addition to those research projects, we're doing public outreach campaigns. So, we're trying to help people understand, okay, yeah, climate change is happening but here's some things you can do right now today to help our environment be healthier in the face of climate change that's coming and that's already here. So, those campaigns are . . . the big ones were coral reef health and sunscreen. So, get a jump on protecting Maui's coral reefs, make the sunscreen switch. You don't have to wait for the law to come into effect. Posters and advertisings for, you know, the things that visitors might use. We also have the airport signs; these were 12 panels of messaging signs applied to the windows along the terminal in the airport. Six of them were about sunscreen and snorkel tips, don't walk on the reef, things like this so you capture the visitors right then when they come off and the locals. But right when they get off the plane, oh I didn't know, you know, Maui had a sunscreen law coming in effect, oh I didn't know that coral was alive. The close-up of some of the messaging. And one other campaign that we will be doing in 2020 and moving forward, which I don't have a slide for because it's new for us, but we will be pursuing education about pesticides and herbicides and making the switch to safer options for the environment. And so, that's something that's new for us and it will be . . . we will be doing this year and pursuing additional funding for, this will include webinar on how to make the switch and things like that. So, that will be available to the public. And looking at landscaping, large-scale landscaping, small scale, making the switch. So, wrapping up a couple other outreach things that we did,

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radio PSAs about making the sunscreen switch and about the Hui O Ka Wai Ola program, website pages dedicated to making the switch. See if this plays, I don't know.

MR. KALEPA (from video): Aloha, Maui. Archie Kalepa here asking you to help protect our local coral reefs by switching your sunscreen, avoid sunscreens with oxybenzone and octinoxate, two chemicals that can harm or kill corals. There are lots of safe-for-the-reef choices. Get info at mauireefs.org/sunscreen. Brought to you with aloha by Maui Nui Marine Resource Council, Maui Visitors Bureau, County of Maui Office of Economic Development, and me, Archie Kalepa.

MS. HODGES: So, just a little PSAs like that to help people--

CHAIR KING: Okay.

MS. HODGES: --become aware.

. . .END PRESENTATION. . .

CHAIR KING: Okay, Amy, so I'm going to ask you to stop right there and I know you have a few more slides . . .

MS. HODGES: That's okay.

CHAIR KING: But I want to be able to leave time for any questions we have, and I want to make sure we get to the rest of the presentations.

MS. HODGES: Sure.

CHAIR KING: If that's okay.

MS. HODGES: Yeah.

CHAIR KING: So, do we have any questions from Councilmembers? Mr. Sinenci, you had a question.

VICE-CHAIR SINENCI: Yes. Just some quick questions. So, for the oyster project, you know, for opihi we see that when opihi spawn the little spawn goes up and down the coast. And I was wondering if oysters also have that same, you know, if they're spawning do they, you know, kind of send their . . . going up and down the coast and not just within those cages?

MS. HODGES: So, like a shadow effect to other areas. So . . . just so that we're clear, the oysters that we're currently using, the Pacific species that we have are sterile. And we did that just because they're a nonnative species and the sterile one aren't concerned about . . .

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VICE-CHAIR SINENCI: Okay.

MS. HODGES: They aren't thinking about, I want to reproduce, they're like I just want to eat and get big and fat and filter more water.

VICE-CHAIR SINENCI: Okay. . . .*(Inaudible)*. . .

MS. HODGES: But the native species that we do want to introduce this year, they will be able to spawn. They are already present in Maalaea Harbor in small amounts. And what they do they will spawn out like that and the larva are attracted to their own kind. So, they'll go towards where they recognize other shells of their own kind are. So . . .

VICE-CHAIR SINENCI: Okay, thank you for that --

MS. HODGES: Yeah.

VICE-CHAIR SINENCI: --answer. And then some of the reefs within the harbor I don't see some of that carpet limu that might be more evident in West Maui. Do they have that, is there a problem with . . .

MS. HODGES: That algae overgrowth.

VICE-CHAIR SINENCI: Yeah.

MS. HODGES: Yeah. You know the harbor doesn't have as much algae on the floor, it's mostly thick billowy fluffy sediment everywhere. They do have a ton of grazers in there from turtles, they're all over the harbor so that could be helping take down any algae. But we haven't seen as much algae overgrowth, there's just heavy layers of sediment in the harbor.

VICE-CHAIR SINENCI: Okay. Thanks. And one last question, Chair. So, we spoke about trees earlier in the meeting. Are there any native trees that would be kind of conducive to the . . . I guess the area, the Maalaea dry . . . dry area that could --

MS. HODGES: Sure.

VICE-CHAIR SINENCI: --maybe prevent erosion or at least . . .

MS. HODGES: Yeah. You know, when we talk about, you know, doing strategic vegetation planting there in the watershed that's super prone to fire. There are species there, we are doing a flora and fauna survey. We're in talks with Hank Oppenheimer to perform that for us to recognize any seed banks that might be useful for species to use in the area. On one thing that we have heard in our talks with DOFA, who's owns land through Land Division is that it's super prone . . . it's an area super prone to fire. They don't necessarily want to revegetate it with a huge forest that will be a large fuel load for the likely fires that continue to happen in the area. So, we'd be looking more at smaller . . . smaller-type species. Yeah.

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VICE-CHAIR SINENCI: Great. Thank you. Thank you, Chair.

CHAIR KING: Okay. Thank you, Mr. Sinenci. Chair Lee?

COUNCILMEMBER LEE: Thank you, Madam Chair. What happens to the oysters secretions . . . excretions?

MS. HODGES: Yeah.

COUNCILMEMBER LEE: What happens?

MS. HODGES: So, they produce . . . they're sucking in water; they're keeping the phytoplankton that's their food and then they're sucking in sediment and pollutants and things. They don't keep that; they spit it out . . . think of like with an owl pellet comes back out of its mouth. I don't know if you know that. But it's called a pseudofeces, and they spit it out and it's enveloped in mucus that's full of proteins. It falls to the floor of the ocean instead of being resuspended in the water column over and over again. And then because it has these proteins in it other critters come along and actually eat it. So, it just continues to be consumed and on the floor not floating around in the water column creating a turbid environment.

COUNCILMEMBER LEE: Okay. So, then they're not contributing to the pollution of the water?

MS. HODGES: No.

COUNCILMEMBER LEE: What is the lifespan of a typical oyster?

MS. HODGES: Yeah. We expect these to live about five years. I've heard they can live as long as 20 for this species. But we would expect . . . if we got five years out them we'd be pretty happy with that. Yeah. They're very, you know, they cost a dollar, so it's pretty good . . .

COUNCILMEMBER LEE: So, on average it cleans 50 gallons a day?

MS. HODGES: Yeah.

COUNCILMEMBER LEE: That's terrific.

MS. HODGES: Yeah. When full grown.

COUNCILMEMBER LEE: Yeah. And finally how much do you normally get from the Office of Economic Development?

MS. HODGES: Sure. This past year we got 225,000 for our programs and we got another 100,000 for the special educational campaigns that I was getting into.

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COUNCILMEMBER LEE: From OED?

MS. HODGES: Correct.

COUNCILMEMBER LEE: Both.

MS. HODGES: Yes.

COUNCILMEMBER LEE: So, is that going to be your request this year?

MS. HODGES: Likely again, yes.

COUNCILMEMBER LEE: Okay. Thank you.

CHAIR KING: Thank you. So, we don't get any pearls out of those oysters.

MS. HODGES: Well, we --

CHAIR KING: . . . *(inaudible)*. . .

MS. HODGES: --actually will be adding the black-lipped pearl oyster as one of our native species. We'd have to talk about permit requirements if we were to take any pearls.

CHAIR KING: Okay. Member Paltin, do you have any questions?

COUNCILMEMBER PALTIN: Yeah, a couple. So, then when they're near to the end do you eat them?

MS. HODGES: You would not be able to eat these. They're not for human consumption and they're technically toxic because of what they're ingesting in the place where they are. So, if they were to die and I was to find a dead body in the cage I would have to dispose of it . . . like it was to the landfill or incineration technically. A lot of the times if one was to die and bust open, a little predator would get in there and probably eat it before I could get to it. It'd be part of the lifecycle in the harbor. But not for human consumption.

COUNCILMEMBER PALTIN: Okay. And then my other questions were, with around the firebreaks on the ridges, do you need to get special permitting for that? And what is involved because I seen when my . . . my brother-in-law makes firebreaks around his house, it's like --

MS. HODGES: Yeah.

COUNCILMEMBER PALTIN: --not a sensitive area? And so, just was wondering . . . I mean the ridge seems kind of . . .

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MS. HODGES: Yeah. Yeah. So, these . . . the firebreaks we're looking to at the moment are existing roads that just need to be graded. So, that a . . . firefighters and DOFA have safer access and can get up them. They cannot on most of these areas other than DOFA special equipment at this time. And the permits we would be needing would probably be grading and grubbing if we needed one. It is going to be under . . . on DLNR property, so it's possible to work under their existing permits there. But, yeah it would be a grading and grubbing . . . would be the permit if it was deemed that we were removing enough soil level.

COUNCILMEMBER PALTIN: And you have best management practices for the intended work?

MS. HODGES: Oh, we definitely will. We have existing BMPs already beyond what are the County and State standards on our website for developers. So, we would apply those and more to our own practices.

COUNCILMEMBER PALTIN: Okay. And then what about like if they don't want trees for the fuel load would vetiver work?

MS. HODGES: Yeah. And we actually have already preordered some vetiver, especially for, you know, water bars across the roads. Things that you can still drive over if you need to access it but that are, you know, fire resistant through their root systems. And for, you know, kick outs, things like that they can help filter. Absolutely. We are talking with sunshine vetiver, preordering some of that. I know it's not native but it's an amazing . . .

COUNCILMEMBER PALTIN: And there's no permit required for that?

MS. HODGES: No. No.

COUNCILMEMBER PALTIN: Thank you.

CHAIR KING: Excellent. Great question. Okay. Thank you so much and thank you to Maui Nui Marine Resource Council. We're going to move one to our next presentation and that is Tamara Sherrill from Maui Nui Botanical Gardens.

. . . BEGIN PRESENTATION. . .
(Maui Nui Botanical Gardens)

MS. SHERRILL: Thank you.

CHAIR KING: I don't know, do you have a PowerPoint?

MS. SHERRILL: I do.

CHAIR KING: Okay.

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MS. SHERRILL: I was just trying to find it here.

CHAIR KING: It's not on Granicus, Members. So, just to let everyone know we have about 10 or 12 minutes for each presentation so we can leave time for a few questions.

COUNCILMEMBER PALTIN: I did see Maui Nui Botanical Gardens on Granicus.

CHAIR KING: Is it on Granicus? Oh. Okay. It's not on mine for some reason. But I may need to refresh. Okay.

MS. SHERRILL: Aloha mai kakou.

COUNCILMEMBERS: Aloha.

MS. SHERRILL: I'm Tamara. And thank you so much for your time today. Maui Nui Botanical Gardens has a line item grant with Office of Economic Development that is \$150,000 and it is base line operational funding. We use that many times over for matches for other grants and it is a very important base line for us. So, thank you so much for that support. I am not a . . . I'm very much a botany geek and I'm not a climate change expert but I appreciate the ability to tell you how just having a site like this is a really good idea and does relate back to the slides that Makalea gave us. So, you know, I'm sure all of you have been to Maui Nui Botanical Gardens, if you haven't please come. This is located right on a remnant coastal dune on Kanaloa Avenue. We are open to the public six days a week. And as you can see from this photograph, you know, right in the middle of Keopuolani Park it is a very coastal site. And it is . . . has been a native plant landscape since 1976 when Rene Sylva started as a groundskeeper when it was still the County zoo. And that was one of the first times that native plants had been used in the landscape in the State and he really was a leader. So, it has become a very shady, beautiful landscape that's an excellent event site. Our next event will be the Hawaiian language immersion fundraiser Hoomau on March 28th. I think our strength besides our location is also just our role in interpretative education garden, a community education center for native plants. We have 12 Saturday cultural workshops that are scheduled for 2020, we've got 10 new docents that we're training this year. We had a 102 visits last year from local schools, about 52 groups, we've got Imua Preschool coming every Friday and staying there all day long. So, it's very, very much a well-used site and these types of educational outreach things that we are doing, you know, transfer of Hawaiian cultural knowledge. It's a really great site for taxonomy and plant identification for anyone trying to learn about native plants. And we really value our conservation partners and are trying to become more valuable to those conservation partners. So, not only through events where they can outreach with the public but also through our seed banking project that we'll talk about a little bit later. So, I believe this really helps with pride of place, I also believe that native plants are really important for identifying Maui as a unique destination and landscape. And the doorway that we use to reach our tourist visitors is as the Hawaiian cultural uses are ethnobotany of these plants. So, you know, this picture of Lei Ishikawa here holding here kapa dye sample from the dyes workshop that we did, every single one of those colors came from native plants from the botanical garden. So, in a very small way, you

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know, I do believe that it addresses the social inequities and degraded living conditions because I think these kinds of green spaces and passive parks and Hawaiian cultural centers really mean a lot to the communities in which they're in. And I think Central Maui is one of those communities where this is going to be very important. We're also just a place where residents come every day and take plant materials. So, we are there available for free, if you come in we do have a small admission fee because we're with OED. We need to be raising some revenue. But we, you know, anyone who wants to collect materials for traditional cultural uses it's always free. We also really promote the idea of native plant landscaping. So, we're available to help residents choose the right plant, spend all that time with them, walk around, show them what a mature plant looks like in the landscape and then we send them on to the local commercial nurseries that Rob Weltman was mentioning. Those nurseries do benefit from the work that we've done with that customer so that they need a little less consultation, know what they're looking for and can buy in larger quantities. And native plant landscaping if it's done right, if you choose the right plant for the right place it will save water. It will save irrigation water and of course any kind of planting can prevent erosion. I believe that this kind of native plant landscaping grows public support for the native forest protection organizations and the type of work that people like Amy are doing. This most recent presentation by Dr. Tom Giambelluca about the water impacts of invasive species in Hawaii was last November. And his research is showing that native forest transpire less water into the air. So, invasive species are actually releasing water into the air at a faster rate . . . I think he said at 40 percent faster rate than native species. So, it's the very concrete proof that native ecosystems are providing better ecosystem services, which of course relates in terms of climate change to water and food supply impacts and also water quality impacts because we're talking about preventing erosion and also just maintaining our watersheds, maintaining our water supply if we have support for native forest restoration. Rob has a very wonderful project, the ReTree Hawaii project, we've been doing it in little . . . a very small way since 2003. We've been under the Kaulunani Grant with DLNR, have been doing our Arbor Day tree giveaway. About a thousand trees, usually averages more about 1,500 trees . . . native trees that are distributed one per person to the public. And we also feature . . . we had 21 different conservation organizations interacting with the public this year. And I believe that, you know, just doing that, you know, has resulted in at least 15,000 trees planted. We also are very much hand holding those residents, so we're giving them a lot of education about the trees, we're helping them pick the tree and we give them a lot of support. So, it's a very high quality, if a lower impact to then something as wonderful as the ReTree Hawaii. And we are a partner with that . . . with that event and we will also be having our Arbor Day event just after it. So, in an indirect way, you know, having these more urban trees, more diverse tree species because we emphasize native species, especially endangered species getting into our neighborhoods do help cool our cities, and improve air quality among . . . of course all the other benefits. And then of course our focus on botany and Hawaiian culture resulted in our . . . adding a large collection of Hawaiian cultivars to our native plant collection. So, if you look at this chart here you can see, you know, of five major crops, maia or bananas, uala or sweet potatoes, ko sugarcane, taro or kalo, and also awa, kava. There were between 700 to 1,000 unique Hawaiian varieties at one point, there's only about 127 that still exist. So, having a living gene bank of these varieties and then getting them out to farmers and home growers is

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preventing plant extinction, it's preventing cultural extinction. It's also the possibility for more diverse local food sources, and we just started our La Ulu at our breadfruit festival to just promote ulu as a, you know, a food that maybe we didn't grow up with but something that we should be eating. Because it's here, it's available, it's an easy tree to grow and, you know, it's a culturally relevant food that more people should be using. So, that's an event that also goes back to these heritage cultivars. And that I think has a very small part to play but I do think that having more genetic diversity in our . . . the types of plants, the types of crop plants that we can plant and making sure that we do preserve these Hawaiian cultivars, these heritage cultivars could have real potential impacts on our food supply in the future. And then last but not least our . . . the project that we've been working on since 2015 is seed storage. So, wild sourced seed storage. And if you look at this picture of 5,000 ohia seeds, if we think about if only 10 percent of those germinated and then if only, you know, 1 in 5 of them survive that's representing a 100 trees. So, if we're talking about conserving genetic diversity this is a really effective and economical way to do it. And what we do is, it's fairly low tech but it does require a little bit of lab equipment, you dry down to a certain relative humidity and then you package into these packages that keep it at that relative humidity. You can really keep seeds viable for much more than they would be in the wild. So, in the case of wildfires, when we need to do research our focus is coastal native plants and also ohia lehua because of the rapid ohia death. There's an initiative to collect from as many different ohia trees as possible to get as much genetic representation from Maui County, get that into storage for research and for future small restoration projects. It does buy land managers time to address threats, so if they're fencing and they've got rare plant populations and their rare plant populations are disappearing then we've got a seed source. So, this is something we've been doing just with interns. Here's a small list, it's not a complete list of the land managers that are on Maui that are storing native seeds with Maui Nui Botanical Gardens right now. And Maui County does need seed banking, although we do send seeds to other facilities on other islands for backup, the reality is since 2015 working with all these different partners, learning from the seed bank, learning from Lyon Arboretum, meeting with people from Kew Millennium Seed Bank we realize that the Maui Nui endemic species and populations are really underrepresented in these other places. And by having something locally here . . . also coastal plants are very, not represented very well. By having a Maui seed bank and focusing on coastal species we're really filling some gaps. And there was a study by Lokahi Network that's in the resources slide that does support that. So, our plans for 2020 are . . . we finally have a dedicated staff member that was provided by a contract with Hawaii Tourism Authority. We'll be making many more wild seed collection trips because we learned from our conservation partners, they don't have time to do this and they got enough on their plate already. So, they need more labor helping to collect seeds that they care for and they own these seeds. And then we'll also be partnering with Dr. Kasey Barton with the University of Hawaii Sea Grant is doing a study on the vulnerability of coastal ecosystems to increase salinity from climate change. So, as seawater goes . . . moves farther inland with sea-level rise we can provide . . . we will be providing a lot of test species that we've collected over the years so that she can test to see which ones might be good for restoration more inland for the coasts. In the future and that's, you know, directly addresses this environmental degradation issue as well as the severe weather and water quality impacts because our

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goal is to support those land managers doing coastal ecosystems and wetland restoration, which are really important to resiliency as you know. Last year we had nearly 500 volunteers and they donated 3,400 hours and we're working on a new nursery and volunteer work area. We would really . . . one of the things I don't have funded, I'm not asking the Council for any funding or the County for any funding, but I am looking for ideas on how to include a small building for the seed banking that we're doing. The seed office . . . if we go back our seed office looks like this. It's just a small . . . you don't need much; you don't need a lot of technology you just need labor and we can do quite a bit in this ten-by-ten office. But if we had a larger building that could house a little bit more equipment we would be able to utilize those volunteers. So, thanks so much for your time and I'd be happy to answer any questions.

. . .END PRESENTATION. . .

CHAIR KING: Okay. Thank you so much for that presentation. I was going to ask you if that one refrigerator was secure enough for a seed bank but . . .

MS. HODGES: Hey, you can . . . we've got more than 500 accessions there so, you know --

CHAIR KING: Okay.

MS. HODGES: --you really can do a lot with a little.

CHAIR KING: So, Members, what I'd like to do is go through our next two presentations and then if you have questions . . . if you can hold questions to the end because I want to make sure everyone gets a chance to do the presentation and we don't run out of time. We've got about a half an hour left and so if you can hold on and address questions at the end that would be great. And, Sherrill . . . so the next that we have . . . Christopher Warren with the Maui Forest Bird Recovery Project. And that one is . . . yeah, that one is on Granicus as well.

. . .BEGIN PRESENTATION. . .
(Maui Forest Bird Recovery Project)

MR. WARREN: All right. Thanks everybody for inviting me. Like I was introduced, my name is Chris Warren, I'm a biologist with Maui Forest Bird Recovery Project. We are a research and management organization devoted to developing and implementing techniques to recover Maui's endangered birds and to restore their habitats through research, development, and application of conservation techniques. Our project was created by the State of Hawaii, US Fish and Wild Life Service, and the University of Hawaii. And what I'm presenting to you today . . . we fall in the potential future funding category.

CHAIR KING: Okay.

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MR. WARREN: So, I'm not specifically asking for funding right now, but I want to present issues related to climate change, related to our native birds here on Maui. And we've now seen this slide a couple times and I don't want to dwell on it too much but it's important that, you know, we all remember that climate change is going to be expressed in numerous ways and it will affect different populations in different ways. For the native birds of Hawaii this will largely be in the categories of habitat loss and changes and for Hawaiian honey creeper specifically, changes in vector ecology. Although this slide is made for human malaria, it's . . . we're . . . I'll be speaking about avian malaria which is very similar. Maui is undergoing a mass extinction crisis with the native birds. This is not something that is a thing of the past, this is something that is ongoing. We're left with 6 out of about 20 species of forest birds left on Maui and 2 of those are critically endangered. And both of those are only found on Maui and nowhere else on the planet. And one of the biggest drivers of these extinctions is avian malaria which is, as you may know, just like human malaria is transmitted by mosquitoes. And here in Hawaii they are non-native invasive mosquitoes. Mosquitoes were introduced anywhere in Hawaii for the first time in 1826 in Lahaina. So, Maui is right at the start of that story. And then the subsequent introduction of the malaria parasite in the '20s or '30 led to very rapid, wide-scale extinctions at lower elevations, literally birds falling out of the trees overnight. And the surviving bird species were then left at high elevation forests with lower temperatures that could restrict the reproduction and survivorship of mosquitoes. However, with climate change we're seeing that mosquitoes are inching higher and higher as the climate warms and other conditions change. And these birds are really getting pushed to the very top of the forest. Their backs are against the wall at this point, there is nowhere left for them to run. One of the species that our project focuses on is the most endangered bird species on Maui, the kiwiku or Maui parrotbill. There's only somewhere around 150 left in the world and they're only found on Maui. One of the big dreams shared by many conservation organizations on Maui is to rebuild this ring or lei forest around Haleakala. Maui like all of the large Hawaiian islands was a forested island, you know, primarily with trees from mauka to makai. And yet we now have pretty devastated watersheds, particularly on Leeward Haleakala. And to start to reverse this our organization as well as numerous partners are attempting to rebuild this forest focusing a lot on the leeward side. Collectively we've now planted over 250,000 native plants on Leeward Haleakala. And I'm very happy to say that there are thousands of acres of both private and public land that are now slated for restoration at high elevations around Leeward Haleakala and the south-facing slope as well as the west-facing slope now. And this is a super positive step, what it means is habitat for native plants and animals, soil retention, just keeping Maui on Maui instead of floating into the sea like we were talking about earlier. And water for everyone and everything, including the people downslope and the wildlife upslope. Ecological conservation can be thought in many ways of preventing loss. We'd love to be at the point of increasing these animals' populations to safe guard them in the future but most of what we do is preventing the loss of what we still have. And one way of doing that is reforesting the high elevations, as I was speaking to, these . . . no matter what these high-elevation forests are going to be . . . have a lower disease risk for the birds going forward. And by restoring habitat up there we can help protect these birds as well as providing lots of benefits for multiple communities. And to do this we need to in large part control of the feral animals in these areas that have destroyed these forests over the last 150 years.

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And in some areas natural succession can be relied on for . . . particularly for many species but it's also going to require planting hundreds of thousands of trees. That 250,000 tree number is . . . I'm very proud to be a part of that but over 100,000 of those were planted in Nakula Natural Area Reserve alone, one sort of small part of this and we're talking about the landscape level. For over a decade one of the primary conservation goals for . . . for us and protecting the bird species is expanding the range and habitat of many of these most threatened species. For kiwikiu this has meant restoring habitat on Leeward Haleakala and reintroducing the species to this formerly occupied area. And you may have read about this recently in the news, but this fall we took a big step towards this goal by translocating birds from the windward slopes and releasing captively [sic] reared kiwikiu. But sadly the disease landscape shifted under our feet during this process, nearly every bird moved to Leeward Haleakala died of avian malaria. This shock then of course saddened us because this elevation was long thought to be relatively safe from disease, I mean that's why we've been planting so many trees and going about this. What we're seeing now is a rapid shift in mosquito numbers and densities and they're now reaching such high elevations that we simply have no place else to put them. And we're running out of options to help these birds. Because translocation is not an option in the short term we feel like we're forced to take drastic action. Since mosquitoes are now penetrating the highest elevations in these . . . what we thought were refugia from disease, we fear that kiwikiu may only have a few years left in the wild. We could lose them in as few as five to ten years. Because of this we're likely going to be taking some number into captivity as a safe haven, this is the only way to ensure that some individuals remain disease free. This is not set in stone yet, but this is one of the leading strategies that we are considering. And I do want to stress that this is . . . the plan is that it's going to be temporary and that we want these birds back on the landscape as soon as possible. Nobody wants to put them in captivity, it breaks our hearts to do it, but we feel like it might be necessary to prevent extinction of the species as a whole. And one of the only things that may save this and other native honey creepers in the long run is landscape scale mosquito control. And one method, the Wolbachia incompatibility method, which I can talk about more in detail if you'd like, will probably be on the ground in the next two to five years. But it may be more . . . many more years after that before it can be scaled up to the point that it can have a meaningful impact on the kiwikiu population, and kiwikiu can simply not wait this long. This method is a great step but saving the kiwikiu and other species may actually depend on the next generation of mosquito control tools, things that can have longer lasting, larger scale impacts. And I just wanted to end . . . I don't want to be overly dramatic but one of my favorite quotes the 19th century nationalist Alfred Russell Wallace likened species as he put it to individual letters that go on to make the volumes of earth's history. And "as a few letters lost may make a sentence unintelligible, so the extinction of numerous forms of life . . . will necessarily render obscure this invaluable record of the past." We can and we must safeguard the most vulnerable among us. It is our responsibility. Unfortunately there's little that we can do to help the species, it won't help us as well. This is not an either or, this is part of the . . . a larger process. And with that I want to thank you for your time and for considering the little birds out there.

. . .END PRESENTATION. . .

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CHAIR KING: Okay. Thank you for your presentation. Makes me sad to end on that picture but I get why . . . I get the importance of what you're doing. So, thank you for your work.

MR. WARREN: Thank you.

CHAIR KING: So, Members, we have one more presentation by The Nature Conservancy. So, we're going to bring Kim Falinski--is that the right way to pronounce it?--up and she'll talk to us about some of the funding that we're giving her, I think The Nature Conservancy. And this is on Granicus as well. So, if you can kind of go through the slides in --

MS. FALINSKI: Yeah.

CHAIR KING: --about maybe 12 minutes would be good.

. . .BEGIN PRESENTATION. . .
(The Nature Conservancy)

MS. FALINSKI: I'll try. Hi everyone, I'm Dr. Kim Falinski, thank you for having me. I'll do my best to get through this so that we have some time for questions. I'm here supporting our marine program, but I need to make sure that there's a footnote in there to note that we also have a pretty robust terrestrial program that manages the forest in Waikamoi and Kapunakea and on Lanai and on Molokai as well. My role in Nature Conservancy is as a specialist for water pollution, so water quality and water quantity. So, I work both with terrestrial and marine to establish how climate change might be affecting our water resources overall. The motivation from our marine side is that coral reefs are threatened by coastal pollution in the form of sediment and nutrient pollution. Coral bleaching which is caused by increasing temperatures in the ocean, causes the corals to bleach and bleached corals are more sensitive to coastal pollution. So, if you have more pollution then your corals are more likely to bleach. Right now thanks to the good work by organizations like the Council, and West Maui Ridge 2 Reef and a number of other organizations you're seeing more restoration projects funded by you guys, funded the State, funded by NOAA. That intent to kind of resolve some of these issues and reduce erosion, reduce wastewater impacts. However, it's really difficult to assess how well each of those projects are affecting their coastal projects without having better monitoring methods. And as some of you in the room know that . . . well what percentage of those sediment/nutrient reductions are going to improve coral health. So, this kind of science-based approach to figuring out how to prioritize our limited funding resources to figuring out what actions are okay, where those actions are prioritized and is . . . are we actually having an impact. Given that the timeline for coral bleaching looks like by 2100 they're saying that most corals will have since passed on if there isn't major changes. So, today I'll talk about three projects with maybe a tiny addendum for one. One is Hui o ka Wai Ola our coastal sampling program that we work with in

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collaboration with West Maui Ridge 2 Reef and the Council here and has been in operation for a couple years. Another is a new program that was generously funded by you guys . . . I think it was a \$127,000 that was also funded by State and Federal as match. And then our applications to community planning to help the most vulnerable communities be able to better support their fisheries resources. Hui o ka Wai Ola was formed as a project out of a really large group of stakeholders at the Federal, State, County levels and the community levels who wanted to see change in coastal water quality. People noticed that their coastal water quality was degrading and wanted to know why, how and how to measure it. And so, the best way to do that was to work in collaboration with the Department of Health, you can collect data but if that data has no . . . has no verification that the data is good then it can't be used for regulatory purposes. So, Hui o ka Wai Ola this community program was the first in the State to establish quality assured methods that matched the Department of Health's and got approved by the Department of Health so that our data could match their database and declare a resource impaired, as necessary, in regulatory terms to then release funding as needed. And so, we measure with this group, and I'll show you the community side of this in a second. We measured turbidity, dissolved oxygen, PH and temperature, and nutrients in the water in an effort to address both the sediment side and the nutrient problems that are affecting our coastal ocean. And we do this with lots of people, we've trained hundreds of volunteers at this point. We have many sites in South and West Maui and we always feel like we want to add more sites because we're expanding. We've supported this program through everything from local businesses to community organizations to Federal funds, and your generous contributions as well. And all of our volunteers get trainings that are comparable to the Department of Health's trainings for their employees. There's wonkiness in this but to create a database to back all of that and house that data and then make that data publicly available, we've gotten three downloads this week alone. We get hundreds of people every month coming to our website to look at the data to figure out if their coastal waters are healthy. And so, there's the funding for this program includes the cost of the supplies, the lab testing. I mentioned we have many, many organizations that are participating in this effort. But the results are that we now have comprehensive sampling at 39 sites I think, although I could be . . .

UNIDENTIFIED SPEAKER: 41.

MS. FALINSKI: She says 41, okay. We're at 41 now, in Maalaea . . . is that the other two . . . Maalaea just got added in, sorry, since I made my slides. So, we have funding to monitor these sites every three weeks and that goes straight up to the Department of Health, they have PacIOOS and a bunch of different organizations for scientists to be able to use to help better figure out what management. And here's all our sites and I'm not going to go into our data right now to tell you where but I'm happy to but I'm happy to . . . if you're like where, where, where, I'll tell you which sites are bad for which different parameters and what we're currently thinking of for source. And the program has been so successful that a newly formed group to match Hui o ka Wai Ola is forming on the Big Island. I'm only saying this to say that Maui has literally set the example for the State and everybody's asking for Maui's documentation in order to reproduce this in their sites. So, based on all this success the next step was to try to figure out what

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the streams are like. Right now the Department of Health doesn't have any protocols, even to copy, to be able to do stream sampling. They don't have quality assurance documents themselves. And so, in order to figure out if a restoration project is working we've set on a one-year project to try to get together a working group together to figure out what those best methods would be. And then recommend them to the Department of Health for upkeep and then be able to train the nonprofits, like Puu Kukui Watershed Partnership, like CORAL, that are receiving funding for restoration to be able to use these methods in their places. So, that we have a standardized way of measuring whether a project was successful or not. It may sound wonky to have to come up with a project to write methods but without those methods you can't compare apples to apples. So, here's two places that could possibly use these methods, we're upgrading Kahana Reservoir in West Maui and we have a project working with . . . in Honolulu Bay. And both of these projects don't have the resources to come up with their own monitoring methods. In the interest of time I'll save you from learning about the specific protocols that the Department of Health that this applies to but basically the protocols will figure out where, when, who collects the data and who's going to make sure the data is quality. In order to do this we're working across with CWRM Department of Health, et cetera. There's not many sediment experts in the State. And so, we're trying to collect all of those sediment experts and put them in the same place to help to work on this. So, the last piece of the work that The Nature Conservancy is doing is that I wanted to talk about today was our work with communities to kind of use this data in our community action planning processes to create better CBSFA's, Community Based Subsistence Fisheries projects. None of this data matters if it's not translating into how people can use it, and so that data needs to be used by communities to plan their own way to improve fisheries, to improve their reefs. And so, TNC's leading on this in a bunch of different communities. We are working with a . . . with the Maui Nui Makai Network across a number of sites in all of Maui Nui that you can see up here. We do everything from monitoring to planning to doing this kind of water quality work. And then bringing a group to legislative . . . to the legislative completion of their community based subsistence fishery. And we do science outreach to match this, so in addition to water quality we're monitoring all the corals to see if they're well. We're doing this using a technique called resilience rankings. And so in addition to going out and saying oh well the coral is this percent cover. We're also trying to say how much keiki are on the reef, how healthy is that reef and using that to rank the reefs in terms of who's going to be the most resilient to climate change so that we can try to figure out which of those reefs we have to prioritize in these efforts. And so, you can see that Kihei is actually looking really good in terms of resilience, some sites along the Pali but these results are better at helping us understand which reefs do we think are going to be able to manage through some of these climate change stressors. And this is a very complicated picture, but the basic point is to say okay we have some reefs that are more resilient and some reefs that are less resilient to climate change. And you have the data now in your hands, I think so you can look at it more closely. I have this thank-you slide up but if you'll give me two seconds to just mention that our freshwater program, that our terrestrial programs in managing the 9,000 acre Waikamoi Forest and Kapunakea in West Maui, Kanepuu on Lanai, Kamakou on Molokai all of these programs are working with UH and Tom Giambelluca's group. Things like this to understand water quantity, and so we found with a study in Waikamoi that 250 million gallons per day . . . 250 million gallons

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per day, I'm saying this correctly, which is almost the entire water budget of Maui would be saved if you can convert from invasive species like Himalayan ginger or rotund native species. And so, in that transition you won't get just a change for the birds, you won't just get change for the ecosystem, but you'll get change for your water budget. And so, to start thinking about that as Maui really needs the water for our overall water needs right now and that every day we have people out in the forest cutting down those invasive species to try to support that mission. Okay, that's all.

. . .END PRESENTATION. . .

CHAIR KING: Wow, thank you so much for that presentation. I . . . because I know you guys were heavily working on the watersheds, I didn't know how involved you were in the coastline projects.

MS. FALINSKI: Great, I'm glad . . .

CHAIR KING: It's really good to see that. So, thank you for . . . for that and for focusing on the shoreline. So, we'll go . . . we'll start with, Mr. Sinenci, and go along. If you have any questions for any of our last three presenters.

VICE-CHAIR SINENCI: Sure. Thank you, Chair.

CHAIR KING: If we could . . .

VICE-CHAIR SINENCI: Yeah. For Mr. Warren, what are . . . are you guys . . . what types of I guess programs are you doing to address the mosquito malaria?

MR. WARREN: It's a bit of a tough issue because some of the tools that we have are just sort of brand new. The Wolbachia incompatibility method is something that was developed for the human health side of it for mosquito-transmitted diseases. And it's something that we know can work to reduce mosquito numbers, unfortunately it was developed for a different species of mosquito. And so, there's always a little bit of time and figuring out the bumps on the road and then there's . . . there is an established regulatory pathway for that method. And that's going to be great but there's still a lot of on-the-ground stuff needs to happen. We need to have a better understanding of mosquito distributions and seasonal patterns. And so, there's going to be a lot more mosquito sampling throughout Maui, particularly in the high elevations. And that's in part to figure out where these Wolbachia mosquitoes will be released where they can have the greatest impact.

CHAIR KING: But that's not happening right now. So, it's in the future.

MR. WARREN: No, it's in the process of permitting and --

CHAIR KING: Oh, okay.

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MR. WARREN: --figuring it out . . . figuring out the actual pathway here, you know, that it can be implemented.

CHAIR KING: Okay.

MR. WARREN: It's also probably going to be on the ground in Kauai pretty soon.

CHAIR KING: Okay. Great, thank you.

VICE-CHAIR SINENCI: And then just one more question for Tamara. If for your ohia studies . . . or are there any ohia studies that will address the rapid ohia death?

MS. SHERRILL: Yes. If you . . . if you go online to the Rapid Ohia Death project the rapid ohia . . . managers are working on monitoring. And there is research that is ongoing to try to find ohia that are resistant. So, one of the reasons for this seed collection effort is . . . it's possible that reforestation might happen using, you know, varieties of ohia that have been shown to be resistant to rapid ohia death. But that's all I know about it at this point, I'm just trying to figure out how to collect as many . . . from as many trees and use the forms that they're . . . you know, that this initiative is using to get the work done before the disease spreads.

VICE-CHAIR SINENCI: Okay. Thank you. That's all for now. Thank --

CHAIR KING: Okay --

VICE-CHAIR SINENCI: --you, Chair.

CHAIR KING: --thank you, Mr. Sinenci. Chair Lee?

COUNCILMEMBER LEE: Thank you. On the Botanical Gardens, I'm glad to hear that you've seemed to have diversified your revenue base since I last looked at it years ago. So, you receive money from the visitor industry?

MS. SHERRILL: Yes. We have all three HTA contracts. So, with community enrichment program for the La Ulu breadfruit day with Aloha Aina for the seed banking initiative and also with Kukulu Ola for the education program.

COUNCILMEMBER LEE: Okay. So, how much do you get from the County?

MS. SHERRILL: One hundred and fifty thousand --

COUNCILMEMBER LEE: Okay.

MS. SHERRILL: --with OED.

COUNCILMEMBER LEE: Okay. You used to get your grants from the Parks Department. I don't know if you go that far back.

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MS. SHERRILL: We . . . we have a lease . . . a long-term lease with the Parks Department and we did used to get grants with the Department of Water supply. That was the one that didn't . . . that moved over to Office of Economic . . .

COUNCILMEMBER LEE: OED.

MS. SHERRILL: So, it's all under OED now. Instead of --

COUNCILMEMBER LEE: So, it's a 150.

MS. SHERRILL: --both under OED and Department of Water supply.

COUNCILMEMBER LEE: Okay. And then how many employees do you have now?

MS. SHERRILL: We currently have seven, however there're a lot of part-time. So, it comes out to about 4.5 full-time.

COUNCILMEMBER LEE: Okay. And you may want to look into the size of your . . . the storage that you're looking for for the seeds, to hold the seeds. Because I think if it's ten by ten or less then you don't need a SMA, okay.

MS. SHERRILL: Oh, okay. Good to know.

COUNCILMEMBER LEE: Yeah. So, then be careful of those things --

MS. SHERRILL: Right.

COUNCILMEMBER LEE: --because you might . . . you might be . . . if you have something bigger than ten by ten you might have to wait five or six years for your SMA permit.

MS. SHERRILL: We did get an SMA permit for the current project.

COUNCILMEMBER LEE: Oh. Okay --

MS. SHERRILL: Yes.

COUNCILMEMBER LEE: --good.

MS. SHERRILL: Yes.

COUNCILMEMBER LEE: Good.

MS. SHERRILL: Thank you.

CHAIR KING: Great. Thank you. Good information. Member Paltin?

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COUNCILMEMBER PALTIN: Thank you. I have one for Ms. Sherrill and Ms. Falinski. For Ms. Sherrill, you know, when you were making your presentation I got held up on the first part about the remnant coastal dunes. And, you know, we recently learned that . . . that Qdo sand in the Central area is older dune deposits from the Holocene and the Pleistocene era. Like which is 3 million years ago, and it's only found in areas in Central Maui. And I just was wondering if you include any education on the dunes as, you know, that . . . it's like a remnant geographical feature that a lot of times in that area especially holds the iwi kupuna. And like what it looks like to me that you guys are doing is just a little kipuka of that --

MS. SHERRILL: Yes.

COUNCILMEMBER PALTIN: --thing and we don't have any formal type of protection at this time. But I think, you know, being that you guys' operations take place all on that, like it's kind of a great opportunity to educate folks. Because as we seen in my Committee, you know, sand is . . . is one of the most valuable resources that we're losing and we're not really making more sand. And so, I just was wondering if there's any education on the dunes or any plans to do that in the future.

MS. SHERRILL: I appreciate that, thank you. That is a great suggestion and . . .

CHAIR KING: Can you speak a little closer into the mic.

MS. SHERRILL: Yes. When you look at the picture that I showed you initially, the dunes that you're observing are kiawe, and that's all part of Keopuolani Park. So, it's not part of the site that we lease, and we don't manage that area. We certainly would, you know, consider moving into that if we had the resources. But yes I agree with you. At our site it . . . because it was the zoo you see very little sand. So, there is one small area that's still sand, everything else has brought topsoil in. So, it's changed the way the soil is. But however we know when we dig down for irrigation it's nine feet of sand, you know, pure sand. So, I would really appreciate if you could connect me with someone who would be able to help those kinds of educational interpretive materials for that. I would . . . and I'll just bring it up to, Chris Nakahashi, Ikaika Nakahashi, he's our board president and he's on the State Historic Preservation Division and he would probably be the first person to start that. Thank you.

COUNCILMEMBER PALTIN: Awesome. Thanks. Yeah I know him, we're Facebook friends.

MS. SHERRILL: Okay.

COUNCILMEMBER PALTIN: And then, Ms. Falinski, it's so refreshing to see your presentation. It really makes me think and miss Ms. Dana Reed, who developed all the QAPP procedures. Because, you know, if the State doesn't accept your data then it's . . . you're just collecting water. I did want to point out that upward of 80 to 85 percent of the trees at Puu Kukui from the Hokulea planting have survived. So, I know that was a question and I texted to get the answer.

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MS. FALINSKI: That's great.

COUNCILMEMBER PALTIN: Yeah. I just was wondering for the Hui o ka Wai Ola is there . . . the new DOH since Watson retired, are they taking on for Stream QAPP procedures? Or do we need to bring Dana back?

MS. FALINSKI: I am the one going to be coordinating writing those stream QAPP procedures. And so, I am meeting . . . I meet with the Department of Health next week. And I'm hoping I get CWRM involved as well because for stream stuff . . . unless you know how much water is coming down it doesn't matter how dirty it is. You have to know how much first and then you can figure out how much sediment is in all that water. So, it's a two-step thing as opposed to just measuring coastal water.

COUNCILMEMBER PALTIN: Oh, man. If we knew how much water was coming down it would solve many problems.

MS. FALINSKI: Right. So, figuring out how to recommend how to . . . how to calculate that, and right now there's just one guy right. Ayron . . . Ayron --

COUNCILMEMBER PALTIN: Strauch, yeah.

MS. FALINSKI: --tells you how much. Ayron Strauch. So, figuring out other ways to collect that information is the key.

COUNCILMEMBER PALTIN: Thank you.

CHAIR KING: Okay. Thank you very much. Any questions, Pro Temp Kama?

COUNCILMEMBER KAMA: I just have one. So, if you could go back to your screen with the picture of all the islands on it and all the colorful dots . . .

CHAIR KING: Who . . . which one? Who is that for? Ms. Falinski?

UNIDENTIFIED SPEAKER: Yeah. Who else has . . .

COUNCILMEMBER KAMA: The Nature Conservancy.

CHAIR KING: Oh, Nature Conservancy. So --

COUNCILMEMBER KAMA: Sorry.

CHAIR KING: --that's, Ms. Falinski.

COUNCILMEMBER KAMA: Yeah.

MS. FALINSKI: This one right?

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COUNCILMEMBER KAMA: Yes. So, I'm sorry I came late --

CHAIR KING: That's okay.

COUNCILMEMBER KAMA: --but can you share with me what do those colorful dots represent and after some of the colorful dots, if I'm looking at your legend, you've got numbers after those dots. So, can you tell me what those mean?

MS. FALINSKI: Okay. So, our Maui Nui Makai Network is --

COUNCILMEMBER KAMA: Yes.

MS. FALINSKI: --a group of different communities that are supporting planning efforts for fishery areas, right. And so, then the orange dots are when our communities are already in the network.

COUNCILMEMBER KAMA: Perfect.

MS. FALINSKI: And the light-orange dots on the right there on East Maui are our new members. So, members that we're taking on new. I didn't mention this so thanks for giving the opportunity that we do opihi monitoring. I'm not one who does the opihi monitoring so it's not on the top of my head always to think about it. But our teams spends a good amount time working with those communities to monitor the opihi and get communities to take less and figure out how to take less. So, all those . . . the blue dots are our current opihi monitoring and the light blue are the ones that are going to be added into that work. And then the swaths, the areas that are like long are places that we've done community action plans. So, sat down with communities to plan, and the ones in purple are our favorite because those are ones that are planned for CBSFA designation and that we've been working communities through the process with the State and DAR.

COUNCILMEMBER KAMA: Okay. Last question, Chair. So, how do you monitor the opihi? What is your process?

MS. FALINSKI: So, I'm perhaps I will speak to my edge, which is that I believe we're using community . . . helping community members make transects and then count along those transects in different places. So, it's a counting method.

COUNCILMEMBER KAMA: Okay.

MS. FALINSKI: A repeated counting but maybe somebody else here who has helped them knows better.

UNIDENTIFIED SPEAKER: . . .*(inaudible)*. . .

MS. FALINSKI: Is that it?

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UNIDENTIFIED SPEAKER: That's correct.

MS. FALINSKI: Because I haven't been able to go out there with them yet. So . . .

UNIDENTIFIED SPEAKER: That's a good summary.

MS. FALINSKI: Okay. Counting along the line is my science way of thinking about it.

COUNCILMEMBER KAMA: So, when you monitor what are you looking for?

MS. FALINSKI: I believe we're looking for mature opihi and then probably --

UNIDENTIFIED SPEAKER: Size and quantity.

MS. FALINSKI: --the keiki. Yeah, how many . . . how many and what size. Without actually being the one that does it that's what I would guess.

COUNCILMEMBER KAMA: Okay. Okay.

CHAIR KING: Do opihi collect any toxins or silt or anything like that like the oysters do?

MS. FALINSKI: I'm sure they do but I don't know if anybody has studied it.

CHAIR KING: Okay.

MS. FALINSKI: Because those . . . the mollusks always would.

CHAIR KING: I just wondered if there were safer places to pick and eat the opihi than others if there's . . .

MS. FALINSKI: I can only --

COUNCILMEMBER KAMA: . . .*(inaudible)*. . .

MS. FALINSKI: --imagine that East Maui is as safe as you get in all of the Hawaiian Islands.

CHAIR KING: Okay. Great.

MS. FALINSKI: It would be my guess.

COUNCILMEMBER KAMA: Thank you, Chair.

CHAIR KING: Okay. Thank you. Thank you, Members, for . . . we're at the end of our agenda and thank you for sitting through and thank you coming back, Ms. Kama. I appreciate it. I think with some really valuable information and I feel really good about a lot of the work that's going on. So, thank you for some great questions.

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COUNCILMEMBERS VOICED NO OBJECTIONS. (Excused: RH, KRF, SS)

ACTION: DEFER PENDING FURTHER DISCUSSION.

CHAIR KING: And we are now adjourned. Have a nice lunch. . . .(gavel). . .

ADJOURN: 12:04 p.m.

APPROVED:



KELLY TAKAYA KING, Chair
Climate Action and Resilience
Committee

car:min:200225:aj

Transcribed by: Ashley Joan

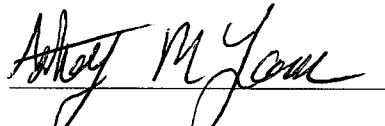
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CERTIFICATE

I, Ashley Joan, hereby certify that the foregoing represents to the best of my ability, a true and correct transcript of the proceedings. I further certify that I am not in any way concerned with the cause.

DATED the 18th day of March, 2020, in Pukalani, Hawaii



Ashley Joan