

## MAUI INVASIVE SPECIES COMMITTEE FINAL MEETING MINUTES

June 5, 2009

ATTENDANCE: Randy Bartlett, Pat Bily, Lloyd Loope, Forest Starr, Kim Starr, Jeremy Gooding, Perry Bednorz, Kuhea Paracuelles, Bob Hobdy, Teya Penniman, Elisse Deleissegues, Chuck Chimera, Mike Ade, Brooke Mahnken, Adia White, Wendy Swee, Adam Radford, Elizabeth Anderson

- The meeting was called to order by R. Bartlett, ML&P at 9:10am. Introductions were made around the table.
- Minutes from the April 3, 2009 meeting were approved. They will be posted on the website.

### ANNOUNCEMENTS

- Teya: we are fortunate to have four interns this summer – three from AmeriCorps Hawaii and one from Hawaii Youth Conservation Corps. Adia White is working with Lissa and Wendy on PR and Education program projects. Adia will be returning to the University of Puget Sound for her sophomore year in the fall and hopes to come back to work with MISC next summer. Ashley Aquino joined the Vertebrate crew for the summer. Ashley grew up on Maui and has been attending San Diego State University. Poha Kanakaole and Edmund Oliveira are both Hana area residents and are spending the summer working with the Hana miconia crew. Poha worked with the crew last summer and is attending Maui Community College. Edmund is enrolled at Southern Oregon University.

### MICONIA CONFERENCE REVIEW

The main focus of the meeting was to review the Miconia conference and began by highlighting the stated objectives of the conference:

1. Synthesize state-of-the-art research on miconia biology, impacts, and control
  2. Facilitate exchange of information and stimulate development of new strategies
  3. Define gaps in knowledge that may be resulting in suboptimal progress
  4. Review the status of research on miconia economics and ecosystem services
  5. Highlight progress and needs for an effective biological control agent
  6. Foster support for miconia work by increasing the visibility of associated challenges and accomplishments
  7. Acknowledge and celebrate past and current support and success
  8. Create a comfortable, fun, safe, interesting conference experience, while minimizing our environmental impact
- Teya: I want to follow-up on the miconia conference and get input on how well we achieved the conference objectives. Pat: the best input we could get would be from the international visitors. Teya: what do we take away from the conference and where do we go from here? Lloyd: we have the ability to contact people now and ask for their help. Teya: from the international perspective, all the feedback has been positive. Jean-Yves has a good blog that is widely circulated. It has resulted in a good ripple effect. Did we meet objective #1 – state-of-the-art research? Forest: Alan pointed out that we need to prove that what we do is science-based. Tom's rainfall findings and the genetics work are all pointing in that direction. Pat: Robert Barreto brought up the idea that we want to know the parent source of our miconia for biocontrol tests. The lab tests should be done on the same miconia as the population to be controlled. There is very little genetic variation. Wendy: can we use the bird vector information for conure control? Adam R.: I talked to that presenter and she thinks that the conures are likely responsible for the random miconia trees we've found.
  - Randy: what were the top three items that came out of the conference - new ideas, research findings, etc.? Jeremy: The conference showed us that nobody has better control technology than we do. The HBT paintball technology does not appear to be very applicable for ground operations. Pat: there is such a small amount of ingredient being used. I don't think there is enough kick in it. Jeremy: he (James Leary) is calibrating so that five balls should be a lethal dose. Pat: one ginger clump I looked at the other day had 20 balls in it and is now sprouting. Jeremy: we will try a number of different chemicals this summer on miconia and see what the effects are. Kuhea: I would like to know what the effects were on non-target species. Teya: he has done a video on the operation. It is on YouTube. There is also a YouTube segment

on miconia operations. Lloyd: my top three would be: 1) I think the perspective given by the hydrological studies was a highlight. It really shows that miconia is a problem. It is important to document what we thought was obvious. 2) We gained a broader perspective on biocontrol. We know it is not a panacea, but there is potential. We have the ability to follow-up now. 3) I have never been much of a fan of modeling, but I was very impressed with Cameron's presentation. MISC should consider getting Cameron or someone to assist us with modeling using the data we have. Kim: the model that evaluated efficiency based on the size of the field team was interesting. Brooke: we need to keep in mind that their infestation is much different than ours. We could run our data in the same model. I liked the modeling to predict spread. Intuitively we know this, but it would be interesting to put in our parameters. Cameron is interested in collaborating with us. I have a model that I presented a while back. There is no need to reinvent the wheel.

- Wendy: it sounded like there is additional funding needed for completion of Tom's raindrop work. Can we look for funding to support that? Adam: funding was identified as the primary issue with biocontrol as well. There is a need for funding for facility development, agent selection, etc. Lloyd: more of the testing could be done in Costa Rica as opposed to bringing the agents here to test. We have some pretty good agents already here. Tracy has one that it would be good to get released. Forest: there were so many options that I can't even remember them all. Adam: they suggested focusing on six. Lloyd: zero in on the ones that are the most practical. It was good to have Department of Agriculture staff at the conference. The nematode has a lot of potential, but it sounds like it is complicated and may not be released soon. There is very little use of nematodes in biocontrol in general. It is difficult to get them to survive in Honolulu. In the long-term we need a better facility on Oahu. I don't see it coming in the next 5-10 years. Tracy's philosophy is we need to work with the facilities we have.
- Teya: was anything else that came out of the biocontrol breakout? Adam has the notes and needs to forward them to Tracy. Lloyd: Tracy is so busy. We should get the notes to him while it is still fresh. This is one of the more important things to come out of the conference. Adam: should I synthesize the notes before I send them? Lloyd: send them to Tracy and ask him. The biocontrol that has been released works well in Tahiti but not in Raiatea or for us. The fungus works in closed canopy, but not in our situation. Adam: the modeling for biocontrol was a big focus of the breakout. Three priority areas were identified: 1) Develop adaptive models to integrate chemical, mechanical, etc. efforts. 2) Develop models that consider many variables so that as new situations arise (e.g., a new biocontrol agent is ready, miconia is found on windward Oahu, etc.) the model can help guide management decisions. 3) Develop models that can portray the impacts of scenarios and management decisions in dollar amounts.
- Lloyd: what about the economic models for biocontrol? They seem to say we wouldn't need ground control if we had biocontrol. Previously they produced an economic study with only ground control as an option. The biocontrol part was just a first approximation. There is not a good answer as to how biocontrol would mesh with ground control. There will likely be a need for both for a long time to come. Teya: one of the perspectives that was put out there was that MISC had devastated the miconia population on Maui to the point that biocontrol wouldn't work. Lloyd: I don't think that was coming from any of the conference attendees. The Hana core is probably perfect for biocontrol. Teya: we don't know what the minimum population for biocontrol is. This is where modeling would be helpful. Adam: there may be alternate hosts, like clidemia, for some agents. Pat: we will probably need a cocktail, not just one thing. The plants most susceptible to the stem-boring weevil are 1-3 meters tall. The agent will stop juveniles from reaching maturity.
- Kuhea: if an agent was released and was very successful and then consequently dies off, would another invasive move in? Teya: there is a lot more clidemia in the core. Jeremy: in general we don't have closed canopy so we are unlikely to run into that situation. Lloyd: we started controlling miconia because we were worried it could take over the forest. Kuhea: the perception may be that you are creating a new problem by fixing an existing problem. Teya: most of the areas we work in are already degraded. Pat: this is already altered forest and it is not static. It will always be in transition regardless of what we do. Lloyd: we couldn't have waited for biocontrol. If we had let it go, we would be as bad off as Tahiti. We were right to keep it to a minimum. There will be issues with revegetation. We will need to coordinate biocontrol and ground control. Kuhea: my point was about managing perspectives.

- Pat: we really need to use both physical control and biocontrol together. Randy: we need to remember that biocontrol is not going to be a silver bullet. We will still need people on the ground. Pat: especially for the outliers. Forest: it is different in a species-led situation vs. a site-led situation. There have been site-led situations, but not a species-led situation like miconia. Lloyd: we don't know for sure what will happen. Teya: it could become a buffer zone strategy similar to what the Big Island is doing now. Chuck: with strawberry guava, there will still be several lifetimes of ground control needed even if the biocontrol works. Forest: who makes the final determination on whether to release? Lloyd: the simple answer is DLNR on state land.
- Teya: what was learned from the field trips? Forest: the Australians were amazed by how much we use helicopters. Jeremy: for us the cost is a non-issue. The canopy in Australia is totally different and helicopter use is not as practical. Pete from Windward went in on the ground and it was a real eye opener for him to get an idea of what they just can't see from the helicopter. Brooke: he seemed a little disheartened. Perry: it helped me to really look at the bigger picture. My focus is so much on the helicopters. Now I see what we've been doing for all these years. The biocontrol discussion really opened the Hana crew's eyes. It is important to teach the crews about these issues. Lloyd: the Hana crew attended the biocontrol session. We need to be able to convince them that it is a good thing. It was great that the conference had so many different kinds of people attending. Pat: we really need to push the public relations with biocontrol. We need to talk with some of the old-timers and record their observations about things like lantana.
- Elisse: can we talk about bulldozers some more? Forest: pasture would make a good buffer. It makes a good buffer for Haleakala. Bob: the lava flow is why it wasn't put into cane or pasture a long time ago. You could clear a lot of it, but it would take a D9. Teya: what did you use for the roads? Bob: D8s. You have to work with the terrain. Randy: there are still some big old native trees in there that you would want to save. If we did put together a proposal for bulldozing the core, we would need to delineate areas. We want to look into the cost and figure out a sample area. Elisse: around a residential area where we can't spray. Jeremy: we need to find the trashed sections of the core. We would never be able to do it where there is any good forest. Kuhea: you would also need to make sure there is nothing cultural in the area.
- Teya: we should define gaps in knowledge. Forest: seed-bank lifespan needs to get plugged into all these equations. We need to make sure there are sites where we are tracking. Teya: we aren't doing that on Maui. Lloyd: 16 years is a long time. We don't need to repeat the work here on Maui. Jean-Yves is doing it already. Bob: if you disturb the ground, you get a huge flush of reproduction. Lloyd: a large percentage won't ever germinate, but you can't count on it. Bob: we did some experimentation with remote sensing. We did see different readings from young vigorous miconia vs. senescent miconia. The technology was rather difficult to utilize. Pat: they may use a straight visual. On Maui they will scan for ginger, clidemia, guava, and above the Hana core. I think the miconia will be pretty obvious. The technology will improve and price will come down. Right now it costs \$3/acre to read. I wouldn't count on remote sensing as a technique. You may get 90%, but then you are still missing 10%.
- Teya: on the topic of gaps in knowledge - we need to do a better job with our own staff of reviewing scientific literature. Pat: do we have data that shows the time from seed to reproductive stage? Do we have plots that we compare? Lloyd: it depends on the micro-environment, light gaps, etc. Jean-Yves found it took four years in Tahiti under ideal conditions. It takes a lot longer in deep shade. Elisse: do we know what the ideal conditions are? Lloyd: to find that out we would need to plant it at different sites. We can guess pretty well. Pat: this will influence the revisit intervals. How effective are we? Jeremy: it depends on the canopy. Remote sensing has not yet had any value. I am skeptical - mixed degraded forest is the most difficult for detection. Pat: it wouldn't be nearly as effective as what you are doing now. Jeremy: you have to ground truth the remote sensing. You only go out on the ground when you expect to find plants. We will move from high density to low density to test remote sensing. We need to be able to find it in the areas that are dense before it will be any good in low density areas.

- Teya: do we need to do any additional research on the biology? We will stick with 3-4 years to seeding as our standard. Chuck: it would be interesting to look at the effect of temperature. Lloyd: miconia only grows up to 3,500 feet elevation on the Big Island. Teya: they did GARP modeling. Lloyd: I didn't feel like it was that accurate. It would be valuable to know the maximum possible elevation. I would question the idea that it only gets up to 3,500 feet. Jeremy: the research that would be good is to look at more efficient application. We have done this for ground work, but not for aerial. Dry time needed on the plant and time on target would both be good things to know. There may be different formulations that translocate more quickly (before it rains). Pat: James Leary might be a good person to look into getting label changes. Jeremy: We are going to test four recipes this summer. With Garlon 3A, it can't rain for at least an hour and must be applied to at least 90% of the canopy. Teya: what about an estimate of non-kills – misses? That would give you an idea of whether you need to go back in. Jeremy: non-kills are almost entirely due to rain. It is impossible to predict. Pat: the efficacy of what you are using is good. We need something that is more rain proof.
- Teya: what about the other breakout sessions? Chuck: for the measuring progress session, Simon gave another version of his talk. It was interesting, but not really a discussion. There were no great revelations. There is a lot of literature out there on eradication vs. containment. Personally the session confirmed for me that I don't really believe in the term eradication. Lloyd: it is interesting that the Australians tend to be very rigorous. The national government only contributes to projects that involve eradications. Teya: the question of eradication is an interesting one. There is a conference in New Zealand on the topic next year. Their definition of eradication is pretty broad.
- Brooke: from the data workshop it was clear that we are all doing basically the same thing. We are collecting similar data. In Australia, they have so few mature plants that they can measure and take a DNA sample on each one. They are dealing with a different level of infestation than we are.
- Jeremy: from the control workshop I learned that all the ISCs are basically doing the same thing. Forest: on a statewide level there are obviously different strategies for each island. Teya: the only real difference is the Big Island. Kauai and Oahu are heading for eradication. Jeremy: we are all using the same chemistry.
- Brooke: we covered 28 acres on the miconia field trip, 15 fruiting trees were found, and 4,653 immature plants were controlled. The units we didn't get to will be completed by the ground crew soon so we will have comparable data. Each of the units only took ~10 people three hours to complete. There were 54 people in the field for the day.
- Elizabeth: total conference expenditures came to ~\$75,000. Big ticket items included \$24,000 for food and drink, \$12,397 for airfare, \$7,616 for lodging & rental of the Y, \$3,000 for the helicopter, and \$3,800 for the conference packets (including program and giveaways).
- Lloyd: I have talked to everyone regarding the proceedings. I will need some help with production. It would be nice if we had some money to hire an editor. I hope to have it out by the end of the calendar year. I am pretty sure we will be able to get papers out of everyone. The proceedings will be posted online. Teya: the Akaku film needs to be edited and we need to work with it a little bit. We hope to put the PowerPoint presentations on the website and pdfs of the posters as well.

## HIGHLIGHTS/UPDATES

### **Funding**

- Elizabeth: we are currently operating primarily off of State and OED funds. FY09 DWS funds have not come in yet. Teya: we are lucky to have huge support from the County. We still don't know what will happen at the state level in the coming year. We may get half of what we had this year, but we aren't counting on it until we have a contract. We will likely receive some Forest Service stimulus funding. There will be \$500,000 for each of two years for the ISCs and another \$500,000 for the watersheds statewide. There will also be \$50,000 from Fish & Wildlife Service per island.

## **Plants**

- Mike: we've surveyed for *Silybum* and haven't found any except at the horse center. It has already gone to seed. We knocked it all down yesterday to contain the seed to the property. We will spray as the keiki come in. Teya: at the last meeting we said we needed to evaluate whether to take *Silybum* on. Pat: how much area was surveyed? Mike: we looked everywhere that was suspect. Lloyd: did you get any results from the newspaper article? Elizabeth: we received a number of calls, but none were actually *Silybum*. Mike: the seed is big so it doesn't seem to spread much by wind. We are continuing to have root sucker issues with the Osage orange.
- Mike: we finished the platform in Honomanu and are fine-tuning the set-up. It will make a big difference in our ability to work in Honomanu. We had a crew at a different LZ in Honomanu this last week. We had low mature kill numbers which is good. There were 63 miconia keiki controlled between Twin Falls and Kapipi. Hank gave us a report of pampas at 3000 feet in Honomanu. This is low for us. We will head there on the ground soon. We just returned from Lanai and mature fountain grass numbers were very low and there was no fruiting ivy gourd for the first time. Fireweed is established on Lanai – it is everywhere now.
- Kuhea: there is \$150,000 available for fireweed control this year. The ranches were not pleased with the performance they were getting. I have been meeting with the Cattleman's Association and making sure the pastures will actually get treatment. The contractor thinks it is better to treat the roadsides, but the grant was for pastures. Forest: it is an integrated pasture issue. Overgrazed pastures will have the worst fireweed. There needs to be a change of management strategy. Rotating out animals more often would really help. Fireweed requires an IPM approach.

## **Vertebrates**

- Adam: the entire vertebrate crew (five people) will be on Oahu next week for brown tree snake training. We tested our giant coqui sprayer and it worked pretty well with a reach of 250-300 feet uphill. There are roughly 25 conures left between the two sites now. We want to see that project through, but there are funding issues.

## **Public Relations**

- Elizabeth: we will be entering a float in the Makawao Fourth of July Parade again this year. Brooke is spearheading our float building effort. We hope to have a new edition of our newsletter out by mid-summer. This edition will focus on Lanai. The Hoike Invasive Species module is moving along thanks to Shannon's efforts. There will be a Hoike teacher's workshop in late August. MISC finally has a Facebook page thanks to AmeriCorps volunteer Adia White. Check it out! Wendy: attendance at our early detection community meetings has been low. We will start doing some targeted workshops soon.

**Next Meeting:** August 28<sup>th</sup> - Molokai, Lanai & Kahoolawe