

MAUI INVASIVE SPECIES COMMITTEE
Friday, February 19, 2016
DRAFT MEETING MINUTES

ATTENDANCE: Lloyd Loope, Kerri Fay, Fern Duvall, Forest Starr, Kim Starr, Chuck Chimera, Rob Parsons, Pali O'Connell, Bob Hobdy, Mike Ade, James Leary, Kim Carlson, Linda Hara, Teya Penniman, Mike Ade, Adam Radford, Abe Vandenberg, Lissa Strohecker, Aja Akuna, Darrell Aquino, Sean Merrell, Monte Tudor-Long, Dustin Palos, Mike Ferguson, Elizabeth Anderson
By Phone: Josh Attwood, Brooke Mahnken

- The meeting was called to order by Lloyd Loope, Chair, at 9:10am
- Minutes from the September 18, 2015 meeting were approved. They will be posted on the website.
- Introductions were made around the room.

ANNOUNCEMENTS

- Dustin: the Garden of Eden cut down some trees that might have ROD. Forest: when you cut the trees, particles are flying everywhere and all encapsulated contagion could be dispersed. It is better to sample the core. Teya: there is a Maui-based working group focused on ROD. There is a huge need for outreach. People are doing what they think they need to do, but we really need to get the word out on best practices. There are working groups for prevention, survey, and outreach/education. DOFAW will be doing aerial surveys (called sketch mapping) and there is also a working group evaluating the best way to conduct rapid response. Protocols are being developed for dedicated gear and standards island-wide. There needs to be a clear plan for how we will respond if ROD is found on Maui. Forest: there is a granular fungicide under development. It would be good to have a protocol in place so homeowners could take a sample. Fern: the gear that was used to cut down the tree at Garden of Eden is contaminated. Alcohol seems to be effective for decon. Forest: there are 34,000 acres of infested trees on the Big Island.
- Lissa: on March 23 there will be a general fungus workshop at UH Maui Collage. Registration information will be sent out.

COQUI FROGS

- Teya: we are fortunate that Maui County is as much a leader as they are. We have already increased our coqui staffing. Josh was helpful in allowing us to move some state funds around and we should have the additional county funds for coqui soon. We will be able to really ramp up. Our local landowners have stepped up and raised the cry. Adam: a huge thanks goes out to our coqui crew as well. This is one of the hardest conservation jobs in Hawaii. We are already seeing results and getting compliments due to the increased staffing. The goal of this meeting is to talk about plans for Maliko and solicit input on how to plan and schedule the work. We will be presenting to the County on March 15. Today is a dry run of what we will present at that meeting.

- Adam: for background, as of the end of last year we had 19 population areas. We really only have 2-3 places aside from Maliko that have frogs right now. We monitor for a year or more from when the last frog was heard. We have faced some significant challenges, like the junkyard in Haiku, and we have shown it can be done. We have been successful with various complex scenarios.
- Adam: basically everywhere there are people, we find frogs. The number of frogs showing up on Maui continues to increase every year. We are receiving a lot more reports in random residential settings. Abe: we can tell the difference between Maui frogs and Big Island frogs. The number of revolving door sites where frogs are coming from the Big Island on cars, etc. is fairly steady. The big increase has been in the Maliko population. There is an inter-ocular band on the Maui frogs.
- Adam: MISC first increased coqui efforts in 2005 and in 2006 the Mayor asked what it would take to get rid of frogs on Maui. We said \$750,000 for the first year and that *“Work must begin along the Maliko Rim area in order to prevent further spread and funds must be secured to begin working within Maliko Gulch as soon as possible.”* At that time the Maliko population was ~127 acres. This situation still holds to a degree today. We need to keep the frogs from spreading out of Maliko to all of Maui. If we hadn’t done what we have to date, frogs would be all over. Frogs have spread through the entire length of the gulch. We have put significant infrastructure in place in the gulch including storage tanks, PVC pipe, and trails. Some of the infrastructure needs to be refurbished at this point.
- Adam: historically a variety of different control methods were tried including caffeine (2% solution) and hydrated lime (3% solution). All are contact poisons which are most effective if applied at night (when the frogs are out). Citric is the only legal chemical at the moment. We are currently using a 12% solution of citric because it is effective and easy to mix (1:1). Citric costs ~\$1.00/lb. We can easily use 2,000 gallons (\$2,000) worth of citric acid in a single night. There have also been a number of non-chemical techniques used. Barriers made of insect mesh along roads and boundaries are useful. They photodegrade, are expensive, and hard to maintain. Hand capturing is an option for small infestations. Vegetation/habitat management gives us a lot of bang for the buck and makes it much easier to go in and control the frogs. We are also looking into hot water/steam as a possibility for homeowners that are not willing to use chemicals. Hot water must be 113 degrees or more for three minutes or more and steam must be 113 degrees for 15 minutes or more. Biological/genetic research is ongoing. Fungi, genetic alterations, and parasites have been considered but none have yet yielded promising results.
- Citric Acid is the best fit:
 - **Pros**
 - User friendly
 - Easy to mix and handle
 - Few non-target impacts
 - Quickly degrades once applied
 - **Cons**
 - Cost
 - Acidic (pH 1 – 2) – hard on equipment
 - Phytotoxic

➤ **Methods of Delivery**

- Ground sprays (the firefighting method)
- Gravity fed system
- Helicopter
- Sprinkler

- Adam: the sprinkler system was designed to overcome some of the operational challenges of the gulch area. A HISC research and technology grant allowed us to pursue this. The objective of the project was to develop effective, science or technology-based management approaches to control coqui. It is nice to have a flexible head and a variety of nozzle sizes so that you can adjust the angle, flow, and spray pattern. You also need to know what you want to cover and pick a sprinkler head that operates within the pressure / flow range required to treat the area. This is true for the pump or gravity required to run the system adequately. 80 PSI / 92 GPM will get you 125 feet of spray (radius) with a traditional pull type sprayer. The biggest plus with this technique is that it allows us to get to hard-to-treat areas. The gravity fed system includes large-volume storage tanks, water/citric and a way to mix them, pipe and hose, and a pressure regulator/breaker. The flow is determined by pipe diameter and flow velocity (1.5" pipe ranges from 34 to 126 GPM). This method is simple, cheap and quiet.
- Adam: in 2008/2009 there were significant rain events and the frogs began moving down the gulch. At the moment, we don't know what is happening on the west side of the gulch. There are very old cane fields, the roads are overgrown, and it is very wet. We are working with HC&S. They bulldozed a road for us so we can get in there and see what is going on. If there are more frogs on the west side of the gulch, it is potentially a big issue.
- Adam: we have developed a system of management units to us help figure out where to go and when. We needed to divide the area into a tangible metrics to help with scheduling and analysis. The units are defined by tax map key parcels and are also based on work area. We need to be able to comprehensively cover each area. For each general area we are defining a map book. We have looked at considerations for how to prioritize. Brooke: we would appreciate input on the buffers. The rim is important because of spread. Roadways, streams, and ditches are vectors. Fern: do you have data for when a frog breaches the buffer? Brooke: the 30 meter buffer seemed realistic as something the crew could fight back in a couple of nights. A 100 meter buffer would be huge and less than 30 wouldn't be enough. Fern: you should use 30 meters until you prove that the number isn't adequate. Brooke: community volunteer effort also taken into consideration. The various factors get assigned points and areas with multiple points are higher priority. The higher scoring areas are highest priority. The community effort properties get extra points because there is more bang for the buck. The way the system is designed some steps are automated. We could easily go in and change the buffer and use a grid instead of management units. We can adjust the score by plugging in random things like cows on a property. Adam: right now it is a coarse filter. The model is adjustable and can be run over and over again with modifications.

- Abe: revisiting on a six week interval breaks the reproductive cycle. We always go in with the intent to spray. We don't just survey. If we know where the frogs are, we can do day sprays. Adam: right now we are focusing on hotspots until we can get more staff on. If people are seeing frogs, there are a lot. They are usually detected by hearing. When we get up to full staffing, we will have a crew focusing on the management units, a roving crew to deal with things that pop up, and a crew to help Darrell with habitat work.
- Adam: in the past when someone called and said they had a frog, we would go right out and deal with it. Now we have to say that we may not be able to get there for a while. In some areas we have homeowners that are doing their own control and habitat work. They are also being very vocal to help get us funding. Darrell: some people have done an impressive amount of habitat work. Sean: more and more people are asking for sprayers and citric acid. Some folks have even requested full 50 lb. bags. Abe: we are looking at getting more sprayers to be housed in certain communities. There have been community committees formed and there is momentum. Adam: we are starting to guide them through the process of helping us. They send us maps of where they know frogs are and we develop a coordinated game plan. We want to foster that sort of relationship. For instance, Darrell will come and knock the vegetation back and then the homeowner is responsible for the maintenance. Chuck: are there any resistant landowners? Adam: we still have a few problematic properties. Abe: there is a lot of peer pressure and we do have some absentee landowners, but 99% are cooperative.
- Adam: we are also exploring potential partner resources including water tankers, the fire department, heavy equipment, water access, knowledge of the area, etc. Staff from DLNR may be able to help. The East Maui Watershed Partnership field staff will be with us for a month this spring. We have also been talking with HC&S.

COST ESTIMATES

- *Cost per acre: \$1,550-2,000 per treatment (citric acid & labor)*
- *Pounds/gallons of citric acid per acre per treatment: 765 (up to 975)*
- *Person-hours per acre treated: 30 (up to 50)*
- *Infested acres: 1,000 (up to 1,300)*
- *Treatments needed to eradicate coqui: 10 (up to 20)*
- Adam: the estimate for total cost for eradication of coqui frogs from Maliko Gulch ranges from **\$4.6 million to over \$15 million**. There are a lot of acres and it takes a long time to cover them. As we ramp up, we will be better able to refine the cost estimate. The additional \$1.2 million that is coming from the county is just for Maliko. Existing funding from the county and state will support work throughout Maui. Josh: after discussion with the Legislature and other funders, I think there is value in coming up with a breaking point figure. At what point would you say it is a lost cause?

BANANA BUNCHY TOP VIRUS

- Adam: our effort on BBTV has gone down considerably. Little fire ants have taken up a lot of our time. Maui has the most Polynesian varieties of bananas in Hawaii and is at risk of losing all of its bananas. BBTV was first found in Hawaii in 1989 and on Maui in 2002 by Mach Fukada from HDOA. MISC initially began working on BBTV in 2004 when the County stepped in and gave us dedicated funding to assist HDOA with survey and control efforts. Infected bananas have been found in Pukalani, Makawao, Haiku, Kihei, Kula, Kahului, Wailuku, and on Molokai. BBTV is most prevalent in Kihei and Central Maui and is becoming more common in Haiku. It is pretty rare on West Maui and has not been found in the farther reaches of East Maui. There is some BBTV in central Molokai and nothing has been found on Lanai to date. There is no biocontrol on the horizon.
- Adam: BBTV is spread by a banana aphid and is hard to control. Aphids are small, have wings, and can blow on the wind. There are other hosts for the virus as well. Certain species are more susceptible than others. BBTV is a unique target for MISC in that it is an agricultural pest. The goal of the project has been to suppress BBTV for as long as possible. Historically, we would canvas entire neighborhoods. This worked okay when there were only a couple of communities known to have infestations. As we found BBTV in more and more places, we got stretched thinner and thinner. We tried an experimental approach where we looked at the known rate of spread and established buffers. We tried this in Kihei using concentric rings (based on known rate of spread) and then randomized the TMKs. Basically the random sampling found about as much BBTV as the more thorough surveys. Outreach is a huge element of our BBTV effort.

MAUI PERSPECTIVE

- Initial county funding was for \$50,000 annually.
- On average in Pukalani and Makawao it takes our crew about 35 site visits (or about 13 hours) to find one new bunchy top occurrence.
- It takes our crew roughly one hour to visit 2.7 sites throughout Maui.

NEW CALEDONIA PERSPECTIVE

- First found in 1999
- Containment strategy implemented
- Similar search and control methods
- 54 person crew operating at \$4.8 million for four year push
- Plantation infestation mandatory destruction, outlier recommended
- Three year PR blitz
- Objective is to protect uninfested areas

FUTURE STEPS/QUESTIONS

- Continue systematic survey and control efforts in impacted communities unless suppression becomes ineffective?
- Expand search efforts and random sampling in apparently uninfested areas?
- Expand, intensify and modify public outreach efforts?
- Make the best use of available funding to maximize survey, control and outreach efforts.

- Work more closely with the agricultural community and others to ensure the longevity of Maui's banana industry and cultural heritage.
- Fern: maybe there should be more searches in areas where there are rare species. We want to protect rare resources. Adam: a geographically oriented approach may be effective. We need to identify where the rare species are located. This is still a valuable project for MISC. We may want to focus on more outreach and a regional approach. We can try to come up with a map that delineates areas of rare bananas. James: if eradication isn't possible, maybe we should drop it. Does Hawaii play a role in worldwide banana breeding and protection? Lloyd: there are banana diseases all over the world. Abe: the big message is "don't move bananas east." Bananas are a good place to look for fire ants. Adam: we should continue outreach and actively support people controlling their own BBTV. Rob: at the minimum, outreach should continue. Abe: Lissa and Darrell are doing a presentation for Master Gardeners. Darrell: outreach should focus on banana farmers. Teya: we may need a dedicated person to focus on this target.

GENERAL UPDATES – MISC TARGET SPECIES

- There are about 13 conures left. Lovebirds are becoming more and more widespread.
- Treatment for fire ants at Andaz finished last week. The infestation was very small and localized. Their landscape management team did the treatment. We will go back and survey. Christina's property will be surveyed soon. The Haiku area where the logs were moved to is in the monitoring phase. LFA have never been found there again. The Huelo population is shrinking except on one side. In Nahiku there was an extensive survey of the recalcitrant property. It has been fully delimited. We need to relook at the truck site again. The LFA video is complete and has aired a couple of times. It is also on YouTube. Future air dates will be announced.

Next meeting: April 29