USACE

Moderator: Jessica Fair
July 28, 2020
8:54 a.m. CT

Attendees:

FWC
Steve Gornak, Danielle Kirkland, Beacham Furse, Tyler Beck, Brendon Hession, Mason Smith

USACE
Mike Carlson, Jessica Fair, Chelsea Bohaty, Jon Lane, Ian Markovich, Tyler Green, Josh Bauer, Erica Skolte

SFWMD

Linda Yarrish, Kaitlyn Quincy, Bobbie Campbel

Lee County Hyacinth Control District

Jason Cull, Colin Lewis, Kavin Watts

Audubon

Paul Grey

Others:

Jason Ferrell, Scott Jackson, Kelli Gladding, Jerry Renny, Kurt Ramsey, Jeremy Slade, James Boggs, Katrina Elsken, Newton Cook, Rep. Cary Pigman

Meeting:

Operator: All participants are now in listen-only mode.

(Skip): Okay. So we're all on listen-only mode. For some reason, the video decided

to stop working. It's not allowing me to share my video. I don't know if it's allowing anybody else to. I see you, Jay. Just can't hear you.

So it looks like people are starting to join on but we're going to wait until 10:00 to go ahead and start.

Okay. So we have with us Dr. Jay Ferrell from the Center of Aquatic and Invasive Plants at the University of Florida IFAS. He is here to give us a presentation on herbicide residue in lake sediment and understanding herbicide fate.

Jason Ferrell: Well thanks (Skippy). I appreciate that brief introduction. And, you know, actually, I have a second title for it. You know herbicides and lake sediments Lake Istokpoga case study. So what this is, is kind of highlighting some work we did on Lake Istokpoga a year or so ago. And I thought it's a good example of how research in the public can intersect and reach common good and common goals.

And so I just wanted to put this together sort of as a reminder to agency people, university folks, as well as stakeholders that we really can work together. We often avoid that because it seems cumbersome or we believe that the public doesn't want to hear from us or the public will say well they don't want to listen to what I have to say. But I think this is a good example of how these groups work together. And we ended up with some really good

information.

So if you'll go ahead and advance to the next slide we'll get into this. So Lake Istokpoga as you guys are well aware it's a very large lake, 27,000 acres roughly in the Sebring area in south Florida. But it's also a shallow lake as is common in Florida. So average depth is about four feet. So the majority of that lake you can stand up just about anywhere in it.

A lot of marsh areas, a lot of spatterdock. So a lot of fairly shallow water. But historically this has been a very nutrient-rich lake and it has been an excellent fishery. It has supported a lot of trophy fish and it has been a destination for anglers not only in Florida but across the country. And because of its nutrient-rich status and its shallow water conditions it's historically been heavily infested with hydrilla. Next.

So back in the early 1990s this lake had become infested with about 20,000 thousand acres of hydrilla. It wasn't totally covered. But I've heard FWC people indicate that you could sit in an airboat in a part of that lake and basically as far as you can see in any direction was nothing but topped out hydrilla.

So because of that, an aggressive lake-wide management program was instituted. So this was full lake fluridone treatments. And they really went after the hydrilla very hard and got it to a more manageable level. But because of the fact that hydrilla is very common in Florida lakes and it does have some qualities that allow fish to congregate most anglers really like having that plant there. And they love to fish it. And it supports some reasonable habitat when it's kept at low levels.

So because of that hydrilla is no longer treated as a lake-wide program but it is

treated in spots. Now the spots may be large but it is still spot treated. Next. Next slide. Now when you look at the fact that it is spot treated the most common herbicide that is used is Endothall. And when you look at the yearly average there's quite a bit of Endothall that's been used over the last 10 years. Next.

But it's not just Endothall that is being used. There's also a reasonable amount of 2,4-D glyphosate and diquat used for floating plants, used for cattails, grasses and other things. So the amount of herbicide usage on Istokpoga has historically been reasonably high. Next.

So things were rocking along pretty good from a stakeholder perspective until around 2017. And that's when Hurricane Irma came across the state. It made landfall as a Category 4 with around 140 mile an hour winds and just swept right over top of Lake Istokpoga and caused a tremendous amount of damage to that lake.

So basically it just ripped a lot of that hydrilla out, rolled it up but it also churned that lake bottom up. It made the whole lake very turbid and really changed how that lake looked. After that though even a couple of years later the hydrilla hadn't come back. And the stakeholders are saying now wait a minute this lake has historically at one time supported 20,000 acres.

Yes we know it got pulled out by the hurricane but we're a couple of years after the fact and there is no hydrilla in Lake Istokpoga. And the question then became -- and it's a very reasonable question -- is the reason there's no hydrilla in this lake because so much herbicide has been used for so long that the sediment is now contaminated and any new tubers that try to sprout are being immediately killed because of access. It's accessing herbicide in the sediment. Next slide.

So this was part of a lengthy series of conversations that was had between FWC, the University Florida and the Lake Istokpoga Advisory Committee. And the advisory committee were making the - asking these questions and trying to find resolution while FWC was attempting to write a lake management plan for them.

So in February of 2019, the Center for Aquatic and Invasive Plants became involved because now we have a question that has a clear research objective. All right. The question is are the sediments contaminated and is that why there's no hydrilla.

So we came together. We worked with the University of Florida group that was facilitating this meeting. We worked with FWC and the advisory committee. And a three-pronged research approach was put together. And there were three studies that were done.

The first let's go sample some of the sediment and send it into a lab and see if there's any herbicide actually in it. Secondly, let's do bioassay. So just because a machine in a lab can't find any herbicide doesn't necessarily mean there's none there. So let's see if that sediment will actually grow plants. And third, let's go out and sample for tubers and see what density of tubers are in that sediment. Next.

So working with the advisory committee three locations were initially found. And they said, you know, this is - these are three areas -- as you see in the pins on the map -- that have historically supported hydrilla. There's not any there. So go there. Collect some sediment. Do some experimentation and determine what's going on. And we also selected three sites in Lake Toho because Lake Toho of course is one of the best hydrilla growing lakes in the world. So we

wanted to use it as a comparison. Next.

So from that, there was - after the initial selection the advisory council said well you know there - three sites is is a nice start but this is a 27,000-acre lake. And I think there needs to be a few - a bit more thorough investigation. So that in - the first three sites increased then to around 36 locations here, here, here, here and here. But again working with the advisory council we said, you know, do we actually need 36. Some of these pins are really close together. And we got that number down to nine which is a bit more manageable.

So now with that, you're going to see some of our projects have only three sites because we already started the project before we went from three to nine. So some data points are from the original three. Some are from nine. But I think it'll be clear when we get through that in a moment. All right. Next Slide.

So we started by taking sediment samples and sending them in to - for lab analysis. And this was the - we used the nine spots as indicated. Now you see in this picture what we used was a Ponar dredge. And a Ponar is a small apparatus.

And it's sort of like a - it's basically a mini dredge. And it is it opens up. You drop it down. And when it hits the lake bottom it closes. And we wanted shallow sediment. We didn't want deep cores because the hydrilla is going to germinate in the top couple of inches.

So it doesn't make sense to take a core that's eight or 10 inches deep because that's - we only want the top. So using that dredge we were able to get a significant amount of sediment. We put these all in bags and stored them on ice. And as they were cold and immediately shipped them to a private

laboratory in Georgia for analysis. And we have now analyzed for nine of the most commonly used herbicides that have been used on Lake Istokpoga in the last decade. So there were a number of herbicides that were screened in that study. Next.

So using almost the exact same procedure we also collected sediment for the bioassay. And again a bioassay is when you collect sediment. You then take it back to the lab or the greenhouse. You dry it out. You sift it. You put it into pots. And then you attempt to grow plants in it. But one thing that I think is interesting and important to notice here is you look in the picture and the individual in the red hat is from the Lake Istokpoga Advisory Council.

And we wanted the advisory council to be present and take part. What we did not want is for this study - this study was done for them. They were concerned. We did the study for them based on that concern. And what we didn't want were people being able to say, you know, we've located and we identified nine locations but you didn't go to any of them.

We didn't want people to say, you know, hey you guys are trying to cut us out. You're trying to be secretive. So we invited advisory council members to go with us. And they were part of that process. And it ended up being extremely helpful. And it was a good lesson for me and other researchers on this project.

But again we took the samples. We filled up five-gallon buckets. And if you've never filled up a five-gallon bucket using a Ponar dredge I ask you to take part in that. Who needs CrossFit when you're pulling a dredge 30 times for each location? Next slide.

So with the bioassay -- as I indicated -- we took those back to the lab. We included some additional controls from Lake Toho. And we also just

prepared some soils in the lab either pure builder sand or sand plus potting mix. And then we planted tomato seeds and hydrilla tubers in there. And we replicated it of course for good statistical technique.

But again the reason we wanted to see if it'll grow these plants is maybe it's not herbicide residues maybe it's something else. So laboratory will give us information on herbicides. This will tell us will it support plant growth. And tomato seeds are a good bioindicator because they're really, really sensitive to a lot of things, environmental stresses. So they're a good indicator plant to use. Next slide.

But we also wanted to understand what was going on from the perspective of tubers. Are there tubers present? So again we went to the original three locations and we took 20 samples at each location. And basically what you do is you go to those three pins that were originally there. You start on a transect and every 30 meters you stop and you sample for tubers. Next slide.

So what you use is this a tuber sampler you see here. It's about a six-inch pipe on a pole. You stick it down in the sediment. You pull that sediment up. You drop it in a basket. And then we use bilge pumps thrown over the side. And it would run water over those samples and knock all of that sediment out. And then you can actually see the tubers there. They're quite easy to see.

And it's very common to have 200 to 300 tubers per square meter in areas that have been (distally) infested. So that's going to end up being, you know, six to 10 tubers for each of these samples. So when you do 20 samples at a location that should give you enough sample size to really get a good count and estimate of the tubers that are present. All right. Next slide.

So that is how we did the work. So now let's get into what we found. Next. So

we're going to start with the analytical analysis. So again this is where we sent the tubers to the lab and we sent the sediment to the lab. They break it down. They inject it into very expensive very sensitive machines and look for herbicide residues.

So we look for a large suite of herbicides and you see the results here. The concentrations are - the report we got back were all indicated with U which is just - it means undetectable. So they did not detect any herbicide in any of the samples. Now you look at their limit of detection. So most of the herbicides it's between 50 and 10 part per billion. And this is well within the application rates of a lot of these. But we were not able to detect with lab techniques.

Now diquat was at 2,000 part per billion which is very very high. So that test was not as sensitive as the others. And if we'll need to get into that at the end with some questions I'll be happy to answer why that one is so different. But point of fact is the lab was not able to detect herbicide in any of the samples we sent. Next.

So now let's look at the bioassay because it's one thing to find herbicide residue in the sediments. But it's another thing to determine if those sediments will actually support plant growth. That's more important than whether or not herbicides are there. Next?

So we're going to start by just looking at the data from the first three locations which is basically north, central, and south end of the lake. And this is tomato seed germination. All right? So we've got Istokpoga in Location 1, 2, 3, Toho 1, 2, 3, and then our two control treatments. So when you look at Istokpoga 1 and 3 -- 72% germination, 88% germination -- all of that is - it looks really good. The Toho 50, 70, 65 - really high amounts in our controls.

So then the question is, "What's going on with Istokpoga 2?" Why is it so much lower? And if - the fact that it is lower what does that mean?

Next slide. So when you look at it, this is now total tomato plant weight. So regardless of germination - so you see there's low germination in Istokpoga 2. But the plants that were there grew very, very well. So the seeds had a difficult time germinating and emerging.

But the plants that did emerge grew just as well and put on just as much biomass as the other two locations. And you compare that to Toho and it basically blows Toho away. That sediment at Istokpoga appears to be much more nutrient-rich than what we had in the Toho sediments. And it was very close to our control.

So the Istokpoga sediments do grow plants quite well. Now why would - why did Istokpoga 2 have such a difficult time with germination? This is what we think happened. Next slide.

When you look at Istokpoga, it has historically been a fairly algae-rich system. And as those algae cells die and go to the bottom they become incorporated into the muck. But those algae cells are very different than plant parts that decompose. Plants decompose and make a - almost like a potting soil type texture. But the algae cells are much more hydrophobic. They really repel water a bit more.

And as we took some of these sediments back and sifted them, you can see where we would put water on and the water would just pool up on top. It wouldn't even sink in. And it would just run off to the side. And you see here the I 2. We could not get that soil material - after it was dried we couldn't get it to wet up again.

So what we believe happened in Istokpoga 2 -- the reason we had such low germination -- is that we had a lot of pockets of super wet and totally dry so that our seeds were just simply not able to have adequate germination conditions. And we think that is why the seed failed to germinate and emerge as well in Istokpoga 2. But the ones that did grow were able to reach water, access it, and grow quite well.

All right. Next slide. All right so we're back to our tomato weights. Next. So the tomatoes grew well. And as you look at our plants side by side, the plants from - that were growing in Toho soils are on the left. Istokpoga soils are on the right. In each picture again you can see that most of the Toho soils the plants germinated well but just didn't develop as well.

But boy in the Istokpoga sediments, whenever they got up they really started moving fast and hard. So again that really goes to show that nutrient-rich nature of Istokpoga and why it has been such an excellent fishery for so many years. Next slide.

But the thing that really is interesting to me is how well did the Hydrilla do? So you look at the Hydrilla tubers that were put in there. In Istokpoga 80, 50 - essentially 50 % germination -- as good if not better than Toho and as good if not better than our controls.

So next slide. So when we had the Hydrilla tubers in there they all supported good Hydrilla growth. And you can see how we grew them out in this common tank. And you can see, you know, T 2, I 1 all randomized through there. Each one of the sediments the tubers germinated. And after they germinated they grew quite well. They topped out. And, you know, it looked - it looked really, really nice after it had a few weeks of growth.

Next slide. So then we went back and took additional sediments from locations four through nine. And again you see similar trends on tomato germination from - you know, some as low as 27, some as high as 82. But, you know, that's what we ended with.

All right. Next slide. So what are some of the conclusions from the bioassay study? Well, tomato seeds planted in Toho and Istokpogo sediments germinated pretty equally to each other, but not quite as good as it did in the control soils. But tomato dry rates - dry weights -were similar between the control and the Istokpoga 1, 2, 3. And they both supported Hydrilla tuber germination and growth.

Next slide. So I think the take-home message is that Istokpoga sediments -- we did not find herbicide concentrations in them. And these data indicate that they do support plant life.

Next slide. So then what's going on? The lab didn't detect herbicides. Hydrilla and tomato seems to grow well - don't seem to be detecting herbicides. So why is there no Hydrilla in Lake Istokpoga? If the soil is good and it's historically supported it, why is it not supporting it now?

Next slide. Well, let's go to the third study and see if we can't help answer that question. So we went back to the original three locations and we did our tuber sampling.

Next. And recall at each of these locations we started and we took 20 samples on a linear transect at north, central, and south parts of the lake. And not a single tuber was found in all of the sampling. So 60 cores, no tubers. Now again realize that in a lake that has had as much Hydrilla as Istokpoga

historically has, it would be expected that it would have two to three hundred tubers per square meter. So the fact that - and that is easily findable with the techniques that were being used. So where did they go? What is going on?

Next slide. Well in short we don't really know. But we do know that similar things have happened on Lake (Wokin Water) and I've - Weohyakapka. I know I'm not saying that right. But I'm going to call it Lake (Wokin Water). But a similar thing happened there back in the '90s. There was a lot of Hydrilla in that system. Three hurricanes passed over it in the early 2000s. And the Hydrilla crashed out and really didn't come back very well.

So this is now a similar occurrence that hurricanes were involved with a crash and lack of recovery. Now there's a lot of our lakes that have had hurricane influence. So why does it not do it to all? We don't know. All right. We simply don't understand why these two systems are different. But it has happened in the same sequence twice.

So next slide. So what's our theory, you know, on it now? Take a theory for what it's worth. This is just us thinking - we don't have any data to support this. But basically our theory is this. Irma came through and ripped up that Hydrilla. Now there were really high winds coming across a quite shallow lake. And it's been indicated that there were as much as six-foot waves on Lake Istokpoga.

Now most of that lake is average four feet deep. So if you have a six-foot wave two feet - the trough of that wave is two feet down in the sediment. And basically think of a big wind bulldozer moving across that lake. It is (ripped) - it is moving that sediment. It is churning that sediment. It is burying a lot of those tubers deep. And we think a couple of things possibly happen.

Number one, it oxygenated all those tubers. And when you oxygenate tubers it does help them germinate. That's why drawdowns always stimulate massive germination of tubers. So we think that that water helped oxygenate the tubers. A lot of them were buried deep and they started trying to germinate and then died.

We think others that were deposited more shallow did germinate. But the water was so cloudy for so long we weren't able to get sufficient light penetration to basically develop those plants and they succumb. Maybe. But what we do think we understand is that that system will support Hydrilla. We - there's no reason why we would ever think that it won't come back in the future. But we think this is how we got to where we are now.

All right. And last slide. And a big thanks to (Bill Howler). He's the one who really did a lot of this work - collected the data. The guy retired on a Thursday, showed back up at work on Friday just like nothing had changed. That was three years ago and he's still coming in. And I'm meeting with him this afternoon. So I kind of hope I never retire either. He looks like he's having a lot of fun.

So with that, I'd be happy to take some questions. I see one that (Jason Cole) put in the chat. "Why couldn't Endothall be tested?" Endothall wasn't tested because (Beechum) literally called every lab he could find across the country. And we could not find a single analytical lab anywhere in the country that tests for Endothall. One of the primary reasons for that is because Endothall is fairly short-lived in the water and most labs - most people don't really do a lot of analysis.

Now the University of Florida have kits that we can test those samples. But most analytical labs don't have the capacity to test for it because it's not a huge

need. So anyway that's why we didn't test for Endothall.

Another question from Mike. "If I'm understanding correctly it seems like there might be an environmental justice-injustice component to this lake's herbicide treatment program if organized bass anglers' preference are driving intensity of treatment. Those catch-and-release anglers are likely of a certain income demographic that is different from the demographic of the people that are harvesting eating fish. So if there's a risk of bioaccumulation in fish not plants, it could be disproportionately affecting certain groups. Just something to consider when decision-makers are listening only to organized voices."

Well, so the question that is really being brought up here is about herbicide bioaccumulation. And to be perfectly honest bioaccumulation of DDT is the driving factor for why EPA was formed in the early 1970s. Every pesticide that is currently registered by EPA has to go through a registration process and a reregistration process. So things like 2, 4-D that are older than the EPA did not get grandfathered in. They have to come in and go through reregistration just as if it were a brand new compound.

So the fact that bioaccumulation is a primary focus of EPA before registration, none of the herbicides or any pesticide currently registered by EPA has any indication of bioaccumulation in the food chain. So I think that's a really important one. Oh, and so (Beechum) cleared up my statement. He said, "Labs will test water for Endothall but they were not able to test the sediments." Thank you. Thank you for that clarification, (Beechum).

(Paul Grey): Okay. Thanks. Yes, so thanks for that presentation. I was actually on the Istokpoga committee and watched this all develop. And I think you guys did a real good job of wrapping up the - there's - you know, on Istokpoga -- even today -- it's not just Hydrilla that's not coming back. But we pretty much have

lost almost all the SAVs in the lake. And there's a whole lot of emergent marsh that has been killed and just doesn't seem to be growing back.

And so, you know, the question is, "Why is that?" And I think you guys did a real good job of showing that it's probably not residual herbicides in the sediments that are preventing regrowth because of the multi-layers that you did the testing.

But the question of why is stuff not growing back is a little bit harder. And, you know, right now with all the open water in the emergent marsh, the things that invade that tend to be Hydrilla - I'm sorry, Hyacinth and lettuce and stuff like that. And the product managers go out and try to control those.

And one hypothesis that I have -- and it would need to be tested -- is that maybe this ongoing treatment of the first invaders of the open marsh is suppressing the other stuff from coming back and how we would get out of this cycle of killing the floating stuff and maybe having an alternate or collateral impacts of the emergence. I'm not really sure.

But I hope that we will start looking into that too because that's a big question. You know, why is the marsh mostly gone right now? It's just - it's - when you go on the lake -- I was just out there a couple of weeks ago -- there are just big open areas of water that's one foot deep and there's just nothing growing there.

So more questions to answer. But I think you guys did a good job on your part of it. And I'm glad that that part of the issue is resolved that these herbicides do break down and are not residual sediment enough to prevent plant growth. So thank you.

Jason Ferrell: Yes. Paul, you're exactly right. So we think we have an indication of what it's

not. But we still don't have - we - like I said, we just have theories about what's going on now. So yes there's a lot of room to really learn more about this situation.

(Paul Grey): Well, I'll just wrap up and then you can go to (Newton). But I do think this is a great example of the university working with the managers and the public and getting more information. So thank you.

Jason Ferrell: Okay. Take it away (Newton).Jason Ferrell:

(Newton Cook): Thank you very much. And Paul thank you for your comment. Good comment. I just want to say that it's a sad thing that's happened there. And I know there's a lot of stakeholders out there who are making a lot of charges and a lot of ill will about what's happened there. But I think this study has shown that it's a lot bigger problem than just the fact that any residual spray or anything like that.

I do suggest that we take a part of this lake and simply let the exotics go. Let the water lettuce go. Let the Hyacinth go. We sure can't get any worse from where we are now. And hopefully, if we get enough vegetation over enough of an area -- a thousand acres or whatever you might want to experiment with -- see if that does not set up a situation where the SAV will start taking root. We know the floating vegetation shades out the SAV.

We know that. But we need to do something different and we need to get some vegetation in the lake. So my suggestion is to just take an area and let her go and not do any spraying in that area. You guys are working hard on this and I've been involved as you know for over 15 years on that lake. And God bless you. It's not an easy thing to do.

Jason Ferrell: Well (Skippy) with that I don't want to dominate the rest of the meeting. So if you want I'd be happy to respond to comments in the chat as we move forward and that will allow you to kind of go through the rest of your agenda.

(Skippy): So with that (Brendan) will be discussing the interagency flights. We're going to go over February till July since we haven't had a meeting in a while. We did go over February on our last meeting. But just to kind of bring everybody back to reality. So (Brendan) if you wanted to press Star 6 then go ahead.

(Brendan): All right. So you can see here that the acreages from February to July are definitely going up especially as the weather is starting to get a little bit warmer. We've seen a lot more plant growth in this kind of stretch of time. Really from March to about July, we treated somewhere between 3000 and 4000 acres of plants. We have definitely - we treated 3000 acres.

But kind of with our current situation with kind of our billing of our applied aquatics going to the core for that part of the work, you know, they're still working our pre-approved areas that were approved by our division and what not. So those numbers are a little lost in there. But somewhere around that three to four thousand acre range is what we treated from March to July.

So you can see in that, you know, we got - started to get pretty good decent control there in the month of May. But then as soon as the wind started picking up -- and as well as the weather is starting to get a lot warmer -- we're seeing a lot of those plants move around the lake as well as starting to build up in different areas.

Earlier in the year, we were probably seeing most of the invasive plants kind of centered up in the northwestern marsh where it's now kind of - as we're getting winds that are switching many different directions we're seeing a lot of

those plants get blown out into the center of the lake and just get moved around like a big washing machine.

When looking at the plants now from our last flight from a couple of weeks ago, Chancey Bay and in Eagle Bay -- those areas are seeing a big influx of plant material. It's kind of - the winds have pushed a lot of material both on the east side and kind of the north end of the lake. So that tends to be where a lot of the material is now kind of accumulated up there.

We have had multiple boat locks in kind of the north and the east side of the lake get clogged -- as those winds shift -- much like we did last year. And we're looking into trying to set up some plans in the future that maybe on the east side of the lake at those locks we may be able to do some harvesting to kind of clear them.

But for now, we've used the herbicide to kind of make that process go faster especially since, you know - the way things work the locks ended up opening, I believe, a day or two before or after they got clogged. But it was around pretty much the same time. So we had to try to address those pretty quickly.

I was looking at the numbers from last year in our - as you can see they're kind of - June numbers from this year is about 2050 acres. And last year in June we were actually at about 1100 acres. I was having a little bit of trouble kind of piecing together the numbers from last year and whatnot. But at least from June, we're sitting currently - or this year's June numbers were almost about double what they were last year.

But with that you can see that - I believe our January flight is not on here. I believe that one got canceled for folks - for flight availability issues. And then we had a COVID cancellation of our flight in April. So that's why at least

those two months probably aren't on here. But other than that I don't know if I have too much more on the flight.

(Brendan): Yes. So we should have harvesters returning to the lake in the next couple of months. Right now we're kind of working on trying to find a proper disposal site. We were originally intending for the harvesters to come back to the lake and start work around our pre-approved polygon for harvesting that's around the Indian Prairie Canal.

The issue that we're currently trying to work through is either having the harvesters shift to another part of the lake - because when our contractors tried to do kind of a preliminary site -- take a look at the site for disposal -- they tried accessing down towards the end of that Indian Prairie Canal, on the berms on either side, to try to reach down to the end but we would do the disposal. But unfortunately, they couldn't get down that far.

With the recent rains and everything the kind of - that area where they try to get down there just gets really filled with clay -- wet clay. And then without tracked vehicles, it's going to make reaching down there pretty difficult which refueling and a whole bunch of other kind of operational issues are going to come up because of that.

So we're looking into kind of if we can continue with that plan as well as possibly move them to other spots of the lake. So that's kind of what we're looking at now. But we do expect to have them back in the next month - next few months. They're currently working up on Lake Kissimmee.

They have a little bit of work to do up there. We're working on whether we can split kind of the forces of the harvesting company we have working up there between Okeechobee and Kissimmee. So we're working on all those

things. But we should kind of come together and come back on the lake here in a couple of months once we get all that stuff figured out.

(Steve Gornak): Let's see. Let's start off with the cattail treatment. I'm going to talk straight from the figures here and kind of give an overview of what's going on. If - do you have the first figure from (Alissa's) treatment plan? Is - I'm not looking at - I'm not on the Web. I'm on the phone. So I can't see if you're using - if you have the picture up there or not.

Anyway, to go ahead and move forward with it, basically everything you see on here is past treatments except for the green polygons that are showing this year's 20 - 2020 treatments that are being proposed. We have about 470 acres up in Tin House Cove that are being proposed to be done in that area.

This is all part of the Tin House slough maintenance work to keep that slough open while we work to continue to remove cattail and organics north of that to re-establish that slough. So we definitely want to try to keep that open. There's wading birds, ducks and stuff that live back inside there. So we definitely want to open that up.

Moving down towards Indian Prairie Canal, there are about 32 acres of work that's going to be done in there right off on the north side of the canal. And then some additional work done around Worm Cove area. There's about 1341 acres that we're going to try to treat in there as well.

Moving down to Moonshine Bay -- or, sorry, Moore Haven Marsh - sorry, Moonshine Bay -- we have 552 acres of heavy cattail that was not treated back in the days of (Brent). We did burn in this area but that material came back fairly quickly. So what we want to do is treat that. And the mix that was done in the yellow area there in Moonshine was a glyphosate and (ameza) pure mix.

And that killed - tended to kill some things back.

But we're not seeing as good of a result in the death toll on cattail as we would with a Clearcast mix. So this year we're planning on doing Clearcast at a 32 ounce per acre mix. The size of these treatments are very large. They're going to require helicopters. So we do have to get approval for helicopter work in all the area that we're talking about right now.

So going to the south portion of the lake just north of Boy Scout Cut, that whole cut area for those you who were working way back when I first started -- back in the dinosaur times there -- we had a lot of good eelgrass -- topped out eelgrass, sticky (unintelligible) grass -- that was in that area and had a lot of good bass fishing. And this is an area that was too deep for wading birds.

So mainly this is a fishing territory here. So what we're trying to do right now is to knock out some of the offshore cattail -- that 759 acres is what we have proposed -- and knock out some of the cattail from the offshore, try to give the wave energy in there to have that - the organics broken up in there. We hope that -- on all of these areas that we're talking about -- that we can get some burning done once we've done the herbicide treatment.

And we're still trying to decide the timing of that - of both the herbicide as well as the burning. But we would like to have water levels as low as possible so that we can burn off as much of the stubble as we can once the herbicide has done its job. But we don't want -- especially down in south bay -- we don't want to ignite that peat.

So we definitely want to have some water over top of that. The other areas are basically sand bottom. We can burn all the way down to the mineralized soil and be okay there. There's really no risk of smoke issues for long periods of

time in those areas. Let's see. We have prioritized other areas up in the northwest marsh around King's Bar in Cody's Cove.

There are some very, very heavy cattail in that area that I've been eyeing for quite a bit of time. Removal of this cattail - there you can see there's we have one, two, three, four, and five polygons. The polygon number 1 is the area that we are planning on putting - we're still planning on removing the rest of the - any prairie canal levee on the north side and building a shorebird nesting island there.

In that area, there is a very large amount of eelgrass beds in that region. Again going back in time, when I first got on here we had a lot of hydrilla in this area - in the cut of that area. But we also had a lot of eelgrass growing in there with sporadic pondweed growing in there. So this is a great fishing area. It's a little bit deeper.

So you don't have a whole lot of wading bird activity there. But the opportunity to remove cattail and replace it with more beneficial eelgrass and peppergrass is -- to me -- is a very - it brings this point to - this area to one of our higher levels for treatment. So also by removing the cattail in this area we can restore flow when we have northeast winds.

And that flow -- if we can remove the areas where we have number 5 -- polygon number 5 there -- that will complete our connection of the (tin house) cove slough. And if we can remove the cattail and get wind flow - wind in that - out of the northeast and get water flows all the way down that slough, that would be extremely beneficial to that area. So - and then we're also looking at doing treatments number 3 and 4...

(Steve Gornak): Okay. Okay. Well, let me jump back real quick because you heard what I said.

So let me jump back real quick to the very first slide - the very first picture. And basically -- again -- what we were talking about doing is the green -- the light green patches, light green polygons -- are the polygons that we're talking about treating this year - that we have prioritized to treat this year. Okay.

So northwest marsh. you see there's three, four polygons there, a 260, 210, 32 acre and a 1,341-acre polygon down there in Worm Cove. We do want to treat - make those treatments. In Moonshine Bay, we have 552 acres of light green. You see that there. That's in the vicinity of where (Brent) had done some herbicide treatment.

And this particular area was an area that just got burned. It did not get treated. So we're going to do the treatment and then come back and try to burn these areas as well. Recapping, down on South Bay, you see the 759-acre polygon down there. And again let me ask you. Can you all see these polygons? Anybody with a yes or a no.

(Steve Gornak): Okay. Great. Okay. So we are planning on treating that. And again, that's an area that used to be a lot of eelgrass beds in there. It's a very - it's a deep water area, very little wading bird activity in this area. A little bit of snail kite activity down there. I think I see one or two birds flying around there every time - when I go down there. So - but so we do have some - there is some benefit to trying to open this up for snail kites.

But this is mainly fishing. This will be more of a fishing project than it would be anything else. And there's a lot of eelgrass and peppergrass that are outside of this polygon that we hope we'll recruit back into there once we do that treatment. So going to the third photo, this is treatment these are treatments that we're planning on up around Cody's Cove.

And again the - all the descriptions I gave there still stand. But now you can see these polygons. The - and that's polygons two - one, two, and five and then polygons three and four. Those are in the vicinity of the -- if everybody is familiar with our island names -- Pleasure Island is four and Gourd Island and would be three.

These are cuts that we've made that we're trying to maintain some type of openness to them. We get eelgrass in number 4 was - we've replanted spike brush there. That's growing in. We get a lot of wading birds in there. That's a very shallow area. And the same occurs in number 3.

So trying to do some cattail treatments in there and have cattail be replaced with spike brush and eelgrass and stuff like that would be much better than having just the monotypic stands of cattail that are creating organic issues there for us. So anyway, that's what we have set up now.

Now I do want to say that these treatments in around Gourd Island, Pleasure Island and up in Cody's Cove, these are things we're thinking about. We have not prioritized these areas yet. But we will continue to be looking at these in the future. So we just wanted to get those on the map. The areas in the other maps were the light green polygons.

Those are definitely areas that we are going to try to do this year. So before we go to torpedo grass work, is there any questions about the cattail? Okay. So I'm assuming that you're okay with these treatments as we have them planned right now or you want to think about them a little bit. (Paul) do you have a - do you have any comment on those treatments?

(Man 1): But super quickly -- if you all can hear me -- they're only looking at doing up to 850 acres in the light green polygons. And that's still conditional on our

ability to use the helicopters. So we're not looking at the 31 - we're not looking to do 31 plus hundred acres of those light green polygons, only up to 850. And in reading through the document that (Alyssa) put out, she has some suggestions what she would like to do.

But it's not the entire 3100 acres. It's not - doesn't currently include the green polygons that are in the one through five map. So any suggestions, any recommendations, any discussion, please get up with (Steve) and (Alyssa). And they will be more than happy to consider any suggestions you all might have.

(Steve Gornak): And we will be getting up with the inter-agency group once to get closer to actually getting these underway if we get the approval. Like I said, these are - this is going to be a lot of acreage and up to 800 acres as (Beechum) stated there. And it's going to have to be done by helicopter. We have to get approval to put a helicopter up. Everybody knows why.

So we'll be doing some legwork prior to actually getting out and doing this stuff. So - and we'll be back up with the inter-agency group prior to treatment. One person I do want -- since they are on the phone -- is (Newton). Do you have any concerns or ideas about the light green polygon treatments? Maybe he's not on anymore. Did we have any fishermen that were on? Okay. Well we'll keep - we'll go ahead and continue moving forward. We'll just - we'll try to get questions answered as they come in.

(Newton): I think - excuse me. This is (Newton). I was - your - you didn't come through. I think you asked me about the spray. Well, listen. It's very difficult for me to make a -- or anyone -- to make a real judgment. I will say this. Spraying out cattails and replacing it with open marsh is 100% just wonderful work. And

you cannot do too much of it. But since you asked about my concern, I have only one concern.

And that's why I'm here today. And I was gonna express it later. But my name came up. I came on. Be very careful in September. As you know, that early duck season starts the last part of September. So just find those dates. I don't have them right here. And be sure that the duck hunters don't get disturbed by helicopters. (unintelligible). My phone will light up guys. But thank you very much. You guys are doing great work. Just keep it up. Thank you.

(Steve Gornak): Yes. In response to your concern there (Newton) we will not be spraying during those times. I'm not going to. Both (Alyssa) and I have the same understanding of this as well as (Don Beecham) and everybody else in the Okeechobee office, that we will not spray. Well, the condition we're not going - that we're going to try not to create is when you guys go out there you see a bunch of dead stuff. It'll be done either well before so that you - we already have the fallout or it will be done well after.

(Newton): And listen. I know that you do cooperate as much as you can. And believe it or not -- despite a lot of the things you hear -- it is appreciated. But yes, they are very sensitive as you know. And you just have to be careful about when their particular hunting season is running, but particularly the week before or something. You know they go out to a place. They scout it if the place looks good. And they come back a week later. And it's dead. That's not you going to make it for very happy campers.

(Steve Gornak): So that's exactly why we won't be spraying the week before either. I don't want to create that situation for them.

(Newton): Right. And thank you very much. I mean it is appreciated

(Steve Gornak): Okay. Yes. No problem. We appreciate your information though.

(Paul): Yes. And this is (Paul) again. And this is for a longer discussion. But I just wanted to flag the issue. I'm not sure what the timing of these treatments is proposed. But recently (Brandon) was going to do some work down in Moonshine Bay. And the areas that were going to be treated are areas where -- right now -- we have purple (unintelligible) nesting and (unintelligible) Bitterns and King Rails and some other stuff.

And FWC has their state wildlife plan. And those species are considered species of greatest conservation concern. And if we're treating the habitats that they're nesting in while they're nesting, then that's obviously a conflict with the overall goals.

And so there's also been some proposed treatments on just a quota for as soon as possible. Same issue arises. And so I want to sit down with FWC and maybe even Fish and Wildlife Service and talk about how we can make protocols for avoiding the possibility of harming bird nests in their breeder habitat during the nesting season. So that's a longer discussion but something that we really should work out.

(Steve Gornak): Okay. So just out of curiosity, when does the breeding season end for those species?

(Paul): For the (unintelligible), they'll nest clear up until September.
Well that's the thing we can do, is make a matrix of when they tend to nest. I mean, Sandhill Cranes nest in the spring. But there's a lot of different birds nesting. And we just want to avoid those conflicts.

(Steve Gornak): I agree.

(Paul): Again, I can sit down to help you make a matrix. You've got people who can help with that too. And that way we can make some kind of peninsular protocol. I think the birds up in the panhandle might mess with different schedules. But down here we can probably make something that's pretty uniform.

(Steve Gornak): Okay. That's fine. I'll have a list to get back in touch with you. We'll come up with some dates. And then we'll talk again. And then - and again we'll get back with this group.

(Beecham): Okay. That's part of the problem. Yes. (Alyssa) intended this to be sent out or displayed before the meeting so everybody would have an opportunity to look at it. Yes. In the document you will receive, it talks about the timing, talks about the herbicide, talks about the specific location.

And we're looking at either October of this year or May, June of next year. And all of these treatments will be followed up with prescribed fire. And so the questions about trying to do treatments during the tail season - that won't happen. We've learned our lesson with that. We're trying to avoid treating during the waterfowl season.

And we try to avoid treating -- as much as possible -- during peak nesting season for kites and wading birds and marsh birds. We take into consideration - and those types of activities. And there is a timeline that IPM has put out in the past showing all the different conflicts that we try to consider when doing our management activities.

And usually, it ends up a one week window over the entire year where we

think we can do something and it won't conflict with somebody's activities. So yes. This treatment - these treatments would be either in October -- in two months or three months -- or they would be next spring. And each one of those timings -- each one of those treatment periods -- have some advantages and disadvantages.

And once you get the PDF -- once you get the document -- please e-mail (Alyssa) and (Steve) saying, "Here are my comments. Here are my concerns", because we try to take all of these issues into consideration where the herbicides that we're using right now - it's imazapyr clear path. And it's a fairly - it's a very selective herbicide.

But it still is a herbicide. So people have concerns about its use. So yes. We are very aware about trying to avoid impacts to the fish, to wading birds, to kites, to waterfowl, and all of the users. So but that please provide that information to (Alyssa) and (Steve) so we can come up with a plan that helps as many people and animals as possible and creates as little conflicts as possible. Thank you.

(Steve Gornak): Okay. All right. Okay. So the gist of this was to determine whether we have - what gives us better control over torpedo grass, whether it was a mix with glyphosate or just imazapyr alone. Secondary question to this is, can we -- with all the issues with glyphosate -- can we remove glyphosate from the mix and have - still get a good treatment done? So we set this mix with 32 ounces - let's see. Okay.

We set a 64-ounce imazapyr mix with - and tested that against 16 ounces of imazapyr with 96 ounces of glyphosate. So that was our mix that we were looking at. And what we found in a nutshell -- everybody can read this especially after it's sent back out to everybody -- is basically we treated

11,000 acres in the spring of 2019 and then looked at the results of that.

What we found is this - these treatments were done with a boom truck. And it's a system that's used on agricultural lands as well. So we just - we tried to use this particular method out here to see how it works. So if you look at the polygon -- or the first photo -- satellite photo -- we have, we've got three polygons - a blue, a yellow and a green - a light green polygon. Does everybody see that? I don't hear any no's. So I'll assume that you do.

The blue and the yellow polygons were treated with glyphosate and imazapyr mix. And the light green or blue -- whichever one you want to call it down there lower southwest part of the photo -- was a strictly imazapyr mix at 64 ounces per acre. One thing I do want to caution everybody at on the 64 ounces per acre, is that we made sure that we selected areas that didn't have a whole lot of mix. We were looking strictly for monotypic cattail.

And one of the reasons for this is because imazapyr -- at this higher rate -- will kill other plants other than the target species. So we know that we're going to get a solid kill out of it. And that's what we wanted. So that particular light green area was a kill strictly on torpedo grass with a mix of some other plants.

But those were maybe 95% or to 95% torpedo grass and a small mix of other plants though. So we tried to minimize damage to the other marsh species. So basically what was found in this -- if we go down to the results section -- we show the imazapyr and the imazapyr glyphosate coverage, what we did -- this is one-year post-treatment -- what we found is that both the glyphosate imazapyr mix versus the imazapyr itself really resulted in a similar kill.

So with regards to all the issues that we have of glyphosate, what this tells us is that we can remove glyphosate from our mix and be pretty productive with

the imazapyr itself. So more than likely any future work that we do is going to be strictly imazapyr. Let's see. Going down to the next photograph. It has species on the bottom and the number of occurrences on the top. You'll see that we set out transects and looked at look at what was there. And you'll see that...

(Steve Gornak): Sorry about that So you can see what - and almost what you had was in both - you can see the different species that you had. We had more species in the glyphosate imazapyr mix than we did in the imazapyr itself. So again -- like we were saying before -- this just kind of goes back to what I was saying before where we tried to limit the number of species for the imazapyr mix because we knew that it was going to - it was really going to do a job on them, especially at a higher rate.

So that's really all that that's telling us there. So again the discussion on this from the results is that, yes, we can go ahead and remove glyphosate from this mix and eliminate any of the issues with glyphosate, and still go ahead and get a good kill on the torpedo grass. We do have to come back after treatment -- a year after treatment -- and do spot treatments in these areas.

And the spot treatments are more selective because we get out and know and hand spray those, rather than doing it strictly with a truck. There are some areas where the areas are large enough that we can use the boom truck to go ahead and treat those and get them covered fairly quickly.

But spot treatments can be -- and have been in the past -- where we would just get out there and hand treat this as well. So that's it in a nutshell. I know we're - we've still got more time on the meeting. But we're getting down to the last half hour. So are there any questions that you all have about what we just talked about for the torpedo grass treatments? (Beecham), is there anything

that I missed that you might want to comment on?

(Skippy): Okay. (Mason) are you on? I know I didn't catch in the roll call this morning. I see you're on here. Go ahead and press star-6.

(Mason): Okay. Sorry about that. Yes. I'll be quick with this. And I know the meeting's running along here. So I'll try to be as quick with this as I can. I wanted to give a - just a quick update on our fish wildlife and habitat management plan. I did - a couple meetings ago I gave a short overview of our process in how we were going to develop this. And sort of the overall purview of all the things that it is going to cover. Everything from fisheries management, habitat restoration, and invasive plant management.

Essentially everything within FWC's activities. But just to give an update we held three public meetings in February to kind of kick off the whole process. And so right now we are in the general input phase, the initial input phase where we are conducting interviews with businesses, partner agencies, local governments, and stakeholder workshops.

And this sort of - this initial phase we are hoping to complete by the end of August. But in general, interviews we have done 29 of those in all. Many different people within many different agencies. A lot of businesses, tackle shops, fish houses, hotels, marinas. All the businesses that we could identify that were dependent on the lake we tried to - we reached out to.

And then the stakeholder workshops have a similar goal in mind. But we are doing these a little bit differently in terms of having small group discussions. And so we advertised a questionnaire out as broadly as we could. And we are hosting these right now virtually. As you can imagine we have had to modify

a lot of our approaches to be through phone or virtual methods.

And so those are ongoing right now. We are including about a goal of 10 people are under to keep the discussions really good and have a high participation in each workshop. So those are ongoing and hope to conclude those by the end of August.

And then as far as what we have heard so far. I don't want to dig too deep into that at this time because again the idea of this initial phase is to just capture the big picture topics that we can focus in on as we go through the development process.

So the big take-home right now is that we have a lot of diverse opinions on what the ideal lake means to people. A lot of opinions on the current status of the lake. You know that is one consistency I think that many people do feel like there has been a general decline over time depending on which method they are looking at and what their timeframe is.

And other things, you know, there are some, you know, easier things that, you know what an ideal lake means to people. Clearwater, for example, is an easy topic I think. But when you get to those more difficult questions there are a lot of very different and strong opinions on things like that habitat quality of invasive species for example.

And those are the things that we have many many topics to investigate further. There is a lot of nuances there that are coming to light with those sort of preferences of different habitat types. The effect of those habitats on things like water quality which are other really strong drivers of what people want on the lake. So a lot of interconnectedness and a lot of nuances. And also nuances on the types of management techniques as well.

So that is kind of the overview and our next steps we are just going to - we are going to - once we complete this phase we are going to summarize all the information. We are going to work - we have an internal working group within FWC of subject matter experts.

And we are going to work on developing a focused stakeholder survey based on all this information that we have gathered at this initial phase. And so that is going to - that is going to be in development throughout the fall and move from there. So that is the general overview and I am - I left my computer for a brief moment so I am only on the phone right now. If there are any questions I wouldn't be able to see them on the chat. But if anybody did have questions I would be happy to answer those.

(Paul): So FWC is in the process of developing management plans. We are really supportive of that. And you have got one done for Orange Lake and one done for Istokpoga and they are kind of different types of plans. And right now you are working on plans for the Kissimmee Chain and the Harris Chain. Are these plans going to have a common outline? Are they all going to be structured the same? Or do you guys know that yet? Or I was just kind of curious about how they are being developed.

(Mason): I would say that they are all going to have a similar outline but they are all being done independently. Each plan has it as an independent working group that is working behind the development. But obviously we have a pretty focused goal in mind for all the plans.

We have a similar leader, Ryan Hamm who is kind of coordinating all three of those. So there is going to be a lot of similarities but because each system is so

different, the topics that each plan is going to cover that is going to dictate probably a lot of the outline and process of what those plans will look like. And especially Okeechobee having so many unique characteristics to it. I do see it having a lot of unique parts to a plan. All, of course, being within FWC interest. But - so similar but unique in their own ways.

(Paul): All right thanks. Okeechobee is going to be your hardest one I think. But we are all here for you.

(Mason): Thank you. I appreciate it.

(Skippy): So up next (Alex) is going to be talking about the Software Waterway Management Districts' agenda items. (Alex) can you come on?

(Alex): Okay. Okay so first (unintelligible) melaleuca work we did on Lake Okeechobee this year. I don't have a presentation for that. But I will present to you agenda items. So the melaleuca work we do on Lake Okeechobee follows FWC's fiscal year. And this year we were able to complete work basically between Pelican Bay and Ritta Island. The melaleuca in that area of the lake is mostly older, large mature trees that bear seed. And these were all set back in the marsh.

And we had crews go by grounds and treat each tree in these areas (unintelligible). We also had crews (unintelligible) which was burned earlier in the year and they found a lot of small seedling trees along with a few larger ones. So they have completed I don't know how many acres in that area but we will have to revisit it next year to get some more of the seedling trees that they couldn't get to before we ran out of funding.

I also had crews focus on Indian Prairie because we have a lot of sapling trees

up in that area and crews were able to access that area by buggy this year due to lake levels. And they covered quite a bit of ground in total.

We traversed over 800 acres and so for next year, you know, what we have left out on Lake Okeechobee as far as melaleuca is they are getting more difficult to find which is always a really good thing. And we still have some very large mature trees down at the south end of the lake that are about a mile more interior. And I am going to be (unintelligible).

Alex dropped off and Skippy is giving USACE update while we wait.

(Skippy): All right. So just something that we wanted to talk about and give you guys a little update on. Ian and I have kind of developed a new survey technique that we have been doing since COVID has started. Just to help advance our surveys and cover the lake more. What we are doing is before we had divided up the lake into just smaller polygons so we can cover them easier and get a better idea of how many invasive aquatic plants are in those polygons.

We developed these polygons based on the flight zones that we - that have been used for many, many years. Because we wanted to be able to compare the surveys with - the future surveys with the past data. We track ourselves during all of our surveys and we can compile all of our surveys together so we can - here let me just (Alex) that she can go in one second.

Okay so we can kind of see, you know are we missing any areas? You know do we need to go back to certain areas depending on water levels? So what we have been seeing is we can add up all of our polygons, all of our surveys and get a - just the total acreage of invasive plants per month.

And you can see April, May they are relatively the same. And then June has

jumped. July is a little higher but we have not completed July's just yet. So basically our surveys will allow us doing it this way to cover the entire lake in one month's time.

And we can also use this data to compare ground surveys with flight surveys. The only difference is our flight surveys are an average because we take the average of the three, four or five flight - the people that are on the flight versus our ground surveys are total. So just keep that in mind.

And then we can kind of use this data to look like if there are certain areas or certain zones that are being affected more than others. So you can see Zone 7, Zones 8 and Zones 6 are pretty heavily infested. And then while Zones 1, Zones 2 are a lot less.

So we can compile these and I wanted to compare them with treatment areas. So you could see that the map of Okeechobee with the blue polygons. Those are treatment areas that are from FWC. And you can - each of these bars represents the month.

So April, May, and June. And you can see that in Zone 5 we had a great increase in invasive plants. That includes hyacinth and lettuce. And then - but you can also see that at certain times there is a decrease and that could possibly be due to treatment.

But we are dealing with floating plants so you can only suggest that so far. But for instance, in the May, Zone 8 was being treated and you could see that there was a decrease from April to May. And then April, Zone 9 was being treated and you could see it is very low.

So we just wanted to kind of show you guys that. And then this, these pictures

were from yesterday. (Brenda) I will be sending you these. These are some tactics that were forming in Okeechobee Region in the - this is the Pierce Canal lock at the top picture.

This is that, the Pierce Canal in the picture on the right. And then the bottom picture at the boat ramp is Okeechobee Boat Ramp. So we are getting some buildup of plants in these areas that need to be taken care of. All right and that is just a quick one for us. So does anybody have any questions? Okay (Alex) are you back on?

(Alex): Okay. As soon as I start talking. Call drops. So I think when it dropped off I was basically just saying that I am going to be investigating a different type of treatment technique for the remaining isolated large melaleuca trees in the lake. And the ones I am targeting are about a mile or more into the interior marsh and they are surrounded by large stands of dense willow. It was really not that feasible to send crews in by ground or by boat to treat them.

So what I am looking into is a new technology called - I don't know if this is a technical term but it is a spray ball technique and it is an application by helicopter. So once I work out some of the details I will be presenting that to the group and hoping to get I guess buy-in for that type of technology.

And basically what it would do is the helicopter targets the individual trees and delivers a clear application to the melaleuca tree. And that actually would probably be a lot more economically feasible. And I think a lot safer than sending applicators to try to access these areas by foot. And another note on treatment timing is that we would be looking to do these treatments in spring during low lake levels so that these applications wouldn't be put out over standing water.

But there will be more to come as far as the melaleuca work for next year later on possibly after the holidays. So I think that is pretty much it. And any other maintenance treatments for smaller trees would take place either by buggy or by boat. So now I am going to try to share my screen just (unintelligible).

(Alex): Yes just let me know if I get any yeses because I can't see the chatbox anymore. Okay, I can see the chatbox. Perfect. So what I wanted to do is give you all an update on the Okeechobee gourd surveys that we have been doing on the lake for quite some time now. The district has been doing - see there we go.

So to start with some background and a lot of you were pretty familiar with the gourd. This is a federally listed endangered species that only occurs in Florida. Historically, this plant has been found and associated with Pond Apple Forest in Lake Okeechobee in the Everglades marshes and the Everglades before it was Everglades agricultural area.

So the wild remaining populations in Florida only occur naturally in Lake Okeechobee and up on the St. John's River. But my understanding is that the plants differ a little bit in each location. And there are several other cultivated populations on private property and some introductions in natural areas.

But the U.S. Fish and Wildlife is mostly focusing on these naturally occurring populations although they are interested in areas that are where this plant is being reintroduced as well. And so if you haven't seen the Okeechobee gourd or if you don't know too much about it. It is an annual or perennial vine. It has bluish-green heart-shaped leaves. You can see some of the leaves in the bottom right corner of the photo on the screen.

And the flowers which some photos of next are a nice cream-colored flower and they open up in the mornings and by the afternoon those close-up and as the day gets warmer. The gourds which are the fruit are round and they have pale yellowish-green stripes on them. And we know that the seeds germinate in early spring and by late spring/summer you can find the vines growing prostrate.

And then what we have seen a lot is the vines, generally, either on the edges of the Pond Apple Forest or just outside of the shaded areas they will grow prostrate through the low marsh vegetation. And then once they hit the edge of the Pond Apple Forest they will start climbing up and they will even create some like curtains on both sides of the trees.

So Software Water Management District has been coordinating the Okeechobee gourd surveys for a while now since 2007 and that was led by Mike Vogel. And I understand John Lane was a big help with those surveys too.

And since 2019, (Kristen Mason) and myself have taken up the charge to continue these surveys based on the data we had from Mike. And then we are just kind of figuring it out as we go along. And we have been coordinating with U.S. Fish and Wildlife Service and sharing information about, you know, what we are finding out there on the ground.

But during the time where - when Mike was doing these surveys he did note that they did see gourd populations fluctuating and some factors that impacted gourd population were water levels, lubber grasshoppers which apparently really love the gourd vegetation and will just kind of decimate it. And then just some cyclical natural cycles that the plants go through on its own.

There is a really pretty cream-colored flower on the right. And like I mentioned (Kristen) and I have been heading up these surveys since 2000. Not very long. But our first year when we did these surveys we spent two days on the lake specifically focused on climbing the gourd.

And one day was by boat. And the second with two people. And the second day was with a team of six. And we did these surveys by foot. And with that team of six we able to cover 75 acres. And on the boat we covered about 15 miles.

And in 2019, we collected 136 locations. And basically, what we did for each point is was either a single plant, multiple plants. And we made notes in our - that we have now on our ArcGPS system sorry. That describes some of the density. And here you can see the locations for all those points from 2019. We mostly stuck around the (unintelligible) and Kreamer Island area and along the Rim Canal where there are large populations of Pond Apple Forest.

And so all the purple points on the map on the left are all of the gourd locations we found in 2019. And the points that are along the Rim Canal like I mentioned are in the Pond Apple Forest on the edge of the vat. And that was all traverse sites. And you can see the picture on the right. It is a little bit washed out but you can see the gourd growing along the lower vegetation and then hitting that tree line and starting to climb up the pond apples.

And so for this year for 2020, I was hoping to have a big interagency effort and set up survey zones and get more folks involved. Just to get out in some of these areas to kind of split the labor and then also you know to see if we could find new populations and just do a more thorough survey.

COVID-19 threw a wrench in that and we were bid to just a two-person

survey. There are (unintelligible) lake. And we moved to locations where we knew the gourd had historically occurred but we also went to locations that we identified based on signatures from aerial imagery that we thought would be good habitat for the gourd.

And so in 2020, the points on the map that we collected are in yellow. And we collected 49 data points and out of those points we collected two new locations where the gourd had not been previously documented. And so one of our goals from this year was to expand the surveys further west and we wanted to focus on Ritta Island. There historically had been some points out there since we didn't get out there last year. We didn't want to neglect this area.

And you can see we found points on the west side of Ritta where there historically had been observations in 2012. And when we went to the northern tip of Ritta and started exploring the pond apple we just kept following the gourd down the east side the island until we ran out of habitat and gourd.

So this was pretty exciting for us to find these new locations and just to check out some different upland areas on the lake not quite upland but not aquatic. We also spent some time around Halifax (unintelligible). And again there were older observations or historic observations in this area. And then we did continue to find gourds there this year.

So (Kristen) and I since we are kind of - this species is a little new to us and we don't know too, too much about it. We are making some observations as we go along. And so as I have mentioned previously like the gourd is associated with pond apples but we see it more growing on the edges of the pond apple and not so much in this sole shade of the pond apples.

And we recorded more gourd often seen in the smartweed fields in clearings. And many of the areas we went to this year had evidence of the gourds from previous years. And so just to comment on that a little bit. The pictures on the bottom of the screen from left to right. The gourd laying on the ground is from this year. The second photo is potentially this year but more likely from a previous year.

And you can find them laying on the ground fully intact like that or you can find them, older gourds from previous years still hanging on their vines up in the trees. The vines have long died but are still tangled up in the pond that whole canopy. And that board in the third picture is probably several years old. And the last photo on the far right is a gourd that again is probably several years old and has finally broken down that hard outer shell. And there were still seeds inside.

One thing we did think was interesting was that we went to several of these locations where we thought, you know, this would be great habitat for the gourd. This looks like areas where we're finding the gourd in abundance but for some reason, it just wasn't to be found. So we - that kind of got us scratching our heads. I can advance. There we go.

And so we have a few questions that we're thinking about as we move forward with these surveys. And even though this is a heavily endangered species the literature on the species is lacking a little bit. And so we don't have a clear picture of how water levels and rates of rise in gauge influence eagling germination. And it's clear that you need a drawdown for seeds to germinate. But you know the exact soil moisture or lake levels is still an unknown for us.

And then something else we observed while we were out doing these raise is there is a ton of non-media karo and yellow cana lily that's on the edges and

fringes of gourd habitat. And we did even find gourds growing through the tarrow. But we don't know are those species expanding and are they impacting the gourd dispersal and growth?

Another species we found out there was a lot of (panaphndula) which is also a climbing lily vine. And I think that that can have some direct competition with the gourd as well. So we really need to pay attention to what these invasive species are doing, how they're impacting this endangered species and then as a group make some management decisions about how to move forward in dealing with these species. And lastly, there's not a lot out there about seed viability itself and how the seeds live and what some of those triggers are for germination as I mentioned before.

So I think that pretty much sums up our board presentation and I have to thank (Christine Mason) for putting this together, give credit where it's due. And I think I'll hold off on any questions about the gourd and I'll jump into the MERV demonstration. So I'm going to stop sharing for a second and then reshare my screen here. Or I guess while I'm doing this if there are any questions about the gourd I can address them.

Okay, so the next topic on the agenda I - agenda for the district is the MERV demonstrations. So I, unfortunately, was not present for this demonstration. And again I've got to thank somebody else for putting together a presentation. That's (PJ Wilkerson) who's been with the district now I think since April. He compiled this presentation for us to share.

And so the district posted a MERV demonstration. A MERV is a piece of equipment that does mechanical harvesting of floating plants and much more which I'll get into. This took place on June 11 on Lake Okeechobee. So yes it's probably good that I sped through this one. I don't think I need to address the

issues of floating aquatic vegetation on natural environments and flood control, et cetera, so I will go past that.

So the MERV as I mentioned is a different tool for mechanical harvesting. And MERV stands for Multipurpose Environmental Response Vessels and the photo is a picture of MERV. And so this boat like I said can be used for float harvesting of floating plant material but it's also used in oil spill cleanups and I think some dredging projects and sediment removal projects.

So this piece of equipment's a little bit different from your traditional harvesters. It has these two aluminum expanding arms. And those are used to corral the F-A-Vs between the two holes. And that gap between the arms is considered the vessel's mouth. And that's where the floating plants get harvested into.

So once the floating plants go between the two arms and in through the machine's mouth they're pushed into these mesh bags. And there are brackets attached to the boat where the bag can be lowered and also the bag can be lowered or raised depending on your water depth.

And the yellow rope in the middle of the bag helps to kind of contain the size of the bag so it doesn't end up getting overfilled and getting stuck within the two between those two holes or I'm not sure they're pontoons but I may refer to them as that because it's easier.

But so they thought about some different - they've - they made some considerations for not slowing down operations when working in somewhat unpredictable environments. So for the MERV to operate I think at its full capacity it has to work in conjunction with (Wedos) or they're also called tiger cats. And so the (Wedos) will break up larger matts into smaller pieces that

then can be pushed into the MERV. The MERV isn't set up to go through large floating mass of vegetation so it may need smaller chunks. It's got to take little bites basically.

And the (Wedos) are good as well because they can get into areas that the MERV may not be able to access and they can bring the vegetation out to it. So here in the photo, you can see just that. You can see the (Wedo) pushing vegetation from shallower to deeper water towards the MERV.

And so just to mention too that the MERV doesn't just run with one net at a time. It has multiple and it has up to 21. So they can have seven nets on the MERV waiting to be filled, seven nets that are already adrift or being towed to shore to be dumped and brought back out.

And then they can have seven nets on grounds that are being dumped. And it's kind of like a big conveyor system so that you know, they're never sitting idle. There's a constant pushing and their work is constantly being done. And the contractor claims that they can harvest 21 minutes of floating aquatic vegetation every hour and a half. (Unintelligible).

This is a video but I don't think it will play in this format so I'll skip that from now. But here are some photos. Once the (Wedo) tows the net - the net's filled with floating vegetation to shore. A crane will lift them up and they will dump the vegetation out onto the soil pile and then they reuse these nets so there's not a lot of waste being produced in this operation.

One issue that happened during the demonstration was that the crane stalled several times due to the weight of the material in the net. So that's something that needs to be addressed so that productions don't slow down. (Unintelligible).

So (PJ) and the folks that went to this demonstration did see that this machine does have some versatility to it. It can have a shallow draft. I think it needs - it needed to have different (unintelligible) on it at the time of the demonstration. It didn't have the right equipment to achieve this, but it can achieve shallow draft of up to a foot and a half which is ideal for Lake Okeechobee and some other water bodies as well.

They can also outfit a conveyor belt onto the MERV and then transfer the floating aquatic vegetation directly onto a barge that can then take it to shore. As I mentioned they needed just to get some air-cooled engines to eliminate the need for water intake when they're working in muddy conditions. And that will help this streamlined work as well.

And some other uses for the machine sediment removal. They could do that in ditches or culverts. And they have the option to remove the metal frame from the net. So that may help to speed things up if they know they're not going to need to adjust that metal frame for different water depths.

So the area agency participants that came out for the demonstration were given an assessment form. I'm not sure how many were returned to the district. But this was a way for the district to collect information about everybody's thoughts on the machine and how well it could potentially work on the lake.

And so basically a list of pros and cons was compiled specific to the MERV. And the pros are that, you know, it can get into shallower water than traditional harvesters if it's outfitted with the right motors. It does have versatility to work not only in floating for - to collect floating plants but it can be used for other projects.

This is - it's a positive because it's a new innovative technology and it seems like the contractor's willing to work with the district or whoever may want to use this equipment to make modifications and improve its productivity. And it's also mobile so it's easy to move around and it's a lot faster I think than traditional harvesters.

So some of the cons as it stands, you know, without those additional applications like the motor on it, it is limited right now. The cranes stalling out were an issue. So whether they need larger cranes or they need to try to collect less vegetation like have a weight limit so the cranes don't stall, that's still something that still needs to be worked out.

As I said in the beginning the MERVs only collect free-floating or small clumps of plants. They can't just go through large patches and sweep it up like a Pac-Man going by or something. And although the nets are constantly being revolved it's still a slow operation all together because the nets can be cumbersome. And the last column was that you need two or more pieces of equipment for the MERV to work at full capacity. You need the MERV and then the accompanying (Wedo) to complete the operation.

So I tried to go through this fairly quickly. And so here are some links to the MERV brochure inspect and their Facebook page. I saw a comment pop up about bycatch. This wasn't addressed in the presentation. I don't know if (Bobby) or (Katlyn) are on the line and can pop in and address that question about bycatch.

And if everybody's - I'll leave this up. I'll keep sharing my screen. (Katlyn)?.

(Katlyn): Yes, hey guys bycatch was not really addressed in the demonstration but the

chance for bycatch seems to be relatively low considering that the mechanism and the way that it catches the frame for that net kind of sits right up at the top of the water. It probably only goes down about a foot and a half to 2 feet into the water to just kind of get the top about the F-A-V. So I would say that the chancer by-catch is relatively low but definitely still present somewhat.

(Alex): Okay maybe that (unintelligible). I heard they will probably come back and do another demonstration after they make some of their updates so that would be a good topic to bring up with them and to assess during the next demonstration. Anybody else? And now you can talk have about anything that I've cover, melaleuca gourds or the MERV.

How much square footage can a bag hold? I don't know. (Katlyn) or (Bobby) do you have that? Let me go back and see if it addresses anywhere in the presentation. And I may have freeze by it.

(Katlyn): I think that it was covered in the demonstration that day but I don't have that information readily available.

(Skippy): So I did take some notes. I don't think I have the square footage but they did say each bag holds about 300 to 500 pounds

(Skippy): All right, thanks. Let's continue because we are a little bit behind. All right so we'll go to the public comment period.

There was no public comment

(Skippy) And with that, I wanted to thank everybody for hopping on. Thank you (Jay) for presenting and everybody have a good day and be safe.

END