135th Meeting of the South Carolina Aquatic Plant Management Council

Attendance:

Council Members: Chris Page, Bill Marshall, Tammy Lognion, Casey Moorer, Adam Leaphart, Stacey Scherman, Sara Carper

Guests: Julie Holling, Matthew Puckhaber, Brian Lynch, Carl Bussells, Allan Stack, Ernie Guerry, Judson Riser, Levi Kaczka, Chad Holbrook, Lee Henderson, David Winters, David Marshall

Location: WebEx Video Conference

Call to Order: 10:08 a.m. 12/09/2020

Minutes:

Chairman Chris Page called to order the 135th meeting of the South Carolina (SC) Aquatic Plant Management Council (Council). He asked everyone to introduce themselves and tell who they are representing, including the Council members. They did so. Mr. Page made sure everyone was in the conference before moving on. He was in a meeting of the Aquatic Nuisance Species Task Force and noted that boating manufacturers, distributors, and others in the boating world around the country have gotten on board recently with doing things to stopping the transport of invasive species across the country by redesigning their boat specs, filters, cooling water in-takes, and even some of their live wells. They are less likely to transfer invasive species.

Mr. Page moved to the Public comments of the agenda. He gave the public a chance to speak. There was no discussion.

Mr. Page moved to next item on the agenda, which was approving the minutes of the 134th meeting of the Council, which were emailed to you. Mr. Page thanked everyone for being there especially with the circumstances COVID-19 has caused. Mr. Page said he would entertain a motion to approve the minutes. Ms. Holling informed the Council about some information regarding Santee Cooper's (S-C) Federal Energy Regulatory Commission licensing. She stated we usually go off the transcription and do not make changes after the fact but would let Ms. Moorer discuss that more to the Council. Ms. Moorer stated there was only one section on page three of the minutes where Mr. Lynch was discussing the cost and sale of S-C. She thought there was a little wordsmithing from the audio, which may have not been very clear when Ms. Holling and Mr. Puckhaber were trying to transcribe. Ms. Moorer said Mr. Lynch looked over them, as well, and there were a couple changes. He was basically trying to make the point between S-C, how we managed the lake and how that is driven by our mission as a state utility versus if we were sold to a public utility company. (Editor's note: Ms. Moorer meant to say 'private utility company.) Ms. Holling pulled up the section and shared it, so the Council could look at it and

see if it was acceptable. The Council was given a few minutes to read over the modified minutes. Ms. Moorer stated she knows this does not pertain to anything in the plan, so if anyone has any feelings about not changing it, we can discuss that. She made a motion to accept the minutes with this correction provided by Mr. Lynch. Ms. Lognion seconded the motion. Mr. Page asked if there was any other discussion on the minutes. There being none, he called for a vote. The vote passed unanimously. Mr. Page moved on to the recap of 2020 aquatic control operations. Ms. Moorer was given the floor to present.

Ms. Moorer shared her screen to the Council to show her PowerPoint presentation. She said this is going to be a recap of the 2020 aquatic plant control over the past year at S-C. She does have a video embedded in the presentation, but it is lagging through WebEx. If she cannot get that to play, she would send the link to the group via email, or you can search YouTube for "SanteeCooperTV." Ms. Moorer stated during all the challenges with COVID, we were given the opportunity to do several video series, so there is a lot of good information on there. The one she wanted to share was on giant salvinia weevil stocking.

Ms. Moorer said the first slide is on total acres treated this year on the S-C lake system. You will see a pretty good jump from last year. We did over 1440 acres of invasives last year, and this year we did over 3200 acres. We had a very large increase in the acres we treated for invasives. We have treated 2700 acres of giant salvinia. In comparison in the 2019 season, we treated 594 acres. That is about a 350% increase on just giant salvinia acreage being treated this season on Lake Moultrie and Lake Marion. She thanked her team members at S-C for their hard work they put into this year towards attacking giant salvinia. The *Hydrilla* numbers are up this year with 155 acres having been treated. She thinks we treated 31 acres last year. The next couple of slides will have some pictures of one of the treatments we did on *Hydrilla*. We had coontail recovering and moving into that area where we treated *Hydrilla*.

Ms. Moorer noted that for residential areas, we did 80 acres, in comparison to treating 147 acres in the 2019 season. We had 126 requests for spraying this year in residential areas. That number includes water willow, alligatorweed, primrose, and *Lyngbya*. That is a mix of invasive and native species. Like we talked about in the past, we do not like to treat native species on the S-C lakes. When we get requests from our commercial and residential leaseholders who are having access issues, whether it be launching their boat, using a swimming area, or fishing from their dock, we go out and assess those areas. Sometimes it is bad, and sometimes it is only three sprigs of water willow. Those are some of the challenges we have. We did 80 acres of residential and 100 acres of giant cutgrass work this year, in comparison to 107 acres of cutgrass in the 2019 season. She asked if anyone had any questions before she moved on. There were none, so she moved on.

Ms. Moorer informed the Council that every year S-C does hyperspectral data analysis on the S-C lake system and has done so for at least the past 12-13 years now. Last year, we switched to collecting hyperspectral data via satellite. We have been adding data to that analysis and trying to tease out the differences between the fix wing collection and the satellite images. These are

preliminary numbers that we got. The report is not due until December 31st. The next time the Council meets, we will have more information for you.

Ms. Moorer noted that they are missing primrose and alligatorweed, but we do have numbers for Crested Floating Heart (CFH), giant salvinia, *Hydrilla*, and water hyacinth. This data was collected August 19th through the 21st. That is the span on the satellite. We had requested the data from earlier August, because our inflows were down, so turbidity and clarity were better on the system. That makes it easier for the hyperspectral imagery to capture any submersed vegetation, which has to be within three feet of the surface or topped out for it to be picked up. Unfortunately, the week that we requested had a lot of cloud cover. That hindered the collection of the satellite data, so our contractor moved to the following week of the 19th. Ms. Moorer stated you will notice the giant salvinia number seems low. One of the challenges that we have with any type of hyperspectral imagery, regardless of how it is collected, whether it is fixed wing or satellite coverage, is that hyperspectral cannot penetrate through a canopy to identify giant salvinia. Last year, we were looking at around 207 acres of *Salvinia* picked up on the 2019 survey. We are at the same spot this year, regardless of us treating nearly 3,000 acres of *Salvinia* this year.

Ms. Moorer said for the *Hydrilla* number, we are at 80 acres. Last year, in 2019, we were at 143 acres. She would caution everybody to keep in mind that we treated more acreage of *Hydrilla* this year, even if it was not topped out in the system. We cannot call that a topped-out acre of *Hydrilla* other than what we see on the hyperspectral. Our survey is a two-part process. We have ground truthing, where our team members go out and do a couple of rake tosses in the areas looking for invasive species and native species. We are trying to get a handle on the system and see what is going on out there. Water hyacinth numbers are down a little bit this year from last year. Last year was 431. Again, the canopy can affect that number because we have places where we have water hyacinth under cypress and tupelo trees. Hopefully, next time we meet in 2021, we will have the finalized numbers for everybody. She does not have any finalized numbers for our native species. She asked them to just focus on invasive species for this meeting.

Ms. Moorer told us the next couple of slides are pictures that our team members took while they were out on the system year around. You will see some of these pictures are from mid-season and some of these pictures were from late season. You can tell by the clothing the people are wearing. Our team is responsible for a lot of different things at S-C, one of those being water quality. We are pretty much on the system daily, unless it is severe weather. The first few slides have some of the native species. Last year, we saw *Vallisneria* (val or eelgrass) take off. We are happy about that. We are seeing the same this year, even moving into some new areas. Where we did the revegetation project in 2019, those areas are expanding. Now the areas are not topped out, but none the less, the val is there. It was blanketing the bottom as immature plants. We are happy about that. Another shot is a picture of Illinois pondweed. It is native to Florida but does not cause a problem here for us. It is considered a native species for us. It provides fish habitat, as well as, waterfowl.

Ms. Moorer showed two pictures, with one on the left being a winter shot. It was taken a few weeks ago with Mr. Guerry and Mr. Stack. This is the area she was talking about where we were targeted *Hydrilla* with ProcellaCOR. We got 150 acres of *Hydrilla* with a mix of coontail. We did not want to negatively impact our coontail in that area. We wanted to take out the *Hydrilla* so it would not out compete the coontail. We went in there with our newest registered aquatic herbicide, ProcellaCOR, which came out in 2019. Our treatment was mid-season, in the middle of June if she is not mistaken. We went back a couple weeks ago, and this is the shot we took. We threw a rake and 99% of what was on that rake was healthy coontail. We did find a few strands of *Hydrilla* mixed in, so we will have a retreatment of this area in the 2021 season. She wanted to share this with everybody, so you get an appreciation for what we can do with selective herbicides in areas to protect our natives and combat some of the invasives that we are dealing with on the S-C system. The picture on the right is a pretty impressive picture of American lotus. In the background you can see a lot of native vegetation covered with pads. The next picture is a really pretty shot of pickleweed that Mr. Bussells took. We have native submersed species and native emergent species. We have pad plants taking off. All in all, we see a lot of good things on our system.

Ms. Moorer said for the next couple of slides, you are going to be looking at some of the challenges we faced with invasives this year. A couple shots of *Hydrilla*, with stands of *Hydrilla* and *Hydrilla* mixed in with our natives like *Bacopa*, coontail, and pondweed, things we want to protect. We are using ProcellaCOR in some of those places where we can, if we have enough acres to justify using ProcellaCOR to attack the *Hydrilla*.

Ms. Moorer moved to this next slide of *Salvinia*, which was taken on upper Lake Marion. You can see the challenges there with that mud motor going through an area of matted *Salvinia*. This year, we have made some good contacts with some folks that live and recreate on our system who have found places where giant salvinia has taken off. Either we cannot get to or do not have the knowledge to get to these hidden areas, or the equipment to get in there with specific boats. One area is on Hickory Top WMA and you can only get in there by mud motor or a narrow boat. The mud motors we have do not have enough horsepower to get through all the matting and our airboat is too wide to get in there between the trees. We do not want to cut down trees just to gain access. Thankfully, we had some folks reach out to us that were great to work with. Taking us there. We got to do treatments. They would take us there in their boats. That is a big deal with us, getting out there and doing public outreach stuff. People are calling and/or dropping pins for location. That has been a huge help for us this year. This is a shot of giant salvinia in a canal that it had taken over. This year, we have been working with a couple universities and herbicide manufacturers, looking at different methods and active ingredients. We tried several different things. If you guys are interested in exactly what products we have been using and the rates, she would be happy to share that. In the interest of time, she is not going to run through them all, but this is a good example of an area that we treated. It was very effective and had good control. The issues we are still seeing are gaining access to the areas under cypress trees. If we miss any bit of the plants, the recovery is fast, especially during the midst of the growing season when the growing conditions are ideal.

Ms. Moorer noted for the next few slides, we are going to talk about the special needs registration that we requested earlier this year. We had a couple of challenges with it, just with COVID and everything. The timeframe took a little bit longer, but we did get it and that is all that matters. Metsulfuron-Methyl is the active ingredient that is used in right of ways and the forestry industry. Louisiana and Texas have registration. They are both battling *Salvinia*, so we teamed up with Orion Solutions and Bayer to bring this product to the S-C system. We got preapproval in October. We did our first treatment about three weeks ago. These are pictures of the product going out. These are very low rates, so the areas we are using this product on was very limited. The registration label is very strict. We are hoping to gather some more data with our treatment and share that with Louisiana State University (LSU) and different universities that can provide some feedback to Bayer or other manufacturers that have this product. Hopefully, eventually, we can get a full aquatic registration for it. Here is the follow up, three weeks after treatment. We are mixing this herbicide with another contact herbicide, just to speed up the process. Louisiana and Texas have been doing treatments during the summer. We do not have much data on winter treatments. We are doing some testing on the S-C system. We did 10 acres of treatment and will be sharing that data with universities and manufacturers on what kind of efficacity we are getting in the cooler months. Seeing the three-week shots, she felt pretty good about the treatment. She showed a quick video. You see the plant roots are broken off easily. You can tell the herbicide is moving through the plant. We are excited to have this tool in our toolbox moving forward with giant salvinia.

Ms. Moorer moved on to the next video of giant salvinia weevils, which is another tool in our toolbox we have used this year. We were anticipating stocking giant salvinia weevils earlier in the season, but due to COVID, the research facility at LSU and the US Army Corps of Engineers (Corps) was shut down. We were not able to purchase the weevils. We were able to get them later in the season, around September. She played the video, which you can find it on S-C's YouTube channel. Since the audio is not playing well, she will send a direct link to the Council and any guests who would like it. (Editor's note: The direct link is https://youtu.be/BTZx_zWfa7Q.) You can also Google "Santee Cooper YouTube" or type in "SanteeCooperTV" to find S-C YouTube channel. The video is on that channel with other videos our team put together this year. They are informative about native vegetation and problems we have on the system.

Ms. Moorer said last year, in 2019, you may know that we did a native vegetation project with *Vallisneria* and watershield. We wanted to continue that into 2020. We focused on watershield this year. We had three sites on Lake Moultrie and three sites on Lake Marion. These sites were suggestions from people on the lake where they would like to see watershield on the system. Mr. Riser was in charge of this project. He did a lot of research into the different soil types and the different things that watershield needs to be successful. We learned some things from the 2019 planting. A lot of the areas we selected in 2019 dewatered when the lake levels dropped. We have been focusing on at least four feet of water. We planted in June. She showed the sites on Lake Marion and Lake Moultrie. We followed up on these plantings in August.

These plantings were successful and are growing and spreading. This is something we would like to continue to do. We would like to have more natives spread around on the system. We would really like to see these natives established on upper Lake Marion. Upper Lake Marion is a bit of challenge for us because the water is so turbid up there. It is the head of our system. The water quality can be a little bit of a challenge up there sometimes, with invasive species popping up in that area. That is something we hope to continue in 2021. She and Mr. Riser talked this morning about the time and effort that we put into moving the watershield, which is not extreme. It is something our group feels like we can keep doing, as long as we keep having a good clean source. Right now, we are collecting the watershield from a private pond of someone that we know from working in our area. He is still with S-C and has allowed us to go to their family pond, which is basically full of watershield and is taken over. We have been harvesting watershield from his pond and using it across the system the past year.

Ms. Moorer moved to the last few slides. Like Mr. Page mentioned earlier, we are not voting on anything. With what we are seeing across the S-C system, we can go ahead and start talking about what we think we are going to do with grass carp stocking in 2021. Regarding impoundments, last year we asked the Council for approval to stock three new impoundments on our system (Fountain Lake, Dean Swamp, and Church Branch). Fountain Lake is an impoundment that is totally closed off from Lake Marion. It is on the southern side of our system in Orangeburg County. It is mostly residential. You can see from the magnified shot, most of the shoreline has boat slips, piers and swimming areas. We have a real issue in there with milfoil, *Cabomba*, and some *Hydrilla* mixed in. We have been doing several herbicide treatments in there. We did stock some grass carp there last season, but we would like to stock an additional 800 fish into Fountain Lake, which works out to be 15 fish per acre for control. Dean Swamp is in Clarendon County, on northern side of Lake Marion. It is also closed off from Lake Marion. We have been battling *Lyngbya* in this impoundment for the past four years. We are just getting ahead of it. It is also a residential impoundment. Church Branch is the last impoundment that we would like to stock. It is also in Clarendon County, right off Wyboo. It is heavily populated.

Ms. Moorer showed her last slide, of the grass carp population versus *Hydrilla* acreage. She did not know if we would get into this or if there would be any questions about it. She just stuck it in the presentation, hoping we would come back to it. The population level, coming into this year, will be 38,000 fish on our system. That is all she had and asked if anyone has any questions. She would be glad to expand on anything. If you want a copy of the presentation, she would happily send it to you.

Mr. Page thanked Ms. Moorer for her presentation. That was some good information. For the Council members that are not familiar with weevils, they are not very sensitive to cold. (Editor's correction: The weevils are sensitive to cold.) You probably lost all of them you put in with this cold strike that has gotten us. Cold is a two-edge sword. It is going to kill the giant salvinia to some degree, but it is also going to kill your weevils, from my understanding. Mr. Page asked Ms. Moorer if he was correct. Ms. Moorer stated he was right. They cannot survive under a specific temperature. She was not sure what that was, off the top of her head. She said

Mr. Bussells might be able to answer that, since he was the one that headed up the giant salvinia weevil efforts. He dealt with LSU and Dr. Diaz, who has been great to us. If we get a hard winter, our weevils likely will not survive. We are looking into the possibly of being able to cultivate some weevils here in future. What we are seeing in southern Louisiana, or the folks from southern Louisiana are seeing is they are getting awesome help from those weevils, because they are in a different climate than us. Their populations are overwintering, so the weevils are really helping them out a lot. In northern Louisiana, which is in the same zone as us, they are seeing some help, not as great as southern Louisiana. It is not that expensive to do this. We are at the point where we want to throw everything that we can at giant salvinia. Mr. Bussells is looking into booms and getting approval from the Corps to try and corral giant salvinia.

Ms. Moorer noted this year we had a helicopter here that was focusing on *Phragmites* (phrag) and cutgrass work around our generating facilities. We had a huge inflow and we crossed over I-95 and it looked like a river of giant salvinia floating down the system. We were able to get the helicopter on that. As far as the weevils, we are moving forward with that. It is not going to be a silver bullet. We know that. She does not know if you could hear Mr. Bussells talking on the video but that was one of the points he made, that this is not a silver bullet. It is just like grass carp is not a silver bullet for *Hydrilla* and herbicide is not a silver bullet for any other invasive. It really must be an integrated pest management program. That is what we always talk about. That is what we are focusing on, between the educational outreach, the biological control, and the chemical control.

Mr. Moorer remembered one thing she did not mention, in relation to the grass carp we were talking about for impoundments for the system, and what we are seeing. Five years ago, the Council discussed holding the stocking rate on the S-C lakes to 10,000 fish for the next five years. She thinks we are comfortable with this, being the last year of that. The past four years we have done 10,000 fish. We are seeing more *Hydrilla* on the system this year, but our natives are flourishing. We are not seeing damage on those. She thinks that with the preliminary data we have from Mr. Kaczka, which we will see later, and the preliminary stuff we have from ReMetrix's hyperspectral survey, the discussion at S-C is we may be able to hold that stocking at 10,000 fish again this year. She wanted to go ahead and put that out for the Council to start thinking it through when it comes down to vote on the plan. She thanked everyone.

Mr. Page thanked Ms. Moorer again. We will talk more about the number of fish for next year in the last section today. He said the terms she was using are great. Integrated management, nothing is going to work by itself. You have got to stay on top of everything. You are doing a super job of doing management. This is not a hit or miss situation. This is a situation where you must stay on top of stuff, just like pruning your hedges and cutting your grass to some degree. If you stop for a year or two, you are going to go back to a situation where you are going to have to put massive amount of carp and massive amounts of herbicide back into that system. None of us want to see that. We want that continuous work being done that helps with the process. Every little bit helps. You are sitting there looking at biologicals. Biologicals are not going to do the job by themselves most of the time, but they are crucial in getting you the edge when you do go out

there to do herbicide treatments, or drawdowns, or any other method you use. They are crucial in that. It surprises him that you are going to open a greenhouse up there. He wants some of those.

Ms. Moorer stated this is exactly what someone thought through, the team that was here when they decided to open a grass carp hatchery, but this is not the same scale. Thankfully, from our research so far, it does not seem like it would take too much to over winter some weevils here. A much smaller operation than grass carp. That will not happen again. She hopes we never have the need to have that many fish again. The extension agencies in Louisiana are the ones that oversee that program. What they do is they basically have ponds and they grow out *Salvinia*. They have these weevils on the *Salvinia*. They open it to anybody to come up. If you are a homeowner or have a private pond with *Salvinia* in it, you can come there and basically get tubs. They have Rubbermaid tubs and they fill it up and you go stock the weevils in your private pond. We wanted to purchase those weevils from LSU and their extension program. They just cannot. They do not have enough of them for us. We talked about that. They said if they had to supply us, they would have to open several more ponds and that would just be for S-C.

Ms. Moorer said this year we only got 1,000 weevils. There is not a stocking number or information like when you think of stocking grass carp. Knowing that these weevils likely will not overwinter here, if we had a mild winter, we could get this operation going. If you did not hear Mr. Bussells on the video, these weevils only eat giant salvinia. If there is giant salvinia for them to eat, it is great. If not, they will not survive. She would rather have too many than not enough, if she could get her hands on some giant salvinia weevils. Mr. Page stated he has seen some of the greenhouses they have in Louisiana at the meetings he has been to in the past years when they first started to do that. They do not have a very big footprint. Mr. Moorer is correct. It does not take nearly the same level that is does to grow out grass carp. We do not have the same time period. You can keep rolling them out through those greenhouses. He said that was good stuff and thanked Ms. Moorer. He asked if anyone had any questions for Ms. Moorer. Mr. Page asked Ms. Moorer to stop sharing her screen so he could turn it over to Ms. Holling for the DNR presentation. She did and he gave the floor to Ms. Holling.

Ms. Holling wished everyone a good morning. The numbers that we are showing are from the 2020 calendar year. All those species are the primary species treated and usually there is other stuff mixed in, but not always. The total acreage plus the *Phragmites* numbers were only down slightly from last year, despite the limited surveying and treatment caused by COVID. Total cost was down significantly, because we did not use as much ProcellaCOR as last year, when we were doing some testing of it. Water hyacinth continues to be our most problematic species. We did have a jump in the primrose acreage. The *Hydrilla* numbers include a treatment of Lake Wallace for the SC Department of Natural Resources (DNR) State Lakes program. They had an issue with the *Hydrilla* in that system. It is a very shallow system. The majority of the *Phragmites* work we have done on Santee Coastal Reserve. Forty acres were sprayed on USC's Wedge property that is near Santee Coastal Reserve. Those were paid for by those entities, with some minimal cost share by our program.

Ms. Holling showed the control information by waterbody. Ashepoo River has water hyacinth. That is down significantly due to an influx of saltwater, as well as our intense treatments over the last couple of years. Native species have been coming back in the upper part of that system and those are expanding. Back River Reservoir has hyacinth, *Hydrilla*, fanwort and primrose. We are doing a little bit of work on all of those. On Black River, we did a fair number on that. We went further downstream than we usually do, just to pick up a lot of the hyacinth there. That system has hyacinth, alligatorweed, and primrose. We also introduced more of the alligatorweed flea beetles in the upper part of the system early in the year, as soon as we were able to get back out on the water. Those spread easily and usually there is some overwintering of those beetles. The Cooper River has *Hydrilla*, *Egeria*, hyacinth, and primrose. We have not seen any of the giant salvinia moving downstream from S-C lakes. She is hoping that will be delayed for a little while. Goose Creek Reservoir is always our most diverse system, with hyacinth, spatterdock, duckweed, *Hygrophila*, common salvinia, and water lettuce. She got a text one day about giant salvinia on Goose Creek. Then they realized it was just common salvinia. We did get rid of that big area that was seen. On Lake Wallace, that was *Hydrilla* and naiad. Santee Coastal has, as usual, *Phragmites*. On our other WMAs, we dealt with Samworth, which has hyacinth, primrose, common salvinia, cutgrass, and a little bit of phrag. We also worked on Sandy Beach, which has cutgrass, hyacinth, and a variety of pad plants that they wanted cut back for fishing and duck hunting. In our state parks, there is a mix of stuff, including algae, bladderwort, duckweed, and a variety of stuff. A lot of it is native, but what we are working on there is clearing the edges of submersed and emersed vegetation for fishing, swimming, and boating. On the Waccamaw River, primarily we are dealing with hyacinth, but there is a little bit of phrag in that area. We are getting more control over our nursery areas. We have been seeing a fair bit of common salvinia, starting last year and that is expanding, especially into the back waters.

Ms. Holling moved on to the triploid grass carp numbers. The ones that you see here are all maintenance stockings. Goose Creek Reservoir, even though it is a small system, gets a pretty large number because that is an open spillway system. She thinks all those numbers will pretty much stay the same numbers in 2021. We have not been doing a lot of cooperative projects right now, but these are some of the groups that we deal with or work with on a regular basis. We are still at three staff members that work on all the public waters in SC. We always have to deal with Mother Nature, who has been a little bit kind to us this year. Another note in regard to our manpower, our budget is directly related to gas purchases. DNR gets a very small portion of gas tax, which goes into the water recreation fund, and then we get a portion of that every year. That covers all our expenses, staff and equipment, as well as treatments. Amazingly, that number from the water rec fund has not changed a lot due to COVID. People are still buying plenty of gas. We do have a limited budget, which she was just talking about, and we did have some delays due to COVID. There were delays and limitations to our travel, but we worked well around that. That was all she had, and she asked if there were any questions. There were none.

Mr. Page thanked Ms. Holling. He said she hit the nail on the head on a lot of those things. Everybody is experiencing COVID-19 delays and limitations. Everybody deals with a

limited budget to some degree. Mother Nature, and we will throw COVID-19 in there, she is fighting back against us, recently. The grass carp stocking numbers, like he said before, we will talk about that later when we go into what is going to happen in next year's plan. We are in maintenance mode on those. That is a good thing. Ms. Holling does not have three people, she has two and half people, because he is a short timer. No, he is not announcing his retirement right now. It is coming in the next little while. He is just trying to make sure we have all the pieces and parts in place to do what we need to do, not that he is that integral anymore. It is good, and he knows Ms. Moorer will agree with him. If you hire good people that are smart, know their business, and like what they are doing, it makes everybody look really good. Mr. Page thanked all S-C staff, the staff with the State Parks, and other places we work at. The fisheries staff has turn out to be super lately. He told Mr. Holbrook that he has left it in good hands with Mr. Kaczka. People think we just move to different jobs or retire and do not think about it anymore. When you have done some of the stuff that we have done and worked where we have worked, you take ownership of it. It is good to have people like that to have on staff across the state, in different agencies and places. We have been lucky. Most of the agencies we deal with are extremely lucky. They have people that are dedicated and are going to do the job because they want to do it and not because they have to do it. He thanked everyone and the presentations. He said next on the agenda is going to be Mr. Kaczka. Mr. Kaczka will give a preliminary of triploid grass carp health, that we have had at every Council meeting, and give us an update on that. Mr. Page gave the floor to Mr. Kaczka.

Mr. Kaczka said he did not have a ton of slides here this morning, largely because our data so far is very similar to years past. Some of the stuff is going to look like the past couple meetings. Like he said in last January's meeting, he wanted to, rather than taking this as a one-off, year by year approach, he wanted to compare things over multiple years.

Mr. Kaczka noted the biggest difference this year, in 2020 so far, is not necessarily the data we are collecting from the grass carp, but the way we collected the grass carp. In years past, we have used a local bowfishing guide to take us out. We have talked for a little bit now about trying to kind of sever ties with that method of collection, not necessarily because we had any issues with the guy taking us, but we just saw some benefits to trying to collect fish internally, without the use of a guide. Some of those benefits being obvious, including the reduced cost. We are not paying someone take us. We were also kind of limited, both time wise and collection site wise when we went with him. The guide was only available in late summer and early fall and limited collection sites to a handful of areas around the Diversion Canal, just outside the Diversion Canal on both the Lake Marion and Lake Moultrie sides.

Mr. Kaczka said we wanted to kind of diversify where we are getting our fish from and be able to sample and collect fish throughout the year. He expects our sample size will increase from what is typically anywhere from 80 to 100 fish to, hopefully, several hundred moving forward. The bulk of our collection is going to be through a DNR Fisheries employee that spends a lot of time bowfishing on the S-C lakes. He has done this for years now and it was not until recently that we realized he was willing and appreciated the opportunity to help us out and

collect some grass carp when he is out there on the S-C system. He goes throughout the year, but mainly the warmer months, late spring through the end of summer and into the fall. We expect to get most of our fish throughout the year from him. Mr. Page's group was also able to provide a little bit of funding that we normally would have used to pay the guide but used to purchase two bowfishing kits for our Region 4 employees. Our intention here is to make collections out of our office in the colder months.

Mr. Kaczka noticed something in years past. Before our large-mouth bass sampling season, we take our electrofishing boat out to do some test runs and make sure everything is working fine. In some of the areas we go to, there seems to be a good number of grass carp. In the colder months, when their metabolism is slower and they just are not moving around as much, the electrofishing seems to hold them on the surface a lot more than it can do in the warmer months. Electrofishing would not be possible for grass carp when it is warm out. In January through March, when we have time between gill netting season, he thinks we can go out there and use electrofishing to kind of bring the fish to the surface, hold them there, and then use our bowfishing rigs to collect them. Between us and this other DNR Fisheries employee, he thinks we have the potential to, at the very least, get the numbers that we have been getting, but he thinks it is likely that our overall sample size will increase in the next year and in the years moving forward.

Mr. Kaczka stated so far this year, the other Fisheries employee has taken two trips for us. You can see the dates there that those trips were from. He had already taken one trip before that June 26 date, so he comes throughout the year to the S-C system and he is looking forward to helping us. He is also very open to basically saying "where do you want me to get the fish from. I can go anywhere on the system." That provides us more flexibility on where we are collecting these fish. So far, we have gotten 71 fish from him. We have not been able to get out. Well, the Region 4 folks went out a couple times so far, but it has not been since the weather turned. We expect that as this cold weather settles in for the year, we will be able to take our electrofishing boat out and collect more moving forward.

Mr. Kaczka showed the four sites that we got fish from this year so far. He just said earlier about one of the benefits of collecting them internally is kind of breaking away from our traditional sites where we have collected. These four sites are where we have traditionally collected grass carp from. The reason was for this being a new method for us, he wanted to direct our fellow DNR employee to go to areas where we know we are going to get fish from. Since we were trying something new, he did not want to try everything completely new all at once. We knew from past collections that we could get them from these four areas.

Mr. Kaczka displayed the data from the last four years, in terms of a length frequency and an age frequency histogram. Not much has changed, but there was one thing that he did notice that he found kind of interesting and it may just be that. It might be interesting to him and not have a whole lot of biological implications. If you look from 2017 to this year and look at the length frequency, in the first three years, 2017-2019, we can see a fairly uniform bell shape

curve. If we look at the peak of that curve, we can see that in 2017, that peak came in right around that 900mm size class. The same goes for 2018, and then in 2019, that peak has shifted out to the right a little to where the bulk of our collection has come from slightly larger fish, the 950mm length class. In 2020, we have this random bar out here that has been the bulk of our collection, but overall, it seems that the length of the fish we are collecting is kind of getting larger. For a handful of fish compared to the whole system, we are talking about 80 to 100 fish here a year on a 160,000-acre system, this could just be collection bias. It is easier to collect larger fish, but he did find that interesting.

Mr. Kaczka directed the Council to look at this age frequency, where there are two things of note. First is our older fish, this 20-year-old age class. These are not just 20-year-old fish. These are any fish that are 20 years old and older. It is very hard to get an accurate age on a grass carp once they reach the 20 plus age class. Those annuli, the rings that we count to age them, get so tightly packed together that you can see that they are 20 plus years old, but they might be 24 or 25. For all intents and purposes, those fish, from an ecological standpoint in terms of how they are feeding on the system, we consider that once they get to this age they are probably not feeding quite as efficiently and for those reasons we can group them together. In terms of these older fish, you can see that over the past four years our collection numbers have gone down pretty sharply, even before 2017, we were seeing roughly 30 some percent of our total collection throughout the year being made of these old, "legacy" fish. These were fish from the original 1989-1997 stocking. As you would expect, these fish are starting to die off. They live up to 25-30 years, as we have recently found, but that might be the limit. We are starting to see those fish go away. In terms of our younger age classes, similar to the length frequency kind of showing a shift towards slightly larger fish, if we look at our kind of bell shaped curve here from 2017-2020, we are seeing that we are starting to shift towards rather than the bulk of our collection coming from this 4-6-year-old age class to slightly older fish. In 2019, we see that the bulk came from this 6-8-year-old age class. We do have from this past year, of our 71 fish so far, this spike at 3 years old, but again this area right here of 6-7-year-old fish. You know the stocking has been consistent, numbers wise, throughout the last several years, that maintenance of 10,000 a year. He found that interesting. He does not necessarily want to put too much to that right now, just because this is a relatively small sample size, compared to an exponentially larger number of fish that make up the whole population.

Mr. Kaczka noted that he showed this figure at last January's meeting. This is just to show relative condition by age group. We have talked for a while now about younger fish being much more efficient feeders. He broke this up into young, middle and older age classes, with young being 1-6 years old, middle age being 7-12, and older fish being 20 plus. The reason for the gap in that from 12-20-year olds is we know there was a break in stocking from 1997-2007. These would be the fish that were stocked. Anything else in the system would have been in there incidentally from upstream or any potential private releases, which he does not believe are a significant contribution to the population. As you can see and what we would expect, the younger fish seem to be in a little bit better condition than older fish. He has a line going across at 'one.'

Mr. Kaczka reminded the Council that the condition value of 'one' is what is traditionally used in fisheries to gauge the health of a population or the health of an individual fish. For the most part, we see that most of our fish over the last three years are below that 'one' threshold and for those fish that are near or above that 'one' condition factor, it is mostly younger fish. But again, as we have said in years past, the values that we are using to calculate this condition factor are based off the population when they were first stocked in the early 90s and we all know what *Hydrilla* was like back then. We are basically comparing our current fish to fish that were eating at an all you can eat buffet out there.

Mr. Kaczka noted for comparison, this is the 2020 collection so far. Very similar to what he just showed you from the past three years. The bulk of the fish are below that 'one' threshold. The couple fish that are approaching 'one,' or are above it, are of the younger age class. The handful of 20+ year old fish in red are well below 'one.' You can see the average condition factor for these three different age classes. Again, not very different from what we have seen in years past, in the mid- to upper-70s, with those older fish really bringing down the average.

Mr. Kaczka said we have spoken in the past about grass carp mortality and using this metric to help gauge the overall population size. Traditionally and, he thinks, since the initial stockings and those first couple studies on the system, a mortality estimate of 32% has been used. We have talked in the past about some of the issues with this. The first issue is this estimate was calculated back, he believes, in the late 90s. The oldest fish on the system at the time this was calculated were anywhere from 9 to 14 years old. We know that they are much longer lived than that now. There are also issues with obtaining an accurate estimate.

Mr. Kaczka believes he showed this at last January's meeting. This is a theoretical catch curve for calculating mortality. We do not use these younger age classes for this hypothetical fish population, because we assume these fish are not fully recruited to our year type yet. Theoretically and empirically, we know that the population should decline as the fish get older. We use the age classes out here, where our collection numbers start to decline for a given age class. We can run a regression and take the slope of that line. Whatever that slope is gives us our mortality estimate. To compare that to this past year's (2020) collection, he showed ages 1-14. Ideally, what we would like to see is this increase and then this somewhat even decline. We increase and then we drop down here, and it is just all over the map. He does not believe it is necessarily an issue with catchability. We know that a 1-year old fish is smaller, so that is harder to shoot with a bow-fishing rig. We know that older fish are, in theory, slower moving, so they might be easier targets. He thinks we just need to boost our numbers. As we incorporate this new method of collecting fish throughout the year, he thinks we will get more fish, hopefully get more representation for these younger age classes, and see something like what you are looking at between 6 and 10 or 11-year-old fish.

Mr. Kaczka said just for the sake of throwing a number up there, and this needs to be taken with a grain of salt, he did input this year's fish so far, from 2-14-year-old fish into one of

our fisheries software packages. That is coming up with an annual mortality estimate of about 13%. Now we have said for several years that we think the actual mortality is less than that original estimate of 32%, but that was the best thing that we had to go on. He does not know that this is necessarily any better, even though it is showing a lower number. He thinks that moving forward, we will be able to boost our numbers and get a more accurate estimate, but he just wanted to at least look at that and see what estimate we could calculate with this year's numbers.

Mr. Kaczka noted that not much has changed from the last several years. We are seeing a sharp decline in the numbers of our original cohort, but that is to be expected. Fish only live so long, and we are just not seeing as many of those "legacy" fish, as we formerly referred to them. Overall, like we say every year, the grass carp population, on an individual basis and as a whole, appears to be in less than ideal condition. Again, these condition estimates do not account for the population that we are comparing it to, which was that of the early to mid-90s when there was just a buffet out there and there were no small fish. The new collection methods, he thinks, are going to provide a more robust data set to gauge our population health. He thinks that just increasing our numbers is going to allow us to get a greater representation of different age classes and therefore allow us to better estimate a true mortality on the system.

Mr. Kaczka noted it also gives us the ability to pair our collection sites with varying vegetation levels and types. Ms. Moorer mentioned earlier the yearly satellite imagery that is be going on. He has thought for a while that it would be nice to take those estimates, the areas that have really high hydrilla numbers versus low hydrilla numbers and try to pair those with our collection sites and not just collect fish from the same areas year after year. He thinks we will be able to do that. The collections can be adjusted based on the different times of year. Naturally, a fish in February will not be in as good condition as a fish in the peak of growing season, but we can correct for that in our analyses. We can also correct for a fish that was collected in an area of high hydrilla concentration versus low or no hydrilla or other submersed aquatic vegetation.

Mr. Kaczka said the last thing he has is that immediate workup may reduce water weight loss. Our condition factor takes length and weight into account. There is one thing he has noticed over the last couple years when we go out with a bow-fishing guide. We start shooting about 8:00 or so in the evening. We finish up about 11:00 or midnight. We put those fish in a tub, take them back to our walk-in cooler, put them on ice, and work them up the next morning. It has been close to twelve hours since we have collected them by the time we get to them. A lot of times, when you pull these fish out, they just look deflated. He is sure that a lot of that is some air loss, but you can see a giant pool of disgusting smelling and unsightly water at the bottom of these tubs. That is water coming not just from melting ice, but also from the fish themselves. We see this even before we even put them on ice, so it can only be coming from their bodies.

Mr. Kaczka thinks that is biasing their weight. An increased weight put into these calculations, if we were taking their weight right at the time of collection, he thinks would bring up that condition factor a fair amount. We are working kind of internally, going out during the day to collect these fish. We also have a little more flexibility with our other DNR employee who

does bow-fishing on the lakes quite often. He is willing to work with us and do what is best for our collection methods. He thinks that is going to make a difference as well.

Mr. Kaczka said as far as the data goes for the 2020 collection, those condition factors are not necessarily preliminary. Those are what he calculated out and they are what they are. Moving forward he will try to come up with some other data analysis, that is not just an overall summary of what we found, but a little more in depth. He asked if there were any questions. Mr. Bussells asked Mr. Kaczka to let the S-C staff know if you need any help collecting those fish. We have staff that are more than glad to participate in that. Mr. Kaczka said you guys had come out with us last year and that was a big help. Going out in the evening like that can be fun, but tiring. It seems fortuitous that we made the decision to switch to collecting internally this year, just given Covid. He does not know if our guide would have even been available this year. Collecting them moving forward, the S-C staff are much more familiar than we are with the different stands of *Hydrilla*, where it is concentrated and where it is not. They are probably as familiar as we are with where grass carp are and where we can get good numbers from. It would be nice to get a couple boats out there and see what we can do in the next couple months.

Mr. Holbrook said Mr. Kaczka has done a great job on that, and wanted to mention that the way that stocking has been done recently, where we are trying to stock a similar number from year to year, makes some of the work Mr. Kaczka is doing a lot easier. That is something for the Council to keep in mind going forward, if you really want to think about evaluating what the mortality rate is in the reservoir. One of those things, like what Mr. Kaczka was showing earlier, the catch curve analysis, you usually assume equal recruitment from year to year. If you are stocking equal numbers from year to year, then those catch curve analyses are things that you can use. If you fluctuate wildly from year to year, you have to go with a different method. He is sure Mr. Kaczka could do the research and figure out what those other methods are, but for those catch curves analysis, the 10,000 annual stocking really makes that work easier.

Mr. Kaczka said that with a non-stocked population, it is a big assumption, but this is kind of one of those rare opportunities where they are not spawning on their own, so we know what the recruitment is every year. Granted, there are some that are going to probably leave the system in high water or some that are going to enter the system during high water from upstream. He does not know that those numbers of fish leaving the system or coming into the system during high water are making up a significant portion of the population. It is very advantageous for this type of study to have consistent recruitment. Ms. Moorer thanked Mr. Kaczka for putting the work into that and to echo what was said about letting us know if you need help.

Mr. Page also thanked Mr. Kaczka. He was looking at some of the old numbers from the original stockings. He gave a brief overview of the original mortality rates, as well as the stocking numbers. The mortality rate ranged from 22% up to 32%. He was not sure of their methodology, but he can look at some of the old records and try to determine that. The mortality rate stayed at 32% for a period, so that was the number we adopted. It was a worst-case scenario based on all the stuff the Corps had given us. He knows some other studies out of Virginia Tech

on systems like Lake Murray and similar lakes showed the mortality rate anywhere from 20-24%. We use a little bit different mortality calculation for Murray than we do for the S-C system, in part because of the lack of alligator predation in Murray. He thanked Mr. Kaczka again and asked if there were any more questions.

Mr. Page moved on to the "Preliminary Insight for 2021 Aquatic Plant Management Plan" and under that "Topics for 2021 Council Meetings." He thinks one of the topics for the next Council meeting of course is going to be Mr. Kaczka again. Mr. Page would like to see how some of that data has panned out by the time we meet next and maybe we can look at some of that other stuff. He thinks it would be good to go back over the plan one more time. Hopefully, S-C is going to have some of that hyperspectral information finished by the end of January. He asked for confirmation from Ms. Moorer. Ms. Moorer said their contract stipulates that they have their final report by December 31st. She requested preliminary numbers from their sales rep so she could share that with the Council. He focused on invasives first. He did send a val number over this morning, but that is the only native species he sent me. It looked very similar to what we had last year on the system. She does not have the final or anything else yet on submersed or emergent natives. She is hoping by January that we will be able to present that information.

Mr. Page said he was going to share the Lake Marion section. Most of the changes in there have been cleaning up some of the herbicides. Just making sure we had all of them listed that we had the potential to use in there and some of the rates. We have adopted some of the rates and adapted some of them down. We have found a lot of time with ProcellaCOR, you do not have to go with the higher rate. You can go with a lower rate and be just as effective. That has been one of the good things for the past few years. The chemical industry, when they come up with new things, they have listened to what we need. ProcellaCOR was designed specifically for crested floating heart and some other species. One of the good things was it is selective on things like *Hydrilla* and not selective on pondweeds, *Cabomba*, and some of the natives. We are getting more tools in the toolbox, making it a lot easier to do work and be selective in our treatments. You can see from some of the data Ms. Moorer has shown us, vegetation is thriving in the S-C system in places. It is not a virtual desert like has been reported in the past. There are good native species out there. There is a lot of cover for different types of species: fish, waterfowl, and all kinds of other stuff.

Mr. Page noted that we still have not gotten the memorandum of agreement (MOA) with S-C and DNR through the legalese portion of the process. He is not sure if it is hung up on S-C's end or DNR's end. He will remind you that an MOA is not a binding contract between agencies. It is a suggestion that we work together with some goals in mind. That is all it is. Anybody that thinks it is a contract, and you are violating the terms of the contract if you do not meet the goals prescribed in there, they are flat out wrong. That is going to be an issue going forward at times.

Mr. Page thought Ms. Moorer said earlier they had agreed to the 10,000 fish again. We may have to rethink our mortality rates a little bit. He is hoping Mr. Kaczka can, somewhere in the process in the future, determine a different mortality rate than the 32%. The 13-14% kind of

scares Mr. Page and looks kind of low to him. He is basing it on the data we have been looking at for years. We have found that, with the information on the other lakes, Murray, Greenwood, and those areas that had a lot of *Hydrilla*, we kind of have been adjusting our numbers down as we have gotten into some of those. He thinks Lake Murray is down to 1 fish per every 5 surface acres. We are looking at it that way a little bit more and more. Maybe even down to 1:4, one fish per 4 surface acres, which is a little higher rate, but somewhere in that range seems to be the magic bullet for maintenance. There is no magic bullet and it is going to vary from year to year, but right now, long term for 4-5 years we have been looking at it, that number looks good. We have not seen a preponderance of stuff popping up in those areas. We have seen some *Hydrilla*. We have treated it with ProcellaCOR, just like Ms. Moorer and the S-C staff has done. We have done spot treatments. We have not really seen any on Lake Greenwood. We have seen more native species coming on Greenwood and on Lake Murray. Those native species are problematic to some of the people that live out on the lake, or they think the plants are.

Mr. Page thinks one of the main things we are going to suggest this year in the plan, and we can talk about it at the next meeting, is to Dominion Power that they do another drawdown on Lake Murray. Drawdowns are one of those crucial things that help that system in many ways. They are supposed to, by their FERC license, do a drawdown every three years, he thinks. The drawdown is being limited to a shallower depth than it was in the past. That does not help quite as much, but it significantly helps those people with the docks and those shallow coves to help eliminate some of the native vegetation that may be causing their problems.

Mr. Page asked if Ms. Moorer had any things about the S-C system she wanted to bring up for future reference. Ms. Moorer said she thought Mr. Page covered everything that she was going to say about the 10,000 fish and looking at the mortality rate. If we go off what we think the population is, and we are trying to keep consistent on that, we do not even know if we are looking at 30,000 fish in the system. She will say she thinks things are looking great on the system. She just wants to make sure we are not doing these reactive stockings, like have been done in the past. She thinks the consistency is a benefit to the system. Hopefully, at some point, we can get to a true maintenance stocking. Right now, we are doing this adaptive stocking with 10,000 fish per year for a five-year period, as we have discussed before. She is hoping we can back into that number. That was the whole point of doing this 10,000, backing into the number where we need to be. Right now, she is happy with what the Council decided 5 years ago. She thinks things are looking a lot better on the system than 10 years ago.

Mr. Page said it goes back to that mortality rate. If Mr. Kaczka can come up with a better number for us, he would appreciate it. He would like Mr. Kaczka to try a couple different methods, if he has time to do that, although it would be more work. Hopefully, Mr. Holbrook could help, since he still has his finger in the pie of fisheries everywhere. Maybe we can figure out what method they were using and try to do apples to apples based on old data, so we can be more comparative sometimes. He said that number may be absolutely correct, but he does not know. Ms. Moorer will be the first one to tell you, and you fisheries guys will say that you can get a generalization, but you will never get the exact number, he does not think. We just want to

get close. The other good thing about the carp, in his opinion from looking at it from his years of experience, those carp are not starving to death and they do not seem to be actively predating too much on native vegetation. They are sticking with their primary thing of *Hydrilla* and a couple native species that are palatable to them. It is good information to have. We did that early on, then there was a big gap in there where we did not have a lot of data. Science and data must drive this process. You can use your experience to a certain level, but when you have numbers to back it up, you can assure yourself and people around you that you are a little more accurate in what you are doing. He has always said, something that is repeatable, like you are doing with the grass carp survey by the same group of people with basically the same methods helps an awful lot to get that out there to us and the public.

Mr. Page noted the other things in the plan he wants to talk about. We are going to continue working with PRT. With the new herbicides, we have been pretty effective in PRT and are working our way through their systems to help with a lot of public fishing access and recreational access in their lakes. We have had an expansion of a couple of things in places. We now have *Hydrilla* down the Coosawhatchie River. (Editor's note: This should have been hyacinth on the Combahee.) It is not bad, but it is there. He thinks some of this issue is caused by the amount of rainwater going through and we are losing our salinity levels in some places. The salinity levels in the Ashepoo had continued to rise and ebb and flow with the amount of rain we have had in those areas. You can tell that it has significantly affected the hyacinth growth. It is limiting it to some degree in a lot of areas. The same thing on the Waccamaw.

Mr. Page spoke of some new *Hydrilla* concerns. A couple of small private ponds in the upstate seem to have *Hydrilla*. We do not know if it is monoecious or dioecious yet, also called southern or northern *Hydrilla* respectively. He is pretty concerned, because it is up around Gaffney. It is probably the northern version, which will not be as bad to some degree. We have also had it in a couple state lakes. One was Lake Wallace down in Bennettsville. We worked with our fisheries staff. We treated it for them because they had no money at that time. We will get some backside cost share from that crew. We were able to use Sonar. We drew that lake down a couple feet and put Sonar in there and held it there. That was one of the situations where we could use the old school approach with Sonar for a longer-term hold and it is going to be much more cost effective that way. They also have plans to stock that, and we will put that in the plan, in the spring with grass carp at a maintenance stocking rate somewhat close to 10 fish per acre. That is a 280-300-acre lake up there that has one control point and it is not a flow over. It is a riser with a control structure on it, so we will be able to control the fish in there.

Mr. Page said we have had other instances in some private ponds of some *Salvinia molesta*. One was reported and a private contractor is working on that. Mr. Page needs to follow up with him to see if he got it controlled. It was down in Charleston. The very next place down from him was a friend of ours, Charleston Aquatics Nursery. It is funny that the pond closest to him ended up with *Salvinia molesta* in it. We have also had reports from some people living on the tidal creeks around Charleston Aquatics of water hyacinth in the tidal creeks. He does not want to blame Charleston Aquatics, but do the math. It is the closest and probably the most likely

place it could come from, in some form or fashion. Clemson has inspected them before. We have run a couple raids on them in the past after some of these. We will get back with Clemson in the spring and see if we can catch them with some bad stuff again.

Mr. Page said from our side of this, we are going to go through the process of the same stuff we have done. We are going to try to get out and look a little bit through the wintertime. It is kind of cold out there, as you guys know. Nothing is more fun than going out on the airboat or john boat in the dead of winter and try to do a survey all over the lake. You guys are very familiar with that at S-C, he is sure.

Mr. Page asked if anyone else on the Council has anything they would like to see at future Council meetings. Since we are doing it remotely like this, it would probably be easier to get speakers in to do some small presentations. Just email him. He is thinking about meeting maybe in late January. We need to have everything done before March, so carp orders can be put in in a timely manner and get in the lakes before it gets too warm. Ms. Moorer said she would like the Council to get the plan approved quickly, which would help her in securing grass carp and getting them stocked earlier in the year. Mr. Page said it is a little bit easier now than it was in the past.

Mr. Page said at this point, he does not see any major changes in the plan. We may see something different when Ms. Moorer gets her final data in for S-C, but we kind of committed to that five years at 10,000 and he thinks this may be the year we put that 10,000 in and we may see some movement in that system. We may not, as far as *Hydrilla* goes. He thinks that for the next year, not this coming plan, but the year after that, we are going to have to figure out that mortality rate a little better and Mr. Kaczka's going to solve that problem for us and go with a mortality rate stocking in the S-C system. We do not have the data to do that in the other lakes, but they are so low now, at 1:5 and 1:6, that he does not think we have a problem with that.

Mr. Page asked Ms. Moorer if she knew, off the top of her head, the number of fish we have in there per acre or how many acres per fish. Ms. Moorer said she was just looking at that and will figure it up. Mr. Page noted the Corps did a one- or two-year study on that years ago and the number they came up with was 1:8 as the ideal maintenance stocking number. Now they had very limited numbers in their data set and their data sets were not done on lakes as large or a set of lakes as large as S-C. S-C is unique from all the other lakes in the state, because it is two interconnected large lakes. Either one of their lakes would hold up against Murray or Greenwood, but when you add the two together with a connection, you have got a magic issue there. He does not know how to handle that sometimes. It is unique, very unique. It was unique 30 years ago, or more, when we did the stocking, he reminded everyone. That was the first large scale stocking of grass carp to control an invasive species in the world, not just the United States. It was the largest one in the world for tens of years. It has kind of been our baby since we did it. The people before us did it, more so. He was wet behind the ears back then and doing a lot of different things. He still remembers some of the stuff that went on in it and sitting in some of those meetings.

Mr. Page thanked everyone for taking the time out of their schedules to attend this meeting and for doing the work that you do every day. You do not hear it enough. He asked the Council if there was anything else anyone would like to discuss. Ms. Moorer said the carp rate in the S-C lakes is just over 1:4, using the 160,000 acreage number. Mr. Page said those numbers mean more to me sometimes than just looking at statistical analysis. He can sell that number better to the public. If he says there is only one grass carp for every four surface acres of lake out there, that is not a lot of grass carp. He does not see how that affects a lot of things, except what we are trying to get it to affect, the *Hydrilla*. If you had a pond and you only had one bass for every four acres, you would not be happy with your pond.

Mr. Page asked if there was anything else, any other business before the Council. He reminded the Council that he will send you the plan. S-C and DNR will have a meeting here shortly to go over our stuff again to make sure we are singing on the same sheet of music. The plan is ultimately in your hands. We will give you our suggestions as an agency and as the Council chair, he will give you the suggestions for S-C also. If we need to talk about those, S-C can tell you all about them and he can tell you all about the other lakes. We are very thankful to have you here. We are thankful that S-C is still S-C. Hopefully, they do not get sold to somebody that does not want to do their due diligence in all the environmental areas that S-C has to do, and they take pride in doing it.

Mr. Page said if there is no other business, he would be open for a motion to adjourn. Ms. Moorer made a motion to adjourn. Mr. Leaphart seconded the motion. Mr. Page called for a vote, which passed unanimously. He thanked everyone again.

Mr. Page told Ms. Scherman he would be back in touch with her about the State Parks stuff to make sure we are on the same page about that. He thanked Ms. Carper for being here. He will send the meeting information to her from now on, instead of sending it to her boss.

Mr. Page thanked Mr. Winters for being here. Mr. Winters thanked Mr. Page and asked him to keep the SC Boating and Fishing Association in mind with these meeting, so we can sit in. We would love to be of any help that we can. Mr. Page said we appreciate any help we can get. We will put you on the notice list and make sure you get it. We always send a public notice out for this. We only have to post it in the Dennis Building in a public area, but we send it out to our news group, so they can send a Tweet out, put it on Facebook, and in the news releases.

Mr. Page said we will adjourn the meeting. Thank you so much. He will send out another Doodle poll, so we can do this again in January. He adjourned the meeting at 12:02 p.m.