

1/21/08

To Lake Asbury Municipal Services Board:

As promised I would send to you my thoughts on how most effectively handle the hydrilla situation in North Lake Asbury. Upon my return to Gainesville I spoke with Mark Hoyer and sure enough,, he had a bathymetric map. Here are my suggestions. The north lake has been stocked with 1000 grass carp,, or about 10 per acre. As I indicated to the Board,, its not how many you stock, it's the survival rate that counts. If you assume 50% predation, you should have about 5 fish per acre, and this is sufficient to keep hydrilla under control,, it they start with it under control. Think of it this way,, you could put 5 cows in a cornfield with 8 foot tall corn,, and they will never catch up to the corn if it grew year round,,, however you plow the field,, plant corn seed and 5 cows will eat every seed that produces a plant out of the ground... In order to get hydrilla under control,, we must remove the existing biomass that is producing such prolific growth, then assuming we kill the plants to the tubers,, the 5 carp per acre can keep up with the regrowth. So the objective,, control existing hydrilla biomass to allow the carp to get ahead of the hydrilla growth curve...there are many ways to control hydrilla,, mechanical, drawdown, herbicides and so forth, but we have to get the biomass down as inexpensively and in an environmentally sound manner before summer. At least that is what I think the board asked me to consider...

1. I understand from our meeting last Wednesday that the lake was periodically drawdown in the 80's and early 90's for aquatic weed control and other benefits. This is an excellent and inexpensive means of hydrilla control,, and the lake will benefit from an extensive drawdown that would expose >50% of the lake bottom. This will of course dessicate and dry up existing hydrilla, the drawdown will concentrate fish predator and prey species keeping the lake fisheries in balance, and organic accumulation on the lake bottom will be exposed to oxygen and consolidate and oxidize. These are all benefits that have pretty well been documented in many lakes in the state. In fact,, the current drawdown on Rodman reservoir is underway and the drawdowns help it retain its diversity of aquatic plants, animals and fish,, sure,, hydrilla is a problem in rodman,, there are no carp there to keep it under control. One caution on extreme drawdown,, I don't know how far you can possibly draw it down,,, but I understand that the lake has about 5 acres of water 20 feet deep,,, the map shows that an 8-10 foot drawdown would expose maybe 60-70 percent of the lake bottom, leaving water depths of 10-12 feet which should be sufficient to hold all the fish in the lake as long as the hydrilla was not too dense in the remaining area,,, in other words, a more extreme drawdown has to be watched closely to make sure that the crowded fish in the remaining water are not oxygen stressed or killed by too much biomass of hydrilla remaining in the water...A real ace in the deck is the water in the South lake,, if a problem starts to be noted in North lake,, you could release 1 foot or two of high quality water from the upper lake and increase the depth of the 30-40 acres in the north lake by 2 feet. The point is,, you can't just pull the plug and let nature take its course,, because it could... I understand that there is no guarantee that the lake will fill up by this summer,,,, and I understand (maybe) homeowners frustration that lake managers don't know what exactly will happen or sometimes the best way to approach a hydrilla problem,,,, EVERY lake is different. So I think a drawdown has many benefits and weed control is very inexpensive at this point,, just can we get rid of enough hydrilla to allow the carp to get ahead of the growth curve.. can we add herbicide,, a few acres to the remaining hydrilla in

the remaining 30-40 acres after the 8-10 foot drawdown?? You can only make these decisions as you proceed..

2. Another option is to leave the lake levels alone and treat with a fast acting contact herbicide,, and I think the product of choice here is aquathol-K. Fellow scientists and the company have been doing some cold water treatments of hydrilla,, treating the whole lake volume with around 1 ppm of aquathol k. This herbicide has been used in Florida and other states for about 50 years and has recently undergone EPA review for updating the file on the product and its uses.. Anyways,, recent work has shown very good results with around 1 ppm when applied when the water temps are in the low 60's. Ordinarily we use around 3 ppm of aquathol to get effective hydrilla control,, but scientists and the company have done some work over the past two years showing that reduced doses can control hydrilla very well if the entire lake volume is treated, no spot treatments,, and the treatment has to be done when water is cooler. The suspected reason is the slower microbial decay of the herbicide under cooler temperatures.. This herbicide is made of only carbon, hydrogen and oxygen so is easily broken down by bacteria and other microbes in hot water,, has a half-life of maybe 2-3 days,,, in cooler water, the half-life may be 5-8 days..thus exposing the plants to the herbicides for much longer periods of time.. The half-life is the time it takes for half the herbicide to microbially decompose,, from say 1 ppm to one-half ppm Assuming the contractor's figures,, 111 acres, average depth of 11 feet,, cost will be around 40,000\$,, This will work,, it has throughout the state. I think it's highly unlikely that a fish kill would result from such a treatment,, the speed of control is slower with the reduced dosage,, the water is cooler and more oxygen is taken out of the atmosphere and cooler water holds more oxygen anyways,, again,, if we monitor oxygen in the lake and it starts a nose-dive,,, we can release water from the upstream lake,,, question,,, when the water is released from south lake,, does it come off the bottom of the lake,,, bet it does,,, need an O2 profile on the lake. (MORE QUESTIONS FOR NEXT VISIT).

3. According to the data provided,, the 111 acre lake contains 1220 acre feet of water... this is one acre, 1 foot deep, about 330,000 gallons of water...For trivia buffs, 36 million gallons of water in lake Asbury, If you lower the water by 4 feet,,, roughly that removes 4 times 111 acres or about 440 acre feet...this is not entirely true,, but it's close based upon the bathymetric map I have looked at... so basically, you have instead of 1220 acre feet of water to treat with aquathol, you now have 800 acre feet of water,,, which reduces the amount of herbicide and cost by about one-third. Thus,, the fact that the Board felt was the best route to take,, and I agree,, this is a good plan,,, get the water down 4 feet,, take a good look at the lake,,, and treat the remaining 800 acre feet with about 1 ppm of aquathol,,, I am not picking an exact number here,,, the manufacturer should make the recommendation,, they have more experience and stand behind the treatments...I'm sure they have some case histories of other lakes in Florida treated in a similar manner,,,

4. There are few other herbicides that I would be confident in working in this situation..

5. Diquat and copper are standard hydrilla treatments in private water,, DEP does not allow copper in public lakes very often as it may affect snails, manatees and snail kites.... and this treatment kills hydrilla very fast,,, and I want to let the hydrilla die and decay over two, three, four weeks to not put oxygen stress on the fish..

6. Fluridone is a choice, and widely used in florida,, but is very slow acting and you would need to apply at least 10-15 ppb and keep it in contact with hydrilla for at least 70-80 days,,, and any leakage or rainfall event and any dilution would have to be accounted for,,, It was suggested that the dam currently leaks about 1 inch of water per day,, well,, in 12 days,, that is 111 acre feet of water lost,, about 9 acre feet per day,, after 60 days,, about half of the herbicide will be down stream and the freshwater will have to be brought up to concentration... In a flowing situation,, this is a chancy application.

7. Imazamox is a growth regulator,, that I discussed with the Board,, and its in the research phases now.. I frankly don't have enough confidence in it yet to recommend you spend your funds in this direction,,, sometimes you don't want to be the first to volunteer and this has only been done in small,, non-flowing lakes..

8. Mechanical harvesting is an option,, it costs about 300\$ per acre to cut each acre and haul to shore one time,, where would the contractor dispose of the hydrilla??? It has no commercial value.. They can do about 10 acres in a 18 hour day,, and cut down to a 7 foot depth,, We did not discuss this a lot,,, the real question,, if they have to haul to dispose,, its a lot more expensive..

I hope this explains in one location my thought process here; however I am sure there are further questions. I would be glad to meet with you to discuss further as you see fit and I hope to be kept abreast of the project as it evolves... Bill h.

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