Lamprecht Consulting

Pond and Lake Management

October 31, 2009

Lake Francis HOA
C/o Mark deOgburn
1027 Travers Dr.
Charleston, SC 29412

Dear Mark,

I am writing in reference to my September 12th inspection of Lake Francis. This year I was able to visit the lake in the early morning, during a season of the year when oxygen levels typically fall to their lowest point. During the day, oxygen levels will also fluctuate, with the lowest readings occurring at dawn and the highest at sunset. I was able to conduct this year's oxygen profile before 9:30 am, when oxygen levels should be close to their lowest levels.

The two shallow and narrow arms of the lake had oxygen readings of less than 3mg/l (< 50% saturation). These readings seem low given the surface to volume ratio, but remember that these canals remain in shade until mid day and relatively little oxygen is produced until then. Also, the surface of the canals is not disturbed by waves, which reduces diffusion of oxygen into the water when saturation is less than 100%. In spite of this long diatribe, I see no reason for concern.

The main body of the lake was in better shape than what we have observed in the past. Surface oxygen levels in sunny areas were 5mg/l (~70% saturation), which is more than adequate for an early morning reading. While the oxygen readings declined with depth, there was more oxygen at greater depth, reducing the volume of extremely low oxygen. In other words, there was a greater volume of water that was available as fish habitat. I find this encouraging. *Why are things different?* My conjecture would be that clearer water has allowed light to penetrate to a greater depth, allowing more photosynthetic oxygen production at these depths.

The salinity level was back up to 3.3 ppt. We have had several unusual high tide events this spring and summer, which may help explain this return to a higher salinity level. Last year's October measurements approached 0 after a major rain event. Suffice it to say, the fluctuation in salinity should not be a concern.

The grass carp are doing their job. No submerged plant problems were in evidence. A small amount of alligator weed (white flowers) is growing in along the shoreline in one small canal. When I observed it, it was not healthy, having been infested with alligator wee flea beetles. Alligator weed is not considered to be the problem that it once was, because of the presence of flea beetles in coastal SC and because there are now several approved aquatic herbicides that work well on it. Grass carp don't do a great job controlling alligator weed, but I don't see this plant causing major problems. If you observe significant expansion next year, I suggest hiring a licensed applicator to spray it.

Significant weed problems exist in upstream lakes across Harbor View, which could serve and have served to infect Lake Francis. This is just another reason to maintain a prophylactic presence of grass carp. Consider your next maintenance stocking in 3 years.

The threat of a low oxygen fish kill has been reduced because of better oxygen levels at depth. I still would remain mindful of the potential deleterious effects of summer mixing of the deep water arm of the lake. De-stratification of this section of the lake with air driven circulators is probably the most economical approach to reducing the volume of low oxygen water that can produce fish kills when mixed by storm events. Increased storm water runoff should be expected to increase the occurrence of mixing events in Lake Francis. Any alteration of the present storm water runoff system should be carefully scrutinized and mitigation should be pursued.

Regards,

Scott Lamprecht
Fisheries Biologist