

Lamprecht Consulting

Pond and Lake Management

December 29, 2010

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

Dear Mark,

I am writing in reference to my October 2 inspection of Lake Francis. This year's inspection occurred later in the season than last year and it followed a significant rain event. Night time air temperature lows had already started to lower the surface water temperature and I was able to take all my oxygen measures before noon.

We had spoken earlier in the summer about the increased level of alligator weed that had occurred throughout the lake this summer. As illustrated by the presence of alligator weed, grass carp do little to control it. Natural control has been attained in recent years by a tropical beetle that is specific to alligator weed; the alligator weed flea beetle. However, last winter's low temperatures all but eliminated the over-wintering beetles locally and even in Florida. Consequently, this wide spread exotic weed has flourished all over the low country. It roots on the bank and grows out over the surface of the water and can be controlled by manual removal. It is affected by salinities in excess of 5ppt, but when the salinity falls back the plant sprouts new growth. There are approved aquatic herbicides that do a good job on alligator weed, but they must be applied by approved aquatic applicators in all community pond situations. I did not see a huge problem on Lake Francis, but it does harbor other problematic plants. Continue to maintain the alligator weed with manual removal, salinity manipulation, and a higher level of grass carp. The first two recommendations are directly related to controlling the alligator weed, while the last is directed at controlling the other plants that may be sheltered by the alligator weed (ex. Duck weed). In addition, I have requested that Lake Francis be used as a central restocking site for alligator weed flea beetles, if and when they are restocked in South Carolina.

Oxygen readings in the shallow arms of the lake were less than ideal, but not at levels that should cause concern. The arm to the left of your house had 10 am oxygen readings of 2.25mg/l at a temperature of 24.7 C (< 40% saturation, salinity 3ppt). The other shallow areas of the lake were had oxygen readings that were 1.5 to 2.2 times higher, with similar temperature and salinity readings. None of this is alarming and if I came back later in the afternoon or on another day, I would expect to find much higher readings. It was interesting to note an increase in readings as I progressed from the left of your home across the main body of the lake, though I cannot attribute any significance to this phenomenon.

The deep arm of the lake continues to be a source of interest to me. As in the past, there were two distinct water layers. Usually this layering effect is produced by water density differences created by temperature, with a warm layer situated over a cooler layer. During my visit the upper layer

had a temperature of 25.4 C while the lower layer, 10' down, had a temperature of 27.1 C. Clearly, stratification was not temperature related and look at salinity showed a ~3ppt in the upper layer and ~6ppt in the lower. As one would anticipate the oxygen reading in the upper layer ranged from 7mg/l at the surface down to 4mg/l at 9' then fell to ~ 0 below 10' of depth. I don't know how strong this salinity related stratification is and I would be interested in seeing if it holds up during the winter months. I have been postponing this correspondence in hopes of revisiting the lake during the winter months, but I doubt any additional observations would affect your approach to managing the lake in 2011.

In general, the lake appears to be in good shape with the exception of the resurgence of alligator weed. The lake continues to function in a health fashion providing fishing opportunities and being an asset to the community's homeowners. After several years of general improvement, I would give the health of the lake the same grade as 2009.

Things to watch out for in 2011 include the obvious, alligator weed and the problem plants it harbors. Remember that the upstream lakes are a source of problem plants and you need to stay vigilant to stay ahead of the potential problems. I would recommend stocking additional grass carp; no more than 5 per acre. This would be cheap insurance against the reestablishment noxious weed problems.

I am still concerned about the deep arm of the lake. The threat of a low oxygen fish kill has been reduced because of better oxygen levels at depth, but I would still remain mindful of the potential negative effects of summer mixing of the deep water arm of the lake. De-stratification of this section of the lake will reduce the volume of low oxygen water that can produce fish kills when mixed by storm events. I hadn't thought much of the prophylactic use of fire truck pumping to improve oxygen levels (non-emergency use), but perhaps it may have helped thoroughly mix the water column and deterred salinity stratification.

Continue to do what you-all have been doing, with consideration towards the suggestions made in the above text.

Regards,

Scott Lamprecht
Fisheries Biologist