

Lake Restoration Research

There have been some concerns raised with the amount of muck, water quality and use of herbicide for weed control on the West end of the lake from homeowners, WCID board members and FPPOA board members. Due to the concerns, a few homeowners and board members have been researching ways to address the muck, water quality and weed control. We have contacted 2 companies for advice on ways to improve our lake. We have setup meetings with the company Clean-Flo and The Pond Guy. Both companies gave good advice for our lake. Both Clean-Flo and The Pond Guy recommended adding an aeration system to our lake.

Over time organic debris begins to accumulate and the lake becomes overabundant with nutrients. These excess nutrients become an effective plant fertilizer, causing weeds and algae to grow prolifically. You may begin to notice emergent weeds, like cattails and shoreline grasses, growing along the shoreline and a foul smell emanating from the water. The WCID board has used an aquatic herbicide to try and control the existing growth. These herbicide treatments provide a temporary fix to weed and algae control. Not only is the herbicide a temporary fix for weed control. The decaying plant material turns into nutrient-rich lake muck that continues to fuel weed and algae growth. The lake then enters a continuous cycle of reactive treatments to use more chemicals to control growth.

Muck is made up of plant and animal waste. It is caused from dying and decaying organics. The muck produces nitrogen and phosphates in the soil. The nitrogen and phosphates are an excellent source of food for weeds. Increasing nitrogen and phosphates in the lake contribute to low levels of oxygen in the water keeping it cooler on the bottom and warmer on top. As the seasons change the water in the lake will turnover causing the less oxygenated water to mix oxygenated water that can lead to "winter fish kills" and poor water quality. As the dissolved oxygen levels continue to decline, the bacteria that eat the muck will also decline without oxygen to live on. This process adds to the muck and weed control problem.

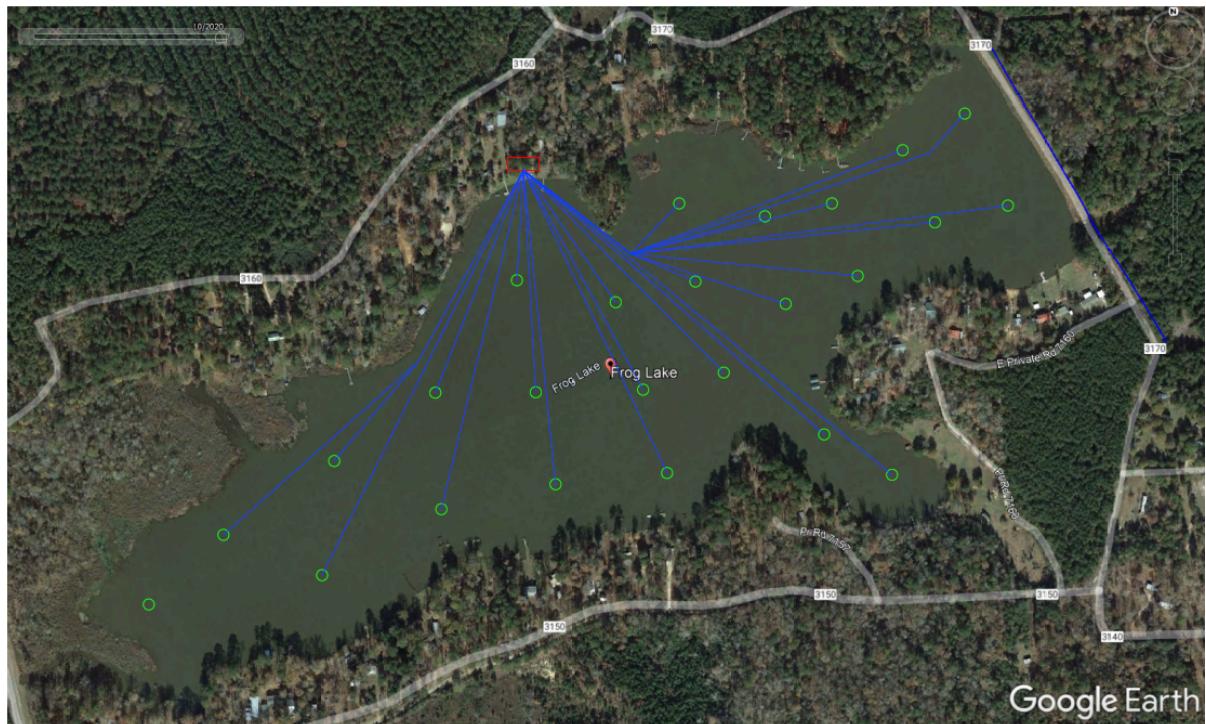
For these reasons, both Clean-Flo and The Pond Guy recommend adding aeration systems to the lake to increase the dissolved oxygen levels in the lake. Increasing the dissolved oxygen levels in the lake will allow the bacteria that eats the muck to flourish. Increasing the good bacteria that eats the muck helps to reduce the muck and is food for larger insects that eat the bacteria. The insects grow larger and are food for the fish. The increased oxygen level and larger amount of food source for the fish allows for a more productive fish population. Adding an aeration system helps with:

1. Aeration reduces lake muck
2. Aeration improves water quality
3. Aeration boosts dissolved oxygen levels
4. Aeration reduces the risk of a fish kill

Both Clean-Flo and The Pond Guy recommended a full lake aeration system. They do not recommend using Muck pellets without the aeration system. The muck pellets contain the aerobic bacteria (good bacteria that eats the muck). If the bacteria does not have enough oxygen, the bacteria will not be effective and the cost of continually treating the lake with muck pellets would be cost prohibitive.

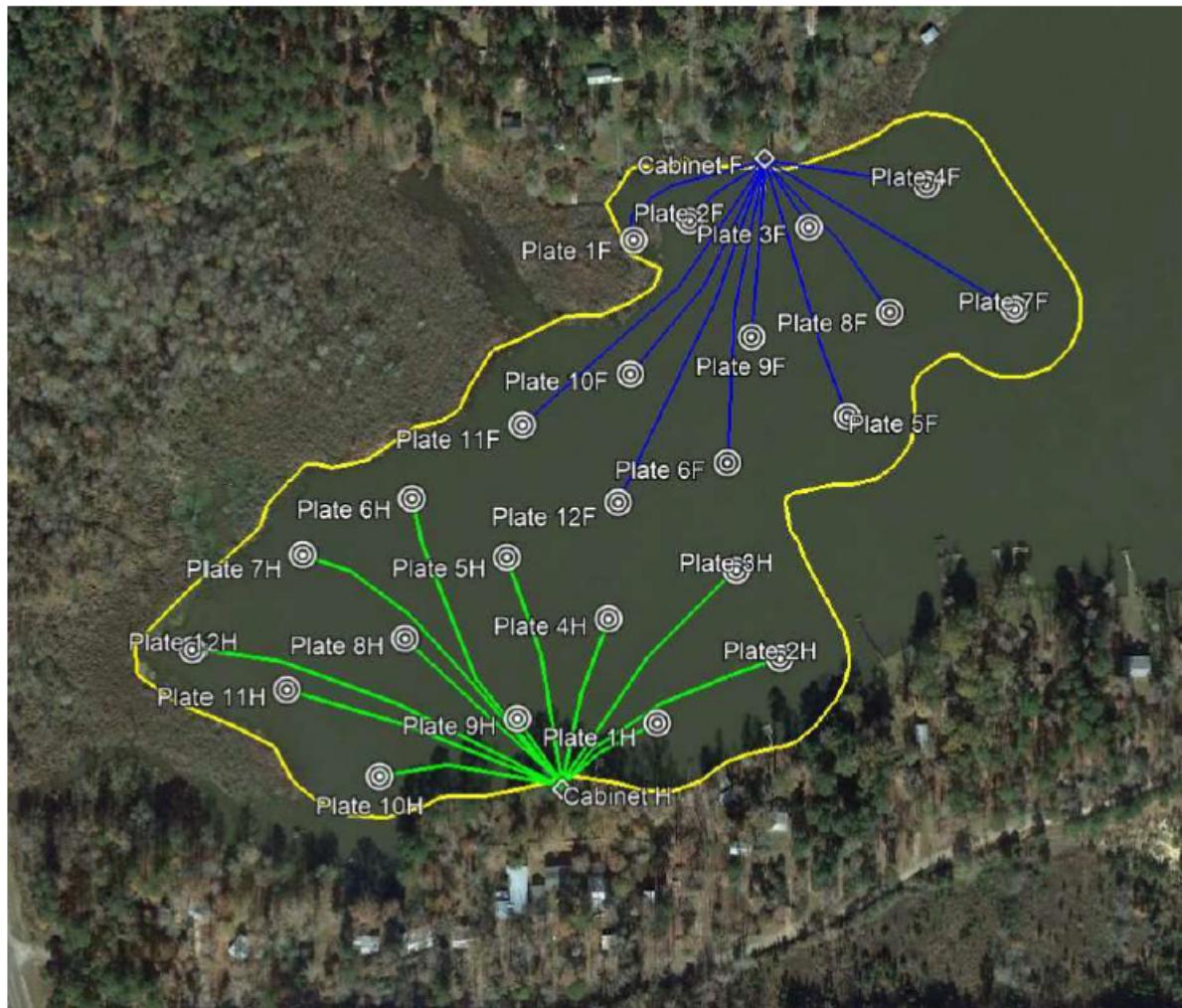
Below are some quotes that have been listed out for an aeration system and muck control pellets. The Clean-Flo quote is for a full lake aeration system. We had asked The Pond Guy to reduce the full lake aeration system. The Pond Guy recommended placing aeration system in the problem areas of the lake. They recommended adding the aeration to the west end of the lake to get started. The quote from the Pond Guy is only for an aeration system on the West end of the lake.

1. Clean-Flo Full lake aeration system quote



The system would consist of a single compressor with 13 hp motor. It would be installed in an 8' x 8' shed or similar enclosure (excluded from Clean-Flo's scope). There would be 25 12-inch diffuses distributed throughout the lake, connected to the compressor with 5/8" self-sinking airline. We recommend that a season program of bio augmentation be followed in addition to installing and operating the diffusion system. A preliminary system layout is attached. The total cost for the aeration system was a little over \$100,000 dollars and the bio augmentation was around \$25,000 dollars per year.

2. The Pond Guy also recommended aeration with addition of muck pellets to clean up the lake. The Pond Guy aeration system quote for the west end of the lake



System 1 of 2

Airmax® LakeSeries™ LS120 Aeration
System

The Pond Guy aeration system was also around \$100,000 dollars. There is roughly 24 surface acres on the west end of the lake. The muck pellets from the Pond Guy is \$250.00 per surface acre. The muck pellets are to be applied once a month. The cost would be \$6000.00 per month for the muck pellets for the entire lake

3. AquaTech was the third company that we had asked for quotes to cleanup the lake. AquaTech recommended muck pellets only. This quote is for the west end of the lake only. This quantity is good for the initial treatment and then a reduced amount would need to be applied monthly. The quote for the initial treatment was around \$18,000 dollars and then \$6,000 dollars per month for additional treatments.

Solar Panel Aeration System

All 3 of the quotes that we received are too much money for our community to be able to afford. Each of the companies recommendations provided good information and I am sure the systems that they quoted would work extremely well. The Frog Pond Lake WCID board had voted to try installing a smaller less expensive system to try to restore the lake in increments. The board had voted to spend a thousand dollars to install a solar aerator system with 4 diffusers on the west end of the lake at the September 24, 2022 meeting.

The system was assembled and installed on November 12, 2022. There are some pictures of the assembly and installation of the system posted on the FFPPOA website in the November 2022 newsletter. <https://frogpondlake.com/>

Many thanks to the team that installed the solar aeration system

- Cris Thompson
- Greg Thompson
- Buck Johnson
- Tool
- Greg Askew
- Kirby Hood