

Buckeye Lake diving into causes of algae problems

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By Matt Reese

Unfortunately, the problem is not a unique one, but the Buckeye Lake community in Fairfield, Licking and Perry Counties has come up with a unique approach to address the challenge of toxic algal blooms that are plaguing many Ohio lakes.

“We have been studying the watershed now for around eight years with the Fairfield County Soil and Water Conservation District, ODNR, Extension, the Ohio Department of Agriculture, and the Ohio EPA trying to understand better what is causing the nutrient increase in Buckeye Lake. As we read the studies that were done in 1930 and in 1973, we discovered that this is not a new situation,” said Merv Bartholow, a director of the Buckeye Lake for Tomorrow (BLT) watershed management group. “It has always been hypereutrophic, it has always been high in nutrients, it has always had blue green algae in it, and it has always had microcystin in it at varying levels. None of that has changed, but we are seeing the higher readings in the toxins than we have in the past. Each year it has been going up.”

And, over the same time frame, other traditional sources of nutrients have improved in the watershed.

“A couple of things have changed in the positive including wastewater treatment plants discharging at far lower levels than what they were discharging 40 years ago. Our plants are discharging about 50% of what the Ohio EPA permits,” Bartholow said. “There are no longer outhouses or septic tanks around the lake. And, farmers are doing a much better job with controlling the fertilizer than they were 40 years ago.”

To get some answers, the Buckeye Lake community and BLT undertook an incredible project to assess every source of water flowing into the shallow former canal feeder lake in the roughly 41-square-mile watershed. The comprehensive approach including the review of every water course and its origins, tile, log jams, erosion, culverts, along with edge of field study with cover crops, soil sampling using GPS on five acre units on six month intervals, sampling lawns and golf courses, parks, and sediments may be the first of its kind in the nation. The survey complimented ongoing sampling of stream tributaries and sediments the stream channels, and sampling in the lake. Jonathan Ferbrache, with the Fairfield Soil and Water Conservation District, headed up the project.

“We have done some things at Buckeye Lake that no one else has done and Jonathan Ferbrache is the real hero in this. He walked every step of every mile of every tributary that runs into this lake, all 77 miles of it. He and an intern did that in 2012 and 2013. Jonathan knows personally the conditions in all of these streambeds,” Bartholow said. “For the most part, the streambeds are in pretty good condition, though there are a few spots with some work that needs to be done. With GPS, he located every single field tile that flows into every single creek that flows into Buckeye Lake. He has them all identified. He knows which tile lines work and which do not. He knows what fields they come from, what is being grown in those fields and whether they are using manure or commercial fertilizer.”

The extensive land survey found some surprising results.

“They found pockets of high levels of nitrates that appear to be coming from old abandoned gas wells that are being fed to the surface through artesian wells,” Bartholow said. “We received a grant from the Ohio Farm Bureau to do a study of phosphorus content in the streams at rain events up near the headwaters of each stream. We wanted to specifically find where high phosphorus content was coming from. We were

able to identify specific fields where high phosphorus levels were entering the water and identify why. Then we went to the landowners or farmers and looked for ways to help them improve that and we are having great success there. We are also working on in-stream sediment traps and in-stream wetlands. We think farmers are doing a pretty good job as it is, but we are trying to improve on that.”

The highest levels of phosphorus coming from fields were found in EPA permitted sludge sites. Some fields were getting multiple applications in the same year and now the applications will likely be every three years.

BLT has also addressed other significant contributors to the problem by working to reduce the carp population in the lake, reduce the [Canada goose problems](#), encourage property owners to avoid lawn fertilizers that include phosphorus, encourage additional agricultural conservation practices, and implement various bioremediation techniques.

In addition, BLT is working on a massive dredging project for the lake.

“With the exception of two or three rain events during the year, the quality of the water coming into the lake most of the time is better quality than the water already in the lake. We think the problem is in the sediment itself in the lake,” he said. “We think it is 160 years of sediment accumulation and we are working with ODNR to increase the capability to dredge the lake to improve the navigation on the lake and improve the nutrient level by removing a good deal of the sediment.”

The sediment is taken out of the lake with a suction dredge.

“The material is 50% water and 50% mud. It is a liquid slurry that can be pumped up to a mile away. We

are working with area farmers and landowners to give us permission with compensation to create dredge material relocation areas away from the lake. These holding areas are basically small ponds,” Bartholow said. “It is left to dewater so the water content is low enough that it can be handled and moved to spread on fields or sold to other farmers or landscapers. The dirt is extremely high in nutrients so it is a valuable product, but it needs to be worked into the soil, otherwise it is too organic. It is great for growing corn and soybeans. We have had a wonderful response from local landowners on the retention areas.”

Thanks to the community wide effort, BLT is hoping Buckeye Lake will make real progress on addressing the increasingly vexing issue of toxic algal blooms, and maybe serve as a model for larger scale statewide efforts. Ultimately, the community problem requires community solutions, as pointed out in the final paragraph of the project summary: “There are small contributions from each acre of the 41-square-mile watershed. The impacts on water quality began 180 years ago with the construction of the canals. Everyone within the Buckeye Lake Nutrient Reduction Project watershed needs to assess their own current impact, no matter how small.”



EPA allowed the group to conduct three borings downstream of the largest livestock operation in the watershed to make sure the manure lagoon was not leaking in November 2013.