

Controlling Algae in Shadow Wood Ponds

Introduction

There are 153 ponds in Shadow Wood covering an estimated 436 acres. Overflow water from the Shadow Wood ponds leaves the property at three locations and eventually drains into Estero Bay. In 2011, the Conservancy of Southwest Florida rated the water quality of Estero Bay a “D” and noted the bay is showing impact of human activity and the influx of new residents. The Health, Safety, Environmental & Transportation / Training (HSET) Committee has conducted a review of the current methods used for algae control at Shadow Wood to: 1) identify improvements to current methods, and 2) investigate the viability of alternatives.

In Southwest Florida, aquatic algae begin to grow rapidly in early spring. Growth continues through the summer and fall with initial development in shallow, still waters. Aquatic algae are primitive plants with no true roots, stems or leaves. Pond algae are found floating on the surface of the water or attached to other plants, bottom sediments or substrates. Of the thousands of algae species, many are beneficial in moderation because they consume carbon dioxide and produce oxygen. If left unmanaged, large algal blooms will quickly develop and aggregate into unsightly mats or clumps. When the algae dies or is killed, the resulting decomposition will consume much of the oxygen, resulting in fish kills. Our ponds are especially vulnerable because the water contains two key algal nutrients, inorganic phosphates and nitrogen. Both originate from natural sources and fertilizer run-off.

Current Control Methods

Minimizing nutrient intrusion is one of the most practical ways to reduce algal growth. However, it is very difficult to manage fertilizer runoff because it requires the coordination of multiple parties, including homeowners, lawn contractors, community associations, and golf course operations. Most Florida groundwater also naturally contains phosphates.

The Lee County Fertilizer Ordinance (which became effective on May 13, 2009) was an attempt to reduce nutrient run-off attributed to fertilizers. Some feel that it has had the opposite effect by encouraging heavy fertilization just before and immediately after the prohibitions are in force (June 1 and September 30). Heavy fertilization may increase nutrient loads in the ponds and promote algal blooms.

Community Development Districts CDD I and CDD II have developed an algae management program with their lake management contractor that seems to strike an effective balance between the competing objectives of aesthetics, environmental responsibility, and cost. For the most part, algal growth has been well managed. The oxygen level in the ponds is reported to be nearly 8 parts per million (ppm), which is optimal for overall pond and fish health. The ponds are checked for algae weekly or biweekly. Shadow Wood homeowners can report algal blooms by calling Cleo Crisman, Operations Manager for the CDD's at 239-498-9020.

At this time, there are no known regulations or permits required for treatment of private ponds such as those in Shadow Wood and other Brooks communities. The contractors hired by the CDD's endeavor to chemically treat each visual appearance of algae well before it becomes problematic.

Copper sulfate is the primary algaecide used in our management program. It is applied topically as a dilute water spray solution where algae have been observed. Depending on the severity, dosages can range from 0.25 ppm to 2.0 ppm. To minimize the overall dosage effect, no more than half of the surface of each pond is treated during each application. Our ponds average about six feet in depth – one part per million is equal to 2.7 pounds per acre-foot (the volume of water found in an area 1 acre x 1 foot deep).

A more expensive form of copper algaecide is chelated copper or copper ethanolamine (trade name Cutrine Plus). It is reported to be more effective than copper sulfate on certain difficult types of algae. Fluridone (trade name Sonar) distributed by Sepro Corporation, is infrequently used for aquatic weed control. Peroxides (trade name Green Clean Pro) and Hydrothol 191 have also been evaluated but have been found to have limited utility.

Two other factors seem to help with algae control in the Shadow Wood ponds: mechanical bubbler type aerators and an abundance of algae eating fish – Blue Tilapia. The CDD's and their contractor maintain approximately 80 aerators in The Brooks Ponds. These help immensely in keeping the dissolved oxygen concentration elevated. They may also depress algal growth somewhat by creating turbulence. Tilapias are vegetarians and will consume algae. However, they are also suspected of crowding out our main game fish, the Large Mouth Bass. The Tilapia proliferates so strongly that it would be extremely difficult to eliminate them completely.

Alternate Methods

Members of the HSET Committee and SWCA staff have reviewed the following algae control methods suggested in the literature and have discussed these options with Dr. Tim Durham at FGCU and officials at Lee County Cooperative Extension. All of these alternate methods appear to have limited effectiveness and are more expensive than our current program.

Dyes are used to shade out the photosynthetic spectrum and effectively starve the algae. They appear to work in deep water but not on shallow littoral zones where the greatest need exists. The current contractor has tried this method but received complaints about the color of the water.

Barley Straw reportedly releases a compound during decomposition that enhances growth of antagonistic bacteria that directly compete with algae. The literature reports very few successful tests. Those that do claim success require very large amounts of straw that is effective only in northern cold water lakes.

Bacterial Inoculum and Animal Feed Grade Cornmeal are other types of biocontrol products similar in concept to barley straw. They are reported to boost antagonistic bacteria. No significant effects have been shown on algal populations.

Aluminum Sulfate and Sodium Aluminate are expected to reduce the concentrations of phosphates by chemical precipitation. Very little data is available, but the chemistry is valid, especially for high alkalinity, hard water commonly found in The Brooks. It is probably more costly than current methods but might be a practical supplement worthy of additional investigation.

Proprietary Algaecides are various products promoted by manufacturers, distributors, and service companies, mostly for use in small ponds or swimming pools. All appear to be very expensive for use in large ponds and many contain copper in some form, and thus would simply be a more expensive source of copper than that already being used.

Suggestions to Protect Our Ponds and Limit Algal Growth

When available, use slow release fertilizers. These are designed to provide a metered feed to turf, without the short term “flushes” of nutrients that encourage algal blooms.

Do not apply fertilizers on turf or on landscape plants that are within ten feet from the top of the slope to the edge of a pond, or on impervious surfaces such as sidewalks or driveways.

Keep nutrients out of the ponds by hiring only certified professional landscapers (Lee County registration decal displayed on all vehicles) who have been properly trained.

Instruct landscapers to leave a collar of uncut grass or taller plants and vegetation along the edges of ponds to help filter out pesticides and fertilizers.

Many thanks to Dr. Tim Durham of Florida Gulf Coast University (FGCU), The Brooks Community Development Districts (CDD & CDD II), Shadow Wood Community Association (SWCA) and members of the Health, Safety, Environmental Transportation / Training (HSET) Committee for reviewing this fact sheet and providing additional information.

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