AQUAGUIDE

Missouri Department of Conservation

Algae Control in Ponds and Lakes

Aquatic plants are a beneficial and necessary part of Missouri ponds and lakes. Without them, most other organisms cannot survive. Plants keep the water oxygenated, provide food, cover and nesting sites, and stabilize the shoreline and pond bottom.

Ideally, 10 to 20 percent of a pond's bottom and surface should have aquatic plants. If more than 20 percent of the pond has aquatic plants, or if aquatic vegetation is interfering with some pond uses, mechanical, biological, or chemical control methods should be considered. Refer to our publication "Nuisance Aquatic Plants in Missouri Ponds and Lakes" for more information on aquatic vegetation.

What are Algae?

Algae are primitive aquatic plants common to virtually all Missouri waters. These simple plants differ from other plants by lacking true stems, leaves or roots. Algae are a basic component of a complex aquatic food web, converting the sun's energy into a form useful to other aquatic life. Algae are also a primary source of dissolved oxygen, which is a byproduct of their energy production. Algae occur in three basic forms: planktonic, filamentous and macrophytic.

Planktonic algae are single-celled, microscopic plants that float freely in the water. When these plants are extremely abundant or "bloom," they make the pond water turn green. Less often, they can turn the water other colors, including yellow, gray, brown or red.

Filamentous algae are sometimes referred to as "pond moss" or "pond scum." Filamentous algae occur as fine green threads that form floating mats, which are often moved around the pond by wind. This type of algae is also commonly found attached to rocks, submerged trees, other aquatic plants and boat docks.

Macrophytic algae resemble true plants in that they appear to have stems and leaves, and are attached to the bottom. The most commonly occurring macrophytic algae in Missouri is called chara or musk grass (due to its strong musky odor). Chara feels coarse to the touch, because of lime (calcium carbonate) deposits on its surface, earning it another common name—stonewort.

Algae Problems

Too much algae can cause taste and odor problems in drinking water and sometimes even fish kills are associated with excessive blooms of planktonic algae. Filamentous algae and macrophytic algae often form dense growths that make fishing, swimming and other recreational uses nearly impossible. Total coverage can restrict sunlight penetration and limit the production of oxygen and food items necessary for good fish growth. Sometimes certain

types of algae called blue-green algae or cyanobacteria can produce toxins that can cause illness in humans and even death in animals. When algae abundance interferes with the intended use of the pond, a control method should be considered.

Mechanical Control

Manual

Mats of filamentous algae may be removed with a rake, seine, wire screen or similar devices. Mats of filamentous algae may be removed with a rake, seine, wire screen or similar devices. However, this control method is very labor intensive and provides only temporary control. In some instances, the algae may seem to grow as fast as it is pulled out. Mechanical control is practical when used in conjunction with chemical control methods or as a maintenance treatment around swimming or fishing areas for an occasional special event. Algae removed from the pond should be deposited below the pond's dam to ensure that nutrients tied up in the vegetation do not re-enter the pond. Algal surface scums can sometimes be controlled with a water pump that circulates the top layer of water in the pond.

Biological Control

Grass Carp (*Ctenopharyngodon idella*)

The grass carp (or white amur) is a plant eating member of the minnow family. Small grass carp will eat algae, but quickly change over to other plants as they age and grow larger. Because of this, they are not effective control of algae.

Chemical Control

ALWAYS READ AND FOLLOW THE PRODUCT LABEL FOR PRECAUTIONS, DIRECTIONS, RESTRICTIONS AND WARNINGS.

Herbicide Use Considerations

1. Proper identification of aquatic plants is critical prior to applying herbicide as different aquatic plants require different herbicides for control.
2. Herbicides rarely eradicate aquatic plants and usually provide temporary control. Retreatment each year might be necessary to control the nuisance vegetation.
3. Read herbicide label for personal protective equipment needed, and restrictions associated with watering livestock, swimming, or irrigation and proper application techniques.
4. Treat the target aquatic plants when they are actively growing, and water temperatures are between 65°F and 80°F. (Typically mid-May through late-June)
5. Treat no more than one-third of the target aquatic plants at 10-day to two-week interval. Dying and decaying aquatic plants remove dissolved oxygen from the water through decomposition. A possible fish kill could result if too much of the target aquatic plant is treated at once.
6. Some herbicides require the use of another product called a surfactant in order to be effective. The surfactant, or "sticker" binds the herbicide to the plant leaf and enables it to "work."

Herbicides can be purchased online or from local farm supply stores.

Common Algae and Herbicides that Provide Control

	Copper and Copper Complexes (Algaecides)	Diquat	Endothall	Flumioxazin	Sodium Carbonate Peroxyhydrate
Planktonic Algae	E		G		G
Filamentous Algae	E	G	G	G	G
Macrophytic Algae	E		G		

Notes:

- *Start treating as soon as you notice new growth. The seeds of some plants stay viable for many years.*
- *Using a combination of treatment methods is often the best way for lasting plant control.*
- Algae control with chemicals works best when algae mats are broken up while the chemical is being applied.

For alternate sources of chemicals and more information on treating aquatic plants, contact your local MDC office or visit **mdc.mo.gov**.

Additional Options

If the above approaches do not work for your situation, or to maintain long term control, you might need to reduce nutrient inputs into your pond or lake. The final approach would be a total pond renovation.

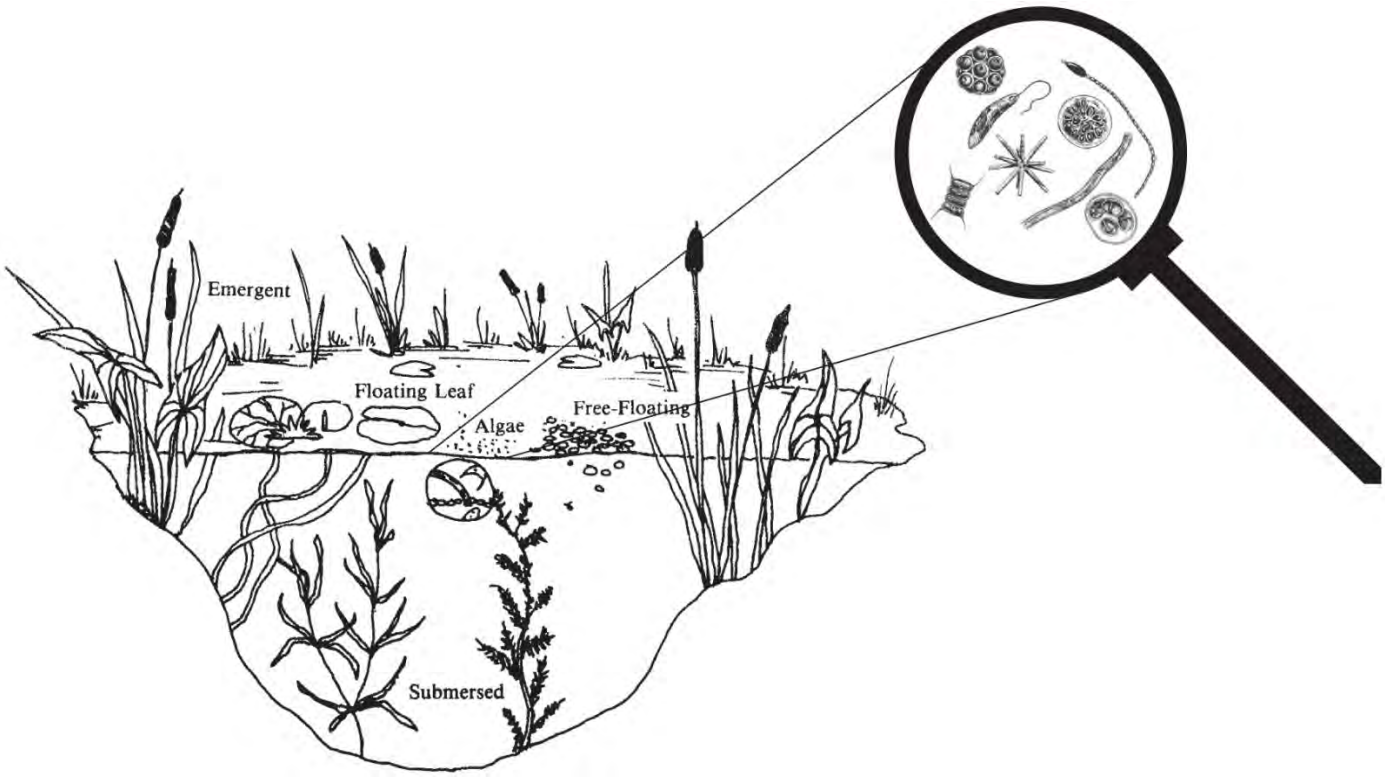
Minimizing Nutrient Inputs

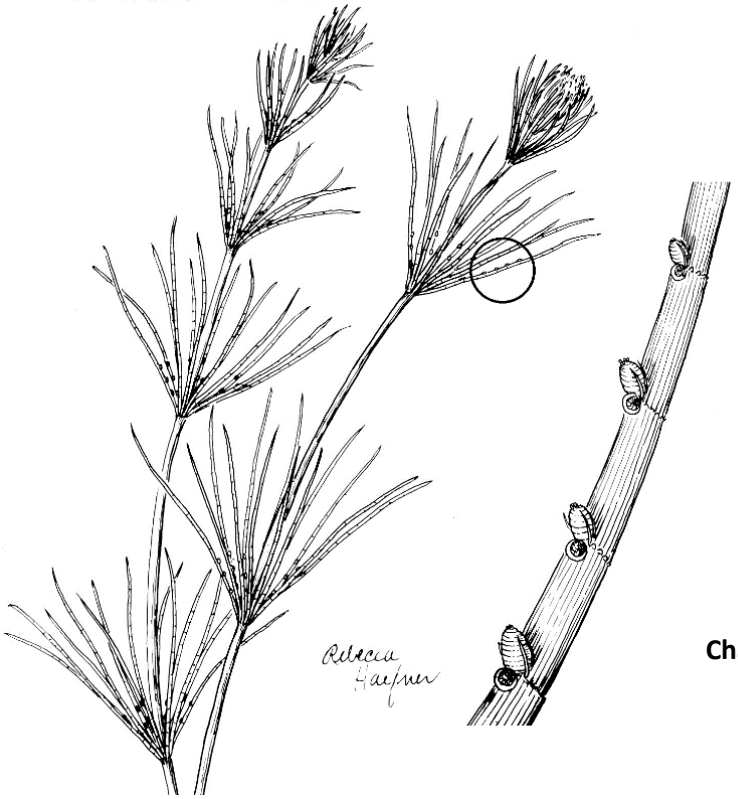
Excess nutrients (nitrogen and phosphorus) should not be allowed to wash into ponds and lakes. Aquatic plants in ponds can grow to nuisance levels in a short time if given the extra nutrients. Sources of nutrients may include runoff from feedlots, fertilized fields or lawns, septic tank seepage, and access by cattle. Nutrients will also accumulate naturally as the pond gets older.

Establishing and maintaining a 100 foot or wider buffer strip of grass and trees around the pond's edge will help filter excess nutrients from runoff water. The construction of small silt retention ponds in the watershed will help settle out nutrients before they enter the pond. Localized nutrient inputs from feedlots or other sources may be avoided by tilling or constructing a water diversion terrace below the nutrient source to direct its runoff away from the pond. Fencing livestock from the pond's edge and watering them from a tank below the dam is also a helpful protective measure. The Natural Resources Conservation Service (NRCS) office for your area can provide information on these and other practices.

Pond Renovation

Draining a pond and drying the basin might be necessary to remove years of sedimentation and accumulation of black muck. This material is a storehouse for nutrients and seeds. Deepening many of the pond's shallow areas to a depth below where light penetrates (3 to 4 feet) may reduce the severity of plant problems. Usually, this technique requires that the water level be drawn down and the pond bottom be allowed to dry enough to allow access for a bulldozer or backhoe. If you can see the bottom of your pond or lake past a depth of five feet, deepening the edges may be impractical as a means of plant control.





Chara *(Chara spp.)*

Determination of Acre-Feet to Calculate Total Amount of Herbicide Needed

If the acreage of the area to be treated is known, the number of acre-feet can be determined by multiplying the number of acres by the average depth (average depth = 1/3 of the maximum depth). For example: A two-acre area is to be treated and has an average depth of three feet. The volume of the water is six acre-feet.

2 acres x 3 feet (average depth) = 6 acre-feet

If the dosage of herbicide recommended is 2 gallons of herbicide per acre-foot, the total herbicide needed would be 12 gallons.

6 acre-feet x 2 gal/acre-foot =12 gallons (total herbicide needed)

If the number of acres is not known, it can be estimated by measuring the number of square feet and dividing by 43,560. The square feet in many cases can be closely approximated by multiplying the average width in feet by the average length in feet. For example: A shoreline area is to be treated. The weeded area is 500 feet long and averages 10 feet wide. The total surface area is 5,000 square feet or 0.115 acres.

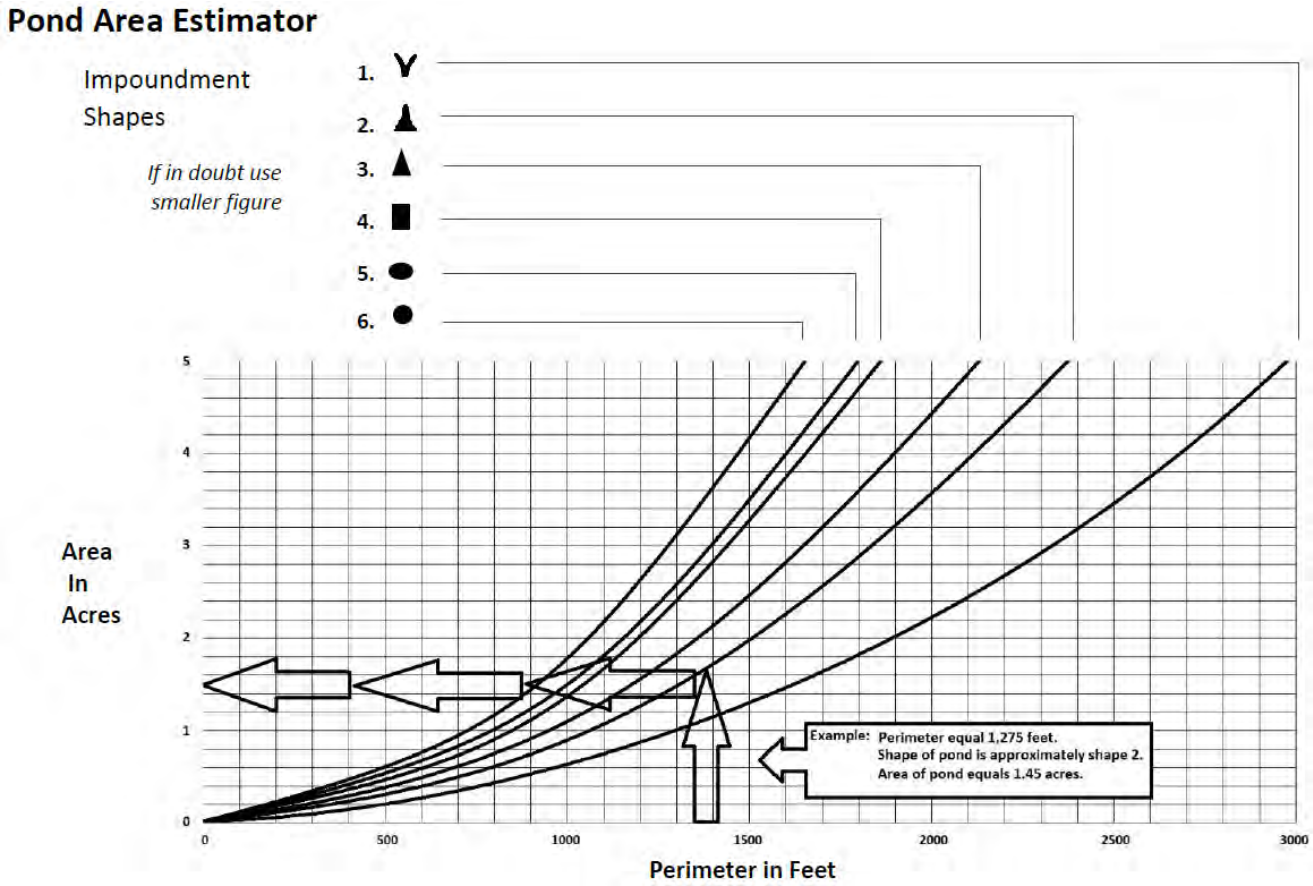
10 feet x 500 feet = 5,000 square feet
5,000 square feet ÷ 43,560 (square feet in an acre) = 0.115 acres

The average depth of water in this shoreline is 1 foot. The total acre-feet is 0.115.

0.115 acres x 1 foot (average depth) = 0.115 acres-feet

If we assume that 4 gal/acre-foot was the recommended dosage, then 0.46 gallons would be needed.

4 gal/acre-foot x 0.115 (acre-feet) = 0.46 gallons (total herbicide needed).



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