

AQUAGUIDE



Missouri Department of Conservation

Grass Carp for Weed Control in Ponds

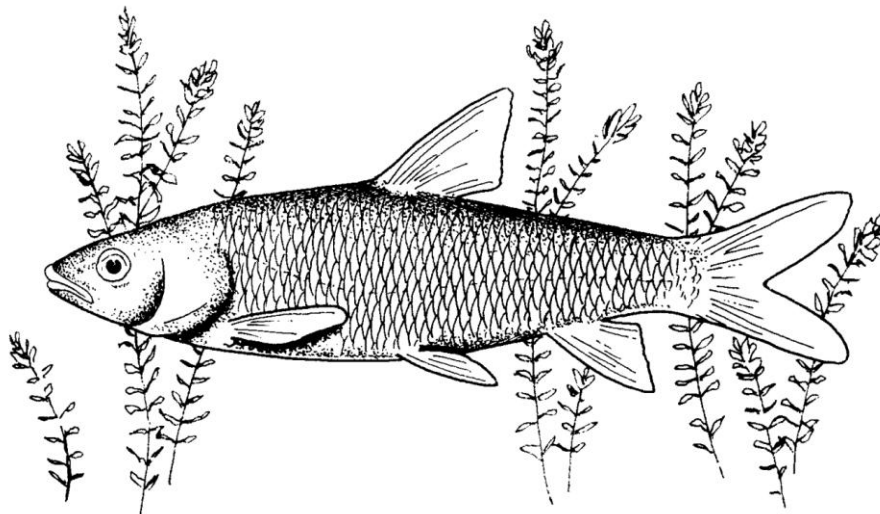
Aquatic plants are a beneficial and necessary part of Missouri ponds and lakes. Without them, most other organisms cannot survive. Plants keep the water oxygenated, provide food, cover and nesting sites, and stabilize the shoreline and pond bottom. These plants are the main food source for tiny invertebrates which are in turn the chief nutrient base of small fishes. They are a vital first link in the food chain that leads through fish to people.

Too Many Weeds

Ideally, 10 to 20 percent of a pond's bottom and surface should have aquatic plants. If more than 20 percent of a pond is plant-covered, there may be reason for concern. Uncontrolled aquatic plant growth interferes with boating, swimming, fishing, irrigation, livestock watering, and most other uses of lakes or ponds.

Aquatic plants can also harm the fishing potential of a body of water. An excess of decaying plants can lower the water's oxygen levels and can kill fish. In some waters, an abundance of aquatic plants overprotects sunfish and other prey species, allowing them to overpopulate and outstrip food supplies which can result in poor growth, or stunting, of the fish.

When aquatic plants hurt, rather than help, a pond, they technically become weeds, and some form of control becomes necessary. Mechanical control of nuisance aquatic plants is effective in some situations but can be labor intensive. Aquatic herbicides are commercially available, but they can be expensive, time consuming with reapplication, and potentially hazardous if misused.



A Biological Alternative

A non-chemical method of nuisance aquatic plant control is possible, thanks to a plant-eating member of the minnow family.

Grass carp is a long, slender, silver-colored fish. This Asian minnow has a terminal mouth (not sucker-like, as does the common carp) and large throat teeth that help it tear and shred plant material.

Grass carp feed almost exclusively on aquatic plants. They can eat 2–3 times their weight each day and may gain 5–10 pounds in a single year. Grass carp can grow up to 100 pounds. The larger they get, the more plant material they consume.

Since grass carp cannot reproduce in ponds and lakes, they are an excellent biological control agent. They can only affect the impoundment during their individual life span. They are usually most effective after their first growing season until around age eight. Due to this growth period, weed decline is usually not apparent in a pond until the end of the second year, depending on the number of fish stocked.

Common aquatic plants eaten by grass carp include:

- Pondweed (*Potamogeton*, *Najas*)
- Milfoil (*Myriophyllum*)
- Coontail (*Ceratophyllum*)
- Waterweed (*Elodea*)
- Muskgrass (*Chara*)
- Cattail (*Typha* spp.)
- Water lilies (*Nymphaea odorata*)

Although grass carp will probably not reduce mature stands of aquatic flora, they may eat the new sprouts and prevent further expansion by these plants.

Stock With Care

Remember that grass carp are an exotic species. Since they cannot reproduce in impoundments, they have a small long-term effect in ponds. However, when released into the flowing waters of a large stream or river, the grass carp can reproduce at an astounding speed. Always take precautions to prevent the carp from escaping the impoundment. This can be as simple as placing a mesh screen across the spillway.

When to Stock

Grass carp should never be stocked as a preventive measure. Introducing grass carp into a new pond before aquatic plants are established can lead to an impoundment stripped of all vegetation, a problem equally as severe as vegetation overgrowth.

Small grass carp will eat filamentous algae (moss) but quickly change over to other aquatic plants as they age and grow larger. Because of this, grass carp are not effective control of algae. Refer to the *Algae Control in Lakes and Ponds* Aquaguide to learn about methods for reducing algae.

How Much to Stock

There are no guidelines for grass carp stocking density rates that will fit all situations. Each pond or lake has its own combination of fertility, water clarity, shallow water, and chemical makeup. Each of these variables affect the number of grass carp required to achieve the level of plant control desired. In addition, different pond owners often desire different amounts of weed control.

The table below suggests an approximate number of grass carp to stock per acre, based upon percentage of weed coverage. These numbers may be modified based upon the variables mentioned above. If in doubt, contact your local MDC office for stocking information specific to your pond or lake.

Percent of plant coverage in lake	Number of carp per acre of water
10–20 percent	mechanical or chemical spot treatment
20–40 percent	2–5 carp
40–60 percent	5–10 carp
more than 60 percent	10–20 carp

Caution: Grass carp can eat beneficial aquatic plants in addition to the nuisance ones. Do not add more than the recommended number for your situation.

What to Stock

The standard recommended size of stocked grass carp is 8–12 inches. Fish at this size are large enough to escape being eaten by bass.

Grass carp may be obtained from Missouri fish producers throughout the state. For the names of nearby grass carp sources, contact your local MDC office or visit mdc.mo.gov.

Monitor Progress

Aquatic plant control with grass carp takes time. Monitor progress by making a simple map of the vegetation when the grass carp are stocked. After three growing seasons, refer to the map you’ve created. If the desired results have not been achieved, you may want to increase the number of grass carp but do not exceed the maximum recommended rate per acre.



Harvesting Grass Carp

There are generally two circumstances that lead to harvesting grass carp from a pond.

1. When nuisance plant growth becomes controlled, particularly in ponds stocked to the maximum density (20 grass carp per acre). Reduce the grass carp by about 50 percent. This prevents overgrazing and the eventual clearing of the pond bottom.
2. When the growth rate of the fish becomes slow. Since grass carp feeding habits decline around age eight, and they cannot reproduce in ponds, older fish need to be removed and restocked with younger fish.

Observations of plant growth and reference to your vegetation map will help determine when restocking is necessary. Before restocking, it is very important that a similar number of fish be removed from the pond. There are several methods of attempting this.

Pole and Line Fishing

Grass carp can be very difficult to catch with a pole and line. They are a very cautious and reclusive fish, preferring to feed unobserved. Their capture makes the effort gratifying due to grass carp being spectacular fighters on a line and very difficult to land.

If you decide to attempt pole and line fishing for grass carp, try first chumming the area to be fished with whole kernel canned corn. Then, fish the area using canned corn, worms, a dough bait with a vegetation base, or pieces of vegetation like lettuce, pea pods, or cherry tomatoes as bait. Remember, grass carp are primarily herbivores, so vegetable baits are the most effective.

Bowfishing

Bowfishing is often an effective method of harvesting grass carp, especially in smaller ponds. If you do not bowhunt, contact a local bowhunter organization for volunteers to remove the excess grass carp. Many bow hunters are eager for the challenge of stalking this wary prey.

Seine nets

Grass carp can be difficult to capture alive because they escape seines by leaping. One of the most effective methods of seining grass carp is to repeatedly bait a small cove. The landowner can block off the cove while the fish are eating, giving them a much smaller area to escape to if they avoid the seine.

If captured alive, grass carp may be stocked into other private waters with weed problems. This method allows landowners to avoid waiting for the fish to reach a large enough size to affect the vegetation.

Eating Grass Carp

Grass carp are considered an excellent food fish worldwide, and often praised for both their flavor and texture.

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

Aquatic plants cannot live without sunlight. The depth to which aquatic plants can grow in a pond or lake is totally dependent on how deep sunlight penetrates. The clearer the water, the deeper plants will grow. 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.

For further information about grass carp for weed control contact your local MDC office or visit mdc.mo.gov.

Estimating Pond Area

Steps for determining the approximate acreage of an impoundment.

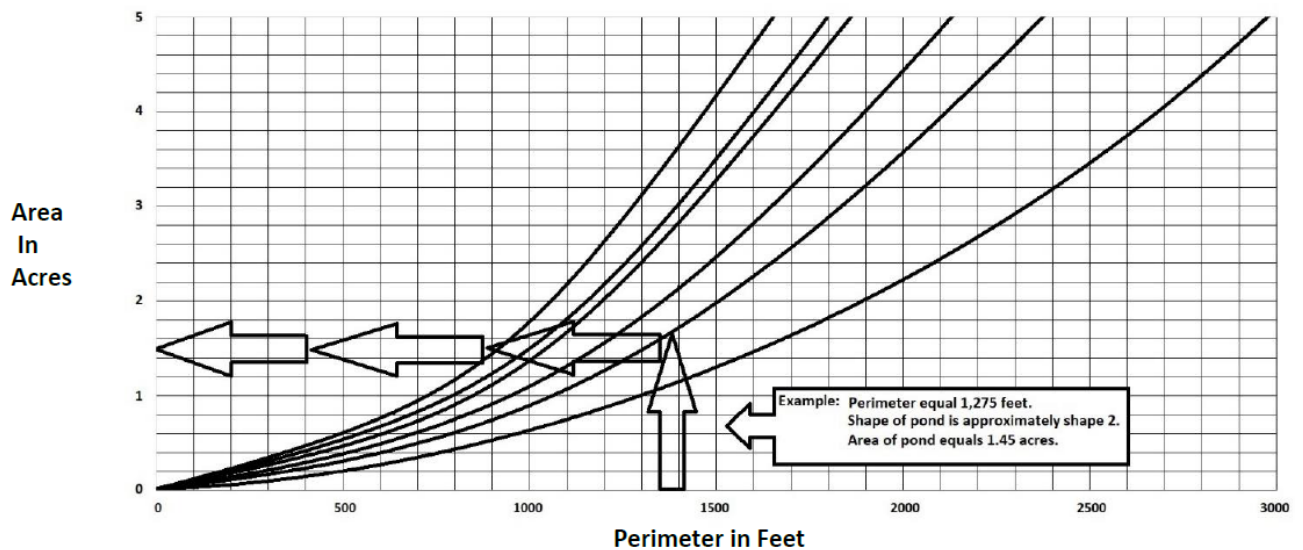
1. Pace off the shoreline.
2. Multiply the number of steps paced by the average length of your stride (usually somewhere between 1.5 and 3 feet). This number is the perimeter in feet of the impoundment.
3. Find the perimeter in feet on the chart and follow that line up to the intersection point with the line corresponding to the pond shape.
4. Look at the number directly to the left of this intersection point. That will be the approximate acreage of the pond.

Pond Area Estimator

Impoundment
Shapes

*If in doubt use
smaller figure*

1. Y
2. ▲
3. ▲
4. ■
5. ●
6. ●





mdc.mo.gov

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