Aquatic plants for ponds and small lakes: benefits and suitable species

Numerous pond owners call, requesting assistance with excessive "moss" (filamentous algae), duckweed, watermeal, and/or algae blooms (planktonic algae). Usually, these plants cause the most problems, in ponds with little or no rooted plants (macrophytes), due to new construction, repeated use of herbicides, or after the wane of a grass carp stocking in which the carp have eaten "all" other aquatic plants.

Why? When desirable rooted plants are absent more nutrients are available for undesirable plant growth! Also, grass carp provide an "allor-nothing" effect. Unless "over-stocked," it does not appear that grass carp are reducing problem plants. When "over-stocked," "all" plants, including filamentous algae will be eaten. Due to the digestive process of grass carp, many nutrients are quickly released back into the water with the carp's waste. These nutrients, along with the nutrients not used by the plants previously eaten, provide a rich environment for other plants to grow. "New" ponds with no rooted plants, or repeated treatments with herbicides, which eliminate plants, can produce similar favorable conditions for these and other nuisance plants to grow!

The plants which grass carp cannot eat, or do not like to eat, will occur as the initial plant problems after the grass carp numbers decrease.

Three-Square Bulrush is a plant with "reedy" or "whip" type stems which are triangular in

Grass carp **DO NOT** eat or control planktonic algae or watermeal. Both plants are too small for grass carp to retain with their gill rakers, which serve as sieves for the food grass carp eat. Even before grass carp numbers begin to decrease, the nutrient rich environment quickly produces a plankton bloom, or occasionally, total coverage of the pond by watermeal.

Phytoplankton blooms (microscopic suspended algae) and watermeal (very tiny floating plants without roots, resembling a green seed) are common causes of summer fish kills. Sunlight penetration into the water is reduced (or eliminated with watermeal) forcing all organisms into the upper, warmer, layer of water where some oxygen may still be produced by planktonic algae, through photosynthesis. Photosynthesis is the production of oxygen and sugars by plants in the presence of sunlight. This warmer water does not naturally hold as much oxygen as cooler water. During the night when all of the animals AND phytoplankton (planktonic algae) need oxygen, the larger animals, primarily fish, die due to insufficient oxygen from competition with the algae. This is often characterized by fish gulping at the surface just before and at sunrise, then the largest of each species of fish dying, including grass carp. On occasion an algae bloom will "die-off", which is followed by the bacterial decomposition of the dead algae. This develops a similar competitive situation for oxygen, in which the fish lose.

Grass carp are not fond of eating **filamentous algae** (green/brown cotton-like mats) or cross section. The leaves have been reduced to a sheath at the base of the stem. The flowers **duckweed** (small floating leaves with hair-like roots). If the pond is in a heavily wooded or otherwise protected area, <u>and</u> subjected to the conditions above (i.e. new, herbicides, carp), duckweed may become a common problem. Otherwise, in an open area, filamentous algae usually becomes a problem under similar conditions. Duckweed can quickly cause a summer fish kill when it covers the pond's surface. If 50% or more of a pond is covered with filamentous algae, a fish kill is possible.

This is when aquatic plants can actually help! If they have not been introduced when the pond is new, a few species of rooted aquatic plants can be beneficial in reducing planktonic algae blooms, filamentous algae, watermeal, and/or duckweed for pond owners. In many cases these beneficial plants can eliminate the need to treat either chemically or biologically for any of these problem plants, especially planktonic and filamentous algae. By out-competing these four problematic type of plants, the beneficial species of aquatic plants will provide: clearer water, reduced shoreline erosion, fish habitat, a wider variety of food items for fish and other organisms, and a fatter wallet for the pond owner. And best of all, not become nuisances themselves! Of course aquatic plants cannot be introduced in the presence of even a few grass carp.

There are three to six species of aquatic plants which are very compatible for pond owners in central Illinois. <u>American Pondweed, Three-</u> <u>Square Bulrush, and Wild Iris</u> are the three most easily recommended species. They <u>generally</u> are presented as brown bullet-shaped structures seated tightly near the tip of the stem. This remain confined to relatively shallow water, do not grow too tall, maintain a relatively kept appearance, and are easily treated or removed if necessary. Softstem Bulrush, Broadleaf Arrowhead, and Wild Celery are additional species which can be recommended to those more interested in wider diversity of plants. These three species grow somewhat deeper than the previous three plants. Softstem Bulrush and Broadleaf Arrowhead get a little taller than Three-Square Bulrush and do not have as "neat" of an appearance. The principle drawback of Wild Celery is that it susceptible to fewer herbicides than many other plants and grass carp do not like to eat it.

American Pondweed produces floating leaves which emerge in late spring. The leaves are spear shaped with the flowers being rather dull small spikes. Usually this species is restricted in its growth to water 3-1/2 feet deep or less. In ponds with steep banks this will keep this plant's growth close to the shoreline so that it is usually not a problem with fishing. On occasion it may grow deeper, especially in very clear ponds like gravel pits, but this is rare. It is easy to remove the plants from an area by hand or with chemicals, or to a small degree control the depth to which they grow with dyes. Local sources of American Pondweed are available, and I provide this species to interested pond or lake owners, annually, in early July. Pondweed established in many local public ponds has eliminated the need to treat for filamentous algae, significantly reducing the costs of maintaining ponds or lakes!

plant is restricted in its growth to water less than eight inches deep. Although growing to 2.5 to 3 feet tall, it keeps a neat growth appearance and does not produce an overly thick stand. Three-Square Bulrush is an excellent shoreline stabilizer.

Wild iris looks very similar to the cultivated "bearded" irises, but with slightly smaller flowers. It develops very showy blue flowers in late spring and early summer. The leaves can reach a height of 3.5 feet making this one of the taller of the



recommended species. Wild iris is restricted to growing primarily on the shoreline. It helps protect the shoreline from erosion while providing valuable aesthetic benefits.

Softstem Bulrush, like Three-Square Bulrush, has "whip" type stems, but they are round in cross section. The flowers are borne as brown bullet-shaped structures on short tassels in clusters near the end of the stem. This plant can grow in water depths up to 12 inches and reaches a height of 3 to 4 feet. Stands can get rather dense, however, it is an excellent shoreline stabilizer, and due to its patchy growth habits, usually does not interfere with fishing. This species is common throughout central Illinois. Softstem Bulrush is easily controlled if needed.

Broadleaf Arrowhead gets its name from the typical shape of leaves. However, the leaves can be quite variable even within a population.

This plant does produce somewhat small, but very showy white flowers. The arrow shaped leaves can reach 4 feet, but usually are around 2.5 feet. Stands can grow rather dense, but usually can be fished over easily. This plant develops a tuber from which new growth develops. Broadleaf Arrowhead is locally abundant in central Illinois.

Wild Celery develops leaves which might remind you of extra-large lawn grasses. The strap-like leaves can reach six inches to 1.5 feet in length. The flowers, borne on a curled stalk, are nondescript, with seed pods resembling small green beans when mature. This plant is a very important food item for ducks, turtles, and other animals. Although reported to grow to 9 feet deep, it does not appear to grow in water much deeper than 1.5 to 2 feet deep in central Illinois. This plant is highly recommended for fish habitat and does not grow out of control in most ponds. I have not seen any potential problems in local lakes where this species has been introduced. The Missouri Department of Conservation recommends this species the most highly of submersed plants.

Unfortunately, most other species of aquatic plants are too aggressive, grow too deep or thick, and/or are too difficult to control in the average pond. For instance, water lilies and American Lotus, have beautiful showy foliage and flowers. However, they can quickly colonize a pond, grow in deep water, and are extremely difficult to control by hand, with herbicides, or grass carp.

Larger ponds or those with steeply sloping shorelines allow more flexibility in choosing

plants. Smaller or shallow, usually older, ponds are much more restricted to what can be planted, without hindering fishing and other activities due to excessive nutrients and shallow water allowing plants to grow further from the shoreline.

Although, these and other plant species can be purchased through mail-order catalogs, this is NOT a recommended way to obtain starts, except with wild celery. Most nurseries are located in Wisconsin, or extreme northern Indiana. The plants stocks these nurseries provide, from much further north, are different genetically than local populations. This is called being of a different "ecotype." Pond owners who have ordered plants from these nurseries have found them to be much more aggressive in spreading. These plants have also retained the shorter growing season of their native area. Although this may not sound like a significant problem, introduction of these genes into local populations could alter the survival or growth characteristics of future generations within a wide area. These plants from different ecotypes may not behave like local populations and are much more likely to become nuisances.

Additional Information:

anonymous. *Aquatic Plants, their identification and management*, Illinois Department of Natural Resources, One Natural Resources Way, Springfield, Illinois 62702. (217)782-6424.

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Whitley, et. al. *Water Plants for Missouri Ponds*, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102. (573)751-4115, ext. 325.

Aquatic, Wetland and Invasive Plant Particulars and Photographs. <u>http://aquatl.ifas.ufl.edu/photos.html</u> University of Florida, Institute of Food and Agricultural Sciences.