



Extension FactSheet

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Benefits and Disadvantages of Aquatic Plants in Ponds

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Aquatic plants are not considered desirable by many pond owners as they are viewed as a nuisance to such pond activities as swimming and fishing. However, all aquatic plants should not be viewed as undesirable, given the benefits they can provide. Many plants are critical to fish and wildlife communities associated with ponds because they provide cover, nesting areas, and food.

Ultimately, whether a plant provides a benefit or is considered a nuisance rests entirely with the pond owner and his/her goals for the pond. For example, a pond owner who desires a high-quality swimming pond often views any aquatic plant as undesirable and may go to great expense to eliminate these plants. Conversely, a pond successfully managed for wildlife will have a variety of aquatic plants present with only a few plant species being considered a nuisance.

The purpose of this fact sheet is to provide pond owners with insight into the value or negative aspects associated with various aquatic plant species.

If control of aquatic vegetation is the desired outcome, Ohio State University Extension Fact Sheets A-3-98, *Controlling Filamentous Algae in Ponds*, and A-4-98, *Chemical Control of Aquatic Plants*, should be obtained and read carefully. The University of Florida's aquatic plant web site at aquat1.ifas.ufl.edu/photos.html provides excellent pictures of most aquatic plants found in Ohio ponds.

Planktonic Algae

These algae are microscopic in size. Planktonic algae assemblages are commonly composed of diatoms, blue-

green algae, and green algae, although other species can be found in Ohio. A better understanding of planktonic algae is available in Ohio State University Fact Sheet A-9-01, *Planktonic Algae in Ponds*.

Benefits

Planktonic algae are the foundation of the aquatic food chain in all ponds and lakes, and their abundance ultimately determines how many pounds of fish, such as largemouth bass and bluegill, can be grown in a pond. Algal abundance is determined by water fertility with higher levels of phosphorus and nitrogen resulting in increased abundance. Higher planktonic algae density enhances food production for fish, making the pond capable of producing more pounds of fish.

As planktonic algae abundance increases, light penetration to deeper water becomes more limited. This, in turn, limits how far from shore submerged aquatic plants and filamentous algae can grow and whether or not they can or will become a nuisance for the owner. As a rule of thumb, water clarity of 24 to 30 inches is desirable for fish production and for limiting other plant species abundances to tolerable levels.

Disadvantages

"Too much of a good thing" certainly can apply to planktonic algae if nutrient levels are too high. These algae can explode in response to high levels of nutrients and literally can turn a pond "pea green," resulting in very low water clarity. In rare instances, pre-dawn oxygen levels can be reduced to lethal levels for aquatic animal life.

The ratio of nitrogen to phosphorus determines whether the planktonic community will be dominated by green algae that are readily eaten by microscopic animals or by blue-green algae that offer less value to the food chain. Low ratios of nitrogen to phosphorus favor blue-green algae rather than the more edible forms of green algae.

Filamentous Algae

Filamentous algae are microscopic algae that form colonies of “filaments” — hence the name. These algae are notorious for forming the large, pillow-like mats of algae that float on the surface of ponds. Common types found in Ohio include *Spirogyra* and *Pithophora*.

Benefits

None in recreational ponds.

Disadvantages

As in the case with planktonic algae, high levels of nutrients can cause filamentous algae abundance to explode, especially in ponds lacking other aquatic plants, becoming so abundant that severe oxygen problems can result in the pre-dawn hours during July and August. Treating a severe filamentous algae problem in summer will almost certainly cause a fish kill. Ohio State University Extension Fact Sheet A-8-01, *Winter and Summer Fish Kills in Ponds*, provides insight into how these types of summer kills occur.

Excessive growth of filamentous algae ruins swimming in many ponds every year. No one enjoys swimming in a pond in which long filaments of algae cling to everything they touch. Additionally, anglers become frustrated with having to remove filamentous algae from their lures after every cast.

Submerged Plants

Submerged aquatic plants are common to most Ohio ponds, unless treatment with a herbicide has occurred or grass carp (white amur) have been stocked. Aquatic plants resemble terrestrial plants in many regards, but lack stem rigidity when removed from the water. Table 1 provides a list of the submerged species that are commonly found in Ohio ponds. Other species may occur in ponds on a limited basis and are not listed.

Benefits

Submerged plants are critical to a well-structured fish assemblage. They not only provide protection for small fish from predators but also produce large numbers of

invertebrates for small fish, such as bluegill, to eat. Research has shown that the optimal abundance of submerged

Table 1. Submerged Aquatic Plant Species Common to Ohio Ponds.

Common Name	Scientific Name
Spiny naiad	<i>Najas minor</i>
Common naiad	<i>Najas flexilis</i>
Southern naiad	<i>Najas guadalupensis</i>
Small pondweed	<i>Potamogeton pusillus</i>
Leafy pondweed	<i>Potamogeton foliosus</i>
Curly leaf pondweed	<i>Potamogeton crispus</i>
Floating-leaf pondweed	<i>Potamogeton nodosus</i>
American elodea	<i>Elodea americanus</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>

plants for largemouth bass-bluegill populations is 15 to 20% of the pond’s surface area. This proportion balances the predator-prey relationship between largemouth bass and bluegill so that both species have all sizes of fish represented in the assemblage.

Submerged plants also are an important food source for many species of waterfowl in the form of vegetation-dwelling invertebrates or the plants themselves. Notable duck species associated with submerged plant beds are blue-winged and green-winged teal, wood duck, gadwalls, American widgeon, and northern shoveler as well as several species of grebes. Many species of herons and egrets hunt the shallow areas of ponds for small fish and frogs where submerged plants occur. A pond managed for wildlife needs submerged plants as a habitat component.

Submerged plants also have an effect on water quality. Their ability to put oxygen into the water is an obvious contribution, but they also provide for long-term storage of nutrients that might otherwise be used to create nuisance levels of planktonic or filamentous algae. Ponds with beds of submerged plants have fewer problems with algae.

Disadvantages

As with all aquatic plants, an excessive amount of submerged plants can cause problems for the pond owner. The exception might be for the dedicated wildlife pond in which no other use is desired. When submerged plants are too abundant, they can cause problems similar to those described for filamentous algae.

Excessive amounts of submerged plants can present a problem for the pond owner who values his/her fishery. Once

plant levels exceed 20% of the surface area, largemouth bass predation on bluegill becomes less effective. Small bluegill can effectively avoid being eaten by darting into the excessive vegetation. Thus, too many bluegill survive, and their growth declines due to increased competition from overcrowding. Bass growth also decreases, as they are unable to find prey effectively and consume enough to grow well. The classic symptoms of this scenario are populations of small, thin largemouth bass and bluegill.

Excessive submerged plants also pose a problem in ponds where water is being pumped out for irrigation, livestock watering, or might be pumped out in case of a fire. These plants can clog a pump intake, lessening the amount of water being pumped and shortening the lifespan of the pump due to excessive wear and tear.

Floating Plants

Floating aquatic plants come in all shapes and sizes from the pinhead size of a watermeal plant to the large leaves of a water lily. Table 2 provides a list of the floating aquatic plant species common to Ohio ponds. Other species may occur in ponds on a limited basis and are not listed.

Benefits

In general, watermeal and duckweed provide few benefits to a pond unless the pond is strictly a wildlife pond. The same species of waterfowl that eat submerged plants will

Table 2. Floating and Emergent Aquatic Plant Species That Are Commonly Found in Ohio Ponds.	
Common Name	Scientific Name
Floating	
Watermeal	<i>Wolffia</i> spp.
Lesser duckweed	<i>Lemna</i> spp.
Yellow water lily	<i>Nuphar advena</i>
White water lily	<i>Nymphaea tuberosa</i>
Water lotus	<i>Nelumbo lutea</i>
Emergent	
Cattails	<i>Typha</i> spp.
Rushes	<i>Juncas</i> spp.
Nutsedges	<i>Cyperus</i> spp.
Spikerushes	<i>Eleocharis</i> spp.
Bulrushes	<i>Scirpus</i> spp.
Purple loosestrife	<i>Lythrum salicaria</i>

The abbreviation “spp” signifies that multiple species of that genus are found in Ohio.

also eat these small floating plants. Pond owners who value the natural, aesthetic qualities of a pond desire water lilies and their showy flowers. Largemouth bass and bluegill both like the shade provided by the large leaves of water lilies. The key is not to allow the lilies to overrun the pond’s shallow areas, maintaining about 15 to 20% coverage

Disadvantages

As with other aquatic plants, an excess of nutrients can cause an overabundance of watermeal and duckweed. It is not uncommon for these small plants to completely cover a pond’s surface in a few short weeks. This type of cover will substantially reduce light penetration so that oxygen-producing photosynthesis in the water underneath the floating plants ceases. Warm water temperatures during summer months keep oxygen-consuming animal respiration and decomposition rates high, possibly resulting in a fish kill from lack of oxygen.

Water lilies are notorious for overspreading a pond in short order, especially if the pond is shallow and the water is clear. Clear water allows these lilies to send up stems and leaves from a greater depth. This severely inhibits recreational activities. Many pond owners have planted water lilies for aesthetics, only to be frustrated with their quick coverage of the pond.

Emergent Plants

Emergent aquatic plants are plants that live in shallow water or just on the shore along a pond. Most of the vegetative portion of these plants grows above the water rather than under the water. From a distance, many resemble grasses. Table 2 provides a list of the emergent aquatic plant species common to Ohio ponds.

Benefits

Emergent plants provide important wildlife benefits to ponds. The plants themselves provide nesting habitat for a variety of bird species, such as song sparrow, red-winged blackbird, and wrens. Many other aquatic bird species, such as rails and herons, utilize emergent plant habitats during migration. Many mammals will make a meal of the green vegetative material growing above the water. Additionally, the seed heads of nutsedges, spikerushes, and bulrushes are attractive to many waterfowl species (mentioned previously)

as a food source. A pond managed for wildlife should strive to have a variety of emergent plants.

Disadvantages

An overabundance of emergent plants can create a problem for some pond owners. This is particularly true for cattails, which account for nearly all pond owner complaints about emergent plants. Cattails have the ability to completely surround a pond and extend several feet into the water if allowed to do so. Even for a pond managed for wildlife, this poses a problem. Habitat diversity is good for wildlife, and a monoculture of cattails does not provide diversity. Excessive emergent plants can create problems for anglers who will find it difficult to effectively fish from shoreline areas.

Cattails are highly attractive to muskrats, a mammal that can damage a pond in some circumstances. Dams are vulnerable to their burrowing activities, and muskrat burrows can compromise their integrity. Muskrat use cattails for a variety of reasons, including food, den material, and as an escape from predators.

One emergent plant species deserves special mention. Purple loosestrife is an invader to Ohio ponds and wetlands and should be controlled, either by pulling the plant and roots or by spraying a herbicide. If left uncontrolled, purple loosestrife quickly spreads and crowds out desirable native emergent plants. A monoculture stand of

loosestrife is the result, providing no benefits to the pond owner or wildlife.

Summary

Most aquatic plants provide benefits to the pond owner if abundance does not become excessive. The “right” amount of plants to have and the “right” composition is up to the pond owner, with his/her primary goals for the pond playing a key role. Pond owners should realize the value of aquatic plants and develop a strategy to promote aquatic plant abundances to levels beneficial for the intended uses.

Planktonic algae are critical to a pond’s fish life and must be present for newly hatched fish to survive. In moderation, submerged and emergent plants provide valuable fish and wildlife benefits. Filamentous algae, duckweed, and watermeal provide few benefits and, in general, should be controlled in most ponds. These problematic species are the result of excessive nutrients, so nutrient reductions will often reduce the problem.

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