

2023 Edition

Lake Weed Guidebook

Identifying & Managing
Aquatic Plant Life

WEEDERS DIGEST
THE LAKE & POND EXPERTS

Lake Weed Guidebook

Identifying & Managing Aquatic Plant Life

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issues? Check out all of our solutions at
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Types of Lake and Pond Plants

Lakes and ponds are an important part of the landscape, providing natural beauty, water for recreation, and a habitat for wildlife. However, they can also become overrun with weeds, which can make them unsafe and unsightly. In this guidebook, we will examine the different types of lake and pond plants and provide tips on how to manage them.

There are several types of lake and pond plants, which can be divided into four categories: shoreline, emergent, floating, and submerged.

A photograph of a pond with tall, green reeds and grasses growing along the shoreline. The text "Shoreline Plants" is overlaid in white.

Shoreline Plants

Shoreline plants are those that prefer to grow on the shore but can tolerate being submerged seasonally. Examples include wildflowers, sedges, rushes, grasses, ferns, vines, shrubs, and trees. These plants provide a range of benefits, including slowing stormwater runoff, absorbing excess nutrients and pollutants, stabilizing shoreline soil to reduce erosion, providing habitat for wildlife, and adding aesthetic value to the property. However, they may also obstruct views of the water and recreation, so it may be necessary to control or remove them.

A photograph of tall, green reeds growing out of the water. The text "Emergent Plants" is overlaid in white.

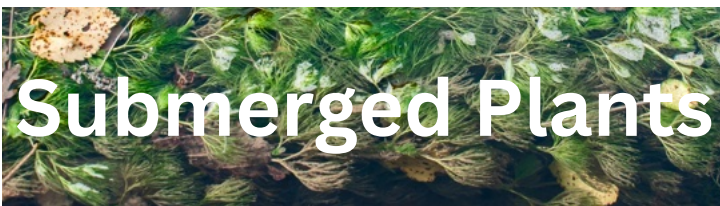
Emergent Plants

Emergent plants are rooted underwater but have the majority of their plant above water. They typically have long, slender leaves that grow vertically from a central point and dense, matted roots that stabilize shorelines and prevent erosion. However, many emergent plants are invasive and can quickly take over an area, so it is important to identify and control them. Examples of emergent plants include cattails, rushes, sedges, and water lilies.

A photograph of a dense patch of bright green, round floating plants (duckweed) on the water surface. The text "Floating Plants" is overlaid in white.

Floating Plants

Floating plants are those that have their roots in the water but the majority of their plant floats on the surface. They can provide habitat and food for wildlife, as well as help to reduce excess nutrients in the water. However, they can also obstruct views and recreation, and some species can be invasive. Examples of floating plants include water lettuce, water hyacinth, and duckweed.



Submerged Plants

Submerged plants are those that grow entirely underwater, with their leaves and stems extending upwards from the substrate. They provide habitat and food for wildlife, as well as help to reduce excess nutrients in the water. However, they can also obstruct views and recreation, and some species can be invasive. Examples of submerged plants include pondweeds, coontail, and Eurasian watermilfoil.

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In order to manage lake and pond plants, it is important to identify the different types and understand their growth habits. This will allow you to implement control measures, such as manual removal, herbicides, or biological control methods, in a targeted and effective manner. Additionally, practicing good lake and pond management, such as reducing excess nutrients, can help to prevent weed growth and maintain a healthy ecosystem.



Invasive Aquatic Plants

Invasive aquatic plants are non-native plants that can harm the ecological health of lakes and ponds, create problems for recreation, and impact water quality. They are difficult to eradicate once established, so management efforts are typically focused on minimizing their negative effects. Commonly managed invasive aquatic plants in the Midwest include Eurasian watermilfoil, curly-leaf pondweed, purple loosestrife, and flowering rush.

It is important to research and understand the specific management requirements and options for your region.

Don't let lake weeds and muck control you, let our team of experts at Weeders Digest help you develop a customized plan to effectively and safely remove them, reach out to us today to schedule a consultation.

Algae

Algae is a type of plant that grows in water. It can be single-celled or large and plant-like, and can be found anywhere in a lake or pond. While algae is important for the aquatic food web and can help oxygenate the water and absorb excess nutrients, it can also become a problem when it grows too much. This can block sunlight and decrease oxygen levels in the water. Algae can be controlled by reducing nutrients in the water, aerating the water, and maintaining proper water levels. If algae becomes a problem, it can be removed physically or treated with chemical algaecides.

There are several ways to address an algae problem in a lake or pond:

1. **Chemical treatment:** Algaecides can be used to kill algae, but they can also be harmful to other aquatic life and plants. Carefully follow the instructions on the product and to consider the potential impacts on the ecosystem. Adjuvants like Algae-Blitz can increase effectiveness.
2. **Physical removal:** Algae can sometimes be removed manually using nets or other tools, but this can be labor-intensive and may not be practical for large bodies of water.
3. **Biological control:** Introducing certain types of bacteria or other natural algae predators can help to control algae growth. This method is generally safer for the environment than chemical treatment, but it may not be effective in all cases.
4. **Nutrient reduction:** Algae need nutrients, such as phosphorus and nitrogen, to grow. Reducing the levels of these nutrients in the water can help to limit algae growth. This can be achieved through measures such as improving the pond's filtration system, reducing fertilizer use, and limiting the amount of organic matter that enters the pond.

The most effective solution for controlling algae in a lake or pond will depend on the specific circumstances and the cause of the algae problem. It may be helpful to consult with a lake management professional to determine the best approach.



Filamentous Algae



Planktonic (discoloration or scum-forming) algae



Plant-like macroalgae



Lake Muck

Lake muck, also known as lake sludge or silt, is a layer of organic matter that accumulates on the bottom of lakes and ponds over time. It can be composed of leaves, twigs, algae, and other decomposing matter. The build-up of muck can lead to crystal clear water and swimming areas becoming unappealing and can cause complaints from visitors.

Muck is primarily made up of decaying organic and inorganic material, such as dead fish or other aquatic animals, dead aquatic plants, and sediment runoff from neighboring streams. It tends to be high in nitrogen and phosphorus. All organic material, such as animal droppings and fallen leaves, can eventually decompose and end up as muck at the bottom of the lake or pond.

While a healthy level of muck can play an

important role in a lake or pond's ecosystem, too much can be damaging. It can shut out the oxygen needed to keep aquatic plants and creatures alive and healthy. Additionally, the bacterial decomposition of the organic matter in the muck can release gasses such as methane and hydrogen sulfide, which can create a foul odor.

If you find yourself with a muck problem, there are solutions available to help you get rid of it and keep it from coming back. It's important to note that the removal and disposal of muck and lake weeds may be regulated by local and state government. Restrictions may include obtaining a permit, or entirely prohibiting the removal or alteration of muck.

There are several ways to address a muck problem in a lake or pond:

1. **Hydraulic jet:** Underwater hydraulic jets, such as the Aqua Thruster, are one of the most effective ways to get rid of muck.
2. **Beneficial bacteria:** There are beneficial bacteria that can be added to the lake to help break down the muck. The beneficial bacteria can come in tablet, pellet and liquid form.
3. **Dredging:** This involves removing the muck from the bottom of the lake using large dredging equipment.
4. **Aeration:** Aeration systems can be used to increase the oxygen levels in the water, which can help to promote the growth of aerobic bacteria that break down the muck.
5. **Barley straw:** Barley straw can be added to the lake, which can help to reduce the growth of algae that can contribute to muck buildup.
6. **Natural solutions:** Some natural solutions such as introducing fish species that feed on the muck, planting native vegetation along the shoreline, and preventing soil erosion around the lake can also be used to prevent and reduce muck buildup.

If you have any questions regarding lake muck or weeds, feel free to contact our specialists at Weeders Digest for assistance.

Identifying Aquatic Plants

Aquatic plants are an important part of any lake or pond ecosystem, but some can be harmful if left uncontrolled. As a lakeshore or pond owner, it is your responsibility to care for your property and the shoreline, which includes identifying and managing any weeds that may be present. In this chapter, we will provide information on common aquatic weeds and tips on how to manage them to maintain a healthy and attractive lake or pond.

Emergent Plants



Bulrush



**Purple Loosestrife
(Spiked Loosestrife
and Purple Lythrum)**



**Flowering Rush
(Grass Rush)**



**Arrowhead
(goosefoot,
nephthytis)**



**White Pond Lily
(American White
Waterlily)**



Cattail

Submerged Plants



**Canada waterweed
(Elodea)**



Starry Stonewort



**Curly-leaf Pondweed
(Crisp-leaved
Pondweed)**



**Eurasian
Watermilfoil (Spiked
Water-Milfoil)**

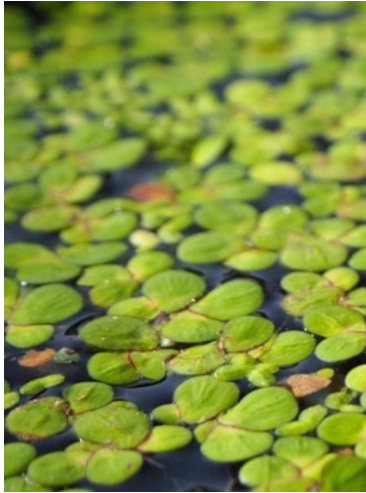


**Chara (Muskgrass,
Stonewort, Sand
Grass)**



**Coontail (Hornwort,
Rigid Hornwort)**

Floating Plants



**Duck Weed (Water
Lentils, Water
Lenses, Bayroot)**



**Hydrilla
(Waterthyme)**



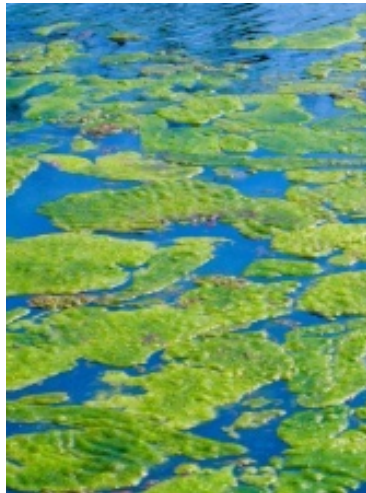
**Water Chestnuts
(Chinese Water
Chestnut)**



Water Hyacinth



**Water Lettuce
(Water Cabbage,
Nile Cabbage,
Shellflower)**



Blue-Green Algae



**Filamentous Algae
(Pond Scum)**



Bulrush

Bulrushes

Plant Type: Emergent

Location: All across the U.S.

Scientific Name: Schoenoplectus

Status: Native

Bulrushes, also known as reeds or pencil reeds, are a type of aquatic plant found in marshes and along the shorelines of lakes and ponds. They grow up to 10 feet tall and thrive in USDA hardiness zones 3 to 9. Bulrushes provide valuable habitat for fish, birds, and other wildlife, but they can also be aggressive colonizers and can be difficult to control. Physical removal methods such as cutting, digging, or mowing may be effective in small areas, but herbicides may also be necessary to fully eradicate bulrushes. Once an area has been cleared, it can often be kept under control with regular cutting below the surface.

Mechanical Removal: Bulrush can be cut, and the rhizomes can be dug up. Physical control is difficult because it can re-establish from seeds and remaining rhizomes. Frequent mowing has been somewhat effective in the control of Bulrush.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake.

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Round-up Custom Glyphosate (Rated: Excellent), Weedtrine Diquat (Rated: Good)

Biological: There is no known biological control for Bulrush; however, goats are known to forage on many types of emergent vegetation.





Purple Loosestrife (Spiked Loosestrife and Purple Lythrum)

Purple Loosestrife (Spiked Loosestrife and Purple Lythrum)

Plant Type: Emergent

Location: Across the U.S.

Scientific Name: *Lythrum salicaria*, *L. virgatum* and any combination thereof

Status: Noxious, Invasive, Prohibited (depending on the state)

Purple loosestrife is an invasive aquatic plant that is native to Europe and Asia. It was introduced to the United States through contaminated ship ballast and the deliberate importation of seeds. Purple loosestrife is characterized by its tall, square-shaped stem with lance-shaped leaves and vibrant purple flowers arranged in spikes. It can grow in a range of wet soil habitats, including shallow water or on dry shorelines.

Purple loosestrife is a major threat to native aquatic plants, as it grows aggressively and outcompetes them for space and resources. It can form dense stands that block access to open water and provide unsuitable habitat for native animals. In addition, its dense root systems can alter the hydrology of wetlands, leading to negative impacts on native species and the ecosystem as a whole.

To control purple loosestrife, physical removal by pulling the weed at the root is recommended for individual plants or small stands. Cutting may lead to re-sprouting and the spread of seeds. Glyphosate herbicides can also be used, but care must be taken to use an aquatic herbicide formulation if treatment is necessary near or in water.

Mechanical Removal: Purple Loosestrife can be cut, and the rhizomes can be dug up. Physical control is difficult because it can re-establish from seeds and remaining rhizomes. Frequent mowing has been somewhat effective in the control of Purple Loosestrife.

Manual Cutting Tools: WeedShear(Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper(Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla(Best Seller), UltraLite Rake.

Chemical: Round-Up Herbicide

Biological: Two "Cella" beetle species (*Galerucella californiensis* and *G. pusilla*) feed on its leaves and shoots and are the most effective of the four types of imported insects. Cellas monitored in the state and elsewhere have decreased the vigor, size and seed output of purple loosestrife, allowing native plants to survive and increase naturally by competing better against smaller loosestrife plants.





**Flowering Rush
(Grass Rush)**

Flowering Rush (Grass Rush)

Plant Type: Emergent

Location: U.S.

Scientific Name: *Butomus umbellatus*

Status: Invasive in Most Midwestern States

Flowering rush is an invasive aquatic plant that can have detrimental effects on the ecosystem of a lake or pond. It grows in dense clusters along shorelines, making it difficult for people and wildlife to access open water. It also outcompetes native plants, reducing biodiversity and potentially impacting the habitat, food, and nesting sites of native species.

To manage flowering rush, mechanical control methods like cutting or hand digging can be effective, but must be done carefully to prevent the spread of root fragments. Chemical control using herbicides, such as glyphosate, may also be used, but timing and application methods should be carefully followed for the

best results. It is important to take action to control flowering rush to maintain the ecological balance of your lake or pond.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake.

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Round-Up Herbicide

Biological: At this time, there are no known biological controls for flowering rush; although, goats are known to forage on many types of emergent vegetation





**Arrowhead
(goosefoot,
nephthytis)**

Arrowhead (goosefoot, nephthytis)

Plant Type: Emergent

Location: Southern States

Scientific Name: Syngonium podophyllum

Status: Certain Types are Invasive

Broadleaf arrowhead is a perennial aquatic plant with distinctive arrow-shaped leaves and showy white flowers. It is often cultivated for ornamental purposes in ponds and ditches, and is known for the starchy tubers that form at the ends of its subterranean runners. While it can be removed manually by raking or sifting the pond, it can re-establish itself from remaining roots and seeds. Chemical control options include various herbicides such as bispyribac, flumioxazin, glyphosate, imazamox, imazapyr, and 2,4-D, which have been found to be effective against broadleaf weeds.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake.

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Round-Up Glyphosate (Rated: Excellent), Weedtrine Diquat (Rated: Good)

Biological: There is no known biological control for Arrowhead; however, goats are known to forage on many types of emergent vegetation





White Pond Lily (American White Waterlily)

Plant Type: Emergent

Location: North & Central America, Canada

Scientific Name: *Nymphaea odorata*

Status: Native

The water lily is a perennial aquatic plant that grows in muddy or silty soils up to 5 feet deep. Its flowers are white with rows of petals surrounding a yellow center, and they float on the water's surface or extend slightly above it. The lily's stem is mostly submerged and rooted on the lake or pond bottom.

Lilies provide food for ducks, who eat their seeds and use the pads to line their nests. They also offer habitat for largemouth bass and sunfish.

White Pond Lily (American White Waterlily)

Lilies can be controlled mechanically through cutting and pulling, but these methods may not be completely effective as the plant can regrow from seeds and rhizomes. There are several herbicides that can effectively eliminate water lilies, including 2,4-D, endothall, triclopyr, glyphosate, imazamox, fluridone, and penoxsulam.

Manual Collecting Tools: Lily Pad Ripper, Long Beach Rake (w/float), since its 100% floating with no roots in the ground a rake, such as Rakezilla (Best Seller) or UltraLite Rake would also be very effective.

Mechanical Collecting: WaterBug, For big jobs: WaterGator, EcoHarvester.

Prevention (Once it's gone, keep it from coming back): Aqua Thruster(Best Seller)

Chemical: Round-up Custom & Nagivate Herbicide





Cattail (*Typha latifolia*, *Typha angustifolia*)

Cattail (*Typha latifolia*, *Typha angustifolia*)

Plant Type: Emergent

Location: Across North America

Scientific Name: *Typha latifolia*, *Typha angustifolia*

Status: Invasive in some states

Cattails, also known as Typha, are a common marsh plant found in North America. They are often identified by their velvety brown spikes and sword-like leaves. There are two main species of cattails: *Typha angustifolia* and *Typha latifolia*. The Narrow-leaved Cattail has dark green leaves that are 1/4 to 1/2 inch wide and the female flowers form a spike 4 to 8 inches long and 1/2 to 1 inch wide. The Broad-leaved Cattail has pale green leaves that are 1/2 to 3/4 inches wide and the female flowers form a spike 4 to 6 inches long and 1 to 2 inches wide. These plants can hybridize and show a blend of features.

Cattails can be a nuisance for those who want to maintain a clean and clear lakeshore. These marsh plants can be found in various water bodies such as marshes, lakeshores, river backwaters, and road ditches. They are known to grow in water, even in brackish water, and reproduce quickly through rhizomes and seeds. This can lead to a large network of rhizomes and shoots in a single growing season. Cattails may provide food for muskrats and other animals such as geese, but they can also be overpopulated and become a problem. They are known for their versatility and can be used for a variety of purposes, but they can also cause issues such as clogging water ways and taking over desirable native plants. Chemically treated Cattails decompose much faster with the addition of an adjuvant.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake.

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Round-Up Glyphosate (Rated: Excellent), Weedtrine Diquat (Rated: Good), CattBite Adjuvant (Rated: Excellent)

Biological: There is no known biological control for Cattails; however, goats are known to forage on many types of emergent vegetation





**Canada Waterweed
(Elodea)**

Canada Waterweed (Elodea)

Plant Type: Submerged

Location: Most of U.S. & Canada

Scientific Name: Elodea Canadensis

Status: Native/Nuisance in Midwest

Elodea is a submerged aquatic plant that is commonly used in aquariums for its ability to help keep the water clean by absorbing excess nutrients and clearing up algae. However, when it escapes into the wild, it can become an invasive species.

Elodea has long, tangled, branching stems that can reach up to three feet in length in cultivation and up to nine feet in the wild. In the spring and summer, it produces tiny flowers and has swirling green leaves that grow in groups of three.

Elodea can be a serious problem in natural bodies of water, where it forms dense mats that can obstruct recreational and business activities.

These mats can also exclude native plant species, reducing biodiversity. Controlling elodea can be difficult, as most eradication methods involve removing plant pieces that can lead to further spread.

To control elodea, it is important to carefully prune or snip the plant and collect all debris to prevent new plants from forming. Using an aquatic herbicide may also be effective in controlling this invasive species.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention(Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Hydrothol 191





Starry Stonewort

Plant Type: Submerged

Location: Midwest

Scientific Name: *Nitellopsis obtusa*

Status: Prohibited in some Midwestern States

Stonewort, also known as starry stonewort, is an invasive aquatic plant that can negatively impact the recreational use and ecological health of lakes and ponds. It is characterized by its bright green, bushy appearance and distinctive star-shaped bulblets. In shallow areas, stonewort can form dense mats that interfere with swimming and other water activities, and it competes with native vegetation, potentially reducing biodiversity.

Starry Stonewort

Effective control measures for stonewort include mechanical removal techniques such as suction dredging and diver-assisted suction harvesting, as well as the use of contact herbicides like endothall, copper, and diquat. These herbicides only damage the parts of the plant that they come into contact with, rather than being absorbed or transported throughout the plant. It is important to carefully follow all label instructions and regulations when using any chemical control measures to ensure the safety of humans and the environment.

Manual Cutting Tools: WeedShear(Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper(Best Seller), Beach Roller, T-Weeder.

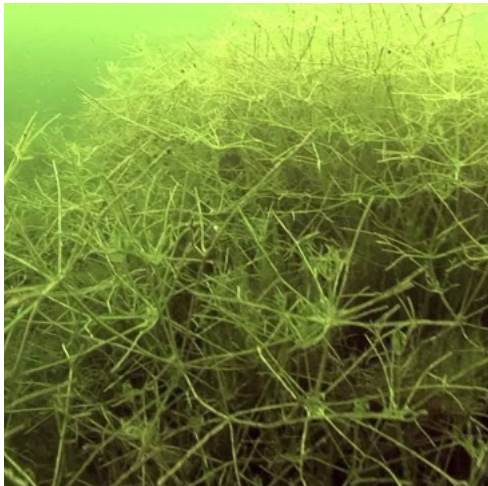
Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Cutrine Plus Algaecide, Copper Sulfate

Biological: An effective biological control agent is not known at this time.





Curly-leaf Pondweed (Crisp-leaved Pondweed)

Plant Type: Submersed

Location: Across Midwest

Scientific Name: *Potamogeton crispus*

Status: Invasive, Prohibited & Restricted in Midwest

Curly-leaf pondweed is a submerged aquatic plant that is characterized by its wavy, lasagna-like leaves. It is typically olive to reddish brown in color and has a stem that is usually white, green, brown, or red. The leaves are about half an inch wide and two to three inches long, with a distinct mid-vein that is serrated on the edges and a blunt tip. They are arranged alternately on the stem and become denser towards the end.

Curly-leaf Pondweed (Crisp-leaved Pondweed)

Curly-leaf pondweed is a floating plant that grows in water depths of 15 to 30 feet and can reach up to 15 feet in height. It thrives in murky water and is able to tolerate low water clarity, making it a common invader of disturbed areas. It can be distinguished from other pondweeds by its lifecycle, which includes the emergence of turions in the fall and a mid-summer death back.

Curly-leaf pondweed can have negative impacts on aquatic systems, including forming dense mats on the surface of the water that restrict swimmers, outcompeting native aquatic plants and potentially lowering biodiversity, and providing unsuitable shelter, food, and nesting sites for native species. Dead plants may also accumulate along the beach during its mid-summer death.

To control curly-leaf pondweed, options include manually cutting or pulling the plant, using rakes or cutting blades, or applying the herbicide endothall. It is important to remove all plant debris to prevent regrowth and spread.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention(Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Hydrothol 191





Eurasian Watermilfoil (Spiked Water-Milfoil)

Plant Type: Submerged

Location: Across Midwest

Scientific Name: *Myriophyllum spicatum*

Status: Invasive, Restricted or Prohibited Across Midwest

Eurasian watermilfoil is an invasive aquatic plant that can have negative impacts on aquatic ecosystems. Its long, branching stems are whorled with finely serrated leaves, and it produces small white flowers that bloom above the water surface from June to August. When it grows rapidly and forms dense mats, it can crowd out native plants and alter the habitat of the water body. These dense mats can also restrict recreational activities, such as swimming, boating, and fishing, and the decomposition of Eurasian watermilfoil can deplete oxygen levels in the water, which can be harmful to aquatic organisms.

Eurasian Watermilfoil (Spiked Water-Milfoil)

To control Eurasian watermilfoil, it can be manually removed using rakes or boats with harvesting systems, or divers can be used to remove it. Aquatic herbicides may also be effective in controlling the growth of this invasive plant. It is important to take action to control Eurasian watermilfoil to prevent it from negatively impacting aquatic ecosystems.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Hydrothol 191





Chara (Muskgrass, Stonewort, Sand Grass)

Plant Type: Submerged

Location: Across Midwest

Scientific Name: alga

Status: Nuisance

Chara is a type of aquatic plant that grows in shallow, still or slow-moving waters. It has a characteristic strong fishy odor and is often found in ponds and lakes. Chara is a rooted plant, meaning it has a stem that is anchored in the mud or sediment at the bottom of the body of water. Its stems are branched and can grow up to 10 feet tall, reaching depths of up to 30 feet. Chara is identified by its small scale-like leaves, which are typically arranged in whorls of 6-8 and are less than half an inch long.

Chara (Muskgrass, Stonewort, Sand Grass)

While Chara can provide some benefits to aquatic ecosystems, it can also have negative impacts. It can contribute to the decrease in water quality by increasing turbidity and lowering oxygen levels, making it difficult for fish and other aquatic organisms to survive. In addition, chara can create habitat that is unsuitable for native species.

To control chara, it can be removed by hand or with mechanical methods such as rakes or cutting blades. Aquatic herbicides may also be used, but they are most effective when applied to young plants in the spring before they have a chance to produce seeds.

Manual Cutting Tools: WeedShear(Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper(Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention(Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Hydrothol 191





Coontail (Hornwort, Rigid Hornwort)

Plant Type: Submerged

Location: U.S. & Canada

Scientific Name: *Ceratophyllum demersum*

Status: Native

Coontail is a submerged aquatic plant that is commonly found in freshwater bodies such as lakes, streams, and ponds. It has long, slender stems that are covered in small, green leaves that resemble the tail of a raccoon, hence its name. These leaves are typically about an inch long and are arranged in a whorl around the stem. Coontail is a hardy plant that can tolerate a wide range of water conditions and is known to thrive in areas with low light levels.

Coontail (Hornwort, Rigid Hornwort)

While coontail can provide habitat and food for a variety of aquatic animals, it can also have negative impacts on waterways. When it grows in dense mats, it can block light from reaching other aquatic plants and can interfere with recreational activities such as swimming, boating, and fishing. In addition, coontail can alter the water's chemistry and reduce oxygen levels, which can be harmful to fish and other aquatic organisms.

To control coontail, mechanical methods such as hand-pulling or raking can be used to remove the plants from the water. Chemical herbicides may also be applied to kill coontail, but they are most effective when applied to young plants in the spring before they have a chance to set seeds. It is important to follow all label instructions and precautions when using herbicides to control aquatic plants.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

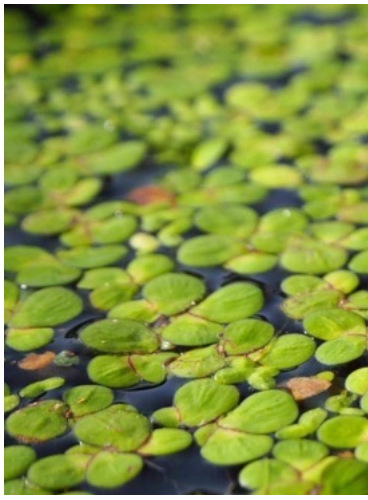
Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug. For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention(Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Hydrothol 191





Duck Weed (Water Lentils, Water Lenses, Bayroot)

Duck Weed (Water Lentils, Water Lenses, Bayroot)

Plant Type: Free-Floating

Location: Most of U.S. & Canada

Scientific Name: Lemna minor

Status: Nuisance in MO, Caution in WI

Duckweed is a small aquatic plant that can be found in both freshwater and saltwater habitats. It is a common problem in ponds and lakes, as it has the ability to quickly spread and cover the surface of the water, leading to a reduction in oxygen levels and making it difficult for other aquatic plants and animals to survive.

Despite its negative impacts, duckweed can also provide some benefits to pond ecosystems. It can help to filter out excess nutrients in the water and is a food source for some species of fish and waterfowl. However, it is important to manage the growth of duckweed in order to maintain a healthy pond environment.

There are several methods for controlling duckweed in ponds and lakes, including introducing natural predators, such as grass carp, using mechanical tools to physically remove the plants, installing an aeration system to increase oxygen levels in the water, and applying chemical treatments. It is important to carefully research and choose the most appropriate method for your specific situation, as some methods may not be suitable for all ponds or may have negative impacts on other aquatic life. Additionally, it may be necessary to implement a combination of these methods to effectively control duckweed growth.

Manual Collecting Tools: Pond Parachute Skimmer

Mechanical Expulsion: Aqua Thruster (Best Seller)

Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Clipper Herbicide w/ a good Catalyst such as ShoreTech AlgaeBlitz

Biological: Introduction of Goldfish and/or Koi





**Hydrilla
(Waterthyme)**

Hydrilla (Waterthyme)

Plant Type: Trailing & Free-Floating

Location: Parts of U.S.

Scientific Name: *Hydrilla verticillata*

Status: Invasive in most states

Hydrilla is a highly invasive aquatic plant that can cause significant damage to the ecological health of lakes and ponds. It grows rapidly, with stems that can reach up to 25 feet in length and add up to an inch per day. The plant forms dense mats on the water's surface, blocking light and displacing native species below. This can lead to the stratification of the water column and decreased oxygen levels, which can result in fish kills. Hydrilla can also have negative impacts on the economy, as it can reduce the value of shoreline properties and disrupt the operation of water treatment plants, power stations, and industrial facilities. In order to manage hydrilla, it is important to use a combination of physical removal and chemical control methods, as well as prevent its spread by cleaning boats and equipment before leaving infested areas.

Manual Cutting Tools: WeedShear (Best Seller), Serrated Lake Weed Cutter.

Manual Pulling Tools: Weed Ripper (Best Seller), Beach Roller, T-Weeder.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug. For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla (Best Seller), UltraLite Rake,

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster (Best Seller), Fountains, Aerators.

Chemical: Cutrine Plus Algaecide, w/ a good Biocatalyst Booster





Water Chestnuts (Chinese Water Chestnut)

Plant Type: Floating - Trailing

Location: Northeast U.S.

Scientific Name: *Trapa natans*

Status: Invasive, Prohibited (depending on the state)

Invasive aquatic plant species, such as water chestnuts, can have significant negative impacts on the health and ecosystem of a lake or pond. Water chestnuts form dense mats of rooted vegetation that can be difficult to navigate, and their sharp spiky fruits can cause injuries. These plants can also shade out native aquatic plants, reducing biodiversity and degrading dissolved oxygen levels, potentially leading to fish kills. To control water chestnuts, a combination of hand, mechanical, and chemical treatments may be necessary. Early detection is critical in preventing and controlling the spread of these invasive plants.

Water Chestnuts (Chinese Water Chestnut)

Manual Cutting Tools: WeedShear(Best Seller), Serrated Lake Weed Cutter, T-Weeder.

Manual Pulling Tools: Weed Ripper(Best Seller), Beach Roller.

Power Tools: Aquatic Vegetation Mower, Aquatic Mower, Lake Groomer, WaterBug, For big jobs: WaterGator, EcoHarvester.

Rakes (for collecting weeds after they've been pulled or cut): Rakezilla(Best Seller), UltraLite Rake.

Mechanical Expulsion: Aqua Thruster (Best Seller)

Mechanical Prevention (Once it's gone, keep it from coming back): Aqua Thruster(Best Seller), Fountains, Aerators.

Chemical: An Aquatic Glyphosate such as Rodeo Custom Herbicide





Water Hyacinth

Plant Type: Floating - Trailing

Location: Tropical America

Scientific Name: *E. crassipes*

Status: Prohibited in WI & MN

Invasive aquatic plant species, such as water hyacinth, can pose a significant threat to the ecological health of lakes and ponds. These plants can cause problems for recreational activities like swimming, fishing, and boating, and can make shorelines unattractive. Water hyacinth, in particular, is a particularly aggressive aquatic plant that can form thick, impenetrable mats that clog waterways, suffocating native plants and reducing oxygen levels in the water, potentially leading to fish kills.

Water Hyacinth

While it is difficult to completely eradicate an invasive species once it has established itself in a body of water, there are several methods that can be used to control the spread of water hyacinth, including handpicking, reducing nutrient levels in the water, mechanical harvesting, and chemical herbicides. It is important to carefully consider the potential impacts of these control methods and to work with an invasive species specialist to develop a management plan that is effective and sustainable

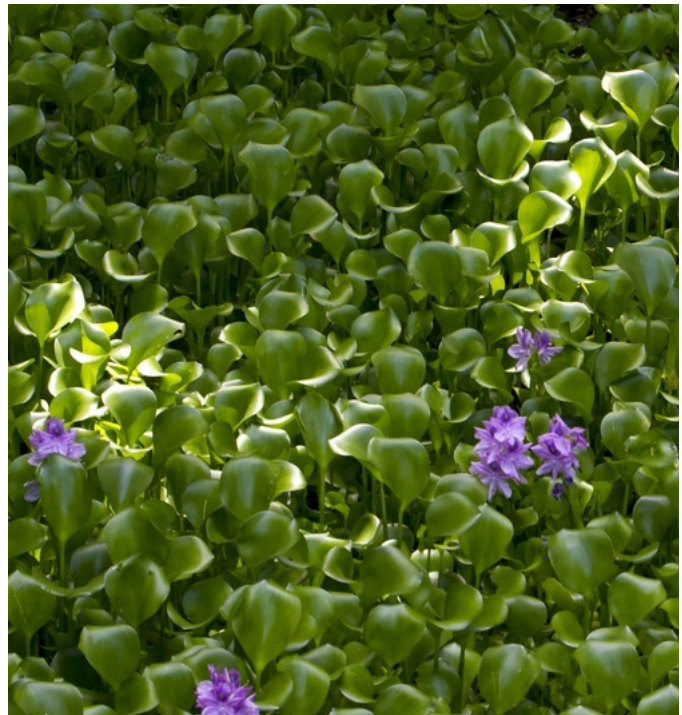
Manual Collecting Tools: Rakezilla (Best Seller) or UltraLite Rake would be very effective.

Mechanical Collecting: WaterBug, For big jobs: WaterGator, EcoHarvester.

Mechanical Expulsion: Aqua Thruster (Best Seller)

Prevention(Once it's gone, keep it from coming back): Aqua Thruster(Best Seller)

Chemical: An Aquatic Glyphosate such as Rodeo Custom Herbicide





Water Lettuce (Water Cabbage, Nile Cabbage, Shellflower)

Plant Type: Floating

Location: Southern U.S.

Scientific Name: *Pistia stratiotes*

Status: Prohibited in WI & IN

Water lettuce is a floating aquatic plant with short branches that bear wedge or oval-shaped leaves that can grow up to 10 inches long. Its roots are long and submerged. Native to South America, water lettuce is an invasive species in the United States that can form dense floating mats, which can deplete oxygen levels and lead to fish deaths if they cover the entire surface of a pond. To control water lettuce, it is recommended to regularly rake or skim the surface of the pond, or to use herbicides. However, it is important to follow the herbicide label instructions carefully to ensure safe and effective application.

Water Lettuce (Water Cabbage, Nile Cabbage, Shellflower)

Manual Collecting Tools: Rakezilla(Best Seller) or UltraLite Rake would be very effective.

Mechanical Collecting: WaterBug, For big jobs: WaterGator, EcoHarvester.

Mechanical Expulsion: Aqua Thruster (Best Seller)

Prevention(Once it's gone, keep it from coming back): Aqua Thruster(Best Seller)

Chemical: An Aquatic Glyphosate such as Rodeo Custom Herbicide





Blue-Green Algae

Plant Type: Floating

Location: Across U.S.

Scientific Name: Cyanobacteria

Status: Native

Blue-green algae, also known as cyanobacteria, can be found in both marine and freshwater environments. It is often seen as a floating scum or mats on the surface of the water and can give the water a blue, green, brown, or reddish-purple hue. In freshwater environments, particularly in lakes, ponds, reservoirs, and slow-moving streams, blue-green algae can thrive in warm water conditions with ample sunlight and nutrients such as phosphorus and nitrogen.

Blue-Green Algae

One of the main concerns with blue-green algae is the production of cyanotoxins, which can be harmful to fish, farm animals, and humans. In addition, blue-green algae can also produce taste and odor compounds that can make the water unpleasant. Mechanical or physical control of blue-green algae can be difficult, with the exception of changing the water in the pond. However, there are several herbicides that have been proven to be effective in controlling blue-green algae, including copper complexes, endothall, alkylamine salts, and sodium carbonate peroxy-hydrate.

Manual Collecting Tools: Pond Parachute Skimmer

Mechanical Expulsion: Aqua Thruster(Best Seller), AirStream Pro

Prevention(Once it's gone, keep it from coming back): Aqua Thruster(Best Seller), AirStream Pro

Chemical: Hydrothol 191, Curtine Plus Algaecide





Filamentous Algae (Pond Scum)

Filamentous Algae (Pond Scum)

Plant Type: Floating

Location: Worldwide

Scientific Name: Spirogyra, Cladophora, and many other varieties

Status: Nuisance

Filamentous algae, also known as string or stringy algae, is a type of aquatic plant that is characterized by long, thin cells that form visible chains, threads, or filaments. These filaments often intertwine to create a mat that looks like wet wool, and can be found on the bottom of shallow water or attached to objects in the water such as rocks or other aquatic plants. Filamentous algae can also float to the surface, forming large mats known as "pond scum." There are many different species of filamentous algae, and it is not uncommon for multiple species to exist in the same pond.

Filamentous algae can be controlled through the use of herbicides or by physically removing it with a rake or other mechanical means. Collected algae can be used for composting or as garden mulch. Algae removal is an ongoing process, as filamentous algae tends to grow and spread quickly. In addition to physically removing the algae, certain dyes can also be used to control its growth. It is important to carefully follow the instructions on any herbicides or dyes used to control filamentous algae to ensure their safe and effective use.

Manual Collecting Tools: The Rakezilla (Best Seller) or the Pond Parachute Skimmer.

Mechanical Expulsion: Aqua Thruster(Best Seller), AirStream Pro

Prevention(Once it's gone, keep it from coming back): Aqua Thruster(Best Seller), AirStream Pro

Chemical: Hydrothol 191, Curtine Plus Algaecide



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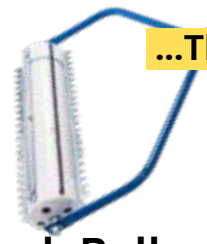
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