

# Hydrilla

*Hydrilla verticillata*



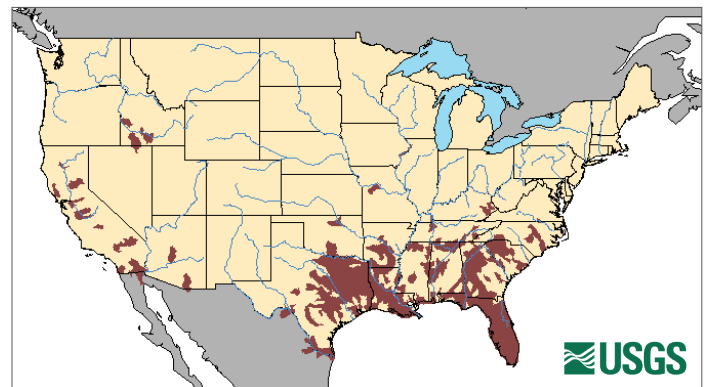
*Hydrilla verticillata* is a submerged, aquatic, perennial plant that many consider nature's "perfect weed". Because it is a federally listed noxious weed, it is illegal to possess, distribute, or transport *Hydrilla* in the United States. This plant grows and spreads at a very fast rate covering the surface of water bodies and restricting boating, fishing, swimming, and other recreational uses.

## Species Description

*Hydrilla* is an aggressively growing perennial plant that roots itself to the bottom of lakes and other waterbodies at depths of up to 12 ft (3.7 m). Its long, branching stems reach up to the water's surface, where it quickly spreads and takes over. *Hydrilla* leaves occur in whorls of 3-8, are typically strap-like, and are pointed with small sharp teeth on the edge. Spines or conical bumps may be found on the midvein on the underside of the leaf, making it rough to the touch. *Hydrilla* can be found in two forms: dioecious, meaning that male and female structures are found on separate plants, and monoecious, meaning a single plant can have both male and female structures. During the late growing season, generally September-October, small white tubers form on the roots of *Hydrilla*. These tubers store food and enable the plant to over-winter.

## Native & Introduced Ranges

Most likely native to Korea, *Hydrilla* was introduced into the United States in the 1950s. While the dioecious form appears to spread only south of South Carolina, the monoecious form is spreading both north and south and is the only form found in Pennsylvania. In Pennsylvania, *Hydrilla* was first reported in the mid-1990s in Adams and Bradford counties, and has since been identified in at least 25 counties spanning the entire state. Currently, Antarctica is the only continent without records of *Hydrilla*.



## Biology & Spread

Both forms of *Hydrilla* have been introduced in the United States, most likely as aquarium plants. Once released, it easily spread across the United States through freshwater recreational activities such as boating and fishing. *Hydrilla* reproduces primarily vegetatively; even the smallest living plant fragment can float downstream and form a new plant. This makes it easy for pieces of *Hydrilla* stuck on boat motors, trailers, livewells or bait buckets to start new infestations. Tubers are also a key component of reproduction and spread as they can remain dormant in the sediment for several years before growing new plants.

## Habitat

Hydrilla is able to grow in a wide variety of still and flowing water settings such as freshwater lakes, ponds, rivers, impoundments, and canals. It tolerates a wide range of pH, nutrient, and light levels. Hydrilla is somewhat winter-hardy; however, the optimum temperatures for growth is 68-81°F (20-27°C).

## Impacts

### Threat to Biodiversity

This invasive plant is characterized by its ability to grow quickly and form dense thick mats at the water surface. Under ideal conditions, Hydrilla can grow up to 2.5 cm (1 in) per day, per stem! These mats prevent sunlight from penetrating into the water and effectively shade out other species growing beneath. As the mats die and decay, bacteria deplete oxygen from the water. Hydrilla can also displace native plant life and shift balanced ecosystems to monocultures, which can alter populations of native fish and other wildlife.

### Economic Costs

Hydrilla interferes with both commercial and recreational freshwater activities and can have an expensive impact. Thick mats can hinder agricultural and hydroelectric power production by reducing irrigation flow rates by up to 90 percent and by clogging water intake pipes and filters. Hydrilla impairs recreational activities like swimming, fishing, water skiing, and boating. Heavy growth can entangle and clog propellers, requiring frequent cleanings to travel even short distances.

Photo courtesy of Wilfredo Robles, Bugwood.org.



Photo courtesy of David J. Moorhead, Bugwood.org.

## Prevention & Control

Hydrilla is difficult to eradicate. Most popular methods of control include the use of herbicides in combination with biocontrols. Contact herbicides can provide temporary control, while systemic herbicides, which are absorbed and spread throughout the plant, provide more long-term control but tend to act slowly. Herbivorous fish have been used for Hydrilla control where allowed by law. Mechanical aquatic weed harvesters are used to temporarily open boating lanes, but the resulting plant fragments can spread vegetation faster and is therefore not recommended.

To prevent the spread of Hydrilla, always remove all visible mud and plants before leaving a water body. Eliminate water from all equipment before transporting to new locations. Clean gear and equipment with either hot water (104°F or 40°C), or salt water OR let dry thoroughly for five days before entering a new water body. Hydrilla is listed as a federal noxious weed, making it illegal to possess, distribute, or transport.

## References:

True-Meadows, S; Haug, E.J; and Richardson, R.J. 2013. Monoecious *Hydrilla*-A review of the Literature. *Journal of Aquatic Plant Management*. 54:1-11.

The University of Georgia, USDA Forest Service, & USDA APHIS PPQ. 2003. *Invasive Plants of the Eastern United States: Hydrilla*.

Posey, MH; Wigand, C; Stevenson, JC. 1993. Effects of an introduced aquatic plant, *Hydrilla verticillata*, on benthic communities in the upper Chesapeake Bay. *Estuarine, Coastal and Shelf Science* 37:539-555.

Support provided by



Education · Extension · Research · <https://seagrant.psu.edu>

Pennsylvania Sea Grant is a partnership of the National Oceanic and Atmospheric Administration (NOAA) and Pennsylvania State University, 2023.



# AQUATIC PLANTS AND ALGAE IN PENNSYLVANIA—

## *The Good, the Bad, and the Ugly*

by Sean Hartzell

Aquatic Invasive Species Coordinator  
Pennsylvania Fish and Boat Commission

Aquatic plants and algae play important roles in aquatic ecosystems, providing food for aquatic herbivores and omnivores such as crayfish, turtles, waterfowl, and fish. However, some aquatic plants and algae are considered aquatic invasive species and may pose threats to aquatic recreation and aquatic ecosystems in Pennsylvania.

Pennsylvania's waters are home to a vast number of native aquatic plants. One common species in lakes, ponds, rivers, and streams is American waterweed (*Elodea canadensis*), sometimes also called common waterweed. American waterweed is a simple stalked aquatic plant with leaves arranged in "whorls" of three leaves. It often grows in clumps immersed in the water but will produce small white or purple flowers during the summer that emerge from the water. While many other aquatic plants die back in the winter, American waterweed persists and provides habitat for fish during the winter months.



American waterweed (*Elodea canadensis*) with cross section of a single whorl with three leaves.

photo: Christian Fischer, CC BY-SA 3.0, via Wikimedia Commons



photo: Brian Pilarcik

*Hydrilla* (*Hydrilla verticillata*) showing toothed leaves.

Similar in look to native American waterweed, the non-native hydrilla (*Hydrilla verticillata*), sometimes also called waterthyme, is native to parts of India and Eurasia and was introduced into parts of North America decades ago, likely from the aquarium trade. Hydrilla can be distinguished from American waterweed, because it has four to eight leaves per whorl unlike the three leaves in American waterweed and has small serrations or spines on the leaves. Hydrilla is considered an aquatic invasive species in Pennsylvania and can grow to major nuisance levels in lakes and ponds. During the warmer months, hydrilla can create dense mats, which may preclude infested areas from boating activities. It grows aggressively, sometimes several inches per day, and may also impact habitat for native species, reducing the breeding habitat and foraging habitat for sportfish. Scientific studies have shown that abundance and quality of fish such as Largemouth Bass and Bluegills may be reduced when hydrilla takes over an aquatic habitat. Unfortunately, hydrilla can be easily spread to other waterways on uncleaned boats, trailers, and fishing gear. Even a small fragment of hydrilla, if introduced into a new waterway, can grow a new colony.

Algae species are abundant in Pennsylvania. Algae are a group of organisms separate from plants that make food through photosynthesis using green chloroplasts in their cells. Most algae will grow in the form of thin layers of "slime" on submerged surfaces such as mud, stones, and aquatic plants, or form scum at the water's surface. One unusual species of alga in Pennsylvania is the didymo (*Didymosphenia geminata*) or "rock snot." Long considered an aquatic invasive species, didymo was recently found to be native to some parts of eastern North America, such as New York. However, it is presently unknown if didymo is a



photo-Brian Blazek

*Hydrilla and other aquatic invasive plants have a high risk of being introduced into new waterways by fragments on uncleaned boats or trailers.*

native “nuisance” species or a non-native species in Pennsylvania. When nutrients in streams are low, didymo will form “nuisance blooms” consisting of long, hairlike algal filaments, sometimes several inches thick, which can cover a stream bottom. Didymo blooms are often temporary and may “slough” off during heavy rain events. Recent research suggests that didymo blooms may not have major impacts towards other aquatic life, and didymo is not harmful to humans. Unlike many other algae species in Pennsylvania, didymo can feel “rough” or “gritty” to the touch (similar to wool) instead of slimy. Didymo appears to prefer cool or coldwater stream and river environments.

Making sure boats, trailers, and fishing gear are clean before their next use can prevent further spread of aquatic invasive species. Simple measures such as checking boats, trailers, and gear to remove mud, debris, and aquatic life before transporting, draining water from gear, live wells, motors, and bilges, and either drying for at least five days or cleaning with hot water can prevent the spread of most aquatic invasive species. For more information on aquatic invasive species, how to report them, and how to clean boats, trailers, and gear, visit [fishandboat.com/Conservation/AIS](http://fishandboat.com/Conservation/AIS). ☐



photo-Tim Daley PA DEP

*Clump of didymo (Didymosphenia geminata) nuisance bloom.*

# CHECK. CLEAN. DRAIN. DRY.

## STOP AQUATIC INVASIVE SPECIES

Plants and animals that compete with native species and damage fishing and boating equipment.



### ✓ CHECK

Check your boat, trailer, and fishing gear for plants, mud, and aquatic life.

### ✓ CLEAN

Remove visible plants, fish, aquatic animals, mud, and dirt from your fishing gear and boats onsite.

### ✓ DRAIN

Drain the water from all equipment before leaving.

### ✓ DRY

Dry everything before entering new water. Allow equipment to dry to the touch. Then, allow it to dry another 48 hours.

*Never release plants, fish, or animals into a body of water unless they came from that water.*

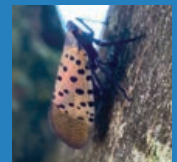
Learn more at [FishandBoat.com](http://FishandBoat.com)

## Stop the Spotted Lanternfly

These invasive insects were first discovered in Pennsylvania in 2014.

The Spotted Lanternfly feeds on the sap of many plants and trees.

Use the QR code below to learn more or report a sighting.



### More information:



[extension.psu.edu/spotted-lanternfly](http://extension.psu.edu/spotted-lanternfly)