Cornell Cooperative Extension

Ponds: Aquatic plant management

Freshwater ponds tend to stably exist in one of two states: (1) clearwater state with submerged macrophytes, or (2) turbid state dominated by algae. It is challenging to manage a pond to be clearwater without macrophytes. Once macrophytes are lost and a pond is in the turbid state, it can be hard to switch back. It is important to understand these two states and the drivers behind them.

Clearwater State (Macrophyte Dominated)

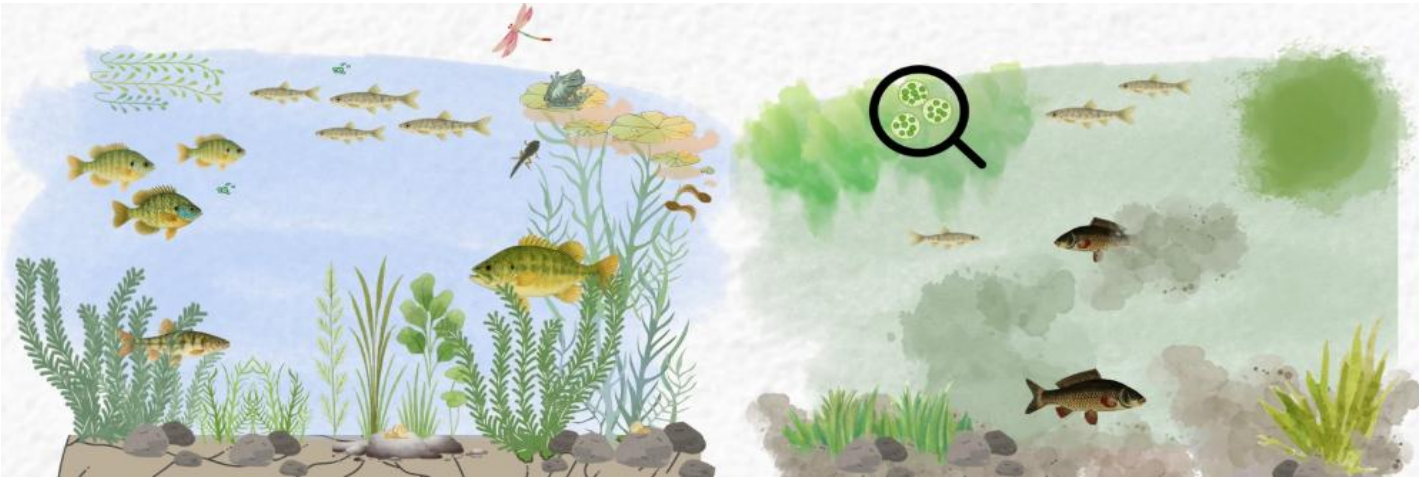
Water appears clear or transparent

- Aquatic plants (macrophytes) dominate
- Plants absorb excess nutrients, which outcompetes algae
- Plant roots stabilize sediments and reduce sediment suspension

Turbid Water State (Algae Dominated)

Water appears green or cloudy

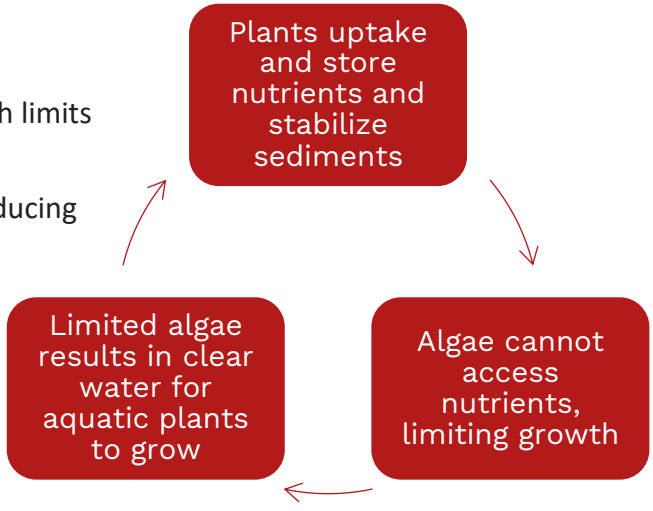
- Phytoplankton (algae) dominate
- Sediments more likely to be suspended in the water column
- Low light penetration



Each stable state is reinforced by environmental conditions and is **difficult to change** without external forcing. Increased nutrients, herbicides, and grass carp can flip a pond from clear to turbid. Removing grass carp, reducing nutrient loads, dredging, and adding native plants can increase the likelihood of establishing a clear state. Broadly, the clearwater state is generally preferred, although dense beds of macrophytes can limit aesthetics and recreation.

Submerged plants benefit ponds by:

1. Taking up nutrients (nitrogen, phosphorus), which limits algal growth
2. Stabilizing the shoreline & bottom sediments, reducing turbidity (cloudiness)
3. Reducing water temperature through shading
4. Providing food and habitat for fish, amphibians, insects, and other wildlife



Which plants are right for your pond?

Healthy ponds benefit from **a combination of plant types** to promote a variety of ecosystem services. There are numerous plants to consider, and we include some suggestions here. Always use native plants.

Shoreline Sediment Stabilization. Stabilize your pond's shoreline with deep-rooted plants, which will also intercept nutrients before they reach your pond. Shoreline plants also increase habitat for wildlife.

Pickerelweed
(*Pontederia cordata*)



Photo via wildadirondacks.org

Bulrush
(*Schoenoplectus* species)



Photo via wilsonbrosgardens.com

Broadleaf arrowhead
(*Sagittaria latifolila*)



Photo via akene.ca

Other plants to consider: rushes (*Juncus* species), swamp milkweed (*Asclepias incarnata*), horsetail (*Equisetum*), sweetflag (*Acorus americanus*), water willow (*Justicia americana*)
Not recommended: cattail (*Typha* species), any non-native species (e.g., *Phragmites*, yellow-flag iris)

Reducing Algae. Submerged and floating-leaved plants take up nutrients and can outcompete algae. They also provide shade, food, and habitat for aquatic organisms.

White or yellow water lily
(*Nymphaea* and *Nuphar* species)



Photo via Peter Friedman

Common Hornwort
(*Ceratophyllum demersum)*



Photo via Donald Cameron

American waterweed
(*Elodea canadensis*)

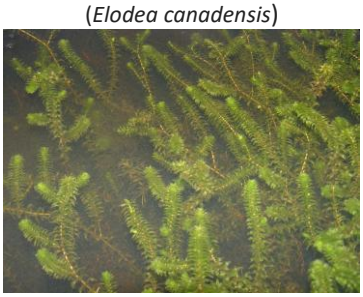


Photo via Donald Cameron

Floating pondweed
(*Potamogeton natans*)



Long-leaved pondweed
(*Potamogeton nodosus*)



American eelgrass
(*Vallisneria americana*)



Other plants to consider: other native *Potamogeton* species
Not recommended: *Brasenia* can become aggressive; any non-native species (e.g., *Hydrilla*, Eurasian milfoil, water chestnut)

Cornell Cooperative Extension
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List of Pond & Wetland Plants for New York State

List of plant species in New York State

- New York Plant Atlas: https://newyork.plantatlas.usf.edu/

Pond and wetland plant identification guides

- Borman, S., R. Korth, and J. Temte. 1997. Through the Looking Glass: A Field Guide to Aquatic Plants. Wisconsin Lakes Partnership. Stevens Point, WI. (Great illustrations, simple, easy to use)

- Crow, G.E. and C.B. Hellquist. 2000. Aquatic and wetland plants of northeastern North America. The University of Wisconsin Press. Madison, WI.

- Eggers, S.D. and D.M. Reed. 1997. Wetland plants and plant communities of Minnesota and Wisconsin. US Army Corps of Engineers. Second edition. (While focused on MN and WI, the guide covers most of the wetland taxa here in NYS)

- Chadde, S.W. 2022. Wetland plants of the Upper Midwest. Orchard Innovations. (While focused on Upper Midwest US, the guide covers most of the wetland taxa here in NYS)