CITY OF BLOOMINGTON MINNESOTA

# Plants & Ponds

Plants are a fundamental part of ponds. To understand how to best manage plants in ponds, people must set expectations that respect the life in a pond and considers the complex mechanisms of that form a pond's ecosystem.

## The Pond Ecosystem:

There are three main categories used when measuring the health of an ecosystem:

1. Resiliency – Capacity of a system to take on disturbance or stress and still remain essentially the same. High resiliency means that an ecosystem is tough and low resiliency means it is fragile.
2. Adaptability – How well the parts of a system can reorganize in response to change. For example, as the climate warms, the species of trees in a forest might change but the forest remains.
3. Transformability – The ability of one type of ecosystem to turn into a completely different ecosystem. If water is drained from a pond, it will become a wetland – same place but different ecosystem.

A pond's ability to be resilient and adaptable depends on the complex web of interactions between biotic and abiotic factors. Abiotic means all the parts that are not alive. This includes things, like chemicals, landscape and weather. Biotic refers to what is alive, like fish, bugs, plants and birds.

Biotic and abiotic factors are like cards in a deck. In a card game, a good player knows that, to win, they must play their hand based on the cards dealt and not based on cards they want. In the same way, every pond should be assessed and managed based on that specific pond and not on an idea of what a hypothetical pond should be.

Generally, a pond can exist in a few different dominance states. Each one is resilient and resists flipping to a different state. Here is a look at four common dominance states of ponds:

# Clear Water Vs. Turbid Water

**Clear water** ponds tend to be dominated by submerged vegetation because sunlight can shine easily into the water. The vegetation helps soak up nutrients and lock in sediments. The many plants help fish and other animals.

**Turbid water** is murky and dark. Sunlight cannot shine very deeply into the water so vegetation has a hard time growing. This allows nutrients to be available and can lead to algae blooms and bad smells.

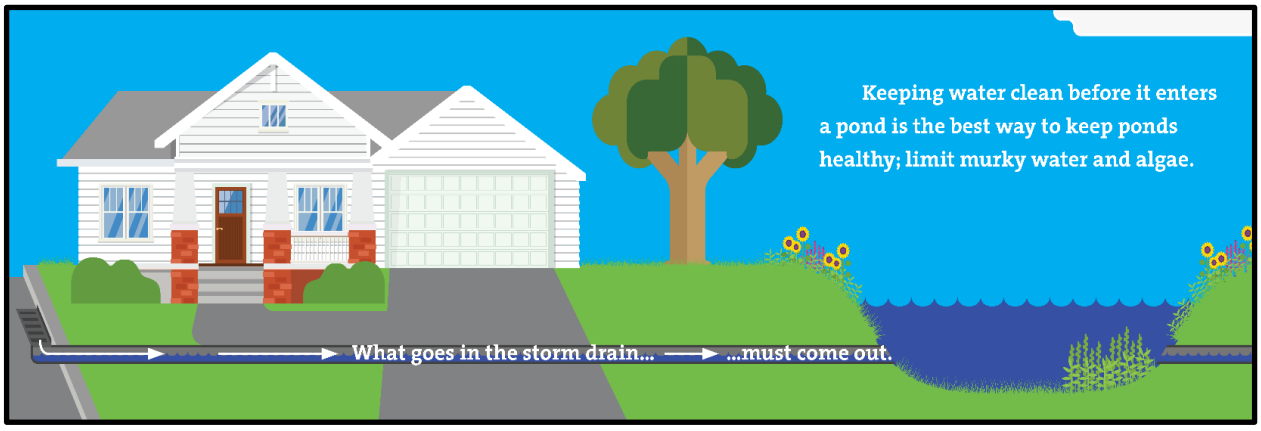
# Duck weed dominant VS. Submerged Vegetation Dominant

Duck weeds are small plants and are native to Minnesota. They can start to dominate ponds by blocking sunlight from reaching submerged plants. Bad smells can occur when dying duckweed start to decompose.

Submerged vegetation dominated systems have clear, open water. The submerged vegetation takes away nutrients from duckweeds, their roots lock in bottom sediment and they create great habitat for wildlife, like fish and insects.

## Management

A pond in an urban landscape receives far more nutrients than a pond in the wilds of the natural world. In urban areas, storm sewers transport water from roads and other impervious surfaces directly to ponds. How an urban pond is managed, must take this into account. By far, the best way to improve the health of a pond and create a healthy, aesthetically pleasing plant community is to stop nutrients from getting into the pond.




<u>Yard Waste</u>

Keep leaves, grass and other yard debris out of ponds. An important way to do this is preventing yard litter from going into storm drains because those often outlet directly into a pond. Keep it off of roads!

<u>Buffers</u>

Native plant buffers surrounding a pond protect the pond by cleaning water flowing over land and stabilizing the shoreline. The native vegetation also provides important habitat for both insects and animals. Don’t mow to the water’s edge!

## Herbicides

Herbicides kill plants. By doing so, they destroy a foundational piece of a pond's ecology. Without submerged vegetation, ponds are more susceptible to be in a turbid or duckweed dominated state. Treating a pond with herbicides is not a good long-term management solution because killing plants each season makes it more likely that the pond will return to an unwanted state the following year. For example, duckweed dominance is a common reason for herbicide use. However, herbicides also kill the submerged vegetation that would otherwise compete with the duckweed for nutrients. Without competition from submerged vegetation, a pond is more likely to be in a duckweed dominated state.

Herbicides come with some benefits. They are particularly helpful in managing aquatic invasive species. Removing invasive species with herbicides, combined with a greater restoration initiative, can be a helpful tool to restore a pond ecosystem. It is also possible to use herbicides in spot treatments for recreation purposes and not substantially reduce the resiliency of a pond's plant communities.

Using herbicide to get clear, open water destroys much more than just the green you can see on the surface. A better way to manage vegetation is to reduce nutrients from reaching the pond. In this photo, a City staff member takes a water sample to test for nutrient levels. Data like this helps the City make positive management decisions to increase pond resiliency and adaptability.