

Private Pond Fact Sheet

Prepared by: Jack Cavagnolo, Ondine Freshwater Consultants LLC

Types of Water Bodies:

When looking to add to or restore a body of water, it is important to know which type you are dealing with to figure out the regulations surrounding it. The common bodies of water are public lakes and ponds, private ponds, waterfront, rivers and streams and wetlands.

Lakes are defined as large bodies of water, usually formed by a glacier or other natural depressions. They almost always have streams or groundwater running into the lake to keep the water level up. Private ponds are a

pond that is either completely owned by one person or entity or located entirely on a person's or entities property. Manmade private ponds can be any size, while natural ponds can be up to 20 acres. Each state has its own definition of wetland, which are usually classified by the aerobic activity of an area. A general definition for a wetland is an area of land that can have a small amount of surface water all year, or just have saturated soil for only a short period of time. A waterfront is an area of a town or entity that is on the shore of a water body.



Private Pond Maintenance:

In most cases, contacting a professional to carry out maintenance for a private pond is the best thing a pond owner can do for the environment and their pond. Each pond is different, and knowing what those differences mean for maintenance is something that professionals carefully consider. There are still small things that can be done easily to help maintain a pond, like keeping leaves, branches, and other rotting plant matter out of the pond, keeping chemicals out of the pond, making sure inlet and discharge aren't being blocked, and making sure any pond infrastructure, like an aeration unit, is prepared for the winter.



Water Quality:

The state of Vermont has its own water quality standards that apply to all bodies of water in the state to ensure the safety of the people and the environment that interacts with that water body. The common contaminants that are measured during a water quality test are nitrate, nitrite, coliform bacteria, chloride, iron, manganese, pH, and sodium.

Sr.No	Parameter	Acceptable range	Desirable range	Stress
1.	Temperature ($^{\circ}\text{C}$)	15-35	20-30	<12, >35
2.	Turbidity (cm)		30-80	<12, >80
3.	Water colour	Pale to light green	Light green to light brown	Clear water, Dark green & Brown
4.	Dissolved oxygen (mg L^{-1})	3-5	5	<5, >8
5.	BOD (mg L^{-1})	3-6	1-2	>10
6.	CO_2 (mg L^{-1})	0-10	<5, 5-8	>12
7.	pH	7-9.5	6.5-9	<4, >11
8.	Alkalinity (mg L^{-1})	50-200	25-100	<20, >300
9.	Hardness (mg L^{-1})	>20	75-150	<20, >300
10.	Calcium (mg L^{-1})	4-160	25-100	<10, >250
11.	Ammonia (mg L^{-1})	0-0.05	0- <0.025	>0.3
12.	Nitrite (mg L^{-1})	0.02-2	<0.02	>0.2
13.	Nitrate (mg L^{-1})	0-100	0.1-4.5	>100, <0.01
14.	Phosphorus (mg L^{-1})	0.03-2	0.01-3	>3
15.	H_2S (mg L^{-1})	0-0.02	0.002	Any detectable level
16.	Primary productivity ($\text{C L}^{-1}\text{D}^{-1}$)	1-15	1.6-9.14	<1.6, >20.3
17.	Plankton (No. L^{-1})	2000-6000	3000-4500	<3000, >7000

Bhatnagar, Anita and Pooja Devi. "Water quality guidelines for the management of pond fish culture." *International Journal on Environmental Sciences* 3 (2013): 1980-2009.

Causes of Poor Water Quality:

There are several causes of poor water quality, some of which are easily fixed, while others can require intense projects. Some of the many potential causes of poor water quality are excess plants in the pond, chemicals being dumped into the pond, lack of flow, high disturbance of benthic sediments, inadequate aeration, high amounts of rotting plants, too much stormwater runoff, presence of invasive species, unhealthy soils surrounding the pond, and shoreline disturbances. In many cases it is hard to know whether a pond has poor water quality just by looking at it. There are some obvious signs that a pond has poor water quality, like high temperature, murky water, or dying plants and animals.

Algae:

A common misconception among pond owners is that surface algae is one of the main factors contributing to an unhealthy pond. Common species of pond algae don't often create large problems by themselves, they mostly take advantage of an already unhealthy pond to grow. Think of it as algae is often a symptom, rather than a sickness. The common species of algae that are blamed for pond problems thrive in high temperature and eutrophic environments, which are common in an unhealthy pond. Putting algaecide in a pond with surface algae may kill the algae, but it will not solve the water quality issues and often creates a plethora of other issues, much worse than the ones you started with.



