

How to

# Make the most of your pond

Think you have a pond on your place?

There are many different types of standing water, ranging from wetlands to lakes, but each has distinct characteristics. For example, a pond is defined as a water body less than 12 surface acres in size (that's about 9 football fields), less than 16 feet deep, and occupied by up to 30 percent with emergent (not submerged) vegetation.

Anything larger or deeper is considered a lake. Water bodies occupied by more than 30 percent emergent vegetation are considered wetlands.

## What are the benefits of having a pond?

Ponds can be natural or artificial systems and are great for many reasons. Direct benefits to landowners include:

- Creating a **place of sanctuary** that provides health benefits like reducing stress and anxiety;
- **Improving land-use efficiencies**, such as reducing areas with ornamental grasses and increasing areas that capture stormwater runoff;
- **Creating habitats** that benefit fish and wildlife populations, which can provide opportunities for recreation like angling and wildlife viewing.

Benefits extend beyond the backyard, as ponds also provide many ecological services, including carbon sequestration, nutrient cycling, and filtering of pollutants.

## What can landowners do to get the most from their pond?

Ponds often need to be altered or enhanced to best achieve the desired benefits. For example, ponds managed for the benefit of multiple species of wildlife are best if they are complex. In other words, they should include diverse plants, varying depths, and gradual shallow banks along at least one edge.

On the other hand, ponds managed for fishing can be simpler as long as temperature and oxygen remain at suitable levels. Let's dive a little deeper into common pond management considerations.

Note that this article is about the management of existing ponds. If you're planning to create a new one, make sure to thoroughly investigate what is required. Among other things, you'll want to check that your geology fits this use, that the necessary permits have been obtained, and that you are willing to do the work to maintain it.



Liz Sunshine, USFWS



When rehabilitating an old pond or building a new pond, a good design includes an area that is at least 8 feet deep and a shoreline area that is around 3 feet deep with gradually sloping banks. Visit <https://bit.ly/bb-pond-building> for additional information on how to construct a pond.

### Temperature and oxygen

Temperature and dissolved

oxygen are two of the most important water quality indicators in a pond. They go hand in hand, as water temperature affects how much oxygen the water can hold. Specifically, colder water can hold more oxygen. These two factors also influence what types of fish can live in a pond.

For example, cold-water fish like trout need colder water temperatures and higher amounts of oxygen (see table). Trout do well in ponds at higher elevations and cooler climates. Conversely, warm-water fish do better in areas that experience extended periods of

warm summer days, such as the eastern plains of Wyoming.

Aeration systems can be used to keep temperature and oxygen levels consistent throughout a pond. These systems can help prevent fish kill events, in which a large number of fish swim to the surface and “gasp” for air shortly before dying and washing to shore.

These events are caused by low dissolved oxygen levels. In summer, fish kills can occur when temperatures get warm and oxygen levels drop. Fish kills can also happen in winter, typically due to large die-offs of aquatic plants that occur when plants are unable to get enough sunlight.

Prevention is the best way to avoid a fish kill event. Once a fish kill starts, it is usually too late to do anything to help.

For more information on fish kills, visit <https://bit.ly/osu-fish-kill>.

### Fish

Ponds can provide important habitats for small-bodied fish like native minnows. These fish are often found in ponds connected to other water sources. **Small-bodied fish** add to species diversity and can be an important forage base for large-bodied game fish.

If **game fish** are desired and not present, there are two options. If public fishing access will be permitted, the Wyoming Game and Fish Department can manage the pond and stock the appropriate species.

### Depth

Depth is an important factor in controlling how a pond functions. Shallow depths (less than 3 feet) allow sunlight to penetrate and aquatic vegetation to grow. These shallow areas support healthy plant communities that add oxygen to the water and filter pollutants.

Deeper areas (more than 4 feet deep) do not usually have as many plants since sunlight often cannot penetrate to the bottom. These deeper areas add space for fish and often have better fish habitat. Deeper areas also prevent the pond from freezing solid.



If the pond is to be managed for private enjoyment, then the Wyoming Game and Fish Department private fish stocking process must be followed. This process requires identifying an authorized hatchery that offers the appropriate and desired species and completing a private fish plant application. For more information on stocking a pond, visit <https://bit.ly/bb-stocking-ponds>.

**Algae, plants, and nutrients**

Algae and aquatic plants are an important component of a healthy pond ecosystem. Good types of algae are free-floating, brown or green in color, and found near the surface of the pond. They are important food items for fish and other aquatic life.

In contrast, **blue-green algae** are noxious species that can cause harmful cyanobacteria blooms (HCB), which create toxic conditions for humans, livestock, and pets. These types of algae tend to have unique characteristics, such as producing a blue-green scum and an unpleasant odor.

For more information about blue-green algae and harmful

cyanobacteria blooms, refer to the Wyoming Department of Environmental Quality’s HCB webpage at [www.wyohcbs.org](http://www.wyohcbs.org).

**Aquatic plants** are rooted in the sediment and provide benefits like adding oxygen to the water and filtering nutrients and pollutants. By providing cover, they help create desirable fish habitat. A good goal is to have about 20 percent of a pond occupied by aquatic plants. Too many plants and algae can reduce the space available to fish and deplete oxygen levels.

Percent coverage can be estimated by splitting the pond into four imaginary quadrants, then estimating a percentage of lake vegetation for each section. The average of the four quadrants provides a rough estimate of the overall percentage of vegetative cover in the pond.

Nutrients in the form of **nitrogen and phosphorus** significantly impact algae and plant abundance, so reducing nutrient levels usually helps reduce growth. Management actions that reduce pond nutrients include: 1) adding wetland buffer areas around the pond to filter nutrients; 2) preventing livestock and geese



Bobby Compton

*Harmful cyanobacteria bloom in a southeast Wyoming pond.*

from using the pond area; and 3) avoiding the use of fertilizer nearby or in areas that drain into the pond. Mechanical removal and herbicide application can also help reduce plant and algae abundance.

For assistance with aquatic plant identification and control, check out Texas A&M Agrilife Extension’s AquaPlant tool at <https://aquaplant.tamu.edu> or contact a local UW Extension or Game and Fish office.

Ponds are a great addition to any property in Wyoming—and healthy ponds are even better. This spring, take a closer look at the standing water on your property and consider implementing some pond management strategies.

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Type of fish	Common species	Preferred July temperatures (°F)	Oxygen needs (ppm)
Cold-water	Trout	50 – 64	≥ 5
Cool-water	Walleye, Yellow Perch	66 – 70	≥ 4
Warm-water	Largemouth Bass, Crappie, Channel Catfish	72 – 79	≥ 2