

EXTENSION NOTES



BUILDING A POND

There are many reasons for building a pond, like having a place to swim, fish and view wildlife. Ponds are also reliable sources of water for livestock, irrigation and fire protection. Whatever the reason, ponds add beauty to a

landscape and provide valuable habitat for animals and fish. This Extension Note offers tips on the construction and maintenance of artificial ponds.

PLANNING YOUR POND

Building a pond is a major undertaking. Before you begin, visit other artificial ponds and ask questions of other pond owners. Or, if you prefer, hire a consultant to do the planning and a reputable contractor to construct the pond.

It's important to think about why you want a pond in the first place. Ultimately, the type of pond you build will depend on how you want to use it. Don't be overly ambitious. Multi-purpose ponds seldom fulfill all of their intended uses. When you've decided what type of pond you want, consider the following:

SITE

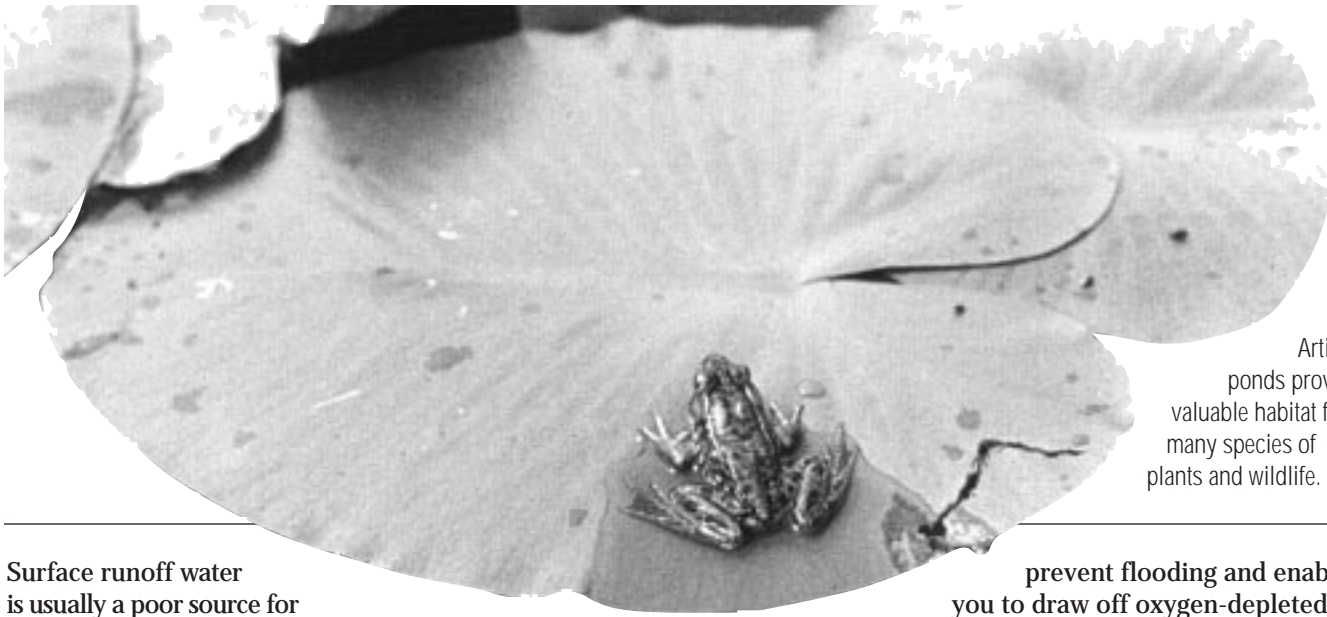
Locate your pond above the floodplain in a well-vegetated area with suitable slopes and contours. The surrounding trees and shrubs will reduce erosion and help to maintain water quality.

WATER SOURCE

The water supply must be sufficient to fill the pond and maintain a constant water level year-round. Groundwater, such as water from a spring, is the best source of water for a pond. The supply of groundwater is usually constant and water quality is generally high. Before you begin to plan and construct your pond, have the source water analyzed to determine whether it is suitable for aquatic life.

Don't divert natural waterways to fill your pond. This method can be harmful to the environment and requires a permit from the Ministry of Natural Resources.





Artificial ponds provide valuable habitat for many species of plants and wildlife.

Surface runoff water is usually a poor source for ponds. The water supply from runoff is often unreliable and may contain silt and excessive nutrients.

SOIL

If possible, build your pond in soil with a clay content of at least 10 to 20 per cent. Clay soils hold water the best. Be sure the same soil type extends well below the depth of your proposed pond. Dig test holes at various locations to be sure. Gravel, sandy soils or limestone do not retain water naturally. You can use plastic molds or vinyl liners to alleviate this problem, but these can be expensive and require regular maintenance.

SHAPE AND DESIGN

Kidney-shaped ponds are recommended. To minimize wind-wave action, lay the longest end of the pond in a north-south direction. Consider building a dam to

prevent flooding and enable you to draw off oxygen-depleted layers of water from the bottom.

Stabilize your pond's banks with clean gravel and rocks.

DEPTH

Ponds used for swimming or to raise fish should be deeper than those intended for waterfowl and wildlife. Fish need a depth of at least 3.7 to 4.6 metres to survive over the winter. Ponds less than three metres deep are more susceptible to a build-up of aquatic vegetation during summer months.

SIZE

The larger the pond, the more difficult it is to build and maintain. A pond of about one acre in surface area should be large enough to sustain a healthy fish population.

POND MAINTENANCE

Be prepared to inspect and repair your pond periodically. Watch for signs of deteriorating water quality and accumulating bottom sediments. These problems are caused by bank erosion, decaying plants and excessive nutrients carried into the pond by runoff from fertilized lawns, septic systems and farming operations.

Thinking ahead can prevent these problems and make your job easier. Here are some points to keep in mind:

- Keep livestock fenced and away from the pond at all times
- Remove aquatic vegetation if it becomes too thick
- Remove snow from the ice on your pond to give plants underneath the ice the light they need to produce oxygen during the winter
- Aerate the water when needed
- Prevent shoreline erosion by planting vegetation or replacing gravel and rocks
- Remove silt and sediment that accumulates on the bottom of the pond
- Watch for muskrats, groundhogs and other animals that might disrupt the banks of the pond

GET REQUIRED PERMITS

Before you begin construction, be sure you have all the necessary permits. It is your responsibility to ensure that all necessary approvals have been obtained.

Having approval from one agency does not guarantee you will receive approval from another. Here are some of the permits you may be required to have:

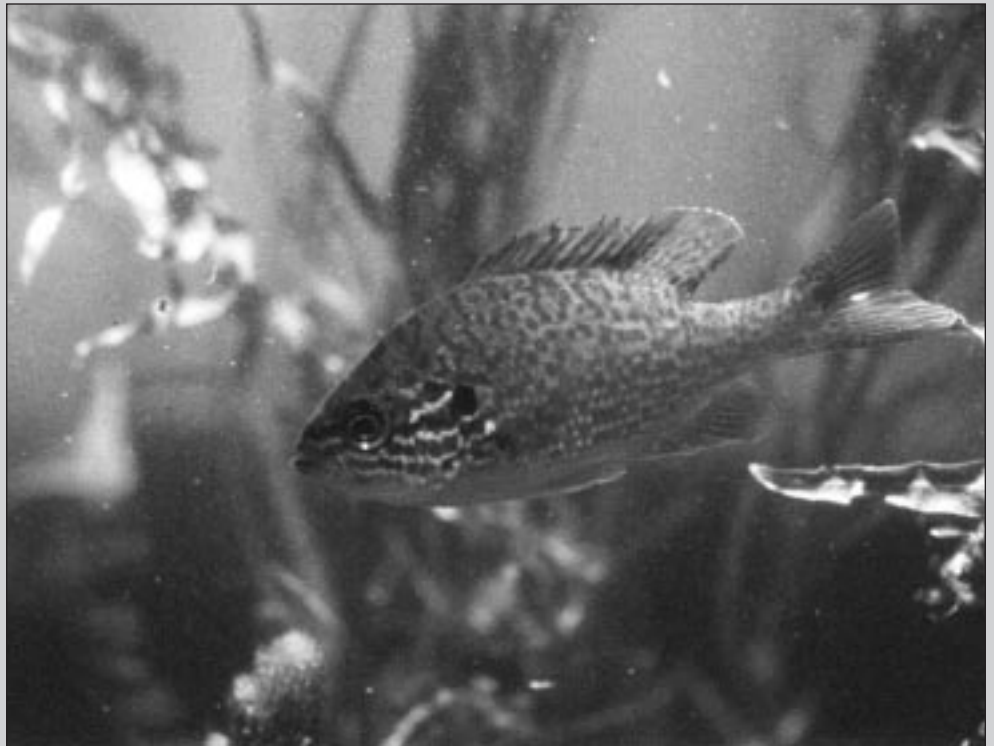
- A permit from the local Conservation Authority, if the pond is to be constructed on a floodplain or involves an alteration to a watercourse
- A permit from the Ministry of Natural Resources to construct a dam or to divert water from a natural watercourse
- A permit from the Ministry of Environment and Energy, if water comes from a natural watercourse at a rate exceeding 10,000 gallons a day
- A permit from the Ministry of Environment and Energy to use herbicides to control aquatic vegetation
- A permit from the Ministry of Natural Resources to transfer fish, if the pond is being stocked
- A resident sport-fishing licence, if fishing in ponds fed by streams flowing through the landowners property

DESIGNING A POND FOR FISH

Ponds for fish should be at least 3.7 to 4.6 metres deep with relatively steep submerged banks to discourage excessive growth of aquatic plants. Rooted aquatic vegetation, such as water lilies and eel grass, should grow in the shallow parts of the pond where light reaches the bottom. Stabilize the shoreline with rocks set on top of a filter cloth. Use clean cobble, larger rocks and boulders to create sheltered areas for fish. If there is little shade, build floating structures to give fish cool places to hide.

Depending on the size and depth of the pond, you may need to aerate the water to ensure there is sufficient oxygen for fish to breathe. In deeper ponds, a bottom draw-off structure may be needed to remove layers of oxygen-depleted water from the bottom of the pond.

Summer water temperature will determine what fish species can live in your pond. Temperatures from 9 to 19 degrees Celsius will support



Summer water temperatures determine what kind of fish to keep in your pond.

cold-water species such as trout, while warmer waters from 17 to 28 degrees Celsius are best for bass or panfish. In either case, it is best to plant shrubs and water tolerant trees, such as willow, to shade the pond during hot summer months.

DESIGNING A POND FOR WILDLIFE



Ponds designed for waterfowl should have an irregular-shaped shoreline and good exposure to sunlight.

All ponds will attract wildlife. However, there are things you can do to entice specific bird and animal species to your site. Ponds designed for waterfowl, for example, are usually no more than 1.2 or 1.5 metres deep with low, sloped banks. These ponds should also have an irregular-shaped shoreline and good exposure to sunlight. Planting fruit bearing shrubs, like dogwood, cranberry and chokecherry, around

the pond's perimeter helps attract songbirds and small mammals. You can also construct nesting islands and nest boxes to attract waterfowl.

Make sure that there is a variety of aquatic plants and that cattails or purple loosestrife do not become dominant. Ideally, your pond will be linked to other forested areas and wildlife habitats.

FURTHER READING

- Agriculture Canada and Ontario Ministry of Agriculture and Food. 1994. *Best Management Practices: Water Management*. 93 p.
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