

Pond Facts #1

Pond Assessment and Inspection

Proper pond management practices should always start with an assessment and inspection of the current conditions in the pond. This fact sheet discusses some of the critical components of a typical pond that should be identified and inspected before tackling pond management issues.

Pond Objectives

An important first step in assessing your pond is to determine the primary objectives for your pond and understand the limitations this will place on other uses. Ponds are frequently used in several ways to satisfy more than one objective. For example, having water available in the pond for fire protection may satisfy one objective without interfering or conflicting with other objectives such as swimming or fishing. Multiple-use ponds are fine as long as the uses are compatible. When conflicting or incompatible uses are desired, it is necessary to assign priorities to the owner's objectives. For example, the objective of providing for swimming may conflict directly with the objective of having water available for irrigation. Irrigation needs may lower the water level to a point where swimming is impossible, at a time when swimming is most wanted. For this reason, you should list and prioritize specific objectives for your pond. Assessing the pond resources is a critical component of setting objectives. Through inspection and assessment of the pond structure, watershed, water sources, and ecology, you can ensure that the pond resources are adequate for your objectives.

The Pond Watershed and Sources of Water

Many pond uses and management strategies will require an understanding of the pond watershed and sources of water. The pond watershed includes the area of land surrounding the pond that contributes water to it. Identifying the pond watershed is important because anything that occurs within this area can impact the pond. Locating a pond in an undisturbed area or minimizing disturbance and land use changes within the pond watershed are important components of protecting a pond.

Many ponds have been constructed where groundwater comes to the surface as springs or seeps. Ponds fed by these groundwater sources may stay cooler during the summer, especially if the flow from the springs is persistent. If possible, the land area contributing water to the springs should be identified and protected to ensure adequate quantity and quality of water for the pond.

Sometimes ponds are constructed on or near a surface stream. The stream may simply flow through a constructed pond or a portion of the stream may be diverted into the pond. In this case, the pond's health relies entirely on the quality and quantity of stream water. The entire land area draining the surface stream becomes critical to the health of the pond.

Where groundwater or streams are not available, a pond may be located to capture surface runoff from the surrounding land (Figure 1). Surface runoff ponds are normally found in depressions often draining 10 to 20 acres of land for a one-acre pond. Land use activities around these ponds is especially critical since water flows directly over the land to the pond. Care should be taken to avoid polluting activities on the land around these ponds.



Figure 1. A pond that collects surface runoff from the surrounding land.

Regardless of the water source, it is a good idea to establish a buffer strip of vegetation around the pond to trap sediment, nutrients, and other pollutants before they enter the pond. The buffer strip should range in width from 10 feet (for a gentle slope) to 50 feet (for a steep slope around the pond).

Inspecting Your Pond

At least once each year you should take some time to inspect the pond structure. Routine inspection and frequent maintenance protect a pond, keep it attractive, and extend its useful life. Lack of inspection and prompt repair of problems may cause more severe damage that is either irreparable or more expensive to fix.

Dam and Banks

The dam and any exposed banks should be checked to ensure that they have complete grass cover and no erosion. Grass, weeds, brush, and small trees should be occasionally cut from the dam and banks. Trimming smaller vegetation allows for a visual inspection of the surface to check for signs of leaks or burrowing animals. Also inspect and repair any fences that are used to keep livestock from accessing the dam or pond embankments. Large trees already existing along the dam or banks should be left alone. Cutting or killing large trees may cause leaks to develop around their decaying roots.

Overflow Pipe

It is especially important to inspect the overflow pipe and remove debris in or near the pipe (Figure 2). Obstructions of this pipe may result in water breaching the dam or continually flowing through the auxiliary spillway (if one exists). The auxiliary spillway should also be inspected to remove debris and repair any obvious erosion.



Figure 2. Inspect the overflow pipe and remove any debris in or near the pipe.

Pond Access

Be sure that any roads to the pond are maintained to allow access for safety vehicles. This is especially important if a dry hydrant exists to allow access for fire trucks. To maximize fire protection benefits from a pond, fire trucks must have access to the pond during all seasons of the year and the dry hydrant should be readily accessible.

Check for Signs of Leaks

The pond water level should be routinely observed to monitor for early signs of leakage. Most ponds lose some water to underground seepage and evaporation. Ponds with little water inflow may lose several inches per day to evaporation in the summer. Losses greater than this may be attributed to a significant leak that is often visible as a wet area outside the pond. Leaks may originate from muskrat burrows, decaying roots, or debris left in the pond dam. If you suspect your pond is leaking, consult the fact sheet titled *Pond Facts #3: Fixing a Leaking Pond* to learn more about methods to fix leaks.

Pond Sediment

A common problem among older ponds is sedimentation. Depending on the source of water, ponds may fill up over time with sediment. As sediment fills in the pond, growth of aquatic plants and algae will generally increase due to increased sunlight penetrating the shallower water.

Sediment levels in the pond should be observed and monitored. If sedimentation is noticeable, steps should be taken to reduce sediment entering the pond. Inspect the pond water source to determine if exposed banks or upstream activities are causing increased sediment. If the pond receives excessive amounts of silt, erosion control practices should be implemented in the watershed. If you do not own upstream land, a small settling basin just upstream from your pond could be built to intercept silt or debris. Sediment can be removed from the pond through dredging but this process is usually time-consuming, expensive, and destructive to pond ecology.

Safety Equipment

Ponds, like any body of water, attract both invited and uninvited people. As part of your pond inspection, consider safety features and equipment to protect visitors. Remove trees, stumps, and brush, which may be a hazard to swimmers. Keep the pond and banks free of rubbish, wire, cans, bottles, and other debris. Mark the swimming area and post safety rules for all permitted water uses. Place

warning signs at all known danger spots. If boating and swimming are permitted, consider building a dock or pier. Attach lifesaving devices such as ring buoys, ropes, or long poles to a safety post located near swimming areas. For more information on pond safety issues and equipment, consult the fact sheet titled *Farm Pond Safety*.

In addition to safety equipment, many pond owners choose to carry comprehensive liability insurance on their property. You should consult with an attorney and an insurance agent for proper interpretation and protection for the specific circumstances involved with your pond

Area and Volume

Other areas of pond assessment include careful measurement of pond area and volume. For more details on how to do this, consult the fact sheet titled *Pond Facts #4: Measuring Pond Area and Volume*.

Water Quality

Pond assessment should include routine testing of the pond water quality. Water tests are helpful for documenting existing problems and monitoring for important changes in water quality. The parameters that should be tested in your pond will depend on your intended uses for the pond. For more details on pond water quality, consult the fact sheet titled *Pond Facts# 5: Water Quality Concerns for Ponds*.

Aquatic Plants and Algae

Identifying and inventorying the aquatic plants and algae growing in the pond during the summer is valuable to determine the existing health of the pond and potential problems in the future. Consult the pond management Web site (www.sfr.cas.psu.edu/water) for pictures and drawings of common aquatic plants and algae that may help identify plants in your pond. You can also e-mail digital photos of plants that you would like identified to Bryan Swistock at brs@psu.edu.

Fisheries

Assessment of existing fisheries in the pond is important for future management decisions regarding stocking, harvest, and habitat requirements. Fisheries assessment is accomplished mostly by records kept by fishermen and visual observations of numbers and sizes of fish from the pond bank. Professional fisheries biologists can also be hired to conduct electrofishing surveys of ponds and lakes to provide more detailed assessment information and management plans. For more information on pond fisheries management consult the fact sheets titled

Pond Facts #11: Fish for Pennsylvania Ponds and *Pond Facts #12: Managing Your Pond Fishery*.

More Information

To access the fact sheets referenced above along with other pond management information, consult the Penn State pond management Web site at www.sfr.cas.psu.edu/water or contact the Penn State Cooperative Extension office in your county .

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Penn State College of Agricultural Sciences research, extension, and resident education programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

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CODE XH0012