

Land & Water

Conserving Natural Resources in Illinois

University of Illinois Extension • College of Agricultural, Consumer and Environmental Sciences

Fisheries Management in Ponds

Pond Design

A good pond fishery depends on proper design. The size, depth, shape, and water quality affect the pond's ability to support fish. However, active management by the landowner is also necessary for maintaining good fishing.

Pond Size. Although smaller ponds can support aquatic life, ponds that are at least 1 acre in size are much easier to manage.

Watershed Size. The pond's watershed should be 10 to 20 acres for every acre of pond surface. Larger watersheds may lead to problems with siltation and sedimentation, or possibly failure of the dam from high water flow.

Depth. In Illinois, one-fourth of the pond should have at least 7 feet of depth in the south and at least 10 feet of depth in the north. Design the shoreline to minimize the amount of water that is less than 3 feet. This will help reduce vegetation problems from shallow water plant species.

Fertility Management. While basic pond fertility is determined by the watershed's soil type, land use practices that use fertilizer can potentially increase the nutrient levels in the pond, leading to excessive growth of aquatic plants.

Landowners planning to construct a pond should contact their county Soil and Water Conservation District office. District staff, in conjunction with staff from the Natural Resources Conservation Service, can provide critical design information and technical support.

Pond Food Chain

A pond's ecosystem, like terrestrial systems, is complex. The vegetation in the pond provides food for microscopic animals and oxygen. The microscopic food is consumed by insects and other organisms, which provide food for small game fish in the pond. The small game fish, in turn, are eaten by larger fish.

With such diversity, the pond ecosystem must include a combination of shallow and deep water areas, as well as aquatic vegetation.

Stocking the Pond: Getting Started

In Illinois, most ponds provide habitat for warm-water species, including largemouth bass, bluegill, channel catfish, and redear sunfish.

Although all ponds have some general similarities, each one is unique, depending on the size, depth, fertility, and water quality. Landowners may also have unique goals for their pond, so the first step in stocking a pond is to consult with a fisheries biologist with the Illinois Department of Natural Resources (IDNR) to determine the stocking rate and combination of species that best fits your situation.

Stocking Combinations

The most common and easiest-to-manage stocking combination for Illinois' ponds is largemouth bass, bluegill, and channel catfish. Many pond owners also add redear sunfish to this

combination to eat snails and crustaceans in the food chain. Although crappies are popular game fish, they commonly cause problems in small lakes and ponds through overpopulation and stunting. Therefore, do not stock crappie in your pond.

In new ponds or renovated ponds without fish, fingerling fish, 1 to 3 inches, are recommended for the initial stocking. The stocking of adult fish can lead to a stunted fish population resulting from high reproductive success with limited predation.

Initial stocking rates of fingerlings for a largemouth bass/bluegill/channel catfish combination vary, depending on the fertility of the soil in your region of the state.

For example, in central and northern Illinois, stocking rates for bass and channel catfish range from 60 to 100 fish per acre, while bluegill range from 500 to 1,000 fish per acre, depending on soil type. However, in the lower-fertility areas of south-central Illinois, stocking rates for bass and channel catfish range from 50 to 90 fish per acre, while bluegill range from 400 to 800 fish per acre, depending on soil type.

This example illustrates the importance of seeking the advice of an IDNR district fisheries biologist in your region of the state. An IDNR district fisheries biologist can make stocking recommendations that are customized to meet your pond's potential fertility level and individual management objectives.

If you follow recommended fingerling stocking rates, spawning success is normally adequate and leads to a balanced population. Do not stock additional fish of any size or allow anyone else to stock their "favorite" fish in your pond. Doing so can lead to a population imbalance.

Supplemental or Corrective Stocking

If the stocking is supplemental to an existing population, larger-sized fish must be used in order to ensure survival. Channel catfish reproductive success is usually not adequate in ponds to maintain the population. Supplemental channel catfish stocking must be done to maintain the population, using 8-inch or larger channel catfish to reduce predation rates by largemouth bass in established ponds.

A corrective stocking to restore a population

balance may be recommended by a fisheries biologist. This usually involves stocking adult bluegill or one-year-old bass, depending on the situation. Corrective stocking should only be done under the direction of a fisheries biologist.

Stocking Other Species

Many people would like to catch a few walleye, muskellunge, or hybrid stripers from their pond. However, these species are better suited for large lakes. In ponds, they compete with other species for food and require continual stocking to maintain their populations.

Fish Not to Stock

Several species of fish should never be stocked in your pond, including all bullhead catfish species, green sunfish, common carp, and buffalo.

The green sunfish and bullheads have very high reproductive rates and can quickly become numerous and stunted in your pond. Additionally, bullheads, carp, and buffalo are bottom feeders and will increase the turbidity or "muddiness" of the pond. All of these species will compete with bluegill and young bass for food and space, decreasing the numbers of these species in your pond.

Harvesting Fish

First Year. After the initial stocking of a pond with fingerlings, it will take two years for the pond to reach carrying capacity or the total number of pounds of fish it can support. You should not harvest any fish the first year after stocking.

Second Year. Bluegill and redear harvesting can begin in mid-July during the second year, but bass should be released if caught.

Third Year and After. You can continue harvesting the bluegill and redear; and after mid-July, you can harvest largemouth bass. To maintain the bluegill and bass population balance, biologists recommend harvesting only the larger bass—those that are at least 15 inches long.

Population Balance

In Illinois, most ponds can support bass and bluegill populations at a 1 to 4 ratio. Therefore,

four pounds of bluegill and/or redear should be harvested for every pound of bass to maintain a balanced population.

When largemouth bass are excessively harvested, the bluegill population has less predation and the population increases. High bluegill populations can decrease bass reproductive success by eating bass eggs and fry during the spawn.

If bass populations remain low, the bluegill population becomes so numerous that none of the fish grow larger than 4 inches in length, because more fish are sharing the same amount of food in the pond's ecosystem.

Determining Population Condition

Pond owners can use several methods to check the condition of their fish population. A population survey, performed by an IDNR district fisheries biologist, is often thought to be the only method to determine population condition. However, a population survey is effective but not necessary.

Pond owners can collect their own population data by recording the species, size, and number of fish harvested from their pond. Using this data, the fisheries biologist can make recommendations that might include adjusting harvest strategies, size limits, or restocking.

Management recommendations will also be determined by pond owner goals. For example, when large bluegill are desired and bluegill harvested from a pond are generally larger than one-third pound and largemouth bass are less than a pound, a pond owner should be satisfied and do nothing to the population.

However, if larger bass are desired by the pond owner in the same situation, the recommendation would be to remove some of the bass until the largemouth bass size increased.

Artificially Feeding Fish

Pelleted fish food is available to supplement natural food sources. This is most commonly used in catfish production ponds. Bluegill feeding is also sometimes done to increase the size of the fish. However, feeding is not necessary and is not usually recommended in normal pond management. The addition of too much feed can lead to excessive decomposition rates, increased biological oxygen demand, and fish kills in the late summer months.

Sources of Fish

The IDNR, Division of Fisheries, can provide pond owners with information regarding current IDNR programs and application procedures for initially stocking of sport fish for a nominal fee.

Your pond must meet specific requirements to qualify for this program. So contact your local IDNR district fisheries biologist to obtain current information. You can also obtain a list of private fish dealers from a district fisheries biologist.

Pond Management Information

The IDNR has two publications pertaining to pond management:

- *Management of Small Lakes and Ponds*
- *Aquatic Plants: Their Identification and Management*

Both publications are available from an IDNR fisheries biologist or at the following website: http://www.ifishillinois.org/programs/Lake_Plant_Lake_Plant_Mgmt.htm

In addition, you can find IDNR fish and fisheries information at the "I Fish Illinois" website: <http://www.ifishillinois.org/index.html>



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Writer

Dave Shiley, University of Illinois Extension natural resources educator

Editor

Doug Peterson, U of I Extension communications specialist

Land & Water Coordinator

Michael C. Hirschi, U of I Extension soil and water specialist