

ISU FISHERIES EXTENSION

Managing Iowa Fisheries

Farm Ponds

Introduction

Iowa contains more than 85,000 ponds, the majority of which are found in the southern portion of the state, although the flatter northern section contains a few. Many land owners use their ponds for both recreation and food production.

Ponds are, however, both complex and simple ecosystems that require understanding and management. Pond complexity depends on the food webs involving many types of organisms. The simplicity of such systems is based on placing a limited number of fish species in the ponds. This publication addresses concerns of landowners who wish to maintain their farm ponds for present and future enjoyment.

Pond Types and Construction

There are three basic types of ponds: watershed (hill), levee, and excavated. Watershed ponds, the most common, have dams constructed to retain water flow of small watersheds. Levee ponds are dug with the removed soil placed as levees on the edges (levees on four sides). Excavated ponds are those dug out of the ground with the removed soil placed off site. If you wish to expand an established pond or build a new one, contact your district United States Department of Agriculture (USDA) Soil Conservation Service (SCS) office. The SCS can provide technical assistance.

Points to consider before building a pond include water source (stream, runoff, springs, or well), watershed size, water quality and quantity, soil type, and access points. The ideal pond has springs as the water source, does not leak, and has adequate water quality and quantity. Groundwater, however, may be relatively free

of organic wastes but low in dissolved oxygen. A low level of dissolved oxygen may be a significant problem when the water flows directly into ponds. Surface runoff has high dissolved oxygen but also may have a high sediment and pesticide load. Dammed streams may have the liability of including established stream fishes in the newly developed pond.

The soil used for the pond dam and bottom should have a high clay content. A pond built on a sandy or gravel substrate will leak. Such a pond will require either bentonite or plastic to seal it, both of which are expensive. Soil types may be determined from county soil survey maps.

In Iowa, each surface acre of water impounded in a watershed requires about 20 acres of watershed. Watersheds too small or too large are detrimental to pond management. Protected timber and grassland are the preferred watershed cover. Cropland is the least desirable due to the associated siltation, which may lead to decreased pond depth, increased turbidity, and pesticide load.

Cattle should not drink directly from a pond because they ruin bank slopes and nearby sod. Other results from cattle usage may be turbid water, destruction of spawning beds, and increased insecticide levels. A nearby watering tank will allow cattle access to water while protecting the dam. A fence constructed 60 to 100 feet from the pond edge should exclude all cattle from the pond and protect it from runoff. Cattle exclusion is required for ponds when construction is cost-shared by state or federal agencies.

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The addition of a tilt pipe or other pond-draining device is desirable (Figure 1). Such devices are used to adjust pond depth in response to fisheries management. Tilt pipes should not exceed four inches in diameter.

The inside of the pond should have slopes of at least 3:1 to control aquatic vegetation. However, the landowner also should consider that such steep slopes might endanger people who walk along the shorelines. The individual landowner needs to address both concerns before completing the pond.

Water Quality

Though water quality may appear to be the same for different ponds, there are often distinct differences that are not immediately obvious. One method used to determine water quality is to watch fish behavior and appearance. Fish that school at the top and gulp at the surface are probably in water that is low in dissolved oxygen. Other symptoms of low oxygen levels are death, blotches on body, and scale loss. These symptoms may be signs of poor water quality, disease, or both. In addition to low oxygen levels, other chemical factors such as alkalinity, pH, and sulfides affect a fish population in a pond. Additional information about water quality may be found in *Managing Iowa Fisheries—Water Quality* (Iowa State University Extension publication PM-1352a).

Fish for Stocking

The few Iowa ponds that have cool springs (55°F and less) may be adapted for cold water species such as trout and salmon. Such ponds are limited. Most Iowa

ponds are more suited for warm water species such as largemouth bass, bluegill, and channel catfish.

Fish for stocking (largemouth bass, bluegill, and channel catfish) are available from the Iowa Department of Natural Resources (IDNR), if the pond meets the following criteria:

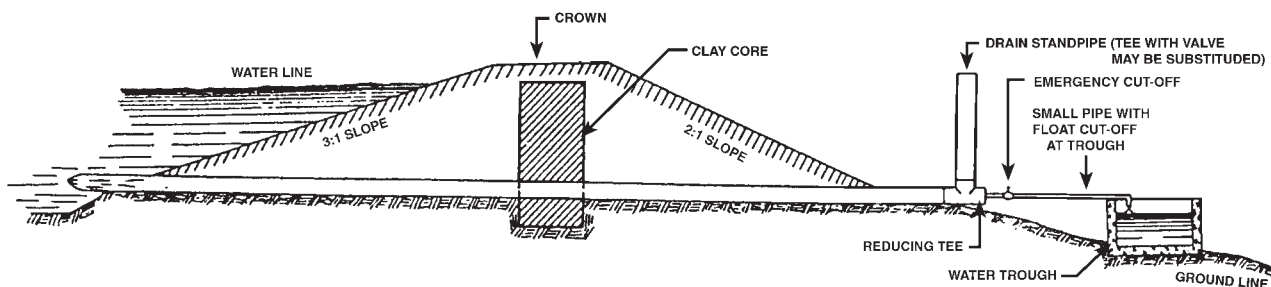
- (1) new or renovated to be free of fish,
- (2) surface area of at least one-half acre,
- (3) maximum depth of at least eight feet, and
- (4) fenced to exclude livestock with a 60-foot minimum buffer between pond edge and fence.

Fish are also sold by several private hatcheries. For a list of private hatcheries in Iowa, contact Iowa State University Extension agriculturists, IDNR personnel, or Iowa State University specialists.

Stocking Rates and Times

The IDNR uses a split stocking approach to farm ponds. In ponds free of all fish, bluegill (sunfish) and channel catfish fingerlings are stocked in the fall and largemouth bass the following spring. This approach allows the bluegill population to become established before the establishment of the predator population of largemouth bass. Bluegills are stocked at 750 to 1,000, 1- to 2-inch fingerlings per surface acre of water and largemouth bass are stocked at 70, 1- to 2-inch fingerlings per surface acre. Channel catfish fingerlings are stocked at 100 per surface acre. Because channel catfish generally do not reproduce well in small ponds, they need to be restocked every two to three years.

Figure 1. Suggested pond layout. Source: Lock, J. and W. Klussman. Improve Your Farm Fish Pond. Texas Agricultural Extension Service, Publication B-213, Page 16.



Cross section of dam showing water trough & drain lines. Turn drain pipe down to lower water level or drain pond.

The IDNR, however, does not provide fish for stocking ponds with an existing fish population. To stock channel catfish in ponds with an established bass population, the landowner must purchase fish from a private source. Only catfish longer than 8 inches should be stocked or the bass will eat them.

Mature Iowa ponds contain about 250 pounds of bluegills per surface acre. Bluegill harvest may start the second year after stocking. Limits on bluegill harvest will generally not be needed in most ponds because bluegill are usually plentiful. An excessive bluegill population will exhibit stunted sizes. Bluegill management requires regulation of bass harvest, such as minimum size limits.

Largemouth bass populations in a balanced pond may approach 50 to 75 pounds per surface acre. Harvest of bass should not begin until three or four years after stocking. A 15-inch size limit is recommended, which means that only fish greater than 15 inches may be removed from the pond. If too many bass are removed and not enough bluegills, a pond with imbalanced populations of both species may result (few large bass and many small bluegills). If the landowner is interested primarily in a large-sized bluegill fishery, no harvest may begin three years after initial stocking. Once half of the channel catfish are harvested, the pond should be restocked with 8-inch fingerlings.

Other Species

Beyond the previously described species, pond owners may want to stock other species in their ponds. Walleye, northern pike, and hybrid striped bass are highly sought after by anglers. These species will not reproduce in ponds and must be restocked periodically. Northern pike and hybrid striped bass often will grow large, while walleye will not. Care must be taken in mixing these fish with others, however. Large predators such as northern pike and hybrid striped bass may prey upon largemouth bass. Crappie stocked into small ponds (not recommended by Iowa Department of Natural Resources personnel) result in a large population of small stunted fish. Their small size, large numbers, and similar food habits enable crappie to compete directly with largemouth bass. Bullheads, though popular with Iowa anglers, should not be stocked into ponds. Bullheads will over-populate and grow slowly in ponds with a limited bass population.

Supplemental Feeding

All ponds contain some natural food for fish. Landowners who wish to feed their fish commercially-prepared artificial diets should determine whether the fish consume the pond's current production. Supplemental diets are not needed in ponds in which the current production is not being used. Those pond owners who need the additional production may use supplemental diets, such as trout, salmon, and channel catfish feeds, to feed a variety of species. The secret to supplemental feeding is consistency. Feed in the same location at the same time each day. Distribute all the feed that the fish will eat in 15 minutes. You should not exceed 25 pounds per surface acre per day in any situation and feed only from spring through fall when water temperatures exceed 60°F. Fish feed is only good for three months (vitamin C duration), so the pond owner should not buy more feed than can be used in that period of time. Fish feeds are available from several animal feed producers and farm cooperatives. It is generally not possible to feed wild populations of largemouth bass.

Pond Balance?

A pond is "balanced" if the populations of individual fish species are adequate in number and size for suitable fishing. Ponds can be checked for their balance using a 30-foot seine or fishing rod. Mid-summer seine hauls consisting of small numbers of bluegill (1 to 3 inches) and largemouth bass (3 to 4 inches) indicate balanced proportions. However, seine hauls that consist only of many bluegills and no largemouth bass, or only green sunfish, bullheads, or tadpoles indicate an unbalanced pond (too few or no bass). Be certain that you are sampling properly. Sample several times before you decide a pond's status.

Fishing may also indicate the degree of balance in a pond. An over-abundant bluegill population is indicated when only 3- to 5-inch bluegills are caught. In contrast, catches of only small largemouth bass (less than 12 inches) may indicate an excess of that species. Overcrowded bluegills may be removed through angling or a size limit on bass harvest. Overcrowded bass may be easily removed through fishing. A balanced pond will contain a bass population in which 40 to 60 percent of the bass larger than 8 inches are larger than 12 inches. Balanced bluegill populations will have 20 to 40 percent of the 3-inch and larger fish being larger than 6 inches.

Vegetation Control

Excessive vegetation may both hinder fishing and cause water quality problems. Vegetation is excessive when more than 20 to 30 percent of the surface is covered.

Vegetation may be in four forms:

- (1) Algae – primitive plants without true leaves or flowers. Many are free, in strings, or clumped together. Pea green soup coloration often results from these.
- (2) Free floating plants – not attached to the bottom. Duckweed is one example.
- (3) Submerged plants – attached to the bottom and grow to the surface. These plants may be called “sea-weed,” “moss,” or “water grass.”
- (4) Emergent plants – rooted to the bottom and extending beyond surface. Common emergent plants are cattails, bulrushes, water lilies, smartweed, and willows.

Methods of vegetation control are: (1) mechanical, (2) biological, and (3) chemical. Most mechanical methods are costly and yield poor results. Biological control can be achieved by stocking grass carp, an exotic fish native to southeastern Asia, or by restricting runoff of nutrients into the pond. Grass carp control rooted plants much more than algae. They are stocked at three to four 8-inch fish per surface acre of water. Because these fish do not reproduce in ponds and have low natural mortality, the landowner will not need to restock for eight to ten years. Several private fish hatcheries in Iowa sell grass carp.

Chemicals may be used to control aquatic vegetation. The best results can be obtained by using a suitable herbicide at the proper time for the type of vegetation that needs to be controlled. In Iowa, chemical applications are best done in the spring when water temperatures start to increase. Caution must be used when

making chemical applications in mid to late summer, when water temps are higher, increasing the potential for fish kills due to oxygen depletion. Before using any chemical, a pond owner must determine all possible uses for that body of water. Many herbicides will make the water undrinkable for livestock and humans. Use only chemicals designed and approved for aquatic use. County extension offices have current lists of approved chemicals. Chemicals are available from local agricultural distributors.

Read and follow carefully all labeled instructions on chemical containers.

Wildlife Benefits

A pond that has adequate cover and food supply will attract a wide variety of wildlife. Landowners may obtain additional information regarding food plots, cover plants, and nesting areas by contacting Iowa State University Extension agriculturists or the IDNR wildlife management biologist in his or her area.

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