

# Pond Management: Good Fishing in the Balance



**Life Skill:** Critical thinking

**Project Skill:** Assessing and managing predator/prey balance in ponds

**Objective:** Collect information on fish populations and evaluate it to determine management recommendations

**Success Indicator:** Participants fish and evaluate at least one local pond

## Provisions Needed

- Access to a pond at least 1 acre in size
- Fishing equipment and bait or lures for catching both bluegills and largemouth bass
- Yardstick or measuring tape
- Notepad and pencil
- Graph paper



## Trailhead

Have you ever fished a pond and caught only a few fish or only small fish? What makes one pond a great fishing hole and another so poor? **The most important factor is the relationship between the numbers of the top predator, largemouth bass, and its main prey, bluegill sunfish** (also known as bream). The overall productivity of a

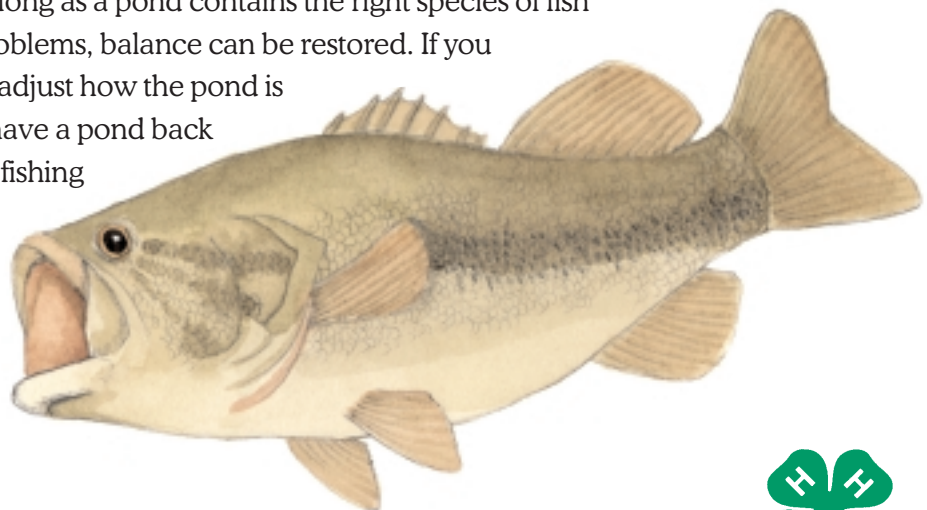
pond will determine how many pounds of fish it can produce. But the balance between predators and prey determines whether those pounds are packaged in quality-size, harvestable fish, or in large numbers of stunted, undersized fish. A well-balanced pond will produce good catches of both bass and bluegills over a broad range of harvestable sizes.

**bluegills**  
are the main prey  
of largemouth  
**bass**



## Trailblazing

One easy and enjoyable way to evaluate a pond's predator/prey balance is to fish for bass and bluegill in the pond, measure all the fish you catch, and make a graph showing the size distribution of each species. An out-of-balance pond doesn't have to stay that way. As long as a pond contains the right species of fish and doesn't have other major problems, balance can be restored. If you assess the pond once a year and adjust how the pond is harvested accordingly, you can have a pond back in balance and providing quality fishing within just a few years.



**If you want to evaluate a pond that belongs to someone else, first get the pond owner's permission.**



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# Pond Management: Good Fishing in the Balance



Explain what you want to do and why. Tell when you would like to do the sampling and who will be involved. Then offer to provide the pond owner with a copy of your findings and recommendations. It is very difficult to keep small ponds in balance because small changes in the number of fish will have big effects. So, select a pond that is at least an acre in size. **Once you have obtained permission and decided when to do the sampling, invite other anglers to help.** Also invite the owner.

On the sampling day, explain to everyone the information you need to collect, and go fishing. **Measure each caught fish to the nearest 1/4 inch, and record the species and length on your notepad (Figure 1).** Try to get lengths on 30 to 50 fish of each species. It's OK if you

Jones Pond May 7, 2001			
Fish Lengths in inches:			
Bass	Bluegill	Other	
11.25	7.75	9.5 (shellcracker)	
11.5	7.5	8.0 "	
12.0	8.25	14.25 (catfish)	
10.75	8.0		
12.25	9.0		
9.75	8.75		
11.5	6.25		
11.5	9.25		
11.25	7.5		
11.75	6.75		
12.5	8.5		

Figure 1.

don't catch all the fish in one day, but it is best to collect all the information within a few weeks.

Once you have a big enough sample, count how many fish fall into each 0.5-inch category (for example, 4.5 to 5 inches, 5 to 5.5 inches, etc.), and draw a bar graph on graph paper showing the size distribution of each species (Figure 2).

**When you finish your data collection and analysis, make a list of recommendations for management of the pond.** If the pond is out of balance, what needs to be done to restore healthy fish populations? Refer to the "Field Guide" below for suggestions. If the pond owner agrees with your recommendations, you might offer to help with or organize the necessary harvesting.

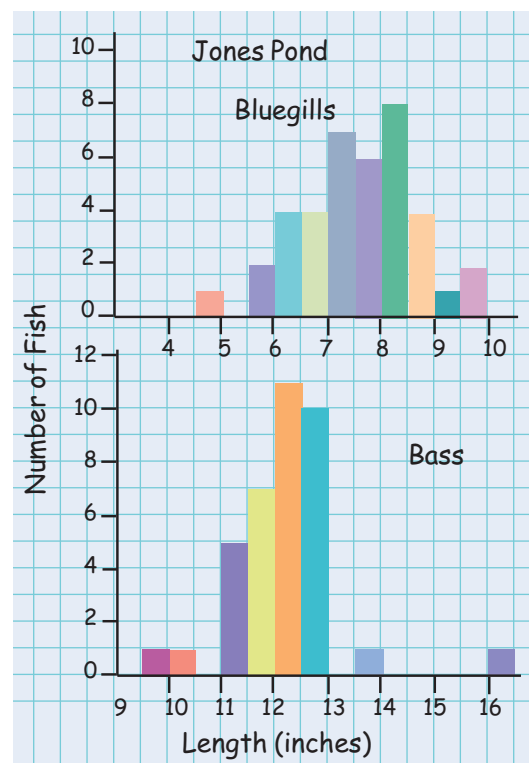


Figure 2.

# Pond Management: Good Fishing in the Balance



## Field Guide

■ Bluegills spawn several times each summer, producing large numbers of young that feed on small **crustaceans** and insect larvae. These small fish are the main prey of largemouth bass. The relationship between bluegill reproduction and bass predation determines pond balance.

■ A balanced pond will produce **bluegills** 6 inches and larger and bass averaging 1 or 2 pounds, with some smaller and larger sizes caught.

■ If bass numbers are low, large numbers of bluegills will survive the first year of life and grow to 3 or 4 inches. But there is only a limited amount of food to go around; as the number of bluegills competing for food increases, their growth will slow. The result is a stunted bluegill population with very few large specimens. There may be a few bass in a pond like this that are big enough to eat the stunted bluegills, but overall bass numbers will remain low because there aren't enough small bluegills to support smaller bass.

Two steps can be taken to correct this situation.

**1** First, keep all the small bluegills you catch. When bluegills are stunted due to overcrowding and limited food, throwing them back to grow some more won't help. If the problem is severe, remove about 100 pounds of bluegill per acre by pulling a **minnow seine** through the shallows. This will allow the remaining bluegills to grow faster.

**2** The second step is to stock an additional 30 to 50 bass (8 inches long or bigger) per acre to increase predation on the young bluegills. Hold off on harvesting bass until the pond is back in balance.

## the relationship between bluegill reproduction and bass predation determines pond balance.

■ If bass are too abundant, almost all the newly hatched bluegills will be eaten before they are 2 inches long. The bass won't have enough food to go around, so they will be thin and stop growing at about 12 inches. But the few bluegills that survive long enough to outgrow **predation** by these stunted bass will have a large food supply to themselves and may grow quite large. If the bass are small and fairly uniform in size and the bluegills are relatively large, the pond is overcrowded with bass. Harvesting about 30 bass per acre will reduce the surplus, increase the growth of the remaining bass, and bring the pond into better balance.

## Suggested Reading

### Pond fish species and their identification

- Rohde, Fred C., Rudolf G. Arndt, David G. Lindquist, and James F. Parnell. *Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware*. Chapel Hill, N.C.: The University of North Carolina Press. 1994.
- Manooch, Charles S., III. *Fisherman's Guide to the Fishes of the Southeastern United States*. Raleigh, N.C.: North Carolina State Museum of Natural History. 1984.

### Pond management practices

- Rice, James A., R. L. Noble, and R. L. Curry, eds. *Pond management guide*, 2nd edition. N.C. Cooperative Extension Service, AG-424. 1999. (Available free from the N.C. Cooperative Extension Service. Most states have basic pond management information available. Contact your local Extension office for information.)
- Lusk, Bob. *Basic Pond Management*. DeSoto, Tex.: Pond Boss Press. 1993 (Ordering information: P.O. Box 12, Sadler, Tex. 76264, (903) 564-6144, <http://www.pondboss.com/books.htm>)

# Pond Management: Good Fishing in the Balance



## The Extra Mile

If you can, evaluate several ponds in your area. Are most of them in balance? If not, are they more often overcrowded with bass or with bluegills? Ask the owner of each pond what kinds and sizes of fish are usually harvested from the pond, and see if that helps explain the predator/prey balance. What management changes would you recommend?

**pull a minnow seine through the shallows to correct out-of-balance pond**



## Field Notes

**share**

- What was the most enjoyable part of this project? The most difficult?
- How many ponds did you evaluate? If more than one, what were the main differences in implementing your evaluation?
- Were there differences in the way you thought a pond should be managed and the owner's preferences?

**process**

- What do you think the balance would look like in a pond that was never fished?
- Would you expect all unfished ponds to have the same predator/prey balance?
- What could the popular practice of catch-and-release fishing mean to the balance of species in a pond?

**generalize**

- How might the balance between predators and prey affect the populations of other animals in your area, such as white-tailed deer or gray squirrels?

**apply**

- How can you apply the thinking process used in this project to evaluate other issues at school or home?
- What parallels are there between the relationships you evaluated in pond management and the commercial harvest of species from wild populations (humans being the predators and the target animal being the prey)?