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Determining the Age of Fish

Michigan State University Extension Service

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## Bluegill

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Lateral Line

Annulus 1

Annulus 2

Annulus 3

Annulus 4

# Determining the Age of Fish

By D. L. Garling and Keith Ashley

**K**nowledge about the age composition of fish populations is essential for effective management. It provides the fisheries manager with information about the condition of the fish, how long they live, their age at certain critical periods during their lives (how old a fish is when it spawns, when its habitat requirements change and when it begins important migrations) and their rate of growth. Use of this information enables the fisheries manager to manipulate the resource for maximum benefit at minimum cost.

## How old is my fish?

Scales are commonly used to age most species of fish. A typical scale from a bluegill is shown here. The scales are usually removed with the blunt edge of a knife from the upper side of the fish, just under the front edge of the dorsal fin and above the lateral line. About 10 scales are taken from each fish sampled because some of the scales collected may be replacement scales, which can't be read accurately. Lateral line scales can't be used for aging because they have a tube through the center which obscures the growth rings.

**S**cales from individual fish are placed in an envelope like those used by coin collectors. Important information is recorded on the outside of the envelope: the collector's name, the type of fish, the locality and method of capture, date and time of capture, and the total length and weight of the fish.

The scales are aged later in a variety of ways. One of the most popular methods uses a microfiche reader. The scales are slightly moistened and placed on the microfiche reader and can be read directly off the screen. You can also place a moistened scale in a 35mm glass slide mount and project it onto a screen with a slide projector. Aging fish is similar to aging a tree by counting the number of growth rings. However, **the age of the fish is determined by counting the number of wide growth rings called annuli.** In our example, the bluegill is 4 years old.

You can also use the projected image to calculate the size of a fish during each year of its life. The size-at-age calculation is based on the ratio:

$$\frac{\text{Total length at age X}}{\text{Scale length at age X}} = \frac{\text{Total length}}{\text{Scale length}}$$

The equation can be solved for total length at age X:

$$\text{Total length at age X} = \text{Scale length at age X} \times \frac{\text{Total length}}{\text{Scale length}}$$

Because the relationship is based on a ratio, the scale length and length to each annulus can be measured directly from the projected image. The calculated length at each age can be compared to the length and age chart to determine how the fish in your lake or pond compare to average-sized fishes for Michigan lakes and ponds.

**A**ging of scaleless fish, such as a catfish, or fish with very small scales, such as trout, presents a different problem. Bony structures such as spines, vertebrae or otoliths (ear bones) must be used. These are cut into thin sections so the annuli can be read. In some cases, the bones are softened with chemicals to make them easier to slice. For example, catfish spines are treated to remove the hard, bony calcium and make the spines soft enough to cut with a razor blade. They are cut just behind the joint to obtain the section needed for aging. Once the sections have been obtained, they can either be soaked in rubbing alcohol or chemically stained to make the annuli easier to see.

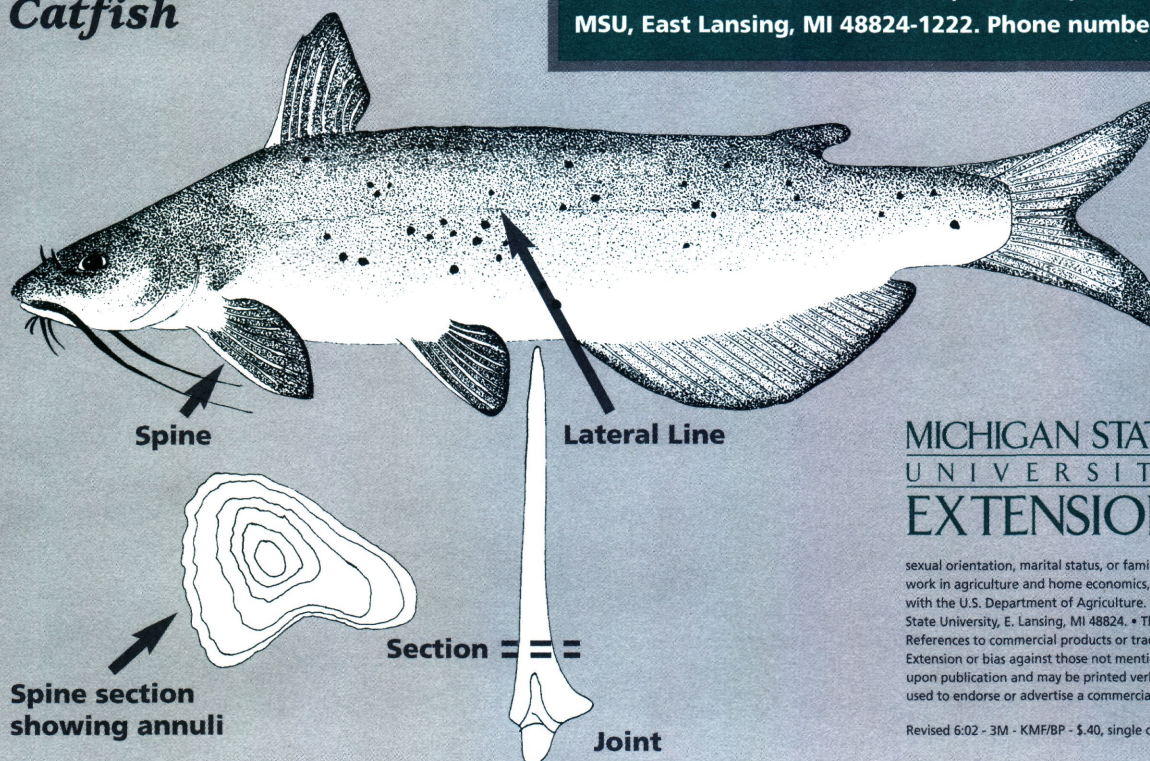
**Summer length ranges at various ages for fishes in Michigan ponds. These are rough statewide values. Growth may be somewhat greater where fish are uncrowded and temperature and food supply are ideal. Growth can be much slower, especially where ponds are overpopulated.**

Kind of fish	Length (in inches)						Life expectancy
	First summer (age 0)*	Second summer (yearling)	Third summer (2-yr-old)	Fourth summer (3-yr-old)	Fifth summer (4-yr-old)	Sixth summer (5-yr-old)	
Rainbow trout**	4-6	9-14	14-17	15-19	***	***	5-7
Brook trout	2-4	6-8	8-12	9-14	11-16	***	5-7
Largemouth bass	1-4	6-8	8-10	10-12	12-14	13-17	14-15
Smallmouth bass	1-4	4-7	7-10	10-12	12-14	13-17	12-14
Channel catfish	1-4	5-7	8-10	11-13	13-15	15-17	10-14
Bluegill	.5-2	3-4	4-5	5-6	6-7	6.5-7.5	10-11

\*Fingerling. \*\*From fall-spawning stock in hatcheries. \*\*\*Very few survive to this age, and growth at this age is extremely variable.

## Channel Catfish

For more information on fisheries management, you can contact Fisheries and Wildlife Extension, Room 13, Natural Resources Building, MSU, East Lansing, MI 48824-1222. Phone number: (517) 355-4478.



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