

## Growth of the Flathead Catfish, *Pilodictis olivaris*, In Grand Lake (Lake O' The Cherokees), Oklahoma<sup>1</sup>

ROBERT M. JENKINS, Oklahoma Fisheries Research Laboratory, Norman.

The flathead catfish is the most valuable commercial species in Oklahoma, comprising about 40 percent of the annual gross income of the commercial fishing industry, and is highly esteemed by setline fishermen and gourmets. Little is known about the rate of growth and abundance of year-classes in flathead catfish populations in recently impounded waters. The present study is an attempt to reconstruct the growth history of this species in Grand Lake, Oklahoma, and to describe growth-rate differences observed in various parts of that 46,000 acre impoundment.

Calculated growth of the channel catfish from sections of vertebrae and pectoral spines has recently been demonstrated by Appelget and Smith (1), Sneed (5), and Sneed and Leonard (6). These writers present a review of pertinent literature, and validate the use of bony structures in ameiriurids by statistical analyses of the data, coupled with comparison of fish of known age. Similarities in spine structure of the catfishes render the cross-section and ring measurement method applicable to the flathead catfish.

### METHODS

Spines from 213 Grand Lake flathead catfish were collected in the summers of 1949 and 1950. The 1949 collection included 123 of 445 individuals killed when rotenone was applied to eight coves representing varied habitats in the reservoir (7). Pectoral spines were removed and stored in scale envelopes. A total-length range of 3.3 to 25.7 inches was represented in this initial sample. During May and June, 1950, an effort was made to extend the length range of the collection upward to include fishes of maximum size existing in the lake. Dorsal spines were taken from 90 individuals ranging up to 45 inches in length and 47 pounds in weight, which were captured in hoop nets of commercial fishermen on the Neosho River Arm of the lake. Maximum size recorded from the reservoir is 65 pounds. The dorsal, rather than the pectoral, spine was removed in the second collection, since previous attempts at sectioning had revealed less deterioration of the bone around the lumen near the base of the dorsal spine. In addition, the structure of the dorsal spine at the base (articulating portion) facilitates cross-sectioning at the distal end of the basal recess, and the relatively greater symmetry of the resulting section presents growth patterns (year marks or annuli) which are circular, rather than oblong as in the pectoral spine.

Spines were cut at the distal end of the basal recess using the saw described by Leonard and Sneed (6). The thin section was placed in water, and the spine radius measured with a movable cross-hair micrometer. Pectoral spines were measured from the center of the lumen along the axis of the ventral lobe. The maximum distance along the lateral axis, from the center to the outer edge, was measured on the dorsal spine section.

Under magnification, a properly cut cross-section shows broad opaque bands interrupted by very narrow, clear bands. These narrow, translucent bands were interpreted as year marks or annuli which were formed during decelerated growth each winter. The alternating, broad, dark-colored bands represent the summer growth period of heightened calcification. Cuertler and Roussov (2) presented a similar description and interpretation in working with the pectoral fin marginal rays of sturgeon.

<sup>1</sup>Contribution of the Oklahoma Fisheries Research Laboratory, a cooperative unit of the Oklahoma Game and Fish Department and the University of Oklahoma Biological Survey.

TABLE IV

Comparison of Growth of Flathead Catfish in Grand Lake, Lake Wagoner, the Illinois River, Oklahoma, and the Upper Mississippi River (8).

BODY OF WATER	NUMBER OF FISH	AVERAGE CALCULATED TOTAL-LENGTH IN INCHES AT END OF YEAR OF LIFE						
		1	2	3	4	5	6	7
GRAND LAKE								
LOWER LAKE (1948)	59	2.5	5.0	7.3	10.2	13.4	15.2	17.9
UPPER LAKE (1948)	61	3.4	6.9	11.3	16.2	18.3	21.4	24.6
NEOSHO RIVER ARM (1949)	86	5.5	10.2	15.0	19.3	23.0	25.8	28.3
LAKE WAGONER (1951)	31	3.5	9.0	15.5	19.4	24.7	25.1	
ILLINOIS RIVER SYSTEM								
TENKILLER RESERVOIR (1951)*	19	3.3	7.9	13.0	17.3	20.3		
QUALLS CUT-OFF LAKE (1951)**	23	2.8	7.0	10.9	13.8	16.0	20.8	22.5

## AGE-GROUPS

		AGE-GROUPS									
		I	II	III	IV	V	VI	VII	VIII	IX	X
GRAND LAKE											
UPPER LAKE (1949)	57	6.1	10.3	13.8	18.8						
NEOSHO RIVER ARM (1950)	74				18.8	24.2	26.0	27.1	30.1	33.2	36.2
UPPER MISSISSIPPI RIVER (1944)	236	8.0	13.0	16.3	17.9	21.5	23.4	27.5	34.0	35.5	37.5
LAKE WAGONER	31	6.1	9.2	16.6	—	31.0	25.4				

\* 600-acre reservoir; impounded in 1951

\*\* Last flooded by Illinois River in June, 1950

## LITERATURE CITED

1. APPELGET, JOHN, AND LLOYD L. SMITH, JR. 1951. Determination of the age and rate of growth of channel catfish (*Ictalurus lacustris punctatus*) of the Upper Mississippi River from vertebrae. Trans. Am. Fisheries Soc. 80(1950): 119-139.
2. CUERRIER, JEAN-PAUL, AND G. ROUSSOW. 1951. Age and growth of lake sturgeon from Lake St. Francis, St. Lawrence River. Report on material collected in 1947. Can. Fish Cult. Issue 10, 1951: 17-29.
3. HILE, RALPH. 1941. Age and growth of rock bass, *Ambloplites rupestris*. (Rafinesque), in Nebish Lake, Wisconsin. Trans. Wisc. Acad. Sci. 33:189-337.
4. LEONARD, E. M., AND K. E. SNEED. 1951. Instrument to cut catfish spines for age and growth determinations. Progressive Fish Culturist. 13(4): 232.
5. SNEED, KERMIT E. 1951. A method of calculating the growth of channel catfish, *Ictalurus lacustris, punctatus*. Trans. Am. Fisheries Soc. 80 (1950):174-183.
6. ———, AND E. M. LEONARD. 1954. Age and growth of the channel catfish, *Ictalurus punctatus*, in Lake Texoma. Trans. Kansas Acad. Sci. 57: (in press).
7. THOMPSON, W. H. 1950. Investigation of the fisheries resources of Grand Lake, Fish Management Rep. No. 18, Oklahoma Fisheries Experiment Station: 46 pp; mimeo.
8. UPPER MISSISSIPPI RIVER CONSERVATION COMMITTEE. 1946. Second progress report of the technical committee for fisheries: 27 pp; mimeo.