

DEPARTMENT OF NATURAL RESOURCES

Madison, Wisconsin

Bureau of Fish Management

Management Report No. 55

UPDATED AGE-LENGTH  
AVERAGES FOR SOUTHEASTERN  
WISCONSIN GAME FISHES

by

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August, 1972

## Introduction

In 1949 Kenneth M. Mackenthun published a paper titled AGE-LENGTH AND LENGTH-WEIGHT RELATIONSHIPS OF SOUTHERN AREA FISHES. This paper has since provided a basis for comparing growth rates of warm water fish surveyed in southern Wisconsin lakes and has been especially helpful in demonstrating stunted panfish populations. To update Mackenthun's original age-length tables and to obtain a localized standard for the Southeast District, scales taken during recent fishery surveys in Kenosha, Racine, Walworth, Milwaukee, Waukesha, Washington and Ozaukee Counties were aged and tabulated and are presented with Mackenthun's original age-length data.

## Procedure

In all, a total of 5,703 scales taken from 1959 through 1972 were segregated by species and lengths were averaged for each age-class. This compares to Mackenthun's sample of 9,736 scales for the same species taken between 1946 and 1948. Most of the recent scale samples were taken since 1965 and represent a cross section of lakes in southeastern Wisconsin. Scales were collected throughout the growing season.

All scales were first pressed into soft plastic and read with the aid of a scale projector-viewer. Most scales were read by either Wilbur Byam, Ron Piening or Howard Druckenmiller. Back calculated lengths were not usually determined and no back calculated lengths are included in the tables.

## Discussion of Procedures

Tables developed by averaging aged scales must be used in light of the many variables involved in annulus formation. Problems in accurately reading fish scales, especially those of older fish, have been demonstrated by many authors. An example of this is pointed out in Leon Johnson's paper, GROWTH OF KNOWN-AGE MUSKELLUNGE IN WISCONSIN. Johnson shows that even with age class III muskellunge, only 80% of known age fish were aged correctly by their scales. At age X, less than 30% accuracy was obtained. Although muskellunge are not considered in this report, the errors inherent in reading muskellunge scales are basically the same for scales of other species.

Kenneth D. Carlander in his HANDBOOK OF FRESHWATER FISHERY BIOLOGY, tabulated average total lengths at each annulus as given by 29 separate authors studying northern pike. A tremendous diversity in average length at any given age is apparent from these tables and further points out the relative unreliability of using averages of fish sampled from different regions of the world for making comparisons with a specific population. Tables given in this report are intended for use in southern and southeastern Wisconsin and any growth-rate comparisons with populations from other areas should be made with caution.

## Literature Cited

- Carlander, Kenneth D.  
1969. Handbook of Freshwater Fishery Biology, Volume One. Iowa State University Press.
- Johnson, Leon  
1971. Growth of Known-Age Muskellunge in Wisconsin. Wisconsin Department of Natural Resources, Technical Bulletin Number 49.
- Mackenthun, Kenneth M.  
1949. Age-Length and Length-Weight Relationship of Southern Area Lake Fishes. Wisconsin Conservation Department Fish Management Report.

TABLE - LENGTH FREQUENCY COMPARISONS -  
1949, MACKENTHUN VS 1972, DRUCKENMILLER

YELLOW PERCH

AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I			4	5.6	4	5.6
II	16	5.6	44	7.5	60	7.2
III	190	7.6	47	8.0	237	7.7
IV	262	8.8	23	8.4	285	8.8
V	139	9.6	1	10.6	140	9.6
VI	39	11.1			39	11.1
VII	5	12.1			5	12.1
TOTAL	651		119		770	

PUMPKINSEED

AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I	No Data	No Data	40	4.6		
II	" "	" "	127	5.0		
III	" "	" "	196	5.6		
IV	" "	" "	74	6.1		
V	" "	" "	28	6.4		
VI	" "	" "				
VII	" "	" "	2	7.7		
TOTAL			467			

\* From Mackenthun's 1949 report of fish sampled during 1946, 1947, and 1948

\*\* Averages from Southeast District fish sampled from 1959 through 1970

TABLE - LENGTH FREQUENCY COMPARISONS -  
1949, MACKENTHUN VS 1972, DRUCKENMILLER

W A L L E Y E						
AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I			121	9.4	121	9.4
II	75	11.8	74	12.3	149	12.1
III	96	13.8	220	14.7	316	14.5
IV	182	16.2	261	17.7	443	17.1
V	144	18.3	117	20.0	261	19.1
VI	79	20.1	46	22.1	125	20.8
VII	32	21.9	20	22.5	52	22.1
VIII	13	25.0	13	24.0	26	24.5
IX	3	29.0	4	24.7	7	26.5
X	3	26.3	2	25.6	5	26.0
TOTAL	627		878		1,505	

R O C K B A S S						
AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I	3	5.2			3	5.2
II	61	5.5	30	5.9	91	5.6
III	278	5.8	44	6.5	322	5.9
IV	310	6.8	30	7.8	340	6.9
V	215	7.6	25	8.8	240	7.7
VI	72	8.5	4	8.6	76	8.5
VII	35	9.5	1	10.0	36	9.5
VIII	6	9.8			6	9.8
IX	1	10.2			1	10.2
X	1	10.1			1	10.1
XI						
XII	1	11.0			1	11.0
TOTAL	983		134		1,117	

\* From Mackenthun's 1949 report of fish sampled during 1946, 1947 and 1948

\*\* Averages from Southeast District fish sampled from 1959 through 1970

TABLE - LENGTH FREQUENCY COMPARISONS -  
1949, MACKENTHUN VS 1972, DRUCKENMILLER

B L A C K C R A P P I E

AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I	83	6.3	116	5.4	199	5.8
II	434	7.2	227	6.5	711	6.9
III	708	7.8	250	10.0	958	8.4
IV	636	9.2	121	9.5	757	9.3
V	206	10.0	61	10.5	267	10.1
VI	81	10.0	3	11.9	84	10.1
VII	19	10.9	3	13.3	22	12.6
VIII	5	11.4			5	11.4
IX	2	12.4			2	12.4
TOTAL	2,174		831		3,005	

B L U E G I L L

AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I	97	5.0	266	4.7	363	4.8
II	529	5.6	749	5.4	1,278	5.5
III	1,424	6.4	930	6.2	2,354	6.3
IV	1,170	7.3	448	7.2	1,618	7.3
V	422	8.0	188	7.6	610	7.8
VI	109	8.8	40	8.0	149	8.6
VII	44	9.7	5	8.8	49	9.6
VIII	10	9.8			10	9.8
IX	5	10.2			5	10.2
TOTAL	3,800		2,626		6,426	

\* From Mackenthun's 1949 report of fish sampled during 1946, 1947 and 1948

\*\* Averages from Southeast District fish sampled from 1959 through 1970

TABLE - LENGTH FREQUENCY COMPARISONS -  
1949, MACKENTHUN VS 1972, DRUCKENMILLER

N O R T H E R N P I K E

AGE	1949*		1970**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I			47	16.4	47	16.4
II	17	16.6	75	18.7	92	18.3
III	72	15.6	44	22.8	116	18.3
IV	104	17.5	35	25.6	139	19.5
V	102	20.3	21	27.6	123	21.5
VI	83	22.8	4	31.5	87	23.2
VII	65	24.0	1	34.0	66	24.1
VIII	37	27.7	1	37.0	38	27.8
IX	21	30.4			21	30.4
X	8	30.9			8	30.9
XI	2	33.7			2	33.7
XII	5	40.0			5	40.0
XIII	2	36.0			2	36.0
TOTAL	518		228		746	

L A R G E M O U T H B A S S

AGE	1949*		1972**		COMBINED	
	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES	NUMBER OF FISH	AVERAGE LENGTH IN INCHES
I	3	6.5	62	7.8	65	7.7
II	74	8.0	134	8.5	208	8.3
III	230	10.1	130	10.5	360	10.3
IV	262	11.3	45	13.8	307	11.7
V	163	12.5	28	14.3	191	12.8
VI	99	14.6	12	16.1	111	14.9
VII	68	16.0	7	17.3	75	16.2
VIII	42	16.9	2	16.5	44	16.8
IX	24	18.4			24	18.4
X	11	19.4			11	19.4
XI	5	19.8			5	19.8
XII	2	19.2			2	19.2
TOTAL	983		420		1,403	

\* From Mackenthun's 1949 report of fish sampled during 1946, 1947 and 1948

\*\* Averages from Southeast District fish sampled from 1959 through 1970