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**AVERAGE GROWTH RATES OF  
FISHES IN MICHIGAN**

By Percy W. Laarman

State-wide average growth rates for several fishes in Michigan were determined previously (Fish Division Pamphlet No. 26, by Wm. C. Latta). Age and growth data obtained more recently have been added and a new summary of average growth rates prepared. A total of 121,419 fish representing 17 species are involved in the present summary. For 8 species sufficient data were available to permit the computation of reliable averages for lengths attained at various months of the growing season.

For fishes collected after January 1 but before the annulus had formed in the spring, the scale margin is counted as an annulus; in other words, all fish have a "birthday" on January 1. Lengths were recorded as total length at time of capture. Information on sex and method of collecting was often lacking; therefore sexes were combined and collecting methods are not treated here in establishing the averages. The average length for each age group of each species in each daily collection for each body of water is the basic statistical unit; each daily average was given equal weight in determining the growth-rate averages



for each month and for each age group.

Revised averages for 17 species of Michigan fishes are shown in Table 1; averages compiled earlier are included for purposes of comparison. Generally, the greatest differences between the "old" and "new" averages occur where relatively few samples are represented in the old averages. Differences between the two averages trend toward an increase in mean length for the more important game fishes.

The monthly growth averages (Table 2) are valuable in that they make possible a more precise evaluation of rate of growth in any given body of water. With only the annual averages for comparison it is difficult to judge the quality of growth in different waters when collection dates are scattered throughout the growing season which, for fish, lasts about 6 months (May to October). The monthly growth averages are given only for those species and age groups (0-IV) for which collections are adequate for this purpose. In this monthly summary, samples were combined for the months of January through April, and again for October through December, because very little growth takes place then.

Theoretically, the average for October through December for a given age group should be the same as the average for January through April of the next older age group. Discrepancies that occurred were probably due to an insufficient number of samples or to selectivity of collecting gear.

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Report approved by G. P. Cooper  
Typed by M. S. McClure

Table 1. --Average total lengths in inches, for each age group of several fishes in Michigan  
 (Number of fish in parentheses. Asterisk denotes revised average. The "old" average is below.)

Species	Age-group													
	0	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Yellow perch*	3.1 (289)	4.6 (2, 861)	6.1 (6, 199)	7.0 (6, 874)	8.0 (5, 213)	9.0 (2, 686)	9.9 (1, 300)	10.7 (666)	11.3 (297)	11.8 (144)	12.3 (24)	12.3 (4)	13.9 (5)	13.2 (3)
Yellow perch	2.5 (85)	4.2 (782)	5.8 (1, 958)	6.8 (2, 439)	7.9 (1, 878)	8.8 (1, 106)	9.8 (581)	10.4 (313)	10.8 (194)	11.4 (78)	12.2 (19)	13.3 (2)	13.9 (4)	13.1 (2)
Bluegill*	2.3 (278)	3.4 (3, 090)	4.4 (6, 252)	5.5 (10,160)	6.4 (10,306)	7.0 (4, 988)	7.5 (2, 346)	7.9 (890)	8.6 (402)	8.8 (147)	9.1 (37)	9.8 (11)	9.7 (9)	...
Bluegill	2.1 (51)	2.9 (1, 521)	4.3 (1, 713)	5.5 (2, 679)	6.5 (2, 620)	7.3 (1, 767)	7.8 (1, 258)	8.0 (577)	8.5 (237)	8.5 (95)	9.2 (31)	9.7 (6)	8.4 (2)	12.1 (1)
Pumpkinseed*	2.8 (82)	3.3 (1, 260)	4.4 (3, 220)	5.2 (4, 152)	5.9 (2, 864)	6.4 (1, 171)	6.9 (507)	7.3 (186)	7.8 (51)	7.4 (8)	8.1 (6)	9.8 (1)	...	...
Pumpkinseed	2.0 (20)	2.9 (326)	4.1 (494)	4.9 (1, 224)	5.7 (681)	6.2 (455)	6.8 (231)	7.3 (77)	7.8 (26)	...	...	...	...	...
Black crappie*	3.6 (49)	5.1 (1, 155)	6.8 (2, 118)	8.2 (1, 573)	9.0 (1, 009)	9.5 (448)	10.6 (199)	10.9 (83)	11.8 (22)	12.2 (12)	...	...	...	...
Black crappie	...	...	5.9 (430)	8.0 (336)	9.0 (253)	9.9 (143)	10.7 (113)	11.3 (40)	11.6 (8)	...	...	...	...	...
Rock bass*	1.5 (27)	3.1 (299)	4.5 (1, 273)	5.6 (1, 658)	6.5 (1, 770)	7.4 (1, 094)	8.2 (661)	8.9 (386)	9.6 (198)	9.9 (93)	10.1 (34)	11.6 (3)	11.7 (1)	...
Rock bass	1.5 (17)	3.2 (176)	4.3 (348)	5.2 (498)	6.2 (630)	7.3 (338)	7.9 (183)	8.8 (129)	9.0 (92)	9.9 (42)	10.5 (13)	...	...	...

Table 1. --continued

Species	Age-group													
	0	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Largemouth bass*	3.6 (696)	6.1 (1, 874)	8.6 (2, 599)	10.6 (1, 885)	12.2 (1, 224)	13.6 (660)	15.1 (299)	16.7 (179)	17.7 (74)	18.8 (45)	19.8 (22)	19.6 (10)	20.8 (2)	...
Largemouth bass	3.3 (174)	6.1 (321)	8.7 (419)	10.0 (505)	12.1 (368)	13.7 (285)	15.1 (111)	16.1 (71)	17.7 (33)	17.9 (20)	...	...	...	...
Smallmouth bass*	3.4 (232)	6.1 (383)	9.2 (801)	11.3 (574)	13.3 (376)	14.9 (238)	15.7 (147)	16.8 (81)	17.5 (44)	18.5 (28)	19.2 (14)	...	19.2 (1)	...
Smallmouth bass	3.3 (33)	5.9 (53)	9.0 (95)	11.2 (158)	13.3 (128)	15.0 (79)	15.3 (45)	16.4 (20)	16.8 (9)	...	...	...	...	...
Northern pike*	10.2 (186)	15.6 (1, 929)	19.4 (2, 394)	22.2 (1, 193)	24.6 (513)	26.5 (212)	28.9 (123)	32.7 (50)	33.4 (19)	38.7 (7)	39.6 (4)	42.0 (1)	48.0 (1)	...
Northern pike	7.9 (16)	15.5 (498)	19.4 (1, 329)	22.2 (623)	23.9 (257)	25.4 (131)	27.7 (62)	32.5 (33)	37.1 (9)	34.8 (6)	44.4 (4)	...	...	30.5 (1)
Walleye*	7.1 (42)	9.5 (256)	13.3 (567)	15.2 (386)	17.2 (551)	18.6 (500)	19.2 (433)	19.6 (259)	21.6 (103)	21.4 (45)	25.2 (23)	23.7 (9)	26.5 (9)	...
Walleye	6.6 (4)	9.1 (42)	12.0 (91)	15.9 (138)	17.8 (316)	18.9 (256)	18.8 (209)	18.8 (130)	21.4 (44)	19.7 (10)	22.6 (3)	...	28.5 (3)	...
Muskellunge*	6.8 (52)	15.7 (3)	19.9 (20)	25.4 (32)	31.9 (12)	34.7 (24)	36.8 (29)	39.2 (37)	41.7 (39)	45.3 (11)	48.7 (4)	47.5 (12)	49.7 (5)	...
Muskellunge	6.8 (52)	15.8 (2)	19.9 (13)	26.2 (21)	32.4 (11)	34.6 (23)	36.8 (28)	39.2 (37)	41.1 (28)	45.3 (11)	51.9 (3)	47.5 (12)	51.8 (3)	...
Grass pickerel*	3.1 (1)	7.8 (15)	9.5 (6)	9.6 (15)	10.2 (10)	10.4 (14)	10.9 (3)	...	...	...	...	...	...	...
Grass pickerel	3.1 (1)	7.0 (4)	7.7 (1)	10.3 (5)	10.5 (5)	9.1 (11)	...	...	...	...	...	...	...	...

Table 1.--concluded

Species	Age-group													
	0	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
Warmouth*	...	3.1 (19)	4.4 (118)	5.2 (334)	5.5 (244)	6.2 (160)	6.7 (116)	6.9 (55)	6.6 (18)	7.5 (4)	7.3 (1)	...	...	...
Warmouth	...	2.0 (3)	4.2 (29)	4.8 (89)	5.5 (127)	6.1 (105)	6.5 (70)	6.7 (48)	6.7 (18)	7.9 (2)	7.3 (1)	...	...	...
Green sunfish*	...	3.0 (47)	3.9 (125)	4.7 (219)	5.1 (139)	5.7 (54)	5.7 (5)	5.0 (2)	...	...	...	...	...	...
Green sunfish	...	3.2 (6)	3.7 (55)	4.5 (65)	5.0 (59)	5.1 (23)	5.8 (3)	4.3 (1)	...	...	...	...	...	...
Longear sunfish*	1.5 (1)	2.5 (22)	3.2 (65)	3.8 (78)	4.0 (65)	4.3 (7)	3.7 (1)	4.3 (1)	...	...	...	...	...	...
Longear sunfish	1.5 (1)	2.4 (19)	3.2 (22)	3.8 (35)	4.1 (39)	4.2 (5)	...	4.3 (1)	...	...	...	...	...	...
Smelt*	...	5.3 (20)	6.9 (379)	7.7 (198)	8.1 (35)	8.8 (3)	9.6 (1)	...	...	...	...	...	...	...
Smelt	...	4.2 (12)	7.0 (93)	7.8 (100)	8.2 (35)	8.7 (2)	...	...	...	...	...	...	...	...
Cisco*	...	8.4 (161)	9.7 (286)	10.6 (311)	11.6 (366)	12.8 (216)	13.9 (141)	13.9 (56)	15.6 (20)	15.7 (4)	14.3 (1)	19.2 (1)	...	...
Cisco	...	9.0 (33)	9.6 (212)	10.3 (253)	11.5 (183)	11.5 (111)	13.5 (72)	13.2 (32)	13.9 (2)	12.4 (1)	14.2 (1)	...	...	...
White sucker*	3.5 (70)	8.6 (261)	12.0 (373)	14.3 (443)	16.3 (245)	16.9 (97)	18.1 (20)	18.1 (8)	...	...	17.7 (1)	20.9 (1)	...	...
White sucker	1.9 (9)	7.2 (40)	11.6 (50)	13.9 (21)	18.6 (9)	16.4 (3)	17.3 (2)	18.1 (1)	...	...	...	...	...	...

Table 2. --State-wide average lengths at various months for several fishes of Michigan

(Total lengths to nearest 0.1 inch, number of fish in parentheses)

Species	Age-group	Month							Age-group average
		Jan. - April	May	June	July	Aug.	Sept.	Oct. - Dec.	
Yellow perch	0	...	...	1.2 (1)	2.1 (20)	2.5 (58)	3.7 (181)	3.3 (29)	3.1 (289)
	I	3.9 (37)	3.7 (230)	4.3 (331)	4.8 (549)	5.2 (642)	5.2 (767)	4.6 (305)	4.6 (2, 861)
	II	5.3 (439)	5.5 (354)	5.8 (859)	5.8 (1, 327)	6.1 (1, 544)	6.7 (1, 177)	6.5 (499)	6.1 (6, 199)
	III	6.4 (542)	6.9 (353)	6.8 (798)	6.7 (2, 054)	7.0 (1, 581)	7.6 (1, 090)	7.5 (456)	7.0 (6, 874)
	IV	7.0 (395)	7.8 (264)	8.0 (629)	7.7 (1, 649)	8.1 (1, 314)	8.6 (628)	8.7 (334)	8.0 (5, 213)
Bluegill	I	3.0 (252)	2.4 (138)	2.8 (422)	3.2 (419)	3.4 (349)	3.8 (913)	3.9 (598)	3.4 (3, 090)
	II	3.8 (344)	3.7 (676)	3.9 (755)	4.4 (945)	4.7 (1, 469)	4.6 (1, 257)	5.1 (806)	4.4 (6, 252)
	III	5.0 (1, 044)	4.9 (981)	5.3 (1, 834)	5.5 (1, 545)	5.7 (1, 734)	5.9 (1, 950)	5.8 (1, 072)	5.5 (10, 160)
	IV	5.9 (2, 140)	5.9 (1, 400)	6.4 (1, 640)	6.4 (1, 524)	6.6 (1, 536)	6.6 (1, 229)	6.5 (837)	6.4 (10, 306)

Table 2. --continued

Species	Age-group	Month							Age-group average
		Jan-April	May	June	July	Aug.	Sept.	Oct. - Dec.	
Pumpkinseed	I	4.3 (11)	2.4 (12)	2.7 (106)	2.9 (252)	3.3 (282)	3.7 (409)	3.8 (188)	3.3 (1, 260)
	II	4.3 (72)	3.8 (225)	4.1 (448)	4.2 (708)	4.4 (760)	4.6 (600)	4.9 (407)	4.4 (3, 220)
	III	4.9 (188)	5.0 (445)	5.1 (813)	5.2 (854)	5.2 (945)	5.6 (720)	5.5 (187)	5.2 (4, 152)
	IV	5.9 (258)	5.9 (415)	6.0 (655)	5.8 (608)	5.9 (482)	6.2 (330)	6.0 (116)	5.9 (2, 864)
Black crappie	I	4.4 (3)	4.1 (92)	4.0 (88)	4.3 (136)	5.0 (204)	5.5 (424)	5.7 (208)	5.1 (1, 155)
	II	5.5 (102)	6.2 (320)	5.9 (278)	6.8 (319)	6.9 (406)	7.5 (412)	7.6 (281)	6.8 (2, 118)
	III	7.7 (165)	7.5 (185)	7.9 (235)	8.0 (327)	8.4 (343)	8.4 (216)	9.0 (102)	8.2 (1, 573)
	IV	8.5 (94)	8.8 (211)	8.8 (82)	9.1 (192)	9.4 (142)	9.2 (204)	9.2 (84)	9.0 (1, 009)
Rock bass	I	1.7 (1)	2.2 (7)	2.6 (13)	2.8 (46)	3.0 (104)	3.7 (67)	3.8 (61)	3.1 (299)
	II	3.5 (2)	3.6 (34)	4.1 (85)	4.2 (179)	4.5 (298)	4.8 (359)	5.3 (316)	4.5 (1, 273)
	III	5.6 (18)	5.6 (115)	5.4 (229)	5.3 (441)	5.6 (471)	5.9 (315)	6.3 (69)	5.6 (1, 658)
	IV	6.4 (39)	5.9 (147)	6.4 (299)	6.4 (601)	6.5 (439)	7.0 (211)	6.9 (34)	6.5 (1, 770)

Table 2. --continued

Species	Age-group	Month							Age-group average
		Jan. - April	May	June	July	Aug.	Sept.	Oct. - Dec.	
Largemouth bass	0	...	...	1.1 (2)	2.6 (23)	2.9 (186)	4.0 (352)	4.0 (133)	3.6 (696)
	I	4.4 (24)	4.1 (74)	4.5 (157)	5.4 (227)	6.4 (466)	6.9 (604)	7.1 (322)	6.1 (1,874)
	II	6.9 (115)	7.2 (348)	7.6 (508)	8.7 (419)	9.1 (460)	9.3 (488)	9.4 (261)	8.6 (2,599)
	III	9.4 (130)	9.8 (262)	10.1 (307)	10.6 (373)	11.0 (332)	11.1 (327)	10.9 (154)	10.6 (1,885)
	IV	11.7 (184)	11.6 (250)	11.8 (213)	12.3 (221)	12.6 (148)	12.4 (137)	12.7 (71)	12.2 (1,224)
Smallmouth bass	0	...	...	...	1.8 (18)	3.5 (97)	3.4 (55)	3.8 (62)	3.4 (232)
	I	3.4 (2)	2.9 (1)	4.0 (18)	5.5 (85)	6.4 (133)	7.0 (81)	7.5 (63)	6.1 (383)
	II	7.6 (7)	7.5 (36)	8.1 (116)	8.8 (206)	9.6 (247)	10.0 (112)	10.5 (77)	9.2 (801)
	III	11.0 (7)	10.6 (38)	10.8 (106)	11.1 (147)	11.6 (208)	11.7 (53)	12.3 (15)	11.3 (574)
	IV	10.4 (2)	12.7 (13)	12.7 (55)	13.2 (126)	13.3 (122)	14.0 (41)	14.5 (17)	13.3 (376)



Table 2. --concluded

Species	Age- group	Month							Age- group average
		Jan. - April	May	June	July	Aug.	Sept.	Oct. - Dec.	
Northern pike	0	...	...	7.2 (2)	7.9 (17)	9.6 (22)	10.5 (78)	11.7 (67)	10.2 (186)
	I	11.7 (20)	12.3 (72)	14.4 (344)	15.2 (391)	15.8 (438)	16.8 (460)	17.7 (204)	15.6 (1,929)
	II	17.8 (145)	18.3 (216)	18.5 (426)	19.5 (717)	19.8 (404)	20.1 (306)	20.7 (180)	19.4 (2,394)
	III	21.1 (84)	22.0 (58)	22.1 (194)	22.5 (394)	21.9 (275)	22.4 (127)	23.3 (61)	22.2 (1,193)
	IV	23.4 (28)	27.6 (11)	24.8 (117)	24.1 (182)	24.5 (126)	25.2 (34)	24.3 (15)	24.6 (513)