

FISHERIES DIVISION  
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**Creel Survey of Bankson Lake,  
Van Buren County, Michigan, 1985-86**

Joan E. Duffy



STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES

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*Abstract.*—A creel survey was conducted on Bankson Lake in fall 1985 and summer 1986, to estimate angler harvest, fishing pressure and catch rates. Bankson Lake can be characterized as having an above average muskellunge and largemouth bass fishery, and a fair panfish fishery. Muskellunge and largemouth bass were the only species taken by anglers in fall, but large numbers of perch and bluegills were also caught during summer. Three times as many muskellunge were harvested than were caught and released in the fall, while summer anglers released 22 times as many muskellunge as were harvested. Fishing pressure in fall was about half of that estimated in summer. More out-of-state anglers fished the lake in fall (72%) than in summer (29%), and more anglers targeted muskellunge in fall (85%) than in summer (40%). Fishing pressure on Bankson Lake was similar to other warmwater lakes in southern Michigan, but catch rates were lower. Bankson Lake should be maintained as a muskellunge brood stock lake, and the success of walleye plants should be evaluated.

Bankson Lake serves as a site to maintain northern muskellunge *Esox masquinongy* as broodstock for Michigan's hatchery program. It remains a popular lake for muskellunge fishing, and is also well known to largemouth bass *Micropterus salmoides* anglers. Interest in fishing for panfish apparently has declined in recent years, when growth rates for panfish declined from the above average growth seen in the late 1960s. Due to these combined uses of Bankson Lake, a creel survey to estimate fishing pressure and harvest of muskellunge and other fishes was initiated in fall 1985, and continued in summer 1986. In this report I present results of those surveys and subsequent management recommendations.

### **Study Site**

Bankson Lake is a 217-acre eutrophic lake situated in south Van Buren County, Michigan. Land use in the watershed is primarily agriculture, with orchards and field crops predominating. The lake has no inlets or outlets, and water levels fluctuate annually depending on precipitation and ground-water levels. The lake has many shallow bays, with wetland edges and a rather wide littoral zone. Maximum depth is 43 ft. A Michigan Department of Natural Resources (MDNR) public access site is located on the north shore, and one boat rental facility is operated on the lake.

Bankson Lake has a long history of management by Fisheries Division, MDNR. It was initially stocked with muskellunge in 1962, and has been stocked annually with muskellunge since 1973. Muskellunge broodstock have been netted from the lake each spring since 1976. Yearling and adult walleyes *Stizostedion vitreum* were stocked in 1986 and 1987, and fingerlings have been stocked annually since 1988. Other unauthorized walleye plants were made prior to 1986, as walleyes were found in spring netting surveys as early as 1983 (walleye are not known to be native to the lake).

### Methods

The fall creel survey was begun on 8 September and continued through 3 December 1985. The summer survey began 30 May and continued through 1 September 1986. Survey methods followed Ryckman and Lockwood (1985). Census clerks counted boat anglers on a semi-random schedule designed to cover most time periods when anglers fish, including all weekend days and holidays. Anglers were interviewed by the clerks, preferably at the end of their fishing trip. Information collected included species and numbers of fish creeled or caught and released, target species, length of fishing trip, bait used, and county of residence.

The fall survey was conducted by a part-time clerk who averaged 20 hours per week on site. Most interviews were conducted from the MDNR public access site. Boat counts were made from the access site and from a private residence on the southwest side of the lake; these two sites allowed boat counts to be made for the entire lake. No attempt was made to count shore or pier anglers.

The summer survey was conducted by a full-time (40 hours per week) census clerk who utilized a boat to count and interview boat, shore, and pier anglers. Shore and pier anglers were combined and considered shore anglers.

Estimates were made of fishing pressure, catch rates, and total harvest by species and season for both years. In 1985 estimates were made of muskellunge that were caught and released, and in 1986 estimates were also made

of muskellunge and largemouth bass that were caught and released. All estimates are reported with approximate 95% confidence limits ( $\pm 2$  standard errors) in Tables 1 through 6.

## Results

### Fall 1985

Muskellunge and largemouth bass were the only species observed by the clerk in the 1985 fall census (Table 1). The total estimated muskellunge catch for fall 1985 from Bankson Lake was 263 fish. Of these, 202 were harvested (mostly in September); the remaining 61 fish were caught and released. During fall 1985, all largemouth bass harvested by anglers (76 fish) were taken in September. A total of 6,803 angler hours (1,198 trips) were spent on the lake. Estimated catch rates indicate that the average angler in fall 1985 spent 26 ( $\pm 18$ ) hours to catch a muskellunge on Bankson Lake, and 90 ( $\pm 142$ ) hours to catch a largemouth bass. No estimate of released largemouth bass was made, so this number is undoubtedly high. Fall anglers kept more than three times as many muskellunge as they released. Almost 90% of the anglers used artificial baits. Muskellunge were the species sought by 85.3% of the anglers, while the other 9.2% were fishing for largemouth bass.

Seventy-two percent of the anglers surveyed in fall 1985 were from out-of-state, mostly from Illinois and Indiana (Table 2). The remaining 28% of the anglers resided in southern Michigan, with residences as far away as Calhoun County.

### Summer 1986

During summer 1986, boat anglers harvested 5,904 fish (Table 3). Bluegills *Lepomis macrochirus* and yellow perch *Perca flavescens* were the most abundant species taken by anglers, followed by largemouth bass, other sunfish (pumpkinseeds and hybrids; *Lepomis* spp.), rock bass *Ambloplites rupestris* and muskellunge. Boat anglers reportedly caught and released 916 largemouth bass, more than 1.6 times the number they harvested. A total of 362 muskellunge were

caught and released; this was more than 22 times the number of muskellunge harvested. Anglers fished for 13,323 hours (2,841 trips) in the summer. Boat angling pressure was relatively constant through the months surveyed. During summer 1986, the average boat angler spent 35 ( $\pm 14$ ) hours for each muskellunge and 9 ( $\pm 3$ ) hours for each largemouth bass caught (includes both harvested and released fish). By contrast, boat anglers fished 4 ( $\pm 3$ ) hours for each bluegill and 7 ( $\pm 8$ ) hours for each yellow perch caught.

Shore anglers took 499 fish, representing four species, during summer 1986 (Table 4). Clerks did not encounter any shore anglers during census in July or August. The species most frequently caught from shore was bluegill, followed by sunfish, yellow perch, and largemouth bass. None of the contacted shore anglers caught and released fish. Shore anglers spent an estimated 956 hours fishing Bankson Lake, mostly in June. Catch per hour for bluegills and sunfish were higher for shore anglers than boat anglers, but the opposite was true for yellow perch and largemouth bass (Tables 3 and 4).

More than 29% of the anglers surveyed during summer were from Illinois and Indiana (Table 5). Many summer cottages on the lake are owned by residents from these states. Residents of southern Michigan as far away as Kent County made up the remaining 71% of the anglers in summer months.

Over 80% of summer anglers used artificial bait, and spin-casting was the most popular method of fishing. Muskellunge were the target species sought by almost 40% of summer anglers and largemouth bass were sought by another 41%.

### Discussion

Bankson Lake has an above-average muskellunge and largemouth bass fishery and a fair panfish fishery. The lake is popular among muskellunge and largemouth bass anglers, and these groups often held weekend tournaments. The clerk saw largemouth bass over 5 pounds taken by anglers on several occasions during

summer 1986. Several large muskellunge over 40 in were also observed.

Boat anglers spent almost twice as many total hours on Bankson Lake in summer 1986 than fall 1985 and made 2.4 times as many trips. Summer anglers caught more species of fish than fall anglers and harvested 23 times as many fish. These differences may be explained by a combination of the type of anglers using the lake at these times, as well as the survey methods. Bankson Lake has many cottages used only in the summer and fishing pressure tends to be higher in summer. Many anglers who target muskellunge fish the lake in fall when summer residents are gone. Eighty-five percent of the fall anglers interviewed targeted muskellunge, while only 40% of summer anglers targeted muskellunge. This resulted in few species other than muskellunge reported to the census clerk during fall. While many muskellunge anglers typically practice catch-and-release, the higher harvest rate in fall could be attributed to "trophy" fish being kept, as well as fish kept by anglers new to the sport. Many muskellunge caught in the summer were taken incidentally by largemouth bass and panfish anglers, which may have also led to higher release rates. The fall survey centered on anglers using the access site and underestimated the harvest of fish by year-round residents who docked boats at their house or cottage. The summer clerks had a boat and could interview all anglers.

Shore fishing is limited on Bankson Lake. Little space is available for shore anglers at the public access site. A large summer camp is located on the lake which affords some shore fishing, but most non-boat fishing is limited to private docks. Shore anglers fished only 6.7% of total angler hours during summer 1986, and the harvest from shore was only 7.3% of the total harvest.

The high degree of catch-and-release fishing for both muskellunge and largemouth bass on Bankson Lake is not unusual. However, we did not attempt to separate anglers who released undersized fish from those who released all fish regardless of size. The estimates in Tables 1 and 3 should not be considered a measure of voluntary catch-and-release fishing of legal fish on Bankson Lake.

The amount of nonresident fishing on Bankson Lake is not uncommon in southern Michigan (Herman 1989). Bankson Lake is located less than 100 mi from Chicago and several large cities in Indiana. Natural inland lakes are relatively rare in the northern portion of Illinois and Indiana, and the reputation of good fisheries in southern Michigan lakes is an attraction to nonresident anglers. Bankson Lake may get some added fishing pressure because of its reputation for consistently good muskellunge fishing.

Fishing pressure on Bankson Lake is similar to other warmwater lakes in southern Michigan where creel surveys have been conducted in the past (Table 6). Fishing pressure was generally higher on the lakes that are nearer to large population centers. Catch per acre (harvested fish) was low on Bankson Lake, but is similar to a few larger lakes, such as Devils Lake (Lenawee County) or Lake Lansing (Ingham County). Catch rates were also low compared to other southwestern Michigan lakes with creel survey data available. This can be partially explained by the amount of catch and release fishing that takes place on Bankson Lake. Also, since panfish are slow growing, anglers probably release many small panfish and find only a few good-size fish to keep.

While this survey was not intended to focus on angler satisfactions, many anglers were vocal about conditions in Bankson Lake. Many complaints heard by the creel clerks were related to small size of panfish, with blame being laid on the muskellunge population in the lake. Biological data, either collected by the creel clerk or taken during spring broodstock netting and other recent surveys, indicate a decline in panfish growth since the late 1960s. Some anglers complained that the largemouth bass fishery was also being adversely affected by muskellunge. The MDNR access site was another source of

angler complaints during the survey. Recent high water levels have left little room for boat launching at the site and the launch pad area is fairly shallow. Parking is limited to six cars with trailers. In the past, tournament parking has filled the site to capacity, and many participants parked along the road. Recreation Division currently does not issue permits for tournament use of the access site due to these safety concerns.

### **Management Considerations**

Future management plans for Bankson Lake could include continued stocking of muskellunge. Because of proximity to Wolf Lake Hatchery, Bankson Lake should continue as a broodstock lake. The current minimum size limit of 42 in will protect the existing stock. There will be sufficient numbers of large females in the lake for broodstock and trophy fishing in the lake will be maintained. An attempt should be made to determine the cause of decline in panfish growth and corrective measures should be implemented if possible. The contribution of stocked walleyes to the fishery should be evaluated with additional fishery surveys. Walleye harvest should be evaluated by either direct contact or by postcard surveys. Biological data should be collected from panfish, walleyes, and muskellunge each spring during broodstock collection so fish growth can be monitored.

### **Acknowledgments**

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Table 1.—Estimated harvest by boat anglers for Bankson Lake, fall 1985. Estimates with  $\pm 2$  SE in parentheses.

Species	Total catch per hour	Fish Harvested			
		Sep	Oct	Nov	Season
Muskellunge	0.0298 (0.0262)	115 (166)	21 (20)	66 (58)	202 (177)
Largemouth bass	0.0111 (0.0175)	76 (119)	0 (0)	0 (0)	76 (119)
Total	0.0409 (0.0346)	191 (204)	21 (20)	66 (58)	278 (213)
Released muskellunge	0.0089 (0.0082)	0 (0)	10 (11)	51 (54)	61 (55)
Angler hours		1,979 (458)	3,112 (513)	1,711 (356)	6,803 (774)
Angler trips		408 (120)	542 (144)	248 (56)	1,198 (196)

Table 2.—Residence of anglers fishing Bankson Lake, fall 1985. Estimates with  $\pm 2$  SE in parentheses; N = 182.

Michigan County	Percent of anglers	Other States	Percent of anglers
Berrien	3.3 (2.7)	Illinois	51.6 (7.4)
Calhoun	2.2 (2.2)	Indiana	18.7 (5.8)
Cass	6.0 (3.5)	Other	1.6 (1.9)
Kalamazoo	10.4 (4.5)		
St. Joseph	1.1 (1.5)		
Van Buren	5.0 (3.2)		



Table 3.—Estimated harvest by boat anglers from Bankson Lake, summer 1986. Estimates with  $\pm 2$  SE in parentheses.

Species	Total catch per hour	Fish Harvested			
		Jun	Jul	Aug	Season
Muskellunge	0.0012 (0.0024)	16 (32)	0 (0)	0 (0)	16 (32)
Yellow perch	0.1369 (0.1410)	79 (68)	1,499 (1,864)	246 (191)	1,824 (1,875)
Largemouth bass	0.0421 (0.0184)	109 (121)	249 (185)	202 (99)	560 (243)
Bluegill	0.2241 (0.1280)	994 (791)	1,610 (1,468)	381 (293)	2,985 (1,693)
Rock bass	0.0027 (0.0036)	0 (0)	1 (3)	35 (47)	36 (47)
Sunfish	0.0355 (0.0290)	105 (115)	275 (352)	93 (103)	473 (385)
Bowfin	0.0007 (0.0015)	0 (0)	0 (0)	10 (19)	10 (19)
<b>Total</b>	<b>0.4431 (0.1949)</b>	<b>1,303 (812)</b>	<b>3,634 (2,406)</b>	<b>967 (381)</b>	<b>5,904 (2,568)</b>
Released bass	0.0688 (0.0275)	178 (145)	430 (286)	308 (166)	916 (361)
Released muskellunge	0.0271 (0.0113)	78 (55)	148 (111)	136 (83)	362 (149)
Angler hours		4,020 (605)	4,415 (533)	4,888 (466)	13,323 (931)
Angler trips		943 (167)	909 (133)	989 (123)	2,841 (247)

Table 4.—Estimated harvest by shore anglers in Bankson Lake, summer 1986. Catches with  $\pm 2$  SE in parentheses.

Species	Total catch per hour	Fish Harvested			
		Jun	Jul	Aug	Season
Yellow perch	0.0126 (0.0256)	12 (24)	0 (0)	0 (0)	12 (24)
Largemouth bass	0.0114 (0.0174)	11 (17)	0 (0)	0 (0)	11 (17)
Bluegill	0.3756 (0.5013)	359 (474)	0 (0)	0 (0)	359 (474)
Sunfish	0.1219 (0.1870)	117 (177)	0 (0)	0 (0)	117 (177)
<b>Total</b>	<b>0.5220</b> <b>(0.5400)</b>	<b>499</b> <b>(507)</b>	<b>0</b> <b>(0)</b>	<b>0</b> <b>(0)</b>	<b>499</b> <b>(507)</b>
Angler hours		415 (90)	215 (71)	327 (146)	956 (186)
Angler trips		79 (25)	0 (0)	0 (0)	79 (25)

Table 5.—Residence of anglers fishing Bankson Lake, summer 1986. Estimates with  $\pm 2$  SE in parentheses; N = 535.

Michigan County	Percent of anglers	Other States	Percent of anglers
Allegan	3.2 (1.5)	Illinois	12.0 (2.8)
Cass	17.9 (3.3)	Indiana	17.6 (3.3)
Kalamazoo	20.6 (3.5)		
Kent	0.6 (0.6)		
St. Joseph	1.1 (0.9)		
Van Buren	27.1 (3.8)		

Table 6.—Seasonal average estimates of fishing pressure, fish harvested and catch rates (all species harvested) for several southern Michigan lakes. Estimates with  $\pm 2$  SE.

Lake and county	Year	Number of seasons <sup>1</sup>	Acres	Hours per acre	Catch per acre	Catch per hour
Bankson Lake, Van Buren County	1985-86	2	217	46 $\pm$ 3	14 $\pm$ 6	0.32 $\pm$ 0.13
Long Lake, <sup>2,3</sup> Barry County	1974-78	9	289	42 $\pm$ 2	46 $\pm$ 7	1.08 $\pm$ 0.18
Round Lake, <sup>3,4</sup> Van Buren County	1977-80	5	187	64 $\pm$ 3	92 $\pm$ 11	1.43 $\pm$ 0.19
Osterhout Lake, <sup>3,4</sup> Van Buren County	1978-79	2	168	39 $\pm$ 5	28 $\pm$ 9	0.72 $\pm$ 0.26
Whitmore Lake, <sup>5</sup> Washtenaw and Livingston counties	1980 1950-65	1 12	677	95 $\pm$ 7 70 $\pm$ 16	29 $\pm$ 9 89 $\pm$ 28	0.31 $\pm$ 1.00 1.12 $\pm$ 0.03
Pontiac Lake, <sup>5</sup> Oakland County	1980 1950-65	1 14	585	81 $\pm$ 6 126 $\pm$ 29	37 $\pm$ 6 153 $\pm$ 134	0.45 $\pm$ 0.08 1.12 $\pm$ 0.10
Kent Lake, <sup>5</sup> Oakland County	1980	2	1,200	159 $\pm$ 12	110 $\pm$ 25	0.69 $\pm$ 0.16
Devils Lake, <sup>6</sup> Lenawee County	1987	1	1,330	31.9 $\pm$ 5.3	14.3 $\pm$ 3.4	0.45 $\pm$ 0.13
Vineyard Lake, <sup>6</sup> Jackson County	1987	1	505	55.6 $\pm$ 8.2	19.5 $\pm$ 7.4	0.35 $\pm$ 0.14
Lake Lansing, <sup>6</sup> Ingham County	1987	1	453	19.8 $\pm$ 4.1	4.2 $\pm$ 1.6	0.21 $\pm$ 0.09

<sup>1</sup>Spring, summer, fall, winter

<sup>2</sup>Beyerle (1980)

<sup>3</sup>Institute for Fisheries Research, unpublished data

<sup>4</sup>Beyerle (1984)

<sup>5</sup>Ryckman and Lockwood (1985)

<sup>6</sup>Herman (1989)

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