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Completion Report
Summer Creel Survey Report for Little Boy and Wabedo Lakes
9 May – 30 September 2020

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Summer Creel Survey
Little Boy and Wabedo Lakes
2020

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Table of Contents

SUMMER CREEL SURVEY REPORT FOR LITTLE BOY AND WABEDO LAKES, CASS COUNTY, MINNESOTA, 2020	4
ABSTRACT	5
Introduction	6
Study Area	6
Methods	6
<i>Creel Strata</i>	6
<i>Estimation of Angling Pressure and Catch Statistics</i>	7
Results	7
<i>Angling and Recreational Pressure</i>	7
<i>Catch and Harvest</i>	8
<i>Walleye</i>	8
<i>Northern Pike</i>	8
<i>Muskellunge</i>	9
<i>Largemouth Bass</i>	9
<i>Smallmouth Bass</i>	9
<i>Black Crappie</i>	9
<i>Sunfish</i>	9
<i>Yellow Perch</i>	10
<i>Additional Species</i>	10
<i>Louise Lake</i>	10
Discussion	10
Acknowledgements	12
References	12
Tables	13
Figures	43
Appendix 1	47
Appendix 2	50

SUMMER CREEL SURVEY REPORT FOR LITTLE BOY AND WABEDO LAKES,
CASS COUNTY, MINNESOTA, 2020

ABSTRACT

A two-stage, stratified random roving creel survey was conducted on Little Boy and Wabedo lakes, Cass County, Minnesota from May 9 to September 30, 2020 to evaluate fishing pressure, catch, harvest, angler demographics, and to aid in evaluation of the Walleye 18-26 inch Protected Slot Limit (PSL) implemented in 2018. The regulation was implemented to protect mature females and increase the spawning biomass, improve population size structure which had declined over time, and produce more consistent and potentially stronger natural year classes. A total of 1,429 angling parties were interviewed; of these, 811 (56.8%) occurred on Little Boy Lake and 618 (43.2%) were on Wabedo Lake. The estimated total fishing pressure on Little Boy Lake was 37,981 angler-hours (26.17 angler-hours per acre), a 14% increase from the 2000 and 2001 creel survey average to a historical high. The estimated total fishing pressure on Wabedo Lake was 35,457 angler-hours (28.92 angler-hours per acre), an 8% increase from the 2000 and 2001 creel survey average. Peak fishing pressure occurred during June in both Little Boy and Wabedo lakes. Combined, an estimated 65,201 fish were caught of which 8,394 were harvested (12.9% of the total catch). Yellow Perch *Perca flavescens* were the most frequently caught fish (8,235 fish or 5.67 fish per acre) on Little Boy Lake and Sunfish (Bluegill, Pumpkinseed Sunfish, and their hybrids) were most abundant on Wabedo Lake (10,507 fish or 8.58 fish per acre). Walleye (*Sander vitreus*) was the primary species targeted by anglers on both Little Boy and Wabedo lakes (40.2% and 22.6%, respectively). Most (77.9%) anglers were Minnesota residents but only a small proportion lived locally (<25 miles from Longville, MN) based on self-reported zip codes. This survey occurred during the Coronavirus (COVID-19) pandemic and statewide Stay-At-Home orders, which may have inflated the amount of fishing pressure observed during the open-water survey period.

Introduction

The Minnesota Department of Natural Resources (MNDNR) has routinely monitored the status of Minnesota fisheries since the onset of standardized lake sampling (MNDNR 1993). To evaluate the status of the fishery in Little Boy and Wabedo lakes, the MNDNR conducted a creel survey during the summer of 2020. Creel statistics, including catch, harvest, and angling pressure were compared to previous creel surveys (Klick 2000; Vandergoot 2001; Pedersen 2016) to evaluate changes to the fishery over time and evaluate potential management actions that may be necessary to regulate harvest.

Currently the fishery is managed using statewide harvest regulations except for Northern Pike *Esox lucius*, managed with a 24 to 36 inch protected slot limit and possession limit of three fish since 2003, and Walleye *Sander vitreus*, managed with an 18 to 26 inch protected slot limit and possession limit of four fish since 2018. The Walleye protected slot limit and reduced bag limit was implemented in an attempt to increase spawning stock biomass in the lake and associated natural reproduction, improve population size structure, and produce more consistent and potentially stronger year classes (Schultz 2018). Comparison of creel statistics with previous surveys indicated angling pressure has increased (Klick 2000; Vandergoot 2001; Pedersen 2016).

Study Area

Little Boy (DOW# 11-0167-00) and Wabedo (DOW# 11-0171-00) lakes are located in central Cass County, Minnesota, four miles south of Longville (Figure 1; 46.924790°N, -94.200285°W). Both lakes are classified as Lake Class 22 (Schupp 1992) with windswept shores and sheltered bays that support emergent and submerged vegetation. The lakes are connected by a navigable channel and anglers frequently traverse both lakes in a fishing trip. Little Boy and Wabedo lakes are primarily managed for Black Crappie *Pomoxis nigromaculatus*, Muskellunge *Esox masquinongy*, Northern Pike *Esox lucius*, and Walleye *Sander vitreus*. Secondary management species include Bluegill *Lepomis macrochirus*, Largemouth Bass *Micropterus salmoides*, Smallmouth Bass *Micropterus dolomieu*, Tullibee (Cisco) *Coregonus artedi*, and Yellow Perch *Perca flavescens*. Muskellunge are native to Little Boy and Wabedo lakes and are self-sustaining despite some infrequent past stocking. The MNDNR implemented a new Walleye stocking strategy for both Little Boy and Wabedo lakes in 2020 (1,000 fry per littoral acre biennially) in combination with special harvest regulations to increase recruitment and fishery potential. This creel survey serves as a benchmark of the fishery as these new Walleye management strategies are implemented.

Methods

Creel Strata

A two-stage, stratified random creel survey was conducted on Little Boy and Wabedo lakes from May 9 to September 30, 2020. The survey was stratified by day type (weekday or weekends), month (May, June, July, August, and September), and two day-period shifts (early or late) with no overlap between shifts. Both lakes were sampled on the same day and only one day-period was sampled on a particular sample date. All weekend days within a month were sampled and the remaining weekdays were randomly selected; holidays were not sampled consistent with labor agreements. Start and end creel survey times were based on the available daylight hours during each month taken from a Minneapolis/St. Paul sunrise/sunset table and to be consistent with previous creel surveys. A sampling

day was considered 15 hours (0700-2200 hours) from May through August and 14 hours (0700-2100 hours) during September.

Estimation of Angling Pressure and Catch Statistics

Boat anglers were contacted using an incomplete trip, roving creel design. Clerks collected information on angler effort, catch, harvest, demographics, primary and secondary species sought and how they accessed the lake (i.e., public access, private dock, or resort). Harvested fish were identified to species and measured to the nearest 0.25-inch with angler permission and unmeasured fish were enumerated. Additionally, anglers were asked to recall the species, number and length of released fish. Because anglers were likely to misidentify Bluegill, Pumpkinseed *Lepomis gibbosus*, and their hybrids these species were combined as Sunfish *Lepomis spp.* for analysis. Shore anglers were not contacted during this survey as the 2001 survey reported shore anglers accounted for less than 1% of the total fishing pressure on both lakes.

Two instantaneous activity counts were conducted via boat on Little Boy and Wabedo lakes in conjunction with angler interviews on each sampling date. The clerk traversed each lake at randomly assigned hourly count times and directions while counting the number of fishing and non-fishing boats observed on the water.

Creel Application Software (CAS) was used to summarize creel statistics (Soupir and Brown 2002), which included angler demographics, pressure, catch rates, harvest rates, total catch and total harvest. The 2001 creel survey preceded current Geographic Information System (GIS) acreages, and as such relied upon planimetered acreage for reporting. In order to accurately compare per acre statistics among surveys, the number harvested per Planimetered Lake acreage was converted to number harvested per GIS acres using the following formula: [(number of fish harvested per planimetered acre)*(total planimetered acreage)/Total GIS acreage]. This calculation was completed for pressure estimates as well. Future creel surveys will use GIS acreage.

Results

Angling and Recreational Pressure

A total of 1,429 angling parties were interviewed from May 9 to September 30, 2020. Of these 811 (56.8%) occurred on Little Boy Lake and 618 (43.2%) on Wabedo Lake. The estimated total fishing pressure on Little Boy Lake was 37,981 angler-hours (26.17 angler-hours per acre), a 14% increase from the 2000 and 2001 creel survey averages (33,418 total angler-hours). The estimated total fishing pressure on Wabedo Lake was 35,457 angler-hours (28.92 angler-hours per acre), an 8% increase from the 2000 and 2001 creel survey averages (32,789 total angler-hours) Peak fishing pressure occurred during June in both Little Boy and Wabedo Lakes (7.83 and 8.35 angler-hours per acre; Tables 1 and 2). Aerial fishing pressure estimates were completed during the summer of 2016. Pressure estimates for Little Boy and Wabedo in 2020 were 16% and 19% higher than averages of the 2000, 2001, and 2016 pressure estimates (Tables 3, 4, and 5). Median distance traveled by anglers in 2020 was 145 miles and ranged from 1.5 to 1,570 miles. Only 9.8% of anglers lived less than 25 miles from Longville, MN (Table 6), and 77.9% of interviewed anglers were Minnesota residents (Table 7). Of interviewed anglers, 79% were males with the majority being over the age of 45 (Table 8). Fishing boats accounted for 84% of the observed surface use on both Little Boy and Wabedo lakes (Tables 9 and 10). The majority of anglers on

Little Boy and Wabedo lakes accessed the lakes via private residences (38.3%) followed by public accesses (31.4%) and resorts (30.3%) (Table 11).

Catch and Harvest

An estimated 65,201 fish were caught of which 8,395 were harvested (12.9% of the total catch on both lakes combined), representing a 32% decrease in overall fish harvest compared to the 2000 and 2001 survey average. Yellow Perch were the most frequently caught fish (8,235 fish or 5.67 fish per acre) on Little Boy Lake and Sunfish (i.e., Bluegill and Pumpkinseed Sunfish) were the most frequently caught on Wabedo Lake (10,507 fish or 8.58 fish per acre) (Tables 12 and 13). Walleye was the primary species targeted by anglers on both Little Boy and Wabedo Lakes (40.0% and 22.1%, respectively) and is slightly lower than was reported by Vandergoot 2001 (Table 14).

Walleye

Anglers on Little Boy Lake harvested an estimated 1,450 Walleye (1,740 pounds or 1.20 pounds/acre) at a rate of 0.0334 per hour and released an additional 2,679 Walleye. Wabedo Lake anglers harvested 431 Walleyes (633 pounds or 0.52 pounds per acre) at a rate of 0.0144 per hour and released an additional 586 Walleye. Walleye harvest in 2020 was lower than the 2000-2001 average on Little Boy Lake however, 2020 harvest was greater on Wabedo Lake. Catch rates were highest during 2020 for both lakes; some of this increase can be attributed to the more restrictive PSL that was not present during 2000-2001 and the increased fishing pressure observed in 2020 (Tables 4, 5, 12, and 13). Walleye catch rates for targeting anglers on Little Boy and Wabedo lakes was 0.2188 and 0.0385 fish per hour, respectively with catch rates for all anglers being 0.0917 and 0.0303, respectively (Tables 17-20). Harvested Walleye lengths ranged from 11.8 to 26.0 inches on Little Boy Lake and from 11.1 to 27.0 inches on Wabedo Lake (Table 25). Respectively, mean length and weight of harvested Walleye was 15.6 inches and 1.2 pounds on Little Boy and 16.5 inches and 1.5 pounds on Wabedo Lake (Tables 15 and 16). Anglers harvested 95.9% (Little Boy) and 91.7% (Wabedo) of walleye caught that were shorter than the PSL. Overall, 29% of the total Walleyes caught on Little Boy and Wabedo Lakes combined were within the protected slot limit. Five Walleyes within the protected slot were illegally harvested and accounted for 2.8% of all measured fish for both lakes (Figure 2). Of the angling parties that targeted Walleye, less than 1% harvested greater than two fish during any particular trip for both lakes (Tables 21-24).

Northern Pike

An estimated 1,172 Northern Pike (2,041 pounds or 1.06 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Six percent of anglers on both Little Boy and Wabedo targeted Northern Pike, as compared to 14% in 2001 (Table 14; Vandergoot 2001). Harvest rates for Little Boy and Wabedo across all anglers were 0.0147 and 0.0144 per hour, respectively. Catch rates for targeting anglers on Little Boy and Wabedo Lakes were 0.1990 and 0.2882 fish per hour, respectively (Tables 17-20). Measured Northern Pike ranged in length from 10.0 to 23.3 inches on Little Boy and 17.0 to 23.7 inches on Wabedo (Table 25). Released Northern Pike up to 38.0 inches were reported on Little Boy with 35.0 inches being the longest reported on Wabedo. Mean length and weight of harvested pike was 20.5 inches and 1.7 pounds (Tables 15 and 16). Mean length of Northern Pike caught by anglers increased by 0.72 inches on Little Boy Lake and decreased by 1.48 inches on Wabedo Lake in 2020, compared to the 2000-2001 average. No illegal pike were observed harvested. Although no special regulation existed in 2000 or 2001, the number of harvested pike was similar in the 2020 survey (Tables 4 and 5; Vandergoot 2001). Of the parties that caught Northern Pike, none harvested their possession limit of three. (Tables 21-24).

Muskellunge

A total of 29 Muskellunge were reported caught for an estimated catch of 254 fish during the 2020 season in both lakes (Tables 13 and 14). No harvested Muskellunge have ever been observed by creel clerks (Tables 4 and 5). Parties targeting muskellunge were 14% (Little Boy) and 20% (Wabedo) in 2020 and were similar to previous observations of 15% and 24%, respectively, in 2001 (Table 14; Vandergoot 2001). Catch rates for targeting anglers on Little Boy and Wabedo Lakes were 0.0110 and 0.0083 fish per hour, respectively. Although catch rates for Muskellunge increased (Tables 17-20), the estimated total catch was similar to 2001 (n = 260 fish) as a slightly greater proportion of fishing parties targeted muskellunge during that survey. Lengths of reported Muskellunge caught ranged from 15.0 to 50.0 inches (Table 25).

Largemouth Bass

An estimated 441 Largemouth Bass (699 pounds or 0.26 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Approximately 8% of Little Boy and 8.9% of Wabedo anglers targeted Largemouth Bass, as compared to 5% and 11% in 2001, respectively (Table 14; Vandergoot 2001). Harvest rates for Little Boy and Wabedo across all anglers were 0.0050 and 0.0074 per hour, respectively. Catch rates for targeting anglers on Little Boy and Wabedo Lakes were 0.3699 and 0.3901 fish per hour, respectively (Tables 17-20). Measured Largemouth Bass ranged in length from 10.0 to 19.3 inches on Little Boy and 11.9 to 16.0 inches on Wabedo (Table 25). Mean length and weight of harvested Largemouth Bass on Little Boy Lake was 14.7 inches and was 2.0 pounds and 13.5 inches and 1.4 pounds on Wabedo Lake (Tables 15 and 16).

Smallmouth Bass

An estimated 175 Smallmouth Bass (312 pounds or 0.12 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Approximately 8% of Little Boy and 7.5% of Wabedo anglers targeted Smallmouth Bass, as compared to 1% for both lakes in 2001 (Table 14; Vandergoot 2001). Harvest rates for Little Boy and Wabedo across all anglers were 0.0024 and 0.0027 per hour, respectively. Catch rates for targeting anglers on Little Boy and Wabedo Lakes were 0.7870 and 0.5451 fish per angler hour, respectively (Tables 17-20). Measured Smallmouth Bass ranged in length from 12.0 to 20.0 inches on Little Boy and 10.5 to 16.3 inches on Wabedo (Table 25). Mean length and weight of harvested Smallmouth Bass on Little Boy was 15.4 inches and 2.3 pounds and 13.8 inches and 1.5 pounds on Wabedo (Tables 15 and 16).

Black Crappie

An estimated 479 Black Crappie (472 pounds or 0.18 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Only 1.9% of anglers on Little Boy and 5.2% of Wabedo anglers targeted Black Crappie, as compared to 7% and 25%, respectively, in 2001 (Table 14; Vandergoot 2001). Respective harvest rates for Little Boy and Wabedo lakes across all anglers were 0.0047 and 0.0066 fish per hour. Catch rates for targeting anglers on Little Boy and Wabedo lakes were 0.0839 and 0.1213 fish per angler hour, respectively (Tables 17-20). Measured Black Crappie ranged in length from 7.0 to 15.2 inches with a mean length and weight of 11.8 inches and 1.0 pounds (Tables 15 and 16).

Sunfish

An estimated 2,681 sunfish (1,091 pounds or 0.41 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Harvest rates for Little Boy and Wabedo lakes across all anglers were

0.0213 and 0.0443 per hour, respectively. Catch rates for targeting anglers on Little Boy and Wabedo Lake were 1.5512 and 2.0998 fish per angler hour, respectively (Tables 17-20). Measured sunfish ranged in length from 6.0 to 10.0 inches with a mean length and weight of 7.9 inches and 0.4 pounds (Tables 15 and 16).

Yellow Perch

An estimated 1,155 Yellow Perch (441 pounds or 0.16 pounds per acre) were harvested from both lakes combined (Tables 4, 5, 12, and 13). Harvest rates for Little Boy and Wabedo lakes across all anglers were 0.0149 and 0.0140 per hour, respectively. Catch rates for targeting anglers on Little Boy and Wabedo lakes were 1.2837 and 0.6288 fish per angler hour, respectively (Tables 17-20). Measured Yellow Perch ranged in length from 5.0 to 12.6 inches with a mean length and weight of 9.4 inches and 0.4 pounds (Tables 15 and 16).

Additional Species

Other species (n caught) reported by anglers included Bowfin *Amia calva* (18), Tullibee (Cisco) (40), and Rock Bass *Ambloplites rupestris* (4,687 caught with 413 harvested; Tables 12, and 13).

Louise Lake

Louise Lake (DOW# 11-0866-00) is a 12.8 acre waterbody located between Little Boy and Wabedo lakes and is accessible by boat from the channel between the two (Figure 1). Louise Lake was not included in the 2000, 2001, or 2020 creel survey designs. However, 18 boats interviewed reported they had spent the majority of their time fishing Louise Lake. Of the 18 boats fishing Louise Lake, 44% reported targeting Black Crappie and 28% targeted Largemouth Bass. A total of 35.77 hours of observed fishing pressure was directed at Louise Lake, and this is expected to be an underestimate because of survey design. Future creels should include Louise Lake as fish movement between the three lakes is expected and fishing pressure directed at Louise Lake may be considerable during portions of the season, particularly during spring when crappie are a common target by anglers on this system.

Discussion

Total fishing pressure was similar to or higher than previous estimates on both lakes. The increase is suspected to have been influenced by the COVID-19 pandemic. Many anglers indicated that they fished these lakes as a result of the closure of the U.S./Canadian border, or that modifications to individual work and/or education schedules allowed for increased fishing opportunity. Additionally, Minnesota reported near record fishing license sales during 2020 (highest since 2000). As of September 30th, 2020 (completion of creel) statewide fishing license sales were 10% higher than the same time in 2019 (MNDNR 2020). Aerial pressure counts in 2016 showed the lowest estimated fishing pressure of any of the four surveys' assigned values for mean party size and mean trip length were similar to or greater than observations from the three roving surveys.

Catch and harvest estimates of most species were below previous creel surveys. In general, anglers caught and harvested similar numbers of Largemouth and Smallmouth Bass, but substantially lower numbers of Black Crappie, Sunfish, Rock Bass, and Yellow Perch in 2020. While angler catch rates for Walleye were higher in 2020, anglers harvested more fish in the 2000-2001 average; likely because of the PSL implemented in 2018. Increased catch rates may have been a result of strong year classes produced in 2016 and 2018. In 2020, 29% of the total Walleye caught by anglers were within the PSL with only 2.8% being illegally harvested. In 2000 and 2001, 12% and 13% of the total Walleye caught by

anglers would have resided within the current PSL; of these, 83% and 61%, were harvested, respectively (Figures 3 and 4). Reduction in harvest should be expected in future creels as Walleye recruit into the PSL and a greater proportion of the population is protected from harvest, assuming that growth is sufficient to move enough fish through harvestable sizes and into the PSL. Electrofishing data during the period of 2008-2014 show Young-of-the-year (YOY) Walleye growth was reduced as a result of suppression from high density fry stockings, and gill net data show that growth rates remained below Walker Area mean length-at-age for these year classes. When growth is reduced Walleye are subjected to longer periods of time before attaining lengths desirable to anglers, thus allowing for additional natural mortality. Evaluation of this regulation should show increases in Spawning Stock Biomass (Walleye ≥ 18.0 inches) in gill net catches. Increased spawning biomass paired with appropriate stocking densities should lead to stronger and/or more consistent year classes and higher Walleye abundance which will provide more opportunity to anglers. Future creels should consider collection of Walleye dorsal spines for age class assignment corresponding with stocking plans when comparing harvest statistics.

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Tables

Table 1. Creel survey sampling summary and angling pressure estimates by stratum for Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

	Stratum					Season
	May	June	July	August	September	
Dates	5/11-5/31	6/1-6/30	7/1-7/31	8/1-8/31	9/1-9/30	5/14-9/30
Days in stratum	23	30	31	31	30	145
N weekdays sampled	8	9	11	8	9	43
N wknd/hol sampled	6	8	8	10	8	42
N incomplete interviews	78	160	129	144	169	680
N complete interviews	24	39	21	26	22	132
N total interviews	102	199	150	170	191	812
N refusals	0	1	0	0	1	2
			<i>Sampling summary (number)</i>			
Mean anglers/boat	2.01 (0.31)	2.23 (0.25)	2.31 (0.14)	2.37 (0.51)	2.14 (0.17)	2.23 (0.14)
Mean trip length (h)	4.74 (0.99)	3.75 (0.67)	3.81 (0.52)	3.38 (0.67)	4.57 (1.07)	4.05 (0.36)
			<i>Boat angler trip length and party size</i>			
Total angler hours	4,826 (787)	11,360 (1,487)	8,154 (966)	7,450 (998)	6,190 (908)	37,981 (2,363)
			<i>Fishing pressure</i>			

Table 2. Creel survey sampling summary and angling pressure estimates by stratum for Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

	Stratum					
	May	June	July	August	September	Season
Dates	5/11-5/31	6/1-6/30	7/1-7/31	8/1-8/31	9/1-9/30	5/14-9/30
Days in stratum	23	30	31	31	30	145
N weekdays sampled	8	9	11	8	9	43
N wknd/hol sampled	6	8	8	10	8	42
N incomplete interviews	63	126	122	133	109	553
N complete interviews	15	14	7	18	11	65
N total interviews	78	140	129	151	120	618
N refusals	0	0	0	1	1	2
	<i>Sampling summary (number)</i>					
Mean anglers/boat	2.17 (0.43)	2.36 (0.30)	2.51 (0.13)	2.05 (0.40)	2.00 (0.33)	2.22 (0.14)
Mean trip length (h)	2.18 (0.23)	3.87 (0.61)	2.95 (0.30)	3.08 (0.67)	7.27 (0.61)	4.07 (0.25)
	<i>Boat angler trip length and party size</i>					
Total angler hours	4,515 (695)	10,238 (1,401)	8,548 (887)	6,933 (761)	5,223 (783)	35,457 (2,104)
	<i>Fishing pressure</i>					

Table 3. Mean anglers per boat and mean trip length for Little Boy and Wabedo lakes, Minnesota, 2000-2020. 2016 aerial estimate values were assigned.

Little Boy					
Survey year	2000	2001	2016	2020	Mean
Mean anglers/boat	1.95	2.00	2.20	2.23	2.10
Mean trip length (h)	3.29	2.90	4.00	4.05	3.56

Wabedo					
Survey year	2000	2001	2016	2020	Mean
Mean anglers/boat	1.98	2.00	2.20	2.22	2.10
Mean trip length (h)	4.75	2.70	4.00	4.07	3.88

Table 4. Estimated total angling pressure and total catch statistics for Little Boy Lake, Minnesota, 2000-2020. Pressure estimates for 2000 and 2001 are adjusted to represent GIS acreage. 2016 pressure estimates only.

Survey year	2000	2001	2016	2020	Mean
<i>Angling pressure</i>					
Angler hours	33,882	32,953	31,667	37,981	34,121
Angler hours per acre	23.34	22.70	21.81	26.17	23.51
<i>Catch per angler-hour (all anglers)</i>					
Black Crappie	0.0013	0.0543	-	0.0065	0.0207
Bowfin	0.0000	0.0008	-	0.0005	0.0004
Burbot	0.0000	0.0007	-	0.0000	0.0002
Largemouth Bass	0.0200	0.0427	-	0.0785	0.0471
Muskellunge	0.0055	0.0038	-	0.0039	0.0044
Northern Pike	0.1508	0.1147	-	0.1170	0.1275
Rock Bass	0.1245	0.1469	-	0.0663	0.1126
Smallmouth Bass	0.0145	0.0158	-	0.1985	0.0763
Sunfish spp.	0.2501	0.441	-	0.0810	0.2574
Walleye	0.1065	0.0863	-	0.1087	0.1005
Yellow Perch	0.3820	0.5026	-	0.2168	0.3671
Total	1.0552	1.5624	-	0.8776	1.1651
<i>Number of Harvested Fish</i>					
Black Crappie	15	840	-	193	349
Bowfin	0	0	-	0	0
Burbot	0	0	-	0	0
Largemouth Bass	75	245	-	132	151
Muskellunge	0	0	-	0	0
Northern Pike	921	770	-	594	762
Rock Bass	1,270	2,220	-	251	1,247
Smallmouth Bass	122	158	-	58	113
Sunfish spp.	2,285	4,993	-	647	2,642
Walleye	2,527	1,210	-	1,450	1,729
Yellow Perch	1,920	1,801	-	697	1,473
Total	9,135	12,237	-	4,022	8,465

^a2003 Northern Pike protected slot limit 24-36" immediate release, 1 over 36" in possession. ^b2018 Walleye protected slot limit 18-26" immediate release, 1 over 26" in possession.

Table 4, cont'd.

Survey year	2000	2001	2016	2020	Mean
<i>Pounds of Harvested Fish</i>					
Black Crappie	14	421	-	198	211
Bowfin	0	0	-	0	0
Burbot	0	0	-	0	0
Largemouth Bass	94	328	-	261	228
Muskellunge	0	0	-	0	0
Northern Pike	1,946	1,753	-	995	1,565
Rock Bass	689	1,554	-	174	806
Smallmouth Bass	145	256	-	133	178
Sunfish spp.	604	1,516	-	250	790
Walleye	3,611	1,695	-	1,740	2,349
Yellow Perch	669	724	-	277	557
Total	7,772	8,247	-	4,028	6,682
<i>Harvest per Angler Hour (all anglers)</i>					
Black Crappie	0.0013	0.0543	-	0.0051	0.0202
Bowfin	0.0000	0.0000	-	0.0000	0.0000
Burbot	0.0000	0.0000	-	0.0000	0.0000
Largemouth Bass	0.0200	0.0427	-	0.0035	0.0221
Muskellunge	0.0000	0.0000	-	0.0000	0.0000
Northern Pike	0.1508	0.1147	-	0.0156	0.0937
Rock Bass	0.0376	0.0673	-	0.0066	0.0372
Smallmouth Bass	0.0145	0.0158	-	0.0015	0.0106
Sunfish spp.	0.2501	0.4410	-	0.0170	0.2360
Walleye	0.1065	0.0863	-	0.0382	0.0770
Yellow Perch	0.3820	0.5026	-	0.0183	0.3010
Total	0.9628	1.3247	-	0.1058	0.7978
<i>Harvest per Angler Hour (targeting anglers)</i>					
Black Crappie	0.0070	0.1789	-	0.0762	0.0874
Bowfin	0.0000	0.0000	-	0.0000	0.0000
Burbot	0.0000	0.0000	-	0.0000	0.0000
Largemouth Bass	0.0176	0.0688	-	0.0105	0.0323
Muskellunge	0.0000	0.0000	-	0.0000	0.0000
Northern Pike	0.0782	0.0724	-	0.0860	0.0789
Rock Bass	1.1721	0.6316	-	0.0050	0.6029
Smallmouth Bass	0.1083	0.1121	-	0.0013	0.0739
Sunfish spp.	0.5100	0.6498	-	0.3520	0.5039
Walleye	0.1058	0.0703	-	0.0800	0.0854
Yellow Perch	0.6837	0.5935	-	0.2233	0.5002
Total	2.6827	2.3774	-	0.8343	1.9648

^a2003 Northern Pike protected slot limit 24-36" immediate release, 1 over 36" in possession. ^b2018 Walleye protected slot limit 18-26" immediate release, 1 over 26" in possession.

Table 5. Estimated total angling pressure and total catch statistics for Wabedo Lake, Minnesota, 2000-2020. Pressure estimates for 2000 and 2001 are adjusted to represent GIS acreage. 2016 pressure estimates only.

Survey year	2000	2001	2016	2020	Mean
<i>Angling pressure</i>					
Angler hours	29,447	36,130	23,573	35,457	31,152
Angler hours per acre	24.85	29.46	19.22	28.92	25.61
<i>Catch per angler-hour (all anglers)</i>					
Black Crappie	0.2312	0.3437	-	0.0152	0.1967
Largemouth Bass	0.1257	0.1210	-	0.1323	0.1263
Muskellunge	0.0062	0.0054	-	0.003	0.0049
Northern Pike	0.0683	0.0691	-	0.1209	0.0861
Rock Bass	0.1574	0.1989	-	0.0611	0.1391
Smallmouth Bass	0.0202	0.0127	-	0.1066	0.0465
Sunfish spp.	0.6716	0.3490	-	0.2963	0.4390
Tullibee (Cisco)	0.0000	0.0000	-	0.0011	0.0011
Walleye	0.0112	0.0102	-	0.0287	0.0167
Yellow Perch	0.3528	0.2758	-	0.1335	0.2540
Total	1.6446	1.3858	-	0.8988	1.3100
<i>Number of Harvested Fish</i>					
Black Crappie	3,267	6,918	-	286	3,490
Largemouth Bass	438	320	-	309	356
Muskellunge	0	0	-	0	0
Northern Pike	436	623	-	576	545
Rock Bass	394	315	-	161	290
Smallmouth Bass	24	28	-	117	56
Sunfish spp.	3,166	1,984	-	2,034	2,395
Tullibee (Cisco)	0	0	-	0	0
Walleye	265	200	-	431	299
Yellow Perch	329	315	-	458	367
Total	8,319	10,703	-	4,372	7,798
<i>Pounds of Harvested Fish</i>					
Black Crappie	1,587	4,156	-	275	2,006
Largemouth Bass	763	418	-	438	540
Muskellunge	0	0	-	0	0
Northern Pike	1,369	1,629	-	1,046	1,348
Rock Bass	132	209	-	174	172
Smallmouth Bass	34	39	-	180	84
Sunfish spp.	800	563	-	841	735
Tullibee (Cisco)	0	0	-	0	0
Walleye	736	446	-	633	605
Yellow Perch	122	93	-	165	127
Total	5,543	7,553	-	3,752	5,616

^a2003 Northern Pike protected slot limit 24-36" immediate release, 1 over 36" in possession. ^b2018 Walleye protected slot limit 18-26" immediate release, 1 over 26" in possession.

Table 5, cont'd.

Survey year	2000	2001	2016	2020	Mean
<i>Harvest per Angler Hour (all anglers)</i>					
Black Crappie	0.1072	0.1922	-	0.0081	0.1025
Largemouth Bass	0.0144	0.0087	-	0.0087	0.0106
Muskellunge	0.0000	0.0000	-	0.0000	0.0000
Northern Pike	0.0143	0.0173	-	0.0162	0.0159
Rock Bass	0.0039	0.0087	-	0.0046	0.0057
Smallmouth Bass	0.0008	0.0008	-	0.0033	0.0016
Sunfish spp.	0.1017	0.0551	-	0.0574	0.0714
Tullibee (Cisco)	0.0000	0.0000	-	0.0000	0.0000
Walleye	0.0087	0.0056	-	0.0122	0.0088
Yellow Perch	0.0108	0.0088	-	0.0129	0.0108
Total	0.2618	0.2972	-	0.1234	0.2275
<i>Harvest per Angler Hour (targeting anglers)</i>					
Black Crappie	0.4450	0.5493	-	0.0685	0.3543
Largemouth Bass	0.0615	0.0335	-	0.0197	0.0382
Muskellunge	0.0000	0.0000	-	0.0000	0.0000
Northern Pike	0.0366	0.0435	-	0.0711	0.0504
Rock Bass	0.1694	0.5372	-	0.0000	0.2355
Smallmouth Bass	0.0000	0.0228	-	0.0144	0.0124
Sunfish spp.	0.7843	0.6369	-	0.4375	0.6196
Tullibee (Cisco)	0.0000	0.0000	-	0.0000	0.0000
Walleye	0.0376	0.0232	-	0.0438	0.0349
Yellow Perch	0.0513	0.5318	-	0.3144	0.2992
Total	1.5857	2.3782	-	0.9694	1.6444

^a2003 Northern Pike protected slot limit 24-36" immediate release, 1 over 36" in possession. ^b2018 Walleye protected slot limit 18-26" immediate release, 1 over 26" in possession.

Table 6. Hometown distances of anglers fishing Little Boy and Wabedo Lakes, Minnesota relative to Longville, MN, May 9th – September 30th, 2020.

Distance (miles)	N	Percent
0-25	289	9.8
26-99	424	14.3
100-199	1,489	50.4
200-499	536	18.1
500-999	151	5.1
1,000 +	66	2.3
Total	2,955	100.0

Table 7. State of residence of anglers fishing Little Boy and Wabedo Lakes, Minnesota, May 9th – September 30th, 2020.

State of Residence	N	Percent
Hawaii	1	0.03
Iowa	187	6.3
Illinois	121	4.1
Indiana	66	2.2
Kansas	20	0.67
Michigan	1	0.03
Minnesota	2,296	77.9
Missouri	18	0.61
North Dakota	24	0.81
Nebraska	25	0.84
South Dakota	9	0.30
Wisconsin	78	2.6
Other	109	3.7
Total	2,955	100.0

Table 8. Demographic groups of anglers fishing on Little Boy and Wabedo Lakes, Minnesota, May 9th – September 30th, 2020. Percentages appear in parentheses.

	Age group (years)						N	
	0-15	16-24	25-34	35-44	45-54	55-64		Over 65
Male	237 (10.3)	192 (8.4)	299 (13.0)	380 (16.6)	471 (20.5)	457 (19.9)	259 (11.3)	2,295 (79.3)
Female	92 (15.3)	59 (9.8)	86 (14.3)	92 (15.3)	98 (16.3)	125 (20.9)	48 (8.0)	600 (20.7)
Total	329 (11.4)	251 (8.7)	385 (13.3)	472 (16.3)	569 (19.7)	582 (20.1)	307 (10.6)	2,895 (100.0)

Table 9. Surface use (boat-hours) by use type and strata for Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Watercraft Type	Stratum					Season
	May	June	July	August	September	
Fishing	4,826 (787)	11,360 (1,487)	8,154 (966)	7,450 (998)	6,190 (908)	37,981 (2,363)
Non-fishing	81 (32)	900 (254)	1,406 (701)	774 (221)	172 (118)	3,333 (480)
Total	4,907	12,260	9,560	8,224	6,362	41,314
Fishing as percentage of total recreational use	98%	93%	85%	91%	97%	92%

Table 10. Surface use (boat-hours) by use type and strata for Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Watercraft Type	Stratum					Season
	May	June	July	August	September	
Fishing	4,515 (355)	10,238 (1,401)	8,548 (887)	6,933 (761)	5,223 (783)	35,457 (2,104)
Non-fishing	180 (79)	987 (349)	1,176 (379)	717 (148)	132 (67)	3,192 (547)
Total	4,695	11,225	9,724	7,650	5,355	38,649
Fishing as percentage of total recreational use	96%	91%	90%	91%	98%	92%

Table 11. Percentage of angler trips accessing Little Boy and Wabedo Lakes, Minnesota, May 9th - September 30th, 2020, via private residence, resorts, or public access.

Year	2000	2001	2020
Access Type			
Private Residence	37.7%	47.5%	38.3%
Resort	39.1%	42.0%	30.3%
Public Access	23.4%	10.5%	31.4%

Table 12. Catch and harvest estimates by stratum on Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum						Season
	May	June	July	August	September	September	
	<i>Number caught</i>						
Bowfin	10 (9)	0 (0)	0 (0)	0 (0)	8 (9)	18 (12)	
Black Crappie	143 (99)	74 (62)	16 (15)	12 (13)	0 (0)	245 (118)	
Largemouth Bass	557 (337)	1,062 (419)	343 (158)	697 (236)	321 (111)	2,981 (618)	
Muskellunge	-	67 (48)	0 (0)	17 (11)	54 (20)	147 (54)	
Northern Pike	494 (135)	1,699 (349)	966 (207)	628 (139)	659 (120)	4,445 (465)	
Rock Bass	50 (36)	1,205 (383)	998 (450)	226 (81)	40 (21)	2,519 (598)	
Smallmouth Bass	1,880 (830)	3,546 (1,099)	587 (199)	1,089 (274)	436 (141)	7,538 (1,425)	
Sunfish spp.	481 (370)	125 (80)	1,480 (588)	891 (431)	99 (60)	3,076 (823)	
Yellow Perch	1,110 (683)	2,025 (434)	3,662 (1,723)	1,108 (402)	329 (262)	8,235 (1,963)	
Walleye	785 (248)	1,430 (502)	804 (267)	737 (188)	372 (131)	4,128 (661)	
Overall	5,519 (1,603)	11,234 (2,185)	8,856 (2,819)	5,407 (957)	2,317 (475)	33,333 (4,053)	
	<i>Number harvested</i>						
Bowfin	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Black Crappie	105 (84)	60 (61)	16 (15)	12 (13)	0(0)	193 (106)	
Largemouth Bass	0 (0)	34 (26)	85 (36)	0 (0)	13 (11)	132 (46)	
Muskellunge	-	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Northern Pike	69 (37)	209 (98)	233 (62)	46 (19)	38 (25)	594 (126)	
Rock Bass	10 (10)	96 (65)	128 (101)	12 (13)	5 (6)	251 (121)	
Smallmouth Bass	0 (0)	7 (7)	32 (33)	9 (9)	11 (11)	58 (37)	
Sunfish spp.	94 (59)	0 (0)	301 (198)	228 (114)	24 (28)	647 (238)	
Yellow Perch	190 (108)	163 (86)	136 (174)	9 (9)	5 (6)	697 (194)	
Walleye	309 (144)	354 (102)	95 (122)	344 (110)	158 (43)	1,450 (233)	
Overall	778 (265)	922 (255)	1,409 (463)	660 (178)	254 (73)	4,023 (622)	

Table 13. Catch and harvest estimates by stratum on Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum						Season
	May	June	July	August	September	September	
	<i>Number caught</i>						
Black Crappie	34 (33)	89 (75)	311 (172)	86 (53)	20 (15)	540 (199)	
Largemouth Bass	436 (114)	1,875 (423)	1,342 (332)	666 (238)	370 (128)	4,690 (613)	
Muskellunge	-	35 (27)	0 (0)	20 (21)	24 (15)	107 (42)	
Northern Pike	963 (344)	1,382 (396)	969 (382)	624 (155)	351 (114)	4,287 (677)	
Rock Bass	126 (57)	1,001 (267)	777 (260)	231 (85)	33 (17)	2,167 (387)	
Smallmouth Bass	403 (151)	1,638 (677)	1,291 (303)	371 (108)	78 (28)	3,781 (765)	
Sunfish spp.	277 (216)	5,268 (2,729)	2,180 (565)	1,714 (476)	1,069 (693)	10,507 (2,919)	
Tullibee (Cisco)	0 (0)	0 (0)	0 (0)	29 (24)	11 (13)	40 (27)	
Yellow Perch	986 (561)	1,226 (594)	1,286 (524)	904 (297)	331 (129)	4,732 (1,023)	
Walleye	404 (164)	343 (84)	63 (53)	135 (90)	72 (40)	1,017 (215)	
Overall	3,655 (813)	12,857 (3,521)	8,218 (1,364)	4,780 (881)	2,359 (963)	31,868 (4,077)	
	<i>Number harvested</i>						
Black Crappie	34 (33)	12 (13)	150 (82)	76 (52)	13 (13)	286 (104)	
Largemouth Bass	0 (0)	113 (62)	113 (66)	29 (20)	54 (48)	309 (105)	
Muskellunge	-	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Northern Pike	158 (60)	56 (25)	276 (135)	40 (22)	46 (16)	576 (152)	
Rock Bass	0 (0)	13 (13)	138 (84)	0 (0)	11 (6)	161 (85)	
Smallmouth Bass	0 (0)	13 (13)	75 (49)	29 (21)	0 (0)	117 (55)	
Sunfish spp.	126 (92)	1,168 (504)	301 (131)	154 (80)	285 (229)	2,034 (581)	
Tullibee (Cisco)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Yellow Perch	301 (166)	35 (22)	25 (24)	86 (85)	11 (12)	458 (190)	
Walleye	163 (82)	158 (50)	0 (0)	58 (45)	52 (35)	431 (112)	
Overall	782 (224)	1,567 (535)	1,078 (296)	471 (171)	473 (355)	4,371 (728)	

Table 14. Frequencies (%) of primary species targeted by anglers in Little Boy and Wabedo lakes, Minnesota, May 9th – September 30th, 2020.

Targeted Species	Stratum						
	May	June	July	August	September	Season	Season
Walleye	69.9	38.0	29.6	44.6	40.2	40.0	40.0
Northern Pike	0.0	5.5	7.9	2.9	9.5	6.0	6.0
Yellow Perch	0.0	0.5	1.3	0.0	0.5	0.6	0.6
Largemouth Bass	3.9	5.0	11.2	13.7	8.0	8.2	8.2
Smallmouth Bass	13.6	16.0	9.2	7.4	4.5	8.7	8.7
Black Crappie	5.8	0.5	1.3	2.3	0.0	2.0	2.0
Muskellunge	N/A	14.0	19.7	13.7	22.1	14.1	14.1
Sunfish spp.	1.0	3.5	3.3	5.1	3.0	5.4	5.4
Any Species	5.8	17.0	14.5	10.3	12.1	15.0	15.0
Wabedo							
Walleye	61.5	16.4	11.0	22.6	22.3	22.1	22.1
Northern Pike	7.7	2.1	8.7	6.8	2.7	5.7	5.7
Yellow Perch	1.3	0.0	0.0	0.0	0.0	0.2	0.2
Largemouth Bass	5.1	7.1	18.9	7.5	8.0	8.4	8.4
Smallmouth Bass	5.1	9.3	12.6	6.8	4.5	7.8	7.8
Black Crappie	7.7	2.9	6.3	7.5	2.7	5.5	5.5
Muskellunge	N/A	25.0	13.4	25.3	33.9	20.0	20.0
Sunfish spp.	7.7	10.7	7.1	6.8	12.5	10.9	10.9
Any Species	6.4	22.9	22.0	15.8	13.4	19.1	19.1

Table 15. Yield estimates and mean weights of harvested fish by stratum for Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum					
	May	June	July	August	September	Season
	<i>Total pounds harvested</i>					
Black Crappie	114 (314)	55 (-)	17 (18)	13 (15)	-	198 (315)
Largemouth Bass	0 (0)	58 (44)	180 (64)	-	23 (18)	261 (80)
Northern Pike	134 (95)	373 (304)	379 (80)	64 (27)	45 (29)	995 (331)
Rock Bass	7 (8)	67 (103)	87 (124)	9 (10)	4 (4)	174 (161)
Smallmouth Bass	0 (0)	16 (17)	66 (-)	20 (21)	31 (-)	133 (27)
Sunfish spp.	36 (26)	-	122 (136)	83 (90)	10 (-)	250 (166)
Yellow Perch	84 (115)	70 (71)	117 (41)	3 (4)	2 (2)	277 (141)
Walleye	431 (343)	542 (256)	300 (190)	312 (197)	154 (68)	1,740 (513)
	<i>Mean weight (pounds) of harvested fish</i>					
Black Crappie	1.1 (3.1)	0.9 (-)	0.4 (0.2)	1.0 (1.6)	-	1.0 (1.7)
Largemouth Bass	-	1.7 (1.8)	1.0 (1.5)	-	1.7 (1.9)	2.0(0.9)
Northern Pike	1.9 (1.9)	1.8 (1.7)	1.6 (0.6)	1.4 (0.8)	1.2 (1.1)	1.7 (0.7)
Rock Bass	0.8 (1.2)	0.7 (1.2)	0.7 (1.1)	0.8 (1.1)	0.8 (1.1)	0.7 (0.7)
Smallmouth Bass	-	2.3 (3.5)	2.1 (-)	2.3 (3.4)	2.9 (-)	2.3 (1.5)
Sunfish spp.	0.4 (0.4)	-	0.4 (0.5)	0.4 (0.4)	0.4 (-)	0.4 (0.3)
Yellow Perch	0.4 (0.7)	0.4 (0.5)	0.4 (0.2)	0.4 (0.6)	0.4 (0.6)	0.4 (0.2)
Walleye	1.4 (1.3)	1.5 (0.9)	1.1 (0.8)	0.9 (0.6)	1.0 (0.5)	1.2 (0.4)
	<i>Mean length (inches) of harvested fish</i>					
Black Crappie	12.3 (35.2)	11.6 (-)	12.1 (17.3)	12.1 (18.5)	-	12.1 (19.5)
Largemouth Bass	-	14.4 (15.6)	14.9 (11.2)	-	14.6 (16.2)	14.7 (8.4)
Northern Pike	21.4 (21.1)	20.7 (20.1)	20.1 (7.4)	19.3 (11.4)	16.8 (16.1)	20.2 (8.1)
Rock Bass	9.6 (15.2)	9.5 (16.4)	9.4 (15.0)	9.6 (14.2)	9.6 (14.8)	9.4 (9.9)
Smallmouth Bass	-	15.4 (23.0)	15.2 (-)	15.4 (22.7)	16.0 (-)	15.4 (10.1)
Sunfish spp.	7.8 (8.3)	-	8.0 (10.5)	7.7 (9.8)	8.0 (-)	7.8 (6.1)
Yellow Perch	10.1 (15.9)	9.9 (10.6)	9.3 (5.6)	9.7 (14.0)	9.7 (14.6)	9.7 (5.7)
Walleye	16.7 (15.3)	16.8 (9.1)	15.1 (10.8)	14.4 (10.2)	14.8 (8.0)	15.7 (5.2)

Table 16. Yield estimates and mean weights of harvested fish by stratum for Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum					
	May	June	July	August	September	Season
	<i>Total pounds harvested</i>					
Black Crappie	28 (28)	11 (12)	119 (183)	112 (243)	4 (-)	275 (305)
Largemouth Bass	0 (0)	189 (213)	147 (57)	45 (32)	57 (112)	438 (249)
Northern Pike	307 (77)	111 (36)	495 (88)	64 (95)	65 (36)	1,046 (159)
Rock Bass	0 (0)	8 (9)	90 (116)	-	7 (4)	106 (117)
Smallmouth Bass	0 (0)	22 (22)	101 (68)	57 (41)	-	180 (82)
Sunfish spp.	55 (43)	434 (286)	141 (88)	71 (50)	140 (323)	841 (445)
Yellow Perch	109 (132)	15 (12)	9 (9)	27 (31)	4 (4)	165 (137)
Walleye	256 (183)	265 (90)	-	47 (43)	65 (105)	633 (234)
	<i>Mean weight (pounds) of harvested fish</i>					
Black Crappie	0.8 (1.2)	0.9 (1.3)	0.8 (1.4)	1.5 (3.4)	0.3 (-)	1.0 (1.2)
Largemouth Bass	-	1.7 (2.1)	1.3 (1.0)	1.6 (1.5)	1.1 (2.3)	1.4 (1.0)
Northern Pike	2.0 (1.0)	2.0 (1.1)	1.8 (1.0)	1.7 (2.8)	1.4 (1.0)	1.8 (0.6)
Rock Bass	-	0.7 (1.0)	0.7 (0.9)	-	0.7 (0.6)	0.7 (0.8)
Smallmouth Bass	-	1.7 (2.5)	1.3 (1.3)	2.0 (2.0)	-	1.5 (1.0)
Sunfish spp.	0.4 (0.5)	0.4 (0.3)	0.5 (0.4)	0.5 (0.4)	0.5 (1.2)	0.4 (0.3)
Yellow Perch	0.4 (0.5)	0.4 (0.5)	0.4 (0.5)	0.3 (0.5)	0.3 (0.6)	0.4 (0.3)
Walleye	1.6 (1.4)	1.7 (0.9)	-	0.8 (1.0)	1.3 (2.3)	1.5 (0.7)
	<i>Mean length (inches) of harvested fish</i>					
Black Crappie	11.3 (15.6)	11.2 (16.4)	11.0 (19.1)	13.3 (27.0)	8.0 (-)	11.5 (12.5)
Largemouth Bass	-	14.3 (20.2)	13.1 (18.0)	14.0 (13.7)	12.4 (25.3)	13.5 (10.9)
Northern Pike	21.4 (10.8)	21.6 (13.4)	20.8 (11.8)	20.6 (33.7)	19.2 (10.9)	20.9 (6.9)
Rock Bass	-	9.3 (13.5)	9.3 (14.4)	-	9.3 (7.8)	9.3 (12.3)
Smallmouth Bass	-	14.3 (20.6)	13.3 (12.8)	15.0 (14.9)	-	13.9 (9.4)
Sunfish spp.	8.1 (8.6)	7.7 (6.3)	8.3 (5.9)	8.2 (8.4)	8.4 (20.7)	8.0 (4.8)
Yellow Perch	9.2 (12.0)	9.6 (9.0)	9.5 (12.7)	9.0 (13.5)	9.1 (14.9)	9.2 (8.4)
Walleye	17.1 (16.1)	17.0 (9.3)	-	13.7 (15.7)	16.0 (26.6)	16.5 (8.0)

Table 17. Estimates of catch and harvest rates for all anglers by stratum on Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum					Season
	May	June	July	August	September	
	<i>Catch per angler hour</i>					
Bowfin	0.0020 (0.0018)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0013 (0.0014)	0.0005 (0.0003)
Black Crappie	0.0296 (0.0336)	0.0065 (0.0055)	0.0020 (-)	0.0017 (0.0014)	0.0000 (0.0000)	0.0065 (0.0033)
Largemouth Bass	0.1154 (0.0695)	0.0935 (0.0431)	0.0421 (0.0211)	0.0936 (0.0468)	0.0519 (0.0141)	0.0785 (0.0184)
Muskellunge	0.0020 (0.0021)	0.0059 (0.0041)	0.0000 (0.0000)	0.0023 (0.0016)	0.0087 (0.0043)	0.0039 (0.0014)
Northern Pike	0.1023 (0.0537)	0.1495 (0.0409)	0.1185 (0.0413)	0.0842 (0.0303)	0.1064 (0.0343)	0.1170 (0.0184)
Rock Bass	0.0104 (0.0218)	0.1061 (0.0371)	0.1224 (0.0810)	0.0303 (0.0117)	0.0065 (-)	0.0663 (0.0192)
Smallmouth Bass	0.3895 (0.1876)	0.3122 (0.1077)	0.0720 (0.0259)	0.1462 (0.0563)	0.0704 (0.0244)	0.1985 (0.0410)
Sunfish spp.	0.0997 (0.2682)	0.0110 (0.0072)	0.1815 (0.0695)	0.1196 (0.0637)	0.0160 (0.0191)	0.0810 (0.0373)
Yellow Perch	0.2301 (0.1951)	0.1783 (0.0547)	0.4491 (0.2211)	0.1488 (0.0550)	0.0531 (0.0360)	0.2168 (0.0563)
Walleye	0.1626 (0.0695)	0.1259 (0.0486)	0.0986 (0.0378)	0.0990 (0.0364)	0.0601 (0.0263)	0.1087 (0.0204)
Overall	1.1436 (0.5577)	0.9889 (0.2607)	1.0861 (0.3991)	0.7257 (0.2195)	0.3743 (0.1189)	0.8776 (0.1407)
	<i>Harvest per angler hour</i>					
Bowfin	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Black Crappie	0.0217 (0.0278)	0.0053 (0.0054)	0.0200 (-)	0.0017 (0.0014)	0.0000 (0.0000)	0.0051 (0.0029)
Largemouth Bass	0.0000 (0.0000)	0.0030 (0.0024)	0.0104 (0.0047)	0.0000 (0.0000)	0.0022 (0.0014)	0.0785 (0.0184)
Muskellunge	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Northern Pike	0.0144 (0.0109)	0.0184 (0.0100)	0.0285 (0.0101)	0.0061 (0.0033)	0.0061 (0.0043)	0.0156 (0.0040)
Rock Bass	0.0020 (0.0059)	0.0084 (0.0058)	0.0157 (0.0117)	0.0017 (0.0017)	0.0009 (-)	0.0066 (0.0033)
Smallmouth Bass	0.0000 (0.0000)	0.0006 (0.0007)	0.0039 (0.0040)	0.0012 (0.0012)	0.0017 (0.0019)	0.0015 (0.0010)
Sunfish spp.	0.0195 (0.0330)	0.0000 (0.0000)	0.0157 (0.0117)	0.0306 (0.0166)	0.0039 (0.0016)	0.0170 (0.0071)
Yellow Perch	0.0395 (0.0311)	0.0143 (0.0073)	0.0404 (0.0200)	0.0012 (0.0011)	0.0009 (0.0010)	0.0183 (0.0056)
Walleye	0.0641 (0.0329)	0.0311 (0.0107)	0.0349 (0.0146)	0.0462 (0.0175)	0.0255 (0.0091)	0.0382 (0.0072)
Overall	0.1611 (0.0879)	0.0812 (0.0273)	0.1728 (0.0646)	0.0886 (0.0296)	0.0411 (0.0146)	0.1059 (0.0198)

Table 18. Estimates of catch and harvest rates of selected species for targeting anglers by stratum on Little Boy Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum						
	May	June	July	August	September	Season	
	<i>Catch per angler hour</i>						
Any Species	7.7268 (6.3614)	2.4585 (0.3549)	2.5784 (0.6987)	2.0366 (0.5702)	0.4011 (0.1118)	1.1644 (0.2246)	
Black Crappie	0.0546 (0.0380)	0.5233 (-)	0.0000 (0.0000)	0.0591 (0.0492)	0.0000 (0.0000)	0.0839 (0.0318)	
Largemouth Bass	2.4078 (0.0980)	0.7080 (0.3009)	0.2737 (0.1067)	0.5061 (0.1606)	0.4946 (0.1678)	0.3699 (0.0636)	
Muskellunge	- (-)	0.0000 (0.0000)	0.0000 (0.0000)	0.0119 (0.0080)	0.0264 (0.0117)	0.0110 (0.0032)	
Northern Pike	0.2763 (0.0687)	0.4698 (0.1525)	0.6771 (0.2474)	0.2235 (0.0683)	0.4160 (0.1908)	0.1990 (0.0331)	
Smallmouth Bass	6.1903 (0.3318)	1.4995 (0.5741)	0.1872 (0.0580)	1.0546 (0.0797)	0.7593 (0.3480)	0.7870 (0.1355)	
Sunfish spp.	2.7221 (-)	2.0936 (0.0000)	3.5698 (1.0014)	5.5921 (5.2142)	2.1064 (0.5182)	1.5512 (0.3117)	
Yellow Perch	0.0000 (0.0000)	2.2992 (-)	5.5922 (2.3450)	0.0000 (-)	33.3333 (-)	1.2837 (0.7946)	
Walleye	0.3941 (0.0780)	0.6381 (0.1448)	0.5164 (0.1424)	0.3302 (0.0539)	0.2087 (0.0620)	0.2188 (0.0256)	
	<i>Harvest per angler hour</i>						
Any Species	1.8141 (0.5499)	0.2416 (0.0959)	0.1961 (0.0994)	0.1699 (0.0981)	0.0383 (0.0284)	0.1587 (0.0525)	
Black Crappie	0.546 (0.0654)	0.5233 (0.5115)	0.0000 (0.0000)	0.0591 (0.0892)	0.0000 (0.0000)	0.0762 (0.0302)	
Largemouth Bass	0.0000 (0.0000)	0.0263 (0.0491)	0.0541 (0.0352)	0.0000 (0.0000)	0.0000 (0.0000)	0.0105 (0.0052)	
Muskellunge	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	
Northern Pike	0.2763 (0.3648)	0.1762 (0.1148)	0.3256 (0.1262)	0.0624 (0.0920)	0.0643 (0.0512)	0.0860 (0.0223)	
Smallmouth Bass	0.0000 (0.0000)	0.0029 (0.0053)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0013 (0.0013)	
Sunfish spp.	0.6805 (0.6436)	0.0000 (0.0000)	0.3038 (0.1582)	1.4096 (0.4530)	0.4889 (0.2994)	0.3520 (0.0920)	
Yellow Perch	0.0000 (0.0000)	0.3432 (0.3683)	1.4309 (0.5949)	0.0000 (0.0000)	0.0000 (0.0000)	0.2233 (0.1340)	
Walleye	0.1599 (0.0614)	0.1645 (0.1305)	0.1755 (0.0638)	0.2104 (0.1382)	0.0947 (0.0288)	0.0800 (0.0113)	

Table 19. Estimates of catch and harvest rates for all anglers by stratum on Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum					Season
	May	June	July	August	September	
<i>Catch per angler hour</i>						
Black Crappie	0.0076 (0.0072)	0.0087 (0.0085)	0.0364 (0.0298)	0.0124 (0.0096)	0.0038 (0.0046)	0.0152 (0.0070)
Largemouth Bass	0.0965 (0.0439)	0.1832 (0.0475)	0.1570 (0.0407)	0.0961 (0.0340)	0.0709 (0.0278)	0.1323 (0.0192)
Muskellunge	0.0063 (0.0104)	0.0034 (0.0022)	0.0000 (0.0000)	0.0029 (0.0030)	0.0046 (0.0025)	0.0030 (0.0014)
Northern Pike	0.2132 (0.0804)	0.1350 (0.0336)	0.1133 (0.0500)	0.0900 (0.0190)	0.0672 (0.0346)	0.1209 (0.0199)
Rock Bass	0.0278 (0.0369)	0.0977 (0.0384)	0.0909 (0.0338)	0.0334 (0.0058)	0.0063 (0.0023)	0.0611 (0.0142)
Smallmouth Bass	0.0892 (0.0375)	0.1600 (0.0644)	0.1510 (0.0423)	0.0535 (0.0194)	0.0150 (0.0077)	0.1066 (0.0222)
Sunfish spp.	0.0613 (0.0487)	0.5145 (0.4087)	0.2550 (0.0804)	0.2472 (0.0936)	0.2047 (0.1742)	0.2963 (0.1099)
Tullibee (Cisco)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0042 (0.0034)	0.0021 (0.0024)	0.0011 (0.0008)
Yellow Perch	0.2183 (0.1598)	0.1198 (0.0651)	0.1504 (0.0566)	0.1304 (0.0469)	0.0634 (0.0331)	0.1335 (0.0320)
Walleye	0.0894 (0.0401)	0.0335 (0.0126)	0.0073 (0.0059)	0.0195 (0.0120)	0.0138 (0.0080)	0.0287 (0.0065)
Overall	0.8096 (0.2784)	1.2558 (0.5807)	0.9613 (0.1987)	0.6894 (0.1869)	0.4516 (0.2513)	0.8988 (0.1727)
<i>Harvest per angler hour</i>						
Black Crappie	0.0076 (0.0072)	0.0012 (0.0012)	0.0175 (0.0177)	0.0110 (0.0093)	0.0025 (0.0040)	0.0081 (0.0040)
Largemouth Bass	0.0000 (0.0000)	0.0110 (0.0065)	0.0132 (0.0074)	0.0042 (0.0036)	0.0104 (0.0097)	0.0087 (0.0031)
Muskellunge	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Northern Pike	0.0349 (0.0135)	0.0055 (0.0026)	0.0323 (0.0199)	0.0057 (0.0036)	0.0088 (0.0034)	0.0162 (0.0048)
Rock Bass	0.0000 (0.0000)	0.0012 (0.0015)	0.0161 (0.0106)	0.0000 (0.0000)	0.0021 (0.0013)	0.0046 (0.0025)
Smallmouth Bass	0.0000 (0.0000)	0.0012 (0.0013)	0.0088 (0.0057)	0.0042 (0.0037)	0.0000 (0.0000)	0.0033 (0.0016)
Sunfish spp.	0.0278 (0.0207)	0.1141 (0.0586)	0.0352 (0.0155)	0.0222 (0.0152)	0.0546 (0.0498)	0.0574 (0.0182)
Tullibee (Cisco)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Yellow Perch	0.0667 (0.0454)	0.0034 (0.0021)	0.0030 (0.0025)	0.0124 (0.0113)	0.0021 (0.0023)	0.0129 (0.0054)
Walleye	0.0361 (0.0185)	0.0154 (0.0076)	0.0000 (0.0000)	0.0083 (0.0060)	0.0100 (0.0071)	0.0122 (0.0035)
Overall	0.1732 (0.0692)	0.1531 (0.0670)	0.1261 (0.0455)	0.0680 (0.0290)	0.0905 (0.0629)	0.1233 (0.0257)

Table 20. Estimates of catch and harvest rates of selected species for targeting anglers by stratum on Wabedo Lake, Minnesota, May 9th – September 30th, 2020. Standard errors appear in parentheses.

Species	Stratum						
	May	June	July	August	September	Season	
	<i>Catch per angler hour</i>						
Any Species	0.6607 (0.7647)	4.500 (1.0628)	2.8208 (0.4566)	2.9774 (1.2672)	1.0258 (0.3057)	0.8844 (0.1277)	
Black Crappie	0.4561 (0.1490)	0.0847 (0.0874)	1.3080 (0.4111)	0.2781 (0.0939)	0.0604 (0.0276)	0.1213 (0.0635)	
Largemouth Bass	0.3793 (0.1171)	1.2615 (0.0607)	1.0143 (0.1823)	0.5745 (0.2643)	0.5456 (0.2912)	0.3901 (0.0612)	
Muskellunge	- (-)	0.0329 (0.0177)	0.0000 (0.0000)	0.0071 (0.0074)	0.0275 (0.0116)	0.0083 (0.0040)	
Northern Pike	1.2075 (0.4775)	0.3614 (0.0481)	0.7825 (0.2492)	0.5146 (0.0671)	0.6991 (0.0473)	0.2882 (0.0768)	
Smallmouth Bass	4.8643 (0.1168)	3.5891 (0.3541)	1.2446 (0.5959)	1.4238 (0.1199)	0.1564 (0.0360)	0.5451 (0.1238)	
Sunfish spp.	3.6662 (0.8063)	7.4392 (2.3393)	1.5609 (0.5869)	7.7982 (3.7583)	4.9582 (1.4362)	2.0998 (0.4799)	
Yellow Perch	1.7561 (-)	0.0000 (0.0000)	0.0000 (0.0000)	1.1250 (-)	0.0000 (0.0000)	0.6288 (0.0630)	
Walleye	0.1251 (0.0457)	0.2366 (0.0374)	0.0000 (0.0000)	0.0684 (0.0496)	0.0499 (0.0329)	0.0835 (0.0185)	
	<i>Harvest per angler hour</i>						
Any Species	0.0000 (0.0000)	0.2084 (0.1214)	0.5331 (0.2474)	0.4907 (0.2054)	0.2434 (0.1725)	0.0887 (0.0216)	
Black Crappie	0.4561 (0.3369)	0.0847 (0.0751)	0.3640 (0.1715)	0.2781 (0.1797)	0.0000 (0.0000)	0.0685 (0.0297)	
Largemouth Bass	0.0000 (0.0000)	0.1506 (0.0911)	0.1857 (0.1649)	0.0000 (0.0000)	0.0188 (0.0339)	0.0197 (0.0087)	
Muskellunge	- (-)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	
Northern Pike	0.5248 (0.3087)	0.1400 (0.2235)	0.3164 (0.2235)	0.0447 (0.0672)	0.0616 (0.0752)	0.0711 (0.0254)	
Smallmouth Bass	0.0000 (0.0000)	0.0000 (0.0000)	0.0977 (0.0902)	0.0739 (0.0791)	0.0000 (0.0000)	0.0144 (0.0087)	
Sunfish spp.	1.2599 (0.5377)	2.9800 (0.6220)	0.0771 (0.0685)	1.0156 (0.4525)	1.5662 (0.3146)	0.4375 (0.0963)	
Yellow Perch	1.7561 (1.3252)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.3144 (0.2199)	
Walleye	0.0458 (0.0359)	0.1040 (0.1125)	0.0000 (0.0000)	0.0317 (0.0320)	0.0421 (0.0416)	0.0438 (0.0101)	

Table 21. Percent of all angling parties who harvested a given number of fish by stratum from Little Boy Lake, Minnesota, May 9th – September 30th, 2020.

Species/stratum	N	0	Number harvested per angler				
			0.1-0.9	1.0-1.9	2.0-2.9	3.0	
Northern Pike							
May	102	94.1%	2.9%	2.9%	0.0%	0.0%	0.0%
June	199	96.0%	2.0%	1.5%	0.5%	0.0%	0.0%
July	150	92.0%	6.0%	2.0%	0.0%	0.0%	0.0%
August	170	97.6%	2.4%	0.0%	0.0%	0.0%	0.0%
September	191	97.9%	2.1%	0.0%	0.0%	0.0%	0.0%
Season	812	95.8%	3.0%	1.1%	0.1%	0.0%	0.0%
Walleye							
May	102	80.4%	10.8%	7.8%	1.0%	0.0%	0.0%
June	199	89.9%	7.0%	2.0%	1.0%	0.0%	0.0%
July	150	94.0%	2.7%	2.0%	1.3%	0.0%	0.0%
August	170	91.8%	3.5%	3.5%	1.2%	0.0%	0.0%
September	191	90.6%	5.2%	3.7%	0.5%	0.0%	0.0%
Season	812	90.0%	5.5%	3.4%	1.0%	0.0%	0.0%

Table 22. Percent of targeting angling parties who harvested a given number of fish by stratum from Little Boy Lake, Minnesota, May 9th – September 30th, 2020.

Species/stratum	N	0	0.1-0.9	1.0-1.9	2.0-2.9	3.0
Northern Pike						
May	2	0.0%	50.0%	50.0%	0.0%	0.0%
June	5	80.0%	0.0%	20.0%	0.0%	0.0%
July	8	37.5%	50.0%	12.5%	0.0%	0.0%
August	4	100.0%	0.0%	0.0%	0.0%	0.0%
September	5	60.0%	40.0%	0.0%	0.0%	0.0%
Season	24	58.3%	29.2%	12.5%	0.0%	0.0%
Walleye						
May	26	30.7%	42.3%	23.1%	7.7%	0.0%
June	19	36.8%	31.6%	21.1%	10.5%	0.0%
July	10	50.0%	10.0%	30.0%	10.0%	0.0%
August	18	50.0%	22.2%	15.8%	11.1%	0.0%
September	25	36.0%	28.0%	32.0%	4.0%	0.0%
Season	98	37.8%	29.6%	24.5%	8.2%	0.0%

Table 23. Percent of all angling parties who harvested a given number of fish by stratum from Wabedo Lake, Minnesota, May 9th – September 30th, 2020.

Species/stratum	N	0	Number harvested per angler				
			0.1-0.9	1.0-1.9	2.0-2.9	3.0	
Northern Pike							
May	78	89.7%	5.1%	3.8%	1.3%	0.0%	
June	140	97.1%	2.9%	0.0%	0.0%	0.0%	
July	129	93.0%	3.9%	1.6%	1.6%	0.0%	
August	151	97.4%	2.6%	0.0%	0.0%	0.0%	
September	120	96.7%	3.3%	0.0%	0.0%	0.0%	
Season	618	95.3%	3.4%	0.6%	0.6%	0.0%	
Walleye							
May	78	88.5%	6.4%	3.8%	1.3%	0.0%	4.0%
June	140	93.6%	4.3%	1.4%	0.7%	0.0%	0.0%
July	129	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
August	151	98.0%	1.3%	0.0%	0.7%	0.05	0.0%
September	120	95.8%	1.7%	2.5%	0.0%	0.0%	0.0%
Season	618	95.8%	2.4%	1.3%	0.5%	0.0%	0.0%

Table 24. Percent of targeting angling parties who harvested a given number of fish by stratum from Wabedo Lake, Minnesota, May 9th – September 30th, 2020.

Species/stratum	N	Number harvested per angler				
		0	0.1-0.9	1.0-1.9	2.0-2.9	3
Northern Pike						
May	1	0.0%	0.0%	0.0%	100.0%	0.0%
June	3	66.7%	33.3%	0.0%	0.0%	0.0%
July	6	0.0%	50.0%	33.3%	16.7%	0.0%
August	5	100.0%	0.0%	0.0%	0.0%	0.0%
September	2	50.0%	50.0%	0.0%	0.0%	0.0%
Season	17	47.1%	41.2%	11.8%	11.8%	0.0%
Walleye						
May	25	32.0%	44.0%	24.0%	0.0%	0.0%
June	23	52.2%	21.7%	21.7%	4.3%	0.0%
July	5	20.0%	20.0%	40.0%	20.0%	0.0%
August	9	33.3%	44.4%	11.1%	11.1%	0.0%
September	8	0.0%	87.5%	12.5%	0.0%	0.0%
Season	70	34.3%	40.0%	21.4%	4.3%	0.0%

Table 25. Observed length-frequency distribution of fish harvested and released from Little Boy and Wabedo Lakes, Minnesota, May 9th – September 30th, 2020.

TL (inches)	Observed number harvested (H) and released (R)					
	Bowfin		Muskellunge		Northern Pike	
	H	R	H	R	H	R
6.00-6.99						
7.00-7.99						
8.00-8.99						
9.00-9.99						1
10.00-10.99					1	3
11.00-11.99						
12.00-12.99						22
13.00-13.99						8
14.00-14.99						23
15.00-15.99				1	3	28
16.00-16.99					2	44
17.00-17.99				1	3	14
18.00-18.99				2	9	76
19.00-19.99					8	44
20.00-20.99				1	19	131
21.00-21.99					23	22
22.00-22.99				1	14	56
23.00-23.99					13	22
24.00-24.99				2		63
25.00-25.99						34
26.00-26.99		1		1		13
27.00-27.99		1		1		15
28.00-28.99						16
29.00-29.99				1		8
30.00-30.99				2		16
31.00-31.99						4
32.00-32.99						1
33.00-33.99				1		3
34.00-34.99						1
35.00-35.99						2
36.00-36.99				2		2
37.00-37.99						1
38.00-38.99						1
39.00-39.99				2		
40.00-44.99				6		
45.00-49.99				4		
≥50.00				1		
Total (N)	--	2	--	29	95	674

Table 25, cont'd.

TL (inches)	Observed number harvested (H) and released (R)					
	Largemouth Bass		Smallmouth Bass		Walleye	
	H	R	H	R	H	R
<4.0						
4.00-4.99		3				
5.00-5.99		2		4		
6.00-6.99		5		7		
7.00-7.99		3		3		
8.00-8.99		21		18		2
9.00-9.99		6		10		3
10.00-10.99	2	18	1	38		28
11.00-11.99	1	6		8	2	21
12.00-12.99	11	73	1	119	3	37
13.00-13.99	9	46	5	40	19	22
14.00-14.99	8	112	5	121	31	10
15.00-15.99	4	76	1	133	30	6
16.00-16.99	4	90	3	153	39	4
17.00-17.99	1	60		155	49	7
18.00-18.99		45		97	1	18
19.00-19.99	1	11		59		17
20.00-20.99	2	13	1	30	1	19
21.00-21.99		4		5	1	16
22.00-22.99		4		1	1	27
23.00-23.99					3	13
24.00-24.99						16
25.00-25.99						8
26.00-26.99					1	2
27.00-27.99					1	7
28.00-28.99						
29.00-29.99						
≥30.00						2
Total (N)	40	598	17	1001	182	284

Table 25, cont'd.

TL (inches)	Observed number harvested (H) and released (R)					
	Black Crappie		Rock Bass		Sunfish spp.	
	H	R	H	R	H	R
<4.0				2		10
4.00-4.99		1		5		175
5.00-5.99				8		227
6.00-6.99		6		32	9	266
7.00-7.99	1	9		18	69	124
8.00-8.99			5	115	92	58
9.00-9.99	5		14	66	26	10
10.00-10.99	4		7	47	7	4
11.00-11.99	6		2	11		
12.00-12.99	15	3	1	9		1
13.00-13.99	3			1		
14.00-14.99	2			1		
15.00-15.99	1	1				
16.00-16.99						
17.00-17.99						
18.00-18.99						
19.00-19.99						
≥20.00						
Total (N)	37	20	29	315	203	875

Table 25, cont'd.

TL (inches)	Observed number harvested (H) and released (R)			
	Yellow Perch		Tullibee (Cisco)	
	H	R	H	R
<4.0		71		
4.00-4.99		114		
5.00-5.99	2	260		
6.00-6.99	1	309		2
7.00-7.99	4	107		
8.00-8.99	17	68		
9.00-9.99	31	9		
10.00-10.99	29	27		1
11.00-11.99	11	3		
12.00-12.99	4			
13.00-13.99				
14.00-14.99				
15.00-15.99				
16.00-16.99				
17.00-17.99				
18.00-18.99				
19.00-19.99				
≥20.00				
Total (N)	99	968	-	3

Figures

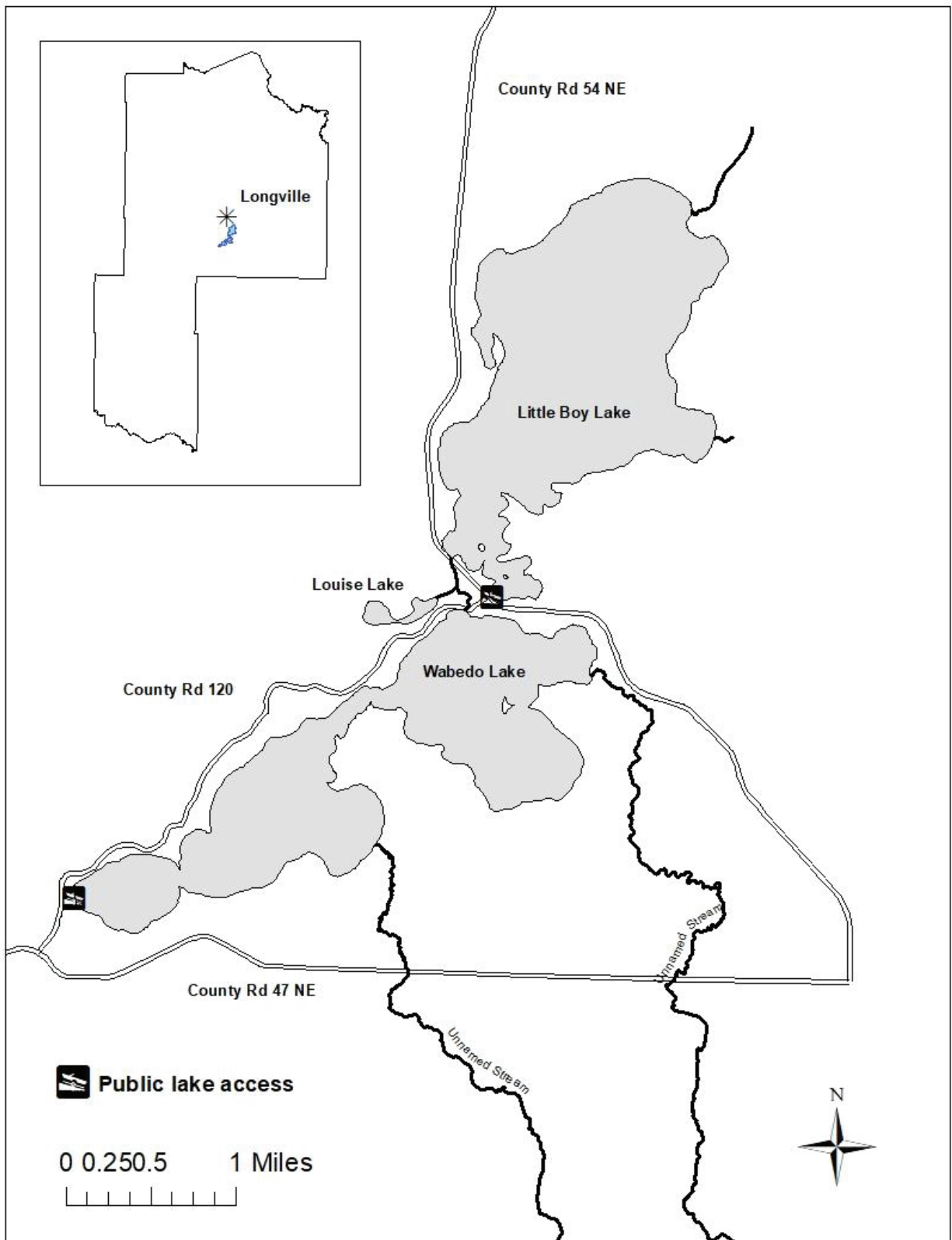


Figure 1. Map of Little Boy, Wabedo, and Louise Lakes in Cass County Minnesota. Inset shows location within Cass County relative to Longville, Minnesota.

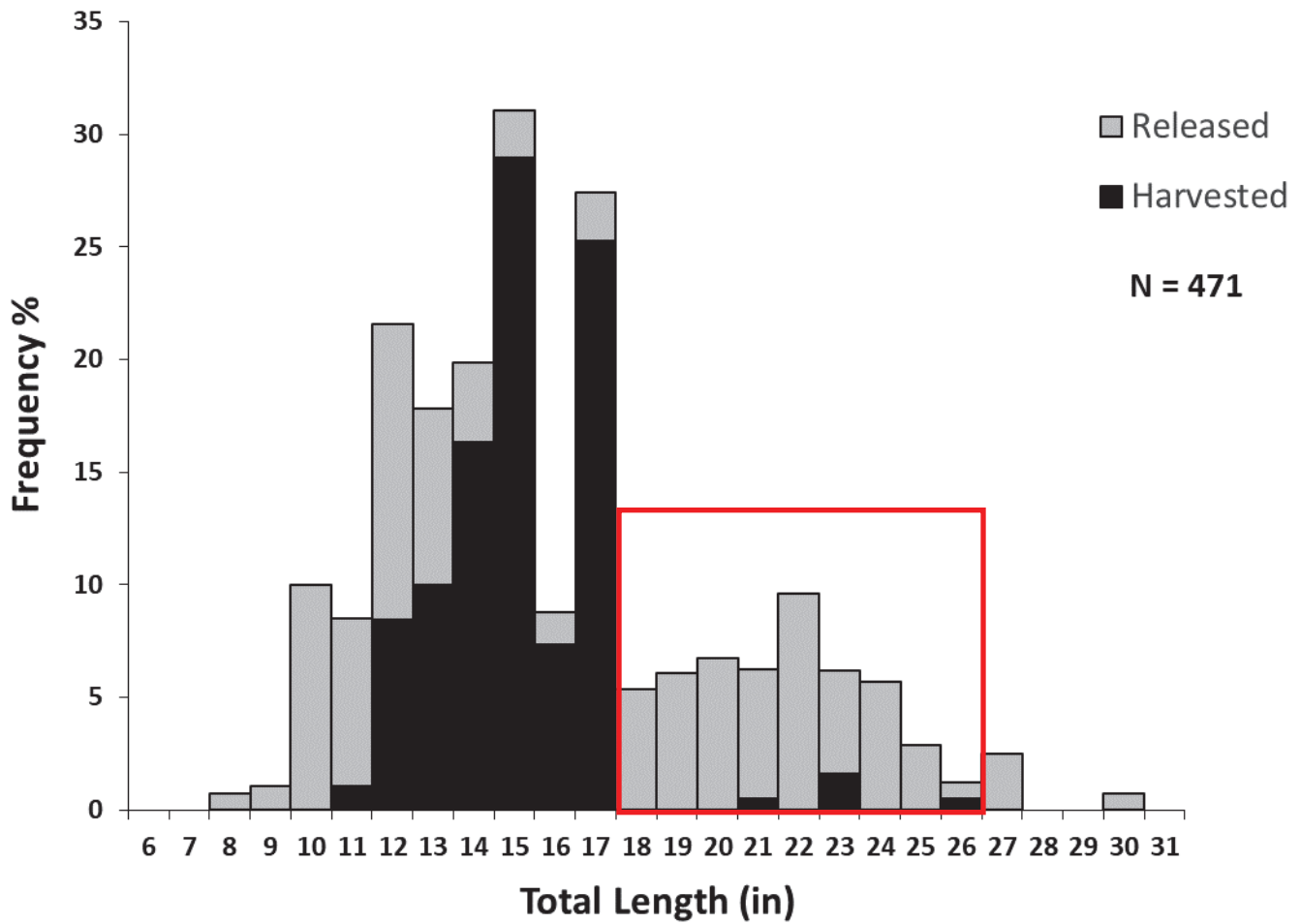


Figure 2. Length frequency distribution (% of observed catch) of harvested and released Walleye on Little Boy and Wabedo Lakes, MN during 2020 summer creel season. Box indicates protected slot limit (18-26") which is 29% of the total catch.

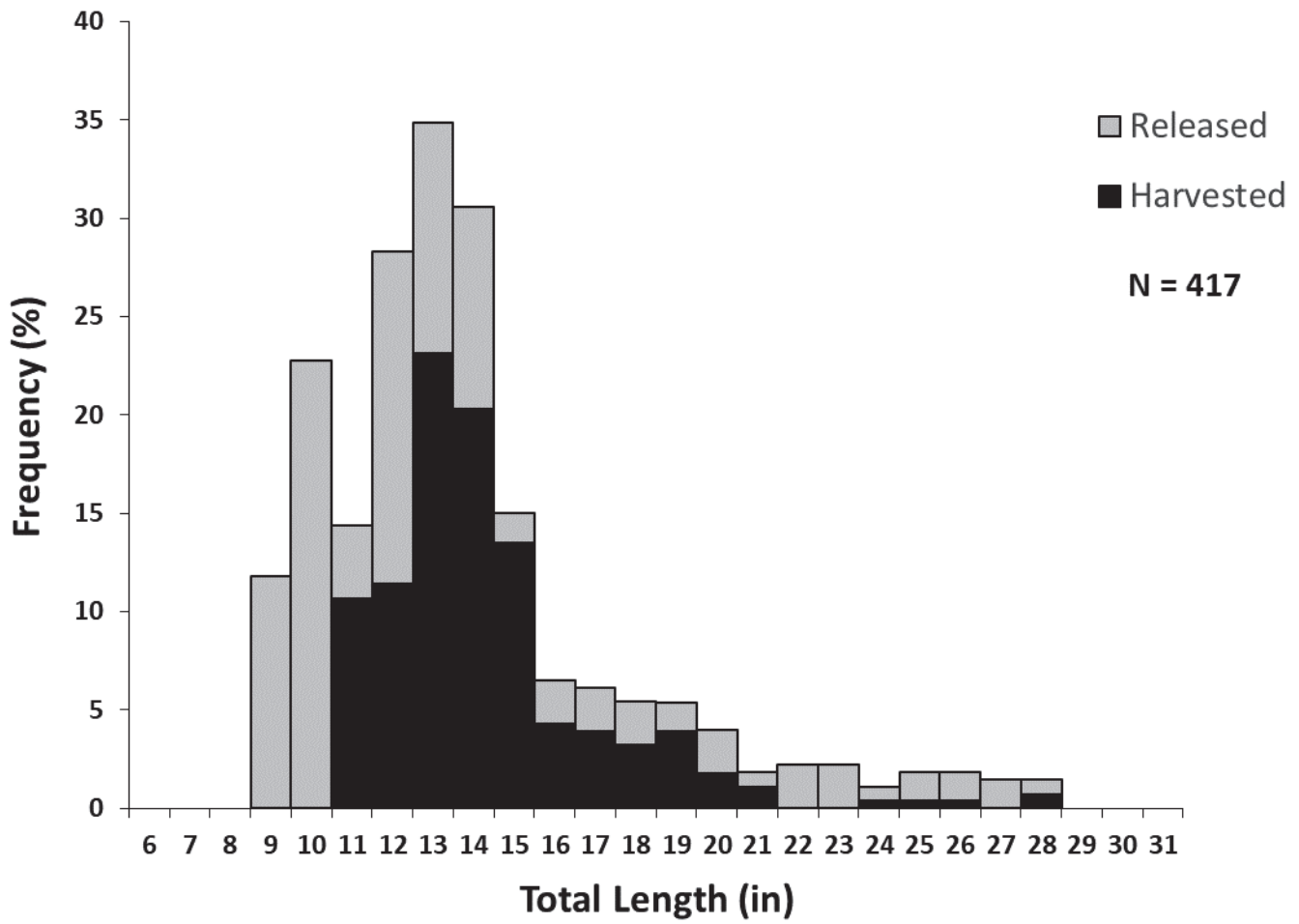


Figure 3. Length frequency distribution (% of observed catch) of harvested and released Walleye on Little Boy and Wabedo Lakes, MN during 2000 summer creel season.

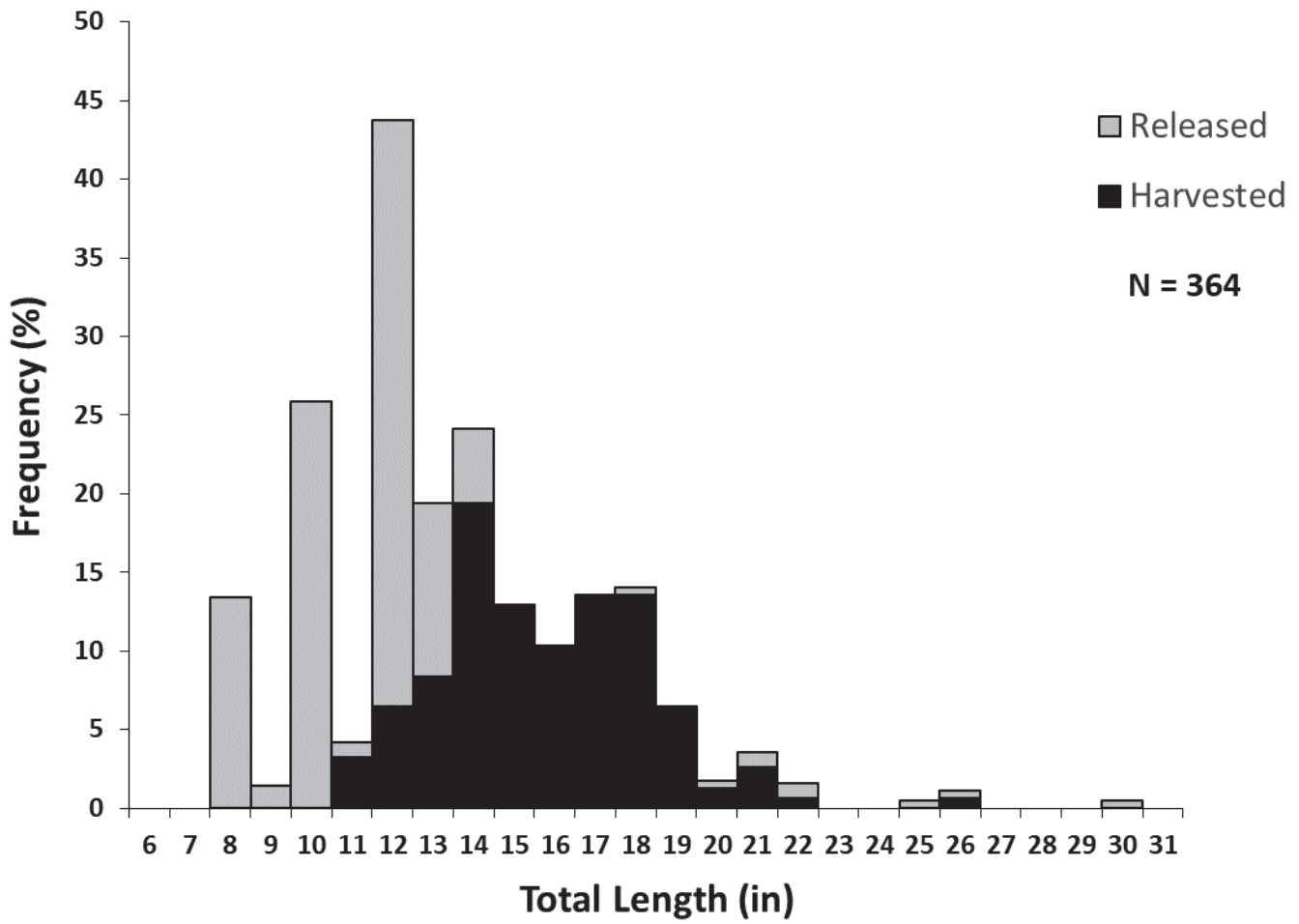


Figure 4. Length frequency distribution (% of observed catch) of harvested and released Walleye on Little Boy and Wabedo Lakes, MN during 2001 summer creel season.

Appendix 1.



**Minnesota Department of Natural Resources
Section of Fisheries**



Jreel Survey Summary for Little Boy Lake, Minnesota

Fish Management Area: Walker

Year Surveyed: May 9th – September 30th, 2020

Angling Pressure

Angler-hours	37,981
Angler-hours/acre	26.20
Anglers/boat	2.23
Mean Trip Length (h)	4.05

Catch (number)

Harvest (number)

Harvest (pounds)

Species	Catch (number)		Harvest (number)		Harvest (pounds)	
	Total N	N/acre	Total N	N/acre	Total lbs.	lbs./acre
Bowfin	18	0.01	-	0.00	-	-
Bullhead spp.	-	0.00	-	0.00	-	-
Northern Pike	4,445	3.06	594	0.41	2,041	1.41
Muskellunge	147	0.10	-	0.00	-	0.00
Burbot	-	0.00	-	0.00	-	0.00
Rock bass	2,519	1.73	251	0.17	174	0.12
Sunfish spp.	3,076	2.12	647	0.45	249	0.17
Smallmouth Bass	7,538	5.19	58	0.04	132	0.09
Largemouth bass	2,981	2.05	132	0.09	262	0.18
Black Crappie	245	0.17	193	0.13	198	0.14
Yellow Perch	8,235	5.67	697	0.48	276	0.19
Walleye	4,128	2.84	1,450	1.00	1,740	1.20
Cisco	-	0.00	-	0.00	-	0.00
All species	33,332	22.96	4,022	2.77	5,072	3.49

Catch Rate (fish/hour)

Harvest Rate (fish/hour)

Species	Catch Rate (fish/hour)		Harvest Rate (fish/hour)	
	Angler Type		Angler Type	
	All	Targeting	All	Targeting
Bowfin	0.0005			
Bullhead spp.				
Northern Pike	0.1170	0.1990	0.0156	0.0860
Muskellunge	0.0039	0.0110	0.0000	
Burbot				
Rock Bass	0.0663		0.0066	
Sunfish spp.	0.0810	1.5512	0.0170	0.3520
Smallmouth Bass	0.1985	0.7870	0.0015	0.0013
Largemouth Bass	0.0785	0.3699	0.0785	0.0105
Black Crappie	0.0068	0.0839	0.0051	0.0762
Yellow Perch	0.2168	1.2837	0.0183	0.2233
Walleye	0.1087	0.2188	0.0382	0.0800
Cisco				



Minnesota Department of Natural Resources
Section of Fisheries



Creel Survey Summary for Wabedo Lake, Minnesota

Fish Management Area: Walker

Year Surveyed: May 9th – September 30th, 2020

Angling Pressure

Angler-hours	35,457
Angler-hours/acre	28.92
Anglers/boat	2.22
Mean Trip Length (h)	4.07

Catch (number)

Harvest (number)

Harvest (pounds)

Species	Catch (number)		Harvest (number)		Harvest (pounds)	
	Total N	N/acre	Total N	N/acre	Total lbs.	lbs./acre
Bowfin	-	0.00	-	0.00	-	-
Bullhead spp.	-	0.00	-	0.00	-	-
Northern Pike	4,287	3.50	576	0.05	474	0.39
Muskellunge	107	0.09	-	0.00	-	0.00
Burbot	-	0.00	-	0.00	-	0.00
Rock bass	2,167	1.77	161	0.01	48	0.04
Sunfish spp.	10,507	8.57	2,034	0.18	382	0.31
Smallmouth Bass	3,781	3.08	117	0.01	82	0.07
Largemouth bass	4,690	3.83	309	0.03	199	0.16
Black Crappie	540	0.44	286	0.03	125	0.10
Yellow Perch	4,732	3.86	458	0.04	75	0.06
Walleye	1,017	0.83	431	0.04	287	0.23
Cisco	40	0.03	-	0.00	-	0.00
All species	31,868	25.99	4,372	3.57	1,672	1.36

Catch Rate (fish/hour)

Harvest Rate (fish/hour)

Species	Angler Type		Angler Type	
	All	Targeting	All	Targeting
Bowfin				
Bullhead spp.				
Northern Pike	0.1209	0.2882	0.0162	0.0711
Muskellunge	0.0030	0.0083	0.0000	
Burbot				
Rock Bass	0.0611		0.0046	
Sunfish spp.	0.2963	2.0998	0.0574	0.4375
Smallmouth Bass	0.1066	0.5451	0.0033	0.0144
Largemouth Bass	0.1323	0.3901	0.0087	0.0197
Black Crappie	0.0152	0.1213	0.0081	0.0685
Yellow Perch	0.1335	0.6288	0.0129	0.3144
Walleye	0.0287	0.0835	0.0122	0.0438
Cisco	0.0011		0.0000	

Creel Survey Summary for Little Boy and Wabedo Lakes, Minnesota								
Length Frequency Summary for the estimated number of fish harvested (inch groups)								
Species	0.0-4.9	5.0-8.9	9.0-12.9	13.0-16.9	17.0-20.9	21.0-24.9	25.0-29.9	≥30.0
Bowfin	-	-	-	-	-	-	-	-
Bullhead spp.	-	-	-	-	-	-	-	-
Northern Pike	-	-	12	86	702	369	-	-
Muskellunge	-	-	-	-	-	-	-	-
Burbot	-	-	-	-	-	-	-	-
Rock Bass	-	-	413	-	-	-	-	-
Sunfish spp.	-	2,140	541	-	-	-	-	-
Smallmouth Bas	-	-	21	144	10	-	-	-
Largemouth Bas	-	-	143	265	33	-	-	-
Black Crappie	-	142	425	16	-	-	-	-
Yellow Perch	-	268	875	12	-	-	-	-
Walleye	-	-	31	1,198	579	52	21	-
Cisco	-	-	-	-	-	-	-	-
Comments:								
Citation: Derks, J. 2020. Summer creel survey for Little Boy and Wabedo lakes, 2020. Minnesota Department of Natural Resources, Section of Fisheries, Study 4, Job # 1100.								
Page 2								

Appendix 2. METHOD FOR CORRECTION OF CATCH AND HARVEST RATES OF TARGETING ANGLERS IN CAS.

Using standard analyses in CAS, targeting catch/harvest rates may be summed across work period, day type, zone, and type of fishing instead of averaging. In order to avoid targeting rates being summed across strata, which inflates targeting catch rates relative to other creel surveys completed by MN DNR, the data need to be pooled into a singular stratum.

1. Create two copy databases to be used solely for calculating targeting rates (one for seasonal; one for work period strata).
2. Open the CAS database in Microsoft Access.
3. Using the Access database with the interview table change these fields
 - a. Day Type Code- all interviews should be DayType = 1
 - b. Work Period- if calculating catch rates for entire season all interviews should be Work Period = 1; if calculating catch rates for each work period make no change.
 - c. Zone- all interviews should be Zone = 1
 - d. Type of Fish- all interviews should be 1 if calculating rates across all angler types, otherwise make no change.
4. Within CAS, make the following changes using the code editor only if calculating catch/harvest rates for entire season:
 - a. Station-Work Period- change work period to Work Period = 1, set dates to encompass entire creel season. Delete all other work periods.
 - b. Analysis Specific Codes- Work Shift Probability- Delete all work shift codes for all work periods except work period 1.
 - c. Analysis Specific Codes- Work Period Days and Hours- Change number of days for rows 1-3 so that they encompass the number of weekend/holiday days, week days, and all days during the creel season. Delete all other rows.