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Completion Report

Buffalo Lake Summer Creel Survey
May 1, 2003 to October 31, 2003

By

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Abstract

A creel survey was conducted on Buffalo Lake from May 1, 2003 to October 31, 2003. The objectives of the survey were to provide information on fishing pressure, catch and harvest, angler demographics, and satisfaction with the fishery. This study complements a winter creel survey conducted in 2002-2003 on Buffalo Lake. Angling pressure was estimated to be 48,275 angler hours or 31.10 angler hours per acre, below the historical median (46.2 hrs/acre) for lake class 24 and well below winter pressure (72,228 hrs). Non-fishing recreational use (3.7 hrs/acre) was relatively low. Most anglers were seeking walleye (48.3%), followed by sunfish (21.7%), largemouth bass (13.8%), northern pike (12.8%) and black crappie (12.2%). An estimated 48,248 fish or 31.03 fish per acre were caught by anglers. Northern pike had the highest estimated yield (6,604 lbs, 4.25 lbs/acre), followed by walleye (6,385 lbs, 4.11 lbs/acre), and sunfish (4,418 lbs, 2.85 lbs/acre). More parties targeted sunfish during summer and sunfish catch and harvest were higher than in winter. The mean fishing success rating of all parties was 3.8 out of 10. Among targeting anglers, sunfish anglers had the highest mean success rating (5.0), followed by largemouth bass (4.8), northern pike (4.4), black crappie (3.9), and walleye (3.8). When asked to rate overall satisfaction with size and number of targeted species, largemouth bass had the highest mean rating for number (6.9) and size (6.9); sunfish were also rated 6.9 for size. Walleye anglers gave the lowest ratings for both number (5.9) and size (6.0), but these are still favorable. Walleye catch rates were higher in summer than winter, but actual catch and harvest was higher in winter due to higher overall pressure and a higher proportion of anglers targeting walleye. Most walleye anglers would be in favor of a special regulation for walleye; however, the current fry stocking strategy has been effective and there seems to be no need for a regulation change at this time. Creel catch rates generally corresponded well with 2003 lake survey net catch data and, for most species, were higher than historic creel results for lake class 24.

Introduction

Buffalo Lake is a popular, multi-species fishery in Wright County, MN, located 30 miles west of the Twin Cities metro area. Walleye fry are typically stocked every other year in Buffalo Lake and lake survey results have found walleye abundance to be above the expected range for lake class 24 since 1982 (Minnesota Department of Natural Resources 2000). The lake receives heavy angling pressure in winter (Minnesota Department of Natural Resources 2004a), but prior to this survey, no summer creel data existed.

Buffalo Lake has undergone substantial changes in recent years. A new municipal wastewater treatment plant was built in 1981; prior to this, effluent was discharged into Buffalo Lake. Water quality was poor, blue-green algal blooms were common, and little submerged vegetation was present at the time. Water quality has improved since then and submergent vegetation is now widespread. Curly leaf pondweed (*P. crispus*) and Eurasian watermilfoil (*M. spicatum*) have also become established and are now abundant.

A summer creel survey was conducted on Buffalo Lake from May 1, 2003 to October 31, 2003 using a full-time creel clerk. The objectives of the survey were to provide information on fishing pressure, catch and harvest, angler demographics, and satisfaction with the fishery. This study complements a winter creel survey conducted in 2002-2003 (Minnesota Department of Natural Resources 2004a). Together, the two surveys provide a year-round view of the fishery.

Study Area

Buffalo Lake is located in eastern Wright County, adjoining the city of Buffalo (Figure 1). Buffalo Lake has a surface area of 1,552 acres (Table 1) and is connected to the Crow River via Deer Lake and Mill Creek. Much of the lake area is littoral (49%), maximum depth is 33 feet, and the lake is classified as eutrophic (combined Carlson's TSI=68, Minnesota Pollution Control Agency 1994). Buffalo Lake is classified as lake class 24 (Schupp 1992) and has a watershed size of 14,527 acres. Three public accesses are located around the lake, along with two public fishing piers.

Methods

A stratified, random, roving creel survey was conducted from May 1, 2003 through October 31, 2003. The survey was stratified by month, day type (weekday, weekend/holiday), and angler type (boat, bank, pier). For individual sampling days, one of two non-overlapping,

nine hour periods (5 AM to 2 PM, 2-11 PM) was used initially. Beginning in August, sampling periods were then shortened by one half hour per month due to declining day length (Table 2); the clerk's day began one half hour later (early shift) or ended one half hour earlier (late shift). A similar creel survey was conducted concurrently on nearby Pulaski Lake using the same clerk. Each sampling period was split equally between the two lakes with the starting lake chosen randomly. Four weekdays were sampled during each two week period and all weekend days were sampled. All weekdays and sampling periods were randomly chosen.

The creel clerk roved the lake by boat or by foot and interviewed as many anglers as possible. During the interview, the clerk recorded the number of anglers in the party, start and end times, angler demographics, and catch information. Fish were measured to the nearest 0.1 inch; length of previously released fish was estimated by anglers. Angler demographics were recorded individually, whereas all other data were recorded for the party. Bank and pier anglers were treated as parties of one. Anglers were also asked a series of questions regarding satisfaction with the fishing and regulations:

1.) "On a scale of 1 to 10, with one being poor and ten being excellent, how would you rate your fishing success today?"

2.) "Have you been interviewed before on this lake?"

3.) "On a scale of 1 to 10, how satisfied are you with the number of (targeted species) you catch on Buffalo Lake?"

4.) "On a scale of 1 to 10, how satisfied are you with the size of (targeted species) you catch on Buffalo Lake?"

5.) (If targeting walleye) "Would you support a special regulation to improve the walleye fishing?" No specific regulation was suggested.

Only one answer to each question was allowed per party.

Angling pressure was estimated from instantaneous counts at randomly selected times. Two counts were made during each sampling period. Recreational users were counted and assigned to categories (Table 3). Data were analyzed with the General Creel Survey Analysis Program (GENCREEL, version 2) (Bindman and Mach 1997).

Results and Discussion

Fishing Pressure and Recreational Use

The creel survey encompassed 184 days and a total of 103 periods were sampled, including 49 weekdays and 54 weekend days (Table 2). A total of 206 activity counts and 872 interviews were recorded. The percentage of complete trip interviews was 35%.

Angling pressure on Buffalo Lake was estimated to be 48,275 angler hours or 31.10 angler hours per acre (Table 3), below the historical median (46.2 hrs/acre) of summer creel survey results for lake class 24 (Cook and Younk 1998). Fishing pressure in the winter was higher (72,228 hrs, 46.5 hrs/acre) than in summer, despite a survey season that covered only three months (Minnesota Department of Natural Resources 2004a). The highest pressure estimates were in May (15,035 hrs, 9.69 hrs/acre), decreasing to the lowest in October (3,492 hours, 2.25 hrs/acre). In contrast, each of the three winter months had pressure greater than 20,000 hours (Minnesota Dept. of Natural Resources 2004a). Mean party size for boat anglers was 1.94; bank and pier anglers were interviewed as parties of one (Table 2). Mean completed trip length for all parties was 3.37 hours.

Non-fishing recreational use was 5,736 hours or 3.70 hrs/acre, with the highest months in July and August (Table 3). This is much lower than on nearby Pulaski Lake (35.3 hrs/acre, Minnesota Dept. of Natural Resources 2004), likely due in part to lower water quality and a higher amount of submergent plant canopy in Buffalo Lake.

Catch and Harvest

An estimated 48,248 fish were caught and 26,431 fish harvested for all species combined for Buffalo Lake (Table 4). Sunfish had the highest catch (19,895, 12.82/acre) and harvest (13,834, 8.91/acre) estimates, followed by black crappie (7,010 caught, 4.46/acre; 5,349 harvested, 3.39/acre)(Tables 4 and 5). Northern pike had the highest estimated yield (6,604 lbs, 4.25 lbs/acre), followed by walleye (6,385 lbs, 4.11 lbs/acre), and sunfish (4,418 lbs, 2.85 lbs/acre)(Table 6).

Sunfish had the highest overall catch rates of 2.23/hour for targeting anglers and 0.39/hr for all anglers (Table 7). Sunfish catch and harvest rates, as well as overall catch and harvest, were higher in the summer than in the winter (Minnesota Department of Natural Resources 2004a). This is likely due to a higher percentage of targeting parties in summer (21.7%, 6.2% in winter). Sunfish in the July 2003 lake survey were caught in low numbers, but the size

distribution was favorable; this is similar to the summer creel results in terms of size (Table 8), but lake conditions may have negatively influenced the catch rate (Minnesota Department of Natural Resources 2004b).

Black crappie catch rates were 0.71/hr for targeting anglers and 0.14/hr for all anglers (Table 7). These are similar to winter creel results; however, the actual numbers caught and harvested were much higher in winter (16,988 caught, 8,452 harvested) when a higher proportion of anglers were targeting crappie (43.6% winter, 12.2% summer)(Minnesota Department of Natural Resources 2004b). Surprisingly, the percentage of released fish was higher in winter (50.2%) than in summer (23.7%). Winter anglers are commonly thought to be more harvest-oriented, but summer growth of the predominant year class may have made black crappie more desirable to harvest.

Among targeting anglers, 13.8% targeted largemouth and 3.4% targeted smallmouth bass (Table 9). The catch rate of targeting anglers was 0.69/hr for largemouth bass and 0.70/hr for smallmouth bass (Table 7) and the size distribution was favorable for both species (Table 8). The largemouth bass catch rate compared favorably with the historical summer creel survey mean catch rate (0.49/hr) for lake class 24 (Minnesota Department of Natural Resources, unpublished data). Several interviewed anglers commented favorably on the bass fishing and angler satisfaction ratings were high (Table 14). Most bass were released (80% largemouth bass, 82% of smallmouth bass)(Table 4). Smallmouth bass have been reported for at least several years by anglers, but past lake surveys have reported few (Minnesota Department of Natural Resources 1994, 2000). Smallmouth bass are common in the Crow River and it seems probable that they colonized Buffalo Lake via Mill Creek and have become established.

Northern pike catch and harvest rates were higher in summer (0.35/hr catch, 0.20/hr harvest) than in winter (0.11/hr catch, 0.07/hr harvest) for targeting anglers (Table 7). This was true for most species and likely reflects the advantage of higher mobility for anglers, higher metabolic rates for fish, and other factors. The summer catch and harvest rates were higher than the historical average (0.22, 0.11/hr, respectively) for lake class 24 (Minnesota Department of Natural Resources, unpublished data). This corresponds fairly well with lake survey results in 2003; the northern pike catch rate of 7.0/gill net was at the top of the third quartile (Minnesota Department of Natural Resources 2004b). Overall, 6,737 pike were caught (4.34/acre) and 2,114 harvested (1.36/acre) during the summer (Table 4); fewer were caught and harvested during the

winter creel (3,776 caught, 1,789 harvested)(Minnesota Department of Natural Resources 1994, 2000). Mean size of harvested and released pike was similar for both seasons. Among targeting anglers, 12.8% sought northern pike in summer and 16.8% in winter (Table 9; Minnesota Department of Natural Resources 2004a).

Walleye anglers had the lowest catch (0.22/hr) and harvest (0.12/hr) rates among targeting anglers, but these values were higher than during the winter creel (Table 7; Minnesota Department of Natural Resources 2004a) and well above the 75th percentile (0.10, 0.07/hr, respectively) for lake class 24 (Minnesota Department of Natural Resources, unpublished data). The summer gill net catch rate (6.8/net) was also above the 75th percentile, corresponding well with these results (Minnesota Department of Natural Resources 2004b). However, walleye anglers caught and harvested more walleye in winter (8,325, 4,770, respectively) than in summer (6,115, 3,473, respectively), despite the shorter winter season (Table 4). This is probably due to a higher percentage of anglers targeting walleye in winter (65.2%) than in summer (48.3%) and higher overall angling pressure in winter (see above). In addition, more than half of all summer pressure was in May and June (Table 3) and walleye catch rates were lower in subsequent months (Figure 2, also see appendix). This may be due in part to increased submergent plant density, but other factors influencing catchability are likely involved as well.

Harvested mean length and weight of black crappie (9.08 inches, 0.42 lbs)(Table 8) were below statewide averages for summer creel surveys (10.3 inches, 0.6 lbs)(Cook and Younk 1998), but angler satisfaction ratings were still favorable (Table 14). Harvested mean length and weight of walleye (16.72 inches, 1.84 lbs) and northern pike (23.86 inches, 3.12 lbs) were above statewide averages, whereas sunfish mean length and weight (7.2 inches, 0.32 lbs) were very similar. Very few yellow perch were caught and nearly all were released (mean length 4.1 inches). Among all targeting anglers, the majority harvested none of the target species, based on complete trip interviews (Table 10). Anglers targeting black crappie, sunfish, or northern pike were most likely to harvest at least one fish, and very few anglers harvested a limit of any species (Table 10).

Additional catch and harvest estimates by season strata can be found in the appendix.

Angler Demographics and Interview Questions

A total of 872 parties were interviewed and most anglers targeted walleye (48.3%) or sunfish (21.7%) for the season as a whole (Table 9). Sunfish were the most sought after species

in August and September, whereas walleye were targeted most in all other months. Anglers were predominantly male (87.0%) and most were 26-45 years old (Table 11). Buffalo Lake has no resorts and seems to be primarily a local destination; most anglers (77% summer, 84% winter) traveled 25 miles or less from home to Buffalo Lake (Table 12; Minnesota Department of Natural Resources 2004a).

When asked the question "On a scale of 1 to 10, with one being poor and ten being excellent, how would you rate your fishing success?", the mean response for all parties was 3.8. 36.1% of all anglers gave a response of 1 or 2, and 6.7% gave a response of 9 or 10 (Table 13). Among targeting anglers, sunfish anglers had the highest mean success rating (5.0), followed by largemouth bass (4.8), northern pike (4.4), black crappie (3.9), and walleye (3.8). These data include both complete and incomplete interviews.

When asked to rate overall satisfaction with size and number of targeted species, ratings were similar between size and number of each species (Table 14), but differed among species. Largemouth bass had the highest mean rating for number (6.9) and size (6.9); sunfish were also rated 6.9 for size. Walleye anglers gave the lowest ratings for both number (5.9) and size (6.0). Satisfaction ratings overall differed among targeting anglers; 62% of sunfish anglers gave a rating of 5 or better, compared to only 43% of walleye anglers. Lower ratings by walleye anglers for satisfaction on a particular day, as well as overall size and number are somewhat misleading. Buffalo Lake has a reputation as the best walleye lake in the area and angler ratings may reflect high expectations that were unmet for some anglers. Also, high angler satisfaction for other species overshadowed good ratings for walleye.

Anglers targeting walleye were asked, "Would you support a special regulation to improve the walleye fishing?" Most anglers responded "Yes" (79.6%, N=279) versus "No" (20.4%, N=57). Angler comments were recorded when given, but far fewer comments were recorded than during the 2003 winter creel survey for the same question (73.8% "Yes"). Most winter angler comments either favored a minimum size limit or opposed a tight harvest slot limit, but no clear pattern was apparent in summer (Minnesota Department of Natural Resources 2004a).

Economic Value

One method for estimating the average amount spent by an angler (non-Great Lakes) on a day of fishing was reported in the 2001 National Survey of Fishing, Hunting and Wildlife-Associated recreation data (US Department of the Interior 2003). An angler trip to Buffalo Lake

was considered an angler day. A total of 48,275 angler hours and 3.37 hours per trip equals 14,325 trips during the summer season. Using the 2001 rate of $26 per trip (food, lodging, transportation, fuel, oil, bait, tackle, and licenses), the estimated value of the summer fishery was $372,450. The estimated value of the winter fishery in 2002-03 was $408,226 (Minnesota Department of Natural Resources 2004a), giving a total estimate of $780,676 for the 10 months covered by the two surveys.

Conclusions and Management Implications

Buffalo Lake receives heavy fishing pressure (77.6 hrs/acre for 10 months). This is especially true for walleye, which most anglers target during the legal season. Walleye fishing pressure is concentrated from the season opening (May) through June, and again from December until the season closes in February. Despite the heavy pressure, most anglers seem satisfied with the fishing on Buffalo Lake; mean satisfaction ratings for size and number of fish caught were above five for all targeted species, both in summer and winter. Although walleye ratings were lower than other species, walleye abundance (from gill nets) was favorable, along with angler catch and harvest rates. This seems to reflect a high level of angler success and satisfaction with other species, rather than dissatisfaction with walleye fishing. Buffalo Lake seems unique in the area by providing quality fishing for such a variety of species.

Most walleye anglers, in summer and winter, would support a special walleye regulation of some kind on Buffalo Lake. The perception that special regulations improve fishing is common; however, anglers opposed to a special regulation often indicated that they felt it would reduce the number of fish they could harvest. However, there seems to be no need for a special regulation at this time. Lake surveys over the past 15 years show an above average population (6.8-10/gill net), despite heavy angling pressure and considerable harvest. The current fry stocking strategy has been successful and will be continued. Yellow perch abundance has fluctuated greatly in the past and should be monitored carefully to determine whether the current low numbers are the result of natural variability, an overabundance of predators, or some other factor. Other game fish species have healthy populations that require no management action at the present time.

Release information shows sharp differences in the proportion of fish released versus harvested. Most largemouth and smallmouth bass caught were released, whereas most sunfish and crappie were harvested. Twice as many northern pike were released than harvested and almost half of all walleye caught were released. Released walleye had a bimodal size

distribution. Fish well above or below the mean length were most likely to be released; fish near the mean were more likely to be harvested (Table 8). This provides some evidence that catch and release ethics have made inroads among walleye anglers on Buffalo Lake.

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Table 1. Descriptive characteristics of Buffalo Lake, Wright County, Minnesota.

Characteristic	Buffalo Lake
DOW number	86-90
Minnesota lake class[1]	24
Total surface acres	1,552
Percent littoral area[2]	49
Maximum depth (ft)	33
Secchi disk transparency[3] (ft)	3.9
Total alkalinity[4] (ppm)	184
Total phosphorus[4] (ppm)	0.141
Shoreline development index[5]	1.09

[1]Schupp (1992).

[2]Percent of the total surface area shallower than 15 ft.

[3]Average for May-October, as recorded by creel clerk during each daylight count.

[4]Lake Assessment Program, Minnesota Pollution Control Agency 1994.

[5]Shoreline length/2(π*lake area)$^{1/2}$, length and area are consistent units (miles and square miles).

Table 2. Summary of creel strata statistics, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Statistic	Month						Entire Season[2]
	May	June	July	August	September	October	
Start date of stratum	05/01/2003	06/01/2003	07/01/2003	08/01/2003	09/01/2003	10/01/2003	05/01/2003
End date of stratum	05/31/2003	06/30/2003	07/31/2003	08/31/2003	09/30/2003	10/31/2003	10/31/2003
Length of fishing day (hours)	18	18	18	17	16	15	
Number of days in stratum	31	30	31	31	30	31	184
Weekdays sampled	7	8	9	8	8	9	49
Weekend/holiday days sampled	10	9	9	10	9	8	54
Number of angler counts	34	34	36	36	34	34	208
Number of boat interviews	136	153	88	85	69	78	609
Number of bank interviews	13	36	33	35	30	16	163
Number of pier interviews	10	16	18	17	11	1	73
Total number of interviews	159	205	139	137	110	95	845
Percent of completed trip interviews	33	25	26	33	56	48	35
Mean numbers per count							
Fishing boats	16.79(2.98)	13.00(1.96)	5.67(0.85)	4.92(0.78)	4.38(0.91)	5.44(1.19)	8.34(0.74)
Bank Anglers	1.21(0.34)	3.26(0.68)	2.78(0.47)	3.27(0.48)	2.97(0.70)	1.25(0.28)	2.48(0.22)
Pier Anglers	1.68(0.34)	2.12(0.41)	1.56(0.32)	1.25(0.29)	1.25(0.29)	0.62(0.22)	1.32(0.14)
Mean number of anglers per party[1]							
Boat party	1.84(0.28)	2.00(0.26)	2.12(0.17)	2.28(0.53)	1.77(0.26)	1.60(0.35)	1.94(0.14)
Mean completed trip data (hours)							
Boat party	3.86(0.93)	4.06(0.85)	3.50(0.62)	3.44(0.79)	3.55(0.78)	2.79(0.58)	3.62(0.35)
Bank angler	0.95(—)	2.24(—)	1.81(0.78)	2.24(—)	2.28(—)	1.14(—)	1.99(0.32)
Pier angler	2.33(—)	—	—	1.18(—)	1.97(0.18)	—	1.65(0.19)
All angler types	3.61(0.92)	3.88(0.80)	3.45(0.61)	3.07(0.72)	3.21(0.63)	2.60(0.62)	3.37(0.28)

[1]Bank and pier anglers were counted as individuals. [2]Season totals were analyzed across months.

Table 3. Recreational water surface use estimates, Buffalo Lake, Minnesota, May 1-October 31, 2003. Standard errors appear in parentheses.

Activity	Month						Entire Season[1]
	May	June	July	August	September	October	
Angler/User Hours							
Boat Anglers	13,720.6(3,000.7)	9,929.5(1,450.5)	5,121.9(702.8)	4,323.9(819.3)	2,643.6(581.6)	3021.2(710.1)	38,760.6(3,621.6)
Bank Anglers	585.0(205.8)	1,320.8(274.3)	1,251.0(247.0)	1,436.5(268.1)	1,232.0(287.2)	440.6(130.2)	6,265.9(591.5)
Pier Anglers	729.0(151.6)	896.6(186.3)	647.0(146.9)	506.8(117.3)	439.0(173.1)	30.0(30.0)	3,248.4(352.0)
All Anglers	15,034.6(3,055.6)	12,146.9(1,634.9)	7,019.9(768.3)	6,267.2(961.9)	4,314.6(898.8)	3,491.8(777.8)	48,274.9(3,865.0)
Water skiing	144.0(144.0)	306.0(164.7)	988.0(502.6)	308.1(144.9)	48.0(33.9)	0.0(—)	1,828.1(598.1)
Pleasure boating	0.0(—)	108.0(58.8)	279.0(111.4)	483.4(221.8)	0.0(—)	7.5(7.5)	914.1(286.7)
Sailing	0.0(—)	103.5(94.9)	120.0(60.3)	348.5(133.9)	460.0(420.5)	0.0(—)	1,134.6(513.8)
Canoeing/kayaking	27.0(19.2)	136.1(81.4)	44.0(44.0)	51.0(51.0)	0.0(—)	21.6(21.6)	292.5(116.1)
Paddle boating	90.0(61.5)	99.0(53.6)	176.0(176.0)	496.2(199.7)	16.0(16.0)	15.0(15.0)	952.3(314.6)
Personal watercraft	45.0(32.4)	59.6(33.5)	239.0(181.0)	188.1(118.2)	48.0(48.0)	0.0(—)	614.8(242.2)
Total non-fishing	306.0(208.1)	812.3(276.2)	1,846.0(687.3)	1,875.3(576.9)	572.0(434.6)	44.1(26.7)	5,736.4(1,159.4)
Total recreation use	15,340.60	12,959.20	8,865.90	8,142.50	4,886.60	3,535.90	54,011.30
Fishing as % of total	98.01	93.73	79.18	76.97	88.29	98.75	89.38
Angler/User Hours per Acre							
Boat anglers	8.84(1.93)	6.40(0.93)	3.30(0.45)	2.79(0.53)	1.70(0.37)	1.95(0.46)	24.97(2.33)
Bank anglers	0.38(0.13)	0.85(0.18)	0.81(0.16)	0.93(0.17)	0.79(0.19)	0.28(0.08)	4.04(0.38)
Pier anglers	0.47(0.10)	0.58(0.12)	0.42(0.09)	0.33(0.08)	0.28(0.11)	0.02(0.02)	2.09(0.23)
All anglers	9.69(1.97)	7.83(1.05)	4.52(0.50)	4.04(0.62)	2.78(0.58)	2.25(0.50)	31.10(2.49)
Water skiing	0.09(0.09)	0.20(0.11)	0.64(0.32)	0.20(0.09)	0.03(0.02)	0.00(—)	1.18(0.39)
Pleasure boating	0.00(—)	0.07(0.04)	0.18(0.07)	0.31(0.14)	0.00(—)	0.00(—)	0.59(0.18)
Sailing	0.00(—)	0.07(0.06)	0.08(0.04)	0.22(0.09)	0.30(0.27)	0.00(—)	0.73(0.33)
Canoeing/kayaking	0.02(0.01)	0.09(0.05)	0.03(0.03)	0.03(0.03)	0.00(—)	0.01(0.01)	0.19(0.07)
Paddle boating	0.06(0.04)	0.06(0.03)	0.11(0.11)	0.32(0.13)	0.01(0.01)	0.01(0.01)	0.61(0.20)
Personal watercraft	0.03(0.02)	0.04(0.02)	0.15(0.12)	0.12(0.08)	0.03(0.03)	0.00(—)	0.40(0.16)
Total non-fishing	0.20(0.13)	0.52(0.18)	1.19(0.44)	1.21(0.37)	0.37(0.28)	0.03(0.02)	3.70(0.75)
Total recreation use	9.89	8.35	5.71	5.25	3.15	2.28	34.8

[1]Season totals were analyzed across months.

Table 4. Catch and harvest estimates, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	5,349.0	(991.1)	1,661.0	(492.3)	7,010.0	(1,291.8)
Bullhead spp.	240.0	(119.5)	814.7	(189.1)	1,054.7	(219.6)
Channel catfish	88.6	(38.8)	151.0	(46.0)	239.6	(59.8)
Largemouth bass	1,044.6	(309.2)	4,188.2	(650.9)	5,232.8	(763.7)
Northern pike	2,114.4	(403.4)	4,622.6	(618.0)	6,737.0	(760.7)
Smallmouth bass	221.8	(69.3)	1,039.0	(342.3)	1,260.8	(350.0)
Sunfish[1]	13,834.1	(2,093.3)	6,061.0	(1,382.8)	19,895.1	(3,068.5)
Walleye	3,473.5	(595.8)	2,642.2	(509.2)	6,115.7	(931.5)
Yellow perch	8.9	(9.0)	340.4	(110.2)	349.3	(112.0)
All species	26,431.2	(2,449.3)	21,816.3	(1,843.0)	48,247.6	(3,648.6)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table 5. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	3.39	(0.64)	1.07	(0.32)	4.46	(0.83)
Bullhead spp.	0.15	(0.08)	0.52	(0.12)	0.68	(0.14)
Largemouth bass	0.67	(0.20)	2.70	(0.42)	3.37	(0.49)
Northern pike	1.36	(0.26)	2.98	(0.40)	4.34	(0.49)
Smallmouth bass	0.14	(0.04)	0.67	(0.22)	0.81	(0.23)
Sunfish[1]	8.91	(1.35)	3.83	(0.87)	12.82	(1.98)
Walleye	2.24	(0.38)	1.70	(0.33)	3.94	(0.60)
Yellow perch	0.01	(0.01)	0.22	(0.07)	0.23	(0.07)
All species	16.97	(1.58)	13.97	(1.17)	31.03	(2.35)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table 6. Yield estimates, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested	Pounds Harvested per Acre
Black crappie	2,215.3(757.6)	1.43(0.49)
Bullhead spp.	331.8.0(27.8)	0.21(0.02)
Largemouth bass	1,769.8(1,654.5)	1.14(1.07)
Northern pike	6,603.6(2,819.3)	4.25(1.82)
Smallmouth bass	670.3(437.5)	0.43(0.28)
Sunfish[1]	4,417.8(1,087.0)	2.85(0.70)
Walleye	6,384.8(2,353.7)	4.11(1.52)
Yellow perch	0.3(—)	0.00(—)
All species	22,008.4(—)	14.18(—)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table 7. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			All Anglers			
Black crappie	0.102	(0.020)	0.032	(0.010)	0.135	(0.027)
Bullhead spp.	0.005	(0.002)	0.016	(0.004)	0.021	(0.003)
Largemouth bass	0.020	(0.006)	0.082	(0.010)	0.102	(0.012)
Northern pike	0.041	(0.002)	0.090	(0.010)	0.131	(0.019)
Smallmouth bass	0.004	(0.002)	0.020	(0.006)	0.025	(0.006)
Sunfish[1]	0.269	(0.042)	0.116	(0.028)	0.387	(0.064)
Walleye	0.068	(0.001)	0.051	(0.006)	0.119	(0.021)
Yellow perch	0.000	(0.000)	0.007	(0.005)	0.007	(0.005)
All species	0.513	(0.047)	0.422	(0.035)	0.937	(0.076)
			Targeting Anglers			
Black crappie	0.548	(0.118)	0.157	(0.084)	0.705	(0.134)
Bullhead spp.	0.392	(—)	0.000	(—)	0.392	(—)
Common carp	0.036	(—)	0.705	(—)	0.741	(—)
Largemouth bass	0.119	(0.045)	0.573	(0.168)	0.692	(0.155)
Northern pike	0.202	(0.036)	0.148	(0.060)	0.349	(0.070)
Smallmouth bass	0.017	(0.009)	0.684	(0.561)	0.701	(0.561)
Sunfish[1]	1.611	(0.249)	0.590	(0.151)	2.230	(0.338)
Walleye	0.122	(0.018)	0.096	(0.021)	0.217	(0.029)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table 8. Length frequency distribution of harvested and released fish, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

TL	BLC		BLH		LMB		NOP	
(inches)	Harvest	Release	Harvest	Release	Harvest	Release	Harvest	Release
<4.0	—	—	—	—	—	—	—	—
4.0-4.4	—	—	—	10	—	—	—	—
4.5-4.9	—	—	—	—	—	3	—	—
5.0-5.4	—	—	—	1	—	4	—	—
5.5-5.9	—	5	—	—	—	—	—	—
6.0-6.4	1	3	—	1	—	8	—	—
6.5-6.9	1	6	—	—	—	—	—	—
7.0-7.4	2	5	—	—	—	—	—	—
7.5-7.9	3	3	—	—	—	—	—	—
8.0-8.4	29	27	—	3	3	17	—	—
8.5-8.9	40	12	—	—	2	—	—	—
9.0-9.4	90	52	—	2	4	4	—	—
9.5-9.9	73	9	—	—	—	—	—	—
10.0-10.4	38	19	1	8	4	55	—	11
10.5-10.9	4	1	—	—	2	—	—	—
11.0-11.4	2	2	1	9	2	5	—	—
11.5-11.9	1	—	2	7	2	22	—	—
12.0-12.9	1	3	6	17	9	26	—	—
13.0-13.9	—	—	2	13	9	53	—	—
14.0-14.9	—	—	—	4	4	69	—	2
15.0-15.9	—	—	—	1	17	40	—	1
16.0-16.9	—	—	—	—	8	38	—	10
17.0-17.9	—	—	—	—	10	18	—	12
18.0-18.9	—	—	—	—	2	12	5	58
19.0-19.9	—	—	—	—	—	2	2	16
20.0-20.9	—	—	—	—	1	7	16	59
21.0-21.9	—	—	—	—	—	1	24	21
22.0-22.9	—	—	—	—	—	2	20	68
23.0-23.9	—	—	—	—	—	—	21	21
24.0-24.9	—	—	—	—	—	—	19	41
25.0-25.9	—	—	—	—	—	—	14	17
26.0-26.9	—	—	—	—	—	—	13	11
27.0-27.9	—	—	—	—	—	—	7	7
28.0-28.9	—	—	—	—	—	—	3	6
29.0-29.9	—	—	—	—	—	—	6	9
30.0-30.9	—	—	—	—	—	—	1	6
31.0-31.9	—	—	—	—	—	—	3	2
32.0-32.9	—	—	—	—	—	—	2	3
33.0-33.9	—	—	—	—	—	—	—	1
34.0-34.9	—	—	—	—	—	—	—	—
35.0-35.9	—	—	—	—	—	—	—	1
36.0-36.9	—	—	—	—	—	—	1	2
37.0-37.9	—	—	—	—	—	—	—	—
38.0-39.0	—	—	—	—	—	—	—	1
>39	—	—	—	—	—	—	—	—
Total N	285	147	12	76	79	386	157	386
Mean Length	9.08	8.74	11.90	10.72	13.94	13.02	23.86	21.14
SE	3.54	6.18	—	—	—	—	10.81	5.66
Mean Weight	0.42	0.39	0.93	0.81	1.69	1.51	3.12	2.30
SE	0.16	0.28	—	0.40	1.66	0.47	1.46	0.62

Table 8 (cont.). Length frequency distribution of harvested and released fish, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

TL	SMB		SUN		WAE		YEP	
(inches)	Harvest	Release	Harvest	Release	Harvest	Release	Harvest	Release
<4.0	—	—	—	17	—	—	—	6
4.0-4.4	—	—	—	55	—	—	1	13
4.5-4.9	—	—	—	14	—	—	—	1
5.0-5.4	—	—	5	90	—	—	—	4
5.5-5.9	—	—	18	91	—	—	—	—
6.0-6.4	—	—	28	69	—	1	—	2
6.5-6.9	—	—	48	27	—	—	—	—
7.0-7.4	—	—	154	78	—	—	—	2
7.5-7.9	—	—	187	40	1	—	—	—
8.0-8.4	—	4	83	9	—	—	—	—
8.5-8.9	—	—	9	11	—	—	—	—
9.0-9.4	—	—	5	1	—	8	—	—
9.5-9.9	—	—	1	—	—	—	—	—
10.0-10.4	—	5	—	—	1	36	—	—
10.5-10.9	1	—	—	—	1	—	—	—
11.0-11.4	—	3	—	—	8	30	—	—
11.5-11.9	1	—	—	—	6	—	—	—
12.0-12.9	—	1	—	—	21	70	—	—
13.0-13.9	—	2	—	—	20	15	—	—
14.0-14.9	—	16	—	—	28	17	—	—
15.0-15.9	1	28	—	—	25	3	—	—
16.0-16.9	3	3	—	—	48	3	—	—
17.0-17.9	4	12	—	—	16	3	—	—
18.0-18.9	4	8	—	—	20	6	—	—
19.0-19.9	3	3	—	—	7	—	—	—
20.0-20.9	—	2	—	—	12	—	—	—
21.0-21.9	—	—	—	—	9	1	—	—
22.0-22.9	—	2	—	—	12	5	—	—
23.0-23.9	—	—	—	—	9	2	—	—
24.0-24.9	—	—	—	—	5	6	—	—
25.0-25.9	—	—	—	—	1	4	—	—
26.0-26.9	—	—	—	—	2	3	—	—
27.0-27.9	—	—	—	—	1	1	—	—
28.0-28.9	—	—	—	—	—	—	—	—
29.0-30.0	—	—	—	—	—	—	—	—
>30	—	—	—	—	—	1	—	—
Total N	17	89	538	502	253	215	1	28
Mean Length	17.03	15.14	7.20	5.67	16.72	13.21	4.00	4.26
SE	24.38	16.94	2.07	2.87	6.80	5.78	—	—
Mean Weight	3.02	2.19	0.32	0.16	1.84	1.08	0.03	0.04
SE	2.18	1.80	0.09	0.09	0.75	0.47	—	0.04

Table 9. Percentage of angling parties targeting species on Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

Species[1,2]	May[3]	June	July	August	September	October	Season
Black crappie	11.6	3.7	10.1	16.7	20.5	18.9	12.2
Common Carp	0.6	1.4	3.6	0.0	0.0	2.1	1.3
Largemouth bass	4.1	15.7	18.7	18.8	18.8	6.3	13.8
Northern Pike	13.4	11.1	7.2	15.2	15.2	17.9	12.8
Smallmouth bass	0.0	1.4	5.0	4.3	8.9	4.2	3.4
Sunfish[4]	12.8	19.0	22.3	37.7	33.9	5.3	21.7
Walleye	75.0	56.9	38.8	21.0	25.0	61.1	48.3
Parties (N)	172	216	139	138	112	95	872

[1]Data analyzed across angler type. [2]Some parties gave multiple responses. [3]The season for walleye and northern pike opened on May 10. The season for largemouth and smallmouth bass opened May 24. [4]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table 10. Percent of anglers[1] who harvested a given number of fish, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

	Number of Fish Harvested per Angler									
Species[2]	0	0.1-0.9	1-1.9	2-2.9	3-3.9	4-5.9	6-7.9	8-9.9	10+	N
Black crappie/all anglers	83.9	7.7	1.3	1.3	2.3	0.7	1.6	0.7	0.5	559
Bl. crappie/crappie anglers	46.2	16.7	1.3	6.4	11.5	1.3	7.7	5.1	3.8	78
Largemouth bass/all anglers	93.0	3.0	2.5	1.4	0.0	0.0	0.0	NA	NA	559
L. bass/L. bass anglers	79.7	0.0	8.5	11.9	0.0	0.0	0.0	NA	NA	59
Northern pike/all anglers	82.6	9.8	4.7	2.0	0.9	NA	NA	NA	NA	559
Northern pike/pike anglers	52.6	17.5	18.6	7.2	4.1	NA	NA	NA	NA	97
Sunfish/all anglers	86.9	3.4	1.3	0.9	1.1	1.3	1.1	1.1	3.0	559
Sunfish/sunfish anglers	52.1	0.0	4.3	2.1	6.4	6.4	6.4	6.4	16.0	94
Walleye/all anglers	80.9	9.5	6.1	0.9	2.0	0.7	0.0	NA	NA	559
Walleye/walleye anglers	68.1	15.0	10.4	1.6	3.6	1.3	0.0	NA	NA	307

[1]Data from completed trip interviews, analyzed across angler type and month. The number of fish harvested per angler was determined by dividing the number (by species) harvested by the number of anglers for each interview.

[2]Bag limits: crappie=10, largemouth bass=6, northern pike=3, sunfish=20, walleye=6.

Table 11. Percent distributions by age and sex of anglers, Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

Age in Years	Males	Females	Combined
0-15	2.8	1.5	4.3
16-25	6.1	0.9	7.0
26-35	26.2	3.5	29.7
36-45	36.6	4.7	41.3
46-55	13.9	2.3	16.2
56-65	1.3	0.1	1.5
Over 65	0	0	0
Total (N=2227)	87.0	13.0	100.0

Table 12. Approximate one-way distance traveled by interviewed anglers to Buffalo Lake, Minnesota, May 1, 2003-October 31, 2003.

Distance[1] in Miles	Responses	Percent
0-10	812	54.5
11-25	341	22.9
26-50	312	20.9
51-100	5	0.3
101-300	12	0.8
Over 300	8	0.5
Total	1490	100

[1]Distances are calculated in a straight line from center of zip code areas.

Table 13. Fishing success ratings[1] from interviewed anglers, Buffalo Lake, Minnesota, May 1-October 31, 2003. One response was collected from each party, regardless of party size.

	Fishing Success Rating					
	1-2	3-4	5-6	7-8	9-10	Total
Angler group	N (%)	N (%)	N (%)	N (%)	N (%)	Responses
Boat anglers	246 (40.4)	83 (13.6)	151 (24.8)	96 (15.8)	33 (5.4)	609
Bank, pier anglers	61 (25.3)	32 (13.3)	67 (27.8)	57 (23.7)	24 (10.0)	241
All anglers	307 (36.1)	115 (13.5)	218 (25.6)	153 (18.0)	57 (6.7)	850
Anglers seeking[2]:						
Black crappie	38 (36.9)	19 (18.4)	25 (24.3)	14 (13.6)	7 (6.8)	103
Largemouth bass	34 (27.9)	21 (17.2)	31 (25.4)	24 (19.7)	12 (9.8)	122
Northern Pike	37 (33.6)	12 (10.9)	33 (30.0)	22 (20.0)	6 (5.5)	110
Sunfish	42 (23.0)	27 (14.8)	51 (27.9)	44 (24.0)	19 (10.4)	183
Walleye	186 (44.4)	54 (12.9)	103 (24.6)	61 (14.6)	15 (3.6)	419

[1]Response of anglers to the question, "On a scale of one to ten, with one being poor and ten being excellent, how would you rate your fishing success today on Buffalo Lake?". [2]Some anglers gave multiple responses.

Table 14. Responses to questions 3 and 4. One response was collected from each party, regardless of party size. Previously interviewed anglers were not asked.

Question 3: "On a scale of 1 to 10, how satisfied are you with the number of (targeted species) you catch on Buffalo Lake?"

	Buffalo Lake	
Species	Mean response	N
Black crappie	6.1	48
Largemouth bass	6.9	66
Northern Pike	6.8	48
Sunfish	6.5	101
Walleye	5.9	276
Total		539

Question 4: "On a scale of 1 to 10, how satisfied are you with the size of (targeted species) you catch on Buffalo Lake?"

	Buffalo Lake	
Species	Mean response	N
Black crappie	6.1	48
Largemouth bass	6.9	65
Northern Pike	6.6	47
Sunfish	6.9	101
Walleye	6.0	258
Total		519

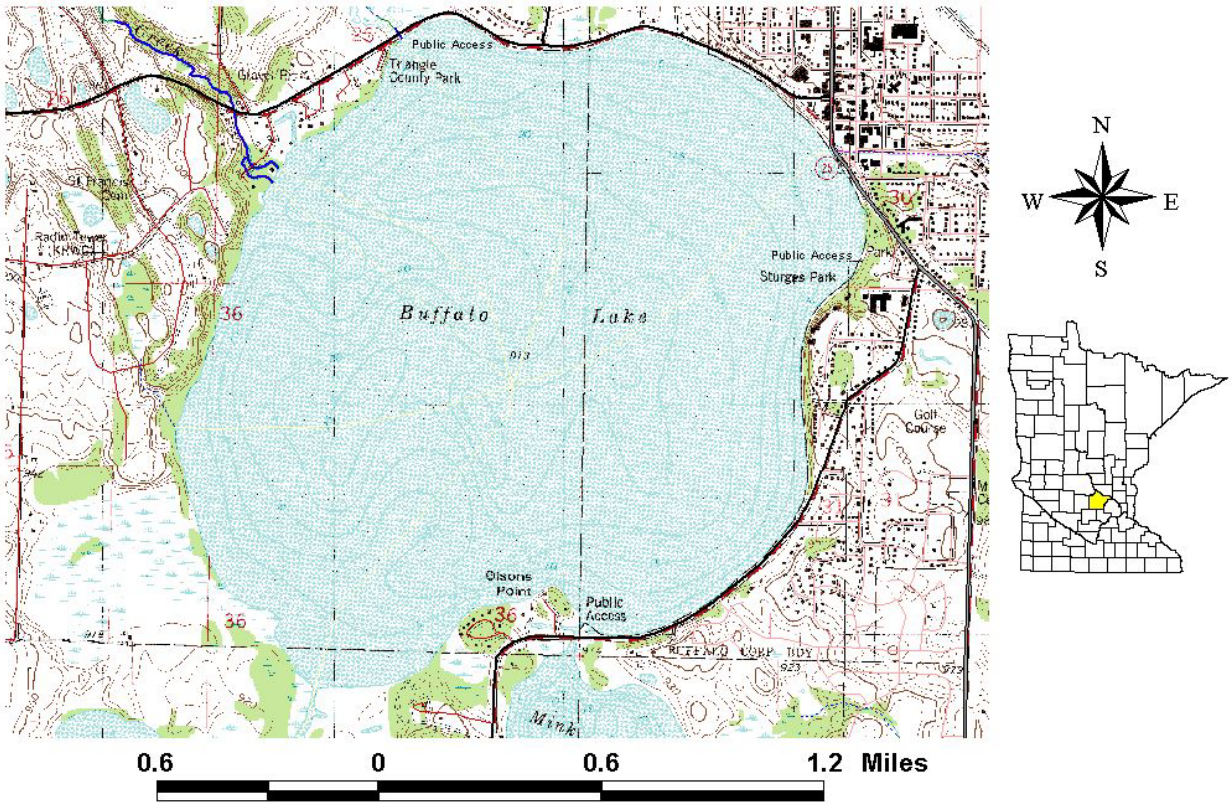

Figure 1. Location of Buffalo Lake, Wright County, Minnesota.

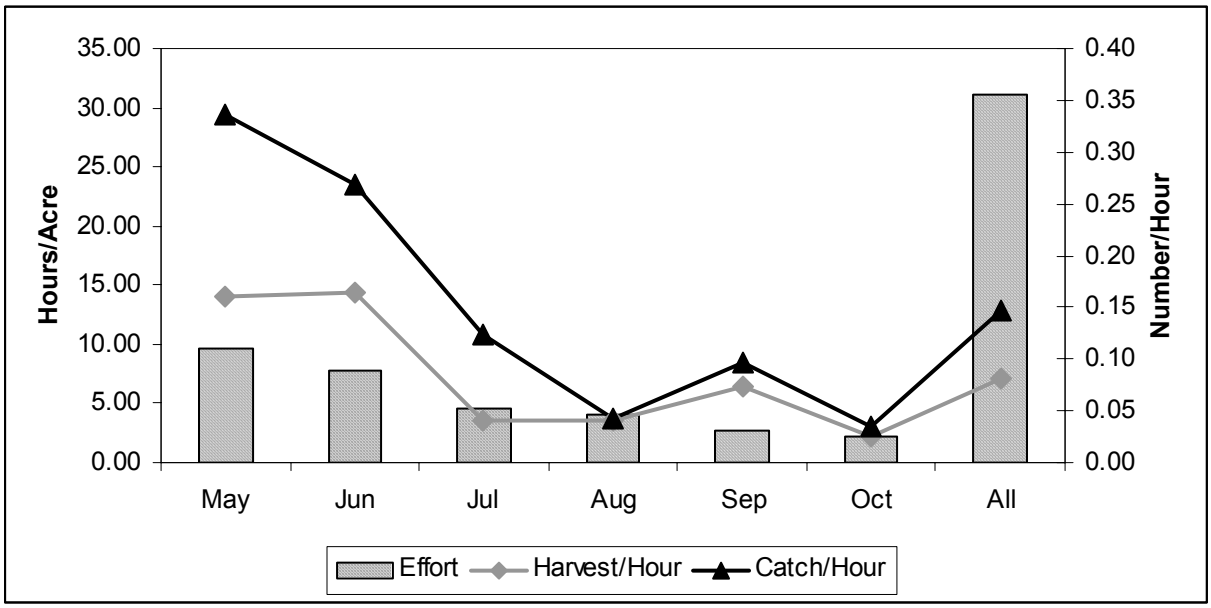

Figure 2. Overall effort and targeting angler catch and harvest rates for walleye, Buffalo Lake, Minnesota, May 1-October 31, 2003.

Addendum: Harvest Summary Form

MINNESOTA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISHERIES				
Creel Survey Summary For Buffalo Lake, May to October 2003				
DOW#: 86-90	County: Wright	Lake Class: 24	Lake Area: 1,552 Acres	Dates of Survey: 5/01/03 - 10/31/03

Fishing pressure (Angler Hours)	48,275	Weekdays surveyed	49
Angler Hours per Acre	31.1	Weekend/Holidays surveyed	55
Average Party Size (boat anglers)	1.9	Number of interviews	868
Average Trip Length (hours)	3.3		

What People Fished for:	Percent of Angling Parties
Black Crappie	12.2
Largemouth Bass	13.8
Northern Pike	12.8
Sunfish	21.7
Walleye	48.3
(Percentages add up to more than 100 due to anglers seeking more than one species)	

	Fish Harvested				Fish Released			
			Average				Average	
Species Caught	Number	Pounds	Length (in)	weight (lb)	Number	Pounds	Length (in)	weight (lb)
Black crappie	5,349	2,215	9.1	0.4	1,661		8.7	0.4
Bullhead species	240	224	11.9	0.9	815		10.7	0.8
Largemouth bass	1,045	1,770	13.9	1.7	4,188		13.0	1.5
Northern pike	2,114	6,604	23.9	3.1	4,623		21.1	2.3
Smallmouth bass	222	0	17.0	—	1,039		15.1	—
Sunfish species	13,834	4,418	7.2	0.3	6,061		5.7	0.2
Walleye	3,474	6,385	16.7	1.8	2,642		13.2	1.1
Yellow perch	9	0	4.0	<0.1	340		4.3	<0.1
All species	26,342	22,008	NA	NA	21,816		NA	NA

Montrose Area Fisheries Office: (763) 675-3301
Minnesota DNR website: www.dnr.state.mn.us

Appendix

Table A1. Catch and harvest estimates, Buffalo Lake, Minnesota, May 1, 2003-May 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	101.7	(56.3)	155.5	(92.3)	257.2	(122.7)
Bullhead spp.	0.0	(0.0)	93.0	(59.4)	93.0	(59.4)
Channel catfish	32.0	(31.4)	10.2	(10.8)	42.1	(33.2)
Largemouth bass	101.7	(73.8)	826.7	(275.6)	928.4	(316.8)
Northern pike	717.7	(334.0)	1,483.3	(492.0)	2,201.0	(593.0)
Smallmouth bass	0.0	(0.0)	10.2	(10.9)	10.2	(10.9)
Sunfish[1]	735.1	(384.2)	675.5	(531.8)	1,410.7	(660.1)
Walleye	1,804.4	(448.2)	1,538.5	(514.5)	3,343.0	(833.8)
Yellow perch	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
All species	3,492.6	685.3	4,792.8	(936.9)	8,285.5	(1,266.0)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A2. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, May 1, 2003-May 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.07	(0.04)	0.10	(0.06)	0.17	(0.08)
Bullhead spp.	0.00	(0.00)	0.06	(0.04)	0.06	(0.04)
Channel catfish	0.02	(0.02)	0.01	(0.01)	0.03	(0.02)
Largemouth bass	0.07	(0.05)	0.53	(0.18)	0.60	(0.20)
Northern pike	0.46	(0.22)	0.96	(0.32)	1.42	(0.38)
Smallmouth bass	0.00	(0.00)	0.01	(0.01)	0.01	(0.01)
Sunfish[1]	0.47	(0.25)	0.44	(0.34)	0.91	(0.43)
Walleye	1.16	(0.29)	0.99	(0.33)	2.15	(0.54)
Yellow perch	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
All species	2.25	(0.44)	3.09	(0.60)	5.34	(0.82)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A3. Yield estimates, Buffalo Lake, Minnesota, May 1, 2003-May 31, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	48.9	(29.2)	0.03	(0.02)
Bullhead spp.	0.0	(0.0)	0.00	(0.00)
Channel catfish	69.0	(—)	0.04	(—)
Largemouth bass	175.1	(242.0)	0.11	(0.16)
Northern pike	2,254.1	(3,605.5)	1.45	(2.32)
Smallmouth bass	0.0	(0.0)	0.00	(0.00)
Sunfish[1]	243.9	(—)	0.16	(—)
Walleye	3,526.5	(1,562.9)	2.27	(1.01)
Yellow perch	0.0	(0.0)	0.00	(0.00)
All species	6,317.6	(—)	4.07	(—)

Table A4. Catch and harvest estimates, Buffalo Lake, Minnesota, June 1, 2003-June 30, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	373.7	(174.1)	170.7	(85.1)	544.4	(222.0)
Bullhead spp.	118.9	(90.4)	209.9	(95.1)	328.8	(131.8)
Channel catfish	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Largemouth bass	493.9	(226.2)	1,342.0	(340.9)	1,835.8	(389.1)
Northern pike	575.0	(202.1)	1,532.2	(344.2)	2,107.2	(364.7)
Smallmouth bass	53.2	(27.4)	201.5	(83.1)	254.6	(83.0)
Sunfish[1]	4,034.0	(838.0)	1,133.2	(353.8)	5,167.2	(1,034.5)
Walleye	1,320.7	(317.3)	1,126.4	(264.6)	2,447.1	(475.8)
Yellow perch	0.0	(0.0)	82.5	(37.3)	82.5	(37.3)
All species	6,969.2	(966.5)	5,808.3	(674.2)	12,777.5	(1,286.8)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A5. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, June 1, 2003-June 30, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.24	(0.11)	0.11	(0.05)	0.35	((0.14))
Bullhead spp.	0.08	(0.06)	0.14	(0.06)	0.21	(0.08)
Largemouth bass	0.32	(0.15)	0.86	(0.22)	1.18	(0.25)
Northern pike	0.37	(0.13)	0.99	(0.22)	1.36	(0.23)
Smallmouth bass	0.03	(0.02)	0.13	(0.05)	0.16	(0.05)
Sunfish[1]	2.60	(0.54)	0.73	(0.23)	3.33	(0.67)
Walleye	0.85	(0.20)	0.73	(0.17)	1.58	(0.31)
Yellow perch	0.00	(0.00)	0.05	(0.02)	0.05	(0.02)
All species	4.49	(0.62)	3.74	(0.43)	8.23	(0.83)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A6. Yield estimates, Buffalo Lake, Minnesota, June 1, 2003-June 30, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	192.7	(128.6)	0.12	(0.08)
Bullhead spp.	104.4	(—)	0.07	(—)
Channel catfish	0.0	(0.0)	0.00	(0.00)
Largemouth bass	951.8	(1,024.3)	0.61	(0.66)
Northern pike	1,799.9	(1,306.3)	1.16	(0.84)
Smallmouth bass	144.3	(86.5)	0.09	(0.06)
Sunfish[1]	1,303.2	(450.4)	0.84	(0.29)
Walleye	2,389.9	(1,054.5)	1.54	(0.68)
Yellow perch	0.0	(0.0)	0.00	(0.00)
All species	6,886.2	(—)	4.44	(—)

Table A7. Catch and harvest estimates, Buffalo Lake, Minnesota, July 1, 2003-July 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	625.7	(253.9)	152.1	(68.0)	777.8	(259.1)
Bullhead spp.	27.5	(19.7)	142.9	(49.5)	170.5	(45.6)
Channel catfish	18.4	(13.5)	76.8	(28.3)	95.1	(30.5)
Largemouth bass	181.6	(79.0)	581.4	(213.5)	763.0	(238.1)
Northern pike	153.5	(57.4)	268.9	(85.0)	422.4	(87.8)
Smallmouth bass	87.9	(39.3)	43.9	(21.2)	131.8	(49.7)
Sunfish[1]	1,789.4	(486.6)	590.6	(248.8)	2,380.1	(490.6)
Walleye	139.0	(57.0)	221.1	(119.2)	360.1	(147.4)
Yellow perch	9.2	(9.2)	109.6	(74.6)	118.7	(77.3)
All species	3,050.5	(562.5)	2,359.7	(384.2)	5,410.3	(640.8)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A8. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, July 1, 2003-July 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.40	(0.16)	0.10	(0.04)	0.50	(0.17)
Bullhead spp.	0.02	(0.01)	0.09	(0.03)	0.11	(0.03)
Largemouth bass	0.12	(0.05)	0.37	(0.14)	0.49	(0.15)
Northern pike	0.10	(0.04)	0.17	(0.05)	0.27	(0.06)
Smallmouth bass	0.06	(0.03)	0.03	(0.01)	0.08	(0.03)
Sunfish[1]	1.15	(0.31)	0.38	(0.16)	1.53	(0.32)
Walleye	0.09	(0.04)	0.14	(0.08)	0.23	(0.09)
Yellow perch	0.01	(0.01)	0.07	(0.05)	0.08	(0.05)
All species	1.97	(0.36)	1.52	(0.25)	3.49	(0.41)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A9. Yield estimates, Buffalo Lake, Minnesota, July 1, 2003-July 31, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	227.6	(197.9)	0.15	(0.13)
Bullhead spp.	23.7	(—)	0.02	(—)
Channel catfish	38.0	(29.7)	0.02	(0.02)
Largemouth bass	206.7	(—)	0.13	(—)
Northern pike	484.5	(—)	0.31	(—)
Smallmouth bass	274.7	(163.0)	0.18	(0.11)
Sunfish[1]	589.1	(241.8)	0.38	(0.16)
Walleye	260.2	(144.5)	0.17	(0.09)
All species	2,222.4	(—)	1.43	(—)

Table A10. Catch and harvest estimates, Buffalo Lake, Minnesota, August 1, 2003-August 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	1,444.1	(393.1)	462.8	(238.9)	1,906.9	(504.9)
Bullhead spp.	7.2	(6.5)	190.3	(97.4)	197.4	(95.3)
Channel catfish	32.5	(29.0)	28.7	(12.3)	61.2	(31.0)
Largemouth bass	158.7	(89.4)	662.0	(223.7)	820.6	(295.0)
Northern pike	368.0	(175.3)	529.5	(161.5)	897.5	(309.9)
Smallmouth bass	65.0	(43.2)	197.9	(58.4)	262.9	(73.2)
Sunfish[1]	4,425.6	(1,434.7)	1,793.8	(594.0)	6,219.4	(1,830.8)
Walleye	108.0	(39.9)	7.2	(7.0)	115.2	(40.1)
Yellow perch	0.0	(0.0)	57.4	(24.8)	57.4	(24.8)
All species	6,634.3	(1,502.3)	3,943.8	(706.9)	10,578.1	(1,951.4)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A11. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, August 1, 2003-August 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.93	(0.25)	0.30	(0.15)	1.23	(0.33)
Bullhead spp.	0.00	(0.00)	0.12	(0.06)	0.13	(0.06)
Channel catfish	0.02	(0.02)	0.02	(0.01)	0.04	(0.02)
Largemouth bass	0.10	(0.06)	0.43	(0.14)	0.53	(0.19)
Northern pike	0.24	(0.11)	0.34	(0.10)	0.58	(0.20)
Smallmouth bass	0.04	(0.03)	0.13	(0.04)	0.17	(0.05)
Sunfish[1]	2.85	(0.92)	1.16	(0.38)	4.01	(1.18)
Walleye	0.07	(0.03)	0.00	(0.00)	0.07	(0.03)
Yellow perch	0.00	(0.00)	0.04	(0.02)	0.04	(0.02)
All species	4.27	(0.97)	2.54	(0.46)	6.82	(1.26)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A12. Yield estimates, Buffalo Lake, Minnesota, August 1, 2003-August 31, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	576.2	(321.8)	0.37	(0.21)
Bullhead spp.	6.7	(—)	0.00	(—)
Channel catfish	50.1	(—)	0.03	(—)
Largemouth bass	237.9	(—)	0.15	(—)
Northern pike	986.9	(842.4)	0.64	(0.54)
Smallmouth bass	222.3	(—)	0.14	(—)
Sunfish[1]	1,283.5	(475.6)	0.83	(0.31)
Walleye	273.8	(—)	0.18	(—)
All species	3,700.3	(—)	2.38	(—)

Table A13. Catch and harvest estimates, Buffalo Lake, Minnesota, September 1, 2003-September 30, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	1,251.3	(363.4)	370.3	(216.5)	1,621.6	(472.3)
Bullhead spp.	60.3	(54.3)	105.5	(59.7)	165.7	(75.4)
Channel catfish	0.0	(0.0)	6.7	(7.3)	6.7	(7.3)
Largemouth bass	66.1	(27.3)	539.9	(235.8)	606.0	(248.0)
Northern pike	172.4	(67.2)	381.2	(140.6)	553.7	(185.3)
Smallmouth bass	6.7	(6.9)	260.3	(192.3)	267.0	(192.3)
Sunfish[1]	1,543.4	(612.0)	1,562.3	(735.2)	3,105.7	(1,303.1)
Walleye	188.7	(96.6)	32.6	(34.4)	221.4	(122.7)
Yellow perch	0.0	(0.0)	33.5	(26.1)	33.5	(26.1)
All species	3,289.0	(724.1)	3,351.8	(840.7)	6,640.7	(1,441.2)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A14. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, September 1, 2003-September 30, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.81	0.23	0.24	0.14	1.04	0.30
Bullhead spp.	0.04	0.04	0.07	0.04	0.11	0.05
Channel catfish	0.00	0.00	0.00	0.00	0.00	0.00
Largemouth bass	0.04	0.02	0.35	0.15	0.39	0.16
Northern pike	0.11	0.04	0.25	0.09	0.36	0.12
Smallmouth bass	0.00	0.00	0.17	0.12	0.17	0.12
Sunfish[1]	0.99	0.39	1.01	0.47	2.00	0.84
Walleye	0.12	0.06	0.02	0.02	0.14	0.08
Yellow perch	0.00	0.00	0.02	0.02	0.02	0.02
All species	2.12	0.47	2.16	0.54	4.28	0.93

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A15. Yield estimates, Buffalo Lake, Minnesota, September 1, 2003-September 30, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	522.7	(330.1)	0.34	(0.21)
Bullhead spp.	63.2	(—)	0.04	(—)
Channel catfish	0.0	(0.0)	0.00	(0.00)
Largemouth bass	106.4	(60.0)	0.07	(0.04)
Northern pike	729.8	(811.0)	0.47	(0.52)
Smallmouth bass	17.3	(—)	0.01	(—)
Sunfish[1]	532.2	(478.9)	0.34	(0.31)
Walleye	254.9	(167.6)	0.16	(0.11)
All species	2,226.5	(—)	1.43	(—)

Table A16. Catch and harvest estimates, Buffalo Lake, Minnesota, October 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested		Number Released		Number Caught	
Black crappie	653.5	(251.3)	128.8	(42.4)	782.3	(259.7)
Bullhead spp.	0.0	(0.0)	21.4	(15.9)	21.4	(15.9)
Channel catfish	15.3	(14.5)	6.1	(6.2)	21.4	(15.8)
Largemouth bass	0.0	(0.0)	177.7	(123.7)	177.7	(123.7)
Northern pike	125.7	(71.1)	453.8	(145.2)	579.4	(166.0)
Smallmouth bass	0.0	(0.0)	159.1	(150.2)	159.1	(150.2)
Sunfish[1]	337.0	(246.4)	52.0	(47.4)	389.0	(251.0)
Walleye	76.8	(48.8)	49.2	(31.8)	126.0	(59.0)
Yellow perch	0.0	(0.0)	6.1	(5.6)	6.1	(5.6)
All species	1,220.5	(362.9)	1,069.7	(254.1)	2,290.2	(447.5)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A17. Catch and harvest estimates per acre, Buffalo Lake, Minnesota, October 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Number Harvested per Acre		Number Released per Acre		Number Caught per Acre	
Black crappie	0.42	(0.16)	0.08	(0.03)	0.50	(0.17)
Bullhead spp.	0.00	(0.00)	0.01	(0.01)	0.01	(0.01)
Channel catfish	0.01	(0.01)	0.00	(0.00)	0.01	(0.01)
Largemouth bass	0.00	(0.00)	0.11	(0.08)	0.11	(0.08)
Northern pike	0.08	(0.05)	0.29	(0.09)	0.37	(0.11)
Smallmouth bass	0.00	(0.00)	0.10	(0.10)	0.10	(0.10)
Sunfish[1]	0.22	(0.16)	0.03	(0.03)	0.25	(0.16)
Walleye	0.05	(0.03)	0.03	(0.02)	0.08	(0.04)
Yellow perch	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
All species	0.79	(0.23)	0.69	(0.16)	1.48	(0.29)

[1]Includes bluegill, pumpkinseed, hybrid and green sunfish.

Table A18. Yield estimates, Buffalo Lake, Minnesota, October 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Pounds Harvested		Pounds Harvested Per Acre	
Black crappie	302.4	(225.0)	0.19	(0.14)
Bullhead spp.	0.0	(0.0)	0.00	(0.00)
Channel catfish	27.7	(—)	0.02	(—)
Largemouth bass	0.0	(0.0)	0.00	(0.00)
Northern pike	354.8	(366.6)	0.23	(0.24)
Smallmouth bass	0.0	(0.0)	0.00	(0.00)
Sunfish[1]	122.3	(108.6)	0.08	(0.07)
Walleye	99.5	(—)	0.06	(—)
All species	949.9	(—)	0.61	(—)

Table A19. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, May 1, 2003-May 31, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.051	(0.025)	0.107	(0.021)	0.158	(0.038)
Largemouth bass	0.335	(0.211)	0.545	(0.247)	0.881	(0.436)
Northern pike	0.474	(0.233)	0.493	(0.526)	0.968	(0.403)
Sunfish	0.126	(0.033)	1.657	(0.451)	1.783	(0.452)
Walleye	0.161	(0.019)	0.175	(0.065)	0.336	(0.066)
			All Anglers			
Black crappie	0.007	(0.004)	0.010	(0.003)	0.017	(0.005)
Bullhead spp.	0.000	(0.000)	0.006	(0.006)	0.006	(0.006)
Channel catfish	0.002	(0.002)	0.001	(0.001)	0.003	(0.002)
Largemouth bass	0.007	(0.005)	0.055	(0.016)	0.062	(0.019)
Northern pike	0.048	(0.024)	0.099	(0.038)	0.147	(0.014)
Smallmouth bass	0.000	(0.000)	0.001	(0.001)	0.001	(0.001)
Sunfish	0.049	(0.024)	0.045	(0.039)	0.094	(0.048)
Walleye	0.120	(0.039)	0.103	(0.033)	0.223	(0.014)
All species	0.233	(0.052)	0.320	(0.066)	0.553	(0.055)

Table A20. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, June 1, 2003-June 30, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.123	(—)	0.000	(—)	0.123	(—)
Bullhead spp.	0.559	(—)	0.000	(—)	0.559	(—)
Largemouth bass	0.294	(0.072)	0.907	(0.876)	1.201	(0.810)
Northern pike	0.204	(0.054)	0.088	(0.043)	0.292	(0.064)
Smallmouth bass	0.000	(—)	0.499	(—)	0.499	(—)
Sunfish	3.011	(0.521)	1.016	(0.458)	4.026	(0.765)
Walleye	0.163	(0.035)	0.106	(0.032)	0.269	(0.046)
			All Anglers			
Black crappie	0.030	(0.014)	0.014	(0.008)	0.044	(0.018)
Bullhead spp.	0.010	(0.007)	0.017	(0.008)	0.027	(0.011)
Channel catfish	0.000	(0.000)	0.001	(0.001)	0.001	(0.001)
Largemouth bass	0.040	(0.020)	0.109	(0.022)	0.149	(0.028)
Northern pike	0.047	(0.017)	0.124	(0.022)	0.171	(0.022)
Smallmouth bass	0.004	(0.003)	0.016	(0.004)	0.021	(0.005)
Sunfish	0.327	(0.057)	0.092	(0.033)	0.419	(0.080)
Walleye	0.107	(0.026)	0.091	(0.020)	0.199	(0.037)
Yellow perch	0.000	(0.000)	0.007	(0.004)	0.007	(0.004)
All species	0.565	(0.069)	0.471	(0.051)	1.037	(0.098)

Table A21. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, July 1, 2003-July 31, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.473	(0.129)	0.114	(0.086)	0.587	(0.094)
Common carp	0.013	(—)	0.727	(—)	0.740	(—)
Channel catfish	0.000	(—)	0.541	(—)	0.541	(—)
Largemouth bass	0.042	(0.016)	0.311	(0.106)	0.353	(0.109)
Northern pike	0.127	(0.013)	0.057	(0.023)	0.184	(0.031)
Smallmouth bass	0.169	(0.078)	0.056	(0.044)	0.226	(0.099)
Sunfish	1.133	(0.283)	0.120	(0.075)	1.254	(0.280)
Walleye	0.040	(0.020)	0.084	(0.046)	0.125	(0.056)
			All Anglers			
Black crappie	0.083	(0.032)	0.020	(0.010)	0.103	(0.033)
Bowfin	0.000	(0.000)	0.004	(0.002)	0.004	(0.002)
Bullhead spp.	0.004	(0.003)	0.019	(0.007)	0.023	(0.007)
Channel catfish	0.002	(0.001)	0.018	(0.010)	0.020	(0.010)
Common carp	0.002	(0.002)	0.010	(0.004)	0.013	(0.005)
Largemouth bass	0.024	(0.010)	0.077	(0.025)	0.101	(0.027)
Northern pike	0.020	(0.008)	0.036	(0.011)	0.056	(0.011)
Rock bass	0.000	(0.000)	0.001	(0.001)	0.001	(0.001)
Smallmouth bass	0.012	(0.003)	0.006	(0.003)	0.018	(0.004)
Sunfish	0.237	(0.070)	0.078	(0.030)	0.316	(0.065)
Walleye	0.018	(0.008)	0.029	(0.016)	0.048	(0.019)
Yellow perch	0.001	(0.001)	0.015	(0.014)	0.016	(0.012)
All species	0.404	(0.078)	0.313	(0.048)	0.717	(0.083)

Table A22. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, August 1, 2003-August 31, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.686	(0.628)	0.046	(0.029)	0.732	(0.629)
Channel catfish	0.000	(—)	0.000	(—)	0.000	(—)
Largemouth bass	0.091	(0.021)	0.368	(0.067)	0.459	(0.075)
Northern pike	0.124	(0.031)	0.122	(0.082)	0.246	(0.067)
Smallmouth bass	0.000	(—)	0.542	(—)	0.542	(—)
Sunfish	1.804	(0.669)	0.755	(0.409)	2.558	(0.931)
Walleye	0.040	(0.035)	0.002	(0.002)	0.042	(0.035)
			All Anglers			
Black crappie	0.211	(0.058)	0.068	(0.035)	0.278	(0.076)
Bowfin	0.004	(0.004)	0.001	(0.001)	0.005	(0.004)
Bullhead spp.	0.001	(0.001)	0.028	(0.015)	0.029	(0.014)
Channel catfish	0.005	(0.004)	0.004	(0.002)	0.009	(0.005)
Largemouth bass	0.023	(0.023)	0.097	(0.057)	0.120	(0.081)
Northern pike	0.054	(0.010)	0.077	(0.018)	0.131	(0.018)
Sucker spp.	0.000	(0.000)	0.001	(0.001)	0.001	(0.001)
Smallmouth bass	0.010	(0.011)	0.029	(0.010)	0.038	(0.012)
Sunfish	0.646	(0.228)	0.262	(0.087)	0.907	(0.289)
Walleye	0.016	(0.004)	0.001	(0.001)	0.017	(0.004)
Yellow perch	0.000	(0.000)	0.008	(0.004)	0.008	(0.004)
All species	0.968	(0.237)	0.575	(0.113)	1.543	(0.310)

Table A23. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, September 1, 2003-September 30, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.828	(0.350)	0.456	(0.327)	1.284	(0.261)
Bullhead spp.	—	(0.000)	—	(0.000)	—	(0.000)
Largemouth bass	0.007	(0.006)	0.555	(0.195)	0.562	(0.196)
Northern pike	0.323	(0.101)	0.619	(0.499)	0.942	(0.437)
Smallmouth bass	0.007	(—)	0.193	(—)	0.200	(—)
Sunfish	1.096	(0.249)	0.727	(0.297)	1.823	(0.378)
Walleye	0.073	(0.049)	0.024	(0.023)	0.097	(0.071)
			All Anglers			
Black crappie	0.271	(0.099)	0.080	(0.050)	0.351	(0.129)
Bowfin	0.000	(0.000)	0.007	(0.008)	0.007	(0.008)
Bullhead spp.	0.013	(0.012)	0.023	(0.016)	0.036	(0.018)
Channel catfish	0.000	(0.000)	0.002	(0.002)	0.002	(0.002)
Common carp	0.000	(0.000)	0.006	(0.005)	0.006	(0.005)
Largemouth bass	0.014	(0.003)	0.117	(0.067)	0.131	(0.069)
Northern pike	0.037	(0.021)	0.083	(0.036)	0.120	(0.053)
Smallmouth bass	0.002	(0.002)	0.056	(0.046)	0.058	(0.046)
Sunfish	0.334	(0.152)	0.338	(0.120)	0.672	(0.123)
Walleye	0.041	(0.023)	0.007	(0.008)	0.048	(0.029)
Yellow perch	0.000	(0.000)	0.007	(0.006)	0.007	(0.006)
All species	0.712	(0.185)	0.726	(0.159)	1.438	(0.207)

Table A24. Harvest, release, and catch rate estimates, Buffalo Lake, Minnesota, October 1, 2003-October 31, 2003. Standard errors appear in parentheses.

Species	Harvest per Angler Hour		Release per Angler Hour		Catch per Angler Hour	
			Targeting Anglers			
Black crappie	0.618	(0.183)	0.073	(0.061)	0.690	(0.153)
Common carp	0.649	(—)	0.000	(—)	0.649	(—)
Largemouth bass	0.000	(0.000)	1.809	(2.054)	1.809	(2.054)
Northern pike	0.133	(0.039)	0.073	(0.047)	0.206	(0.030)
Smallmouth bass	0.000	(—)	5.312	(—)	5.312	(—)
Sunfish	1.636	(0.702)	0.254	(0.392)	1.890	(0.313)
Walleye	0.026	(0.017)	0.009	(0.006)	0.034	(0.017)
			All Anglers			
Black crappie	0.189	(0.031)	0.037	(0.005)	0.226	(0.092)
Bullhead spp.	0.000	(0.000)	0.006	(0.005)	0.006	(0.005)
Channel catfish	0.004	(0.004)	0.002	(0.002)	0.006	(0.005)
Common carp	0.004	(0.004)	0.004	(0.005)	0.008	(0.006)
Largemouth bass	0.000	(0.000)	0.051	(0.058)	0.051	(0.058)
Northern pike	0.036	(0.022)	0.131	(0.026)	0.167	(0.035)
Smallmouth bass	0.000	(0.000)	0.046	(0.044)	0.046	(0.044)
Sunfish	0.097	(0.110)	0.015	(0.013)	0.112	(0.115)
Walleye	0.022	(0.015)	0.014	(0.006)	0.036	(0.016)
Yellow perch	0.000	(0.000)	0.002	(0.002)	0.002	(0.002)
All species	0.352	(0.117)	0.309	(0.079)	0.661	(0.169)

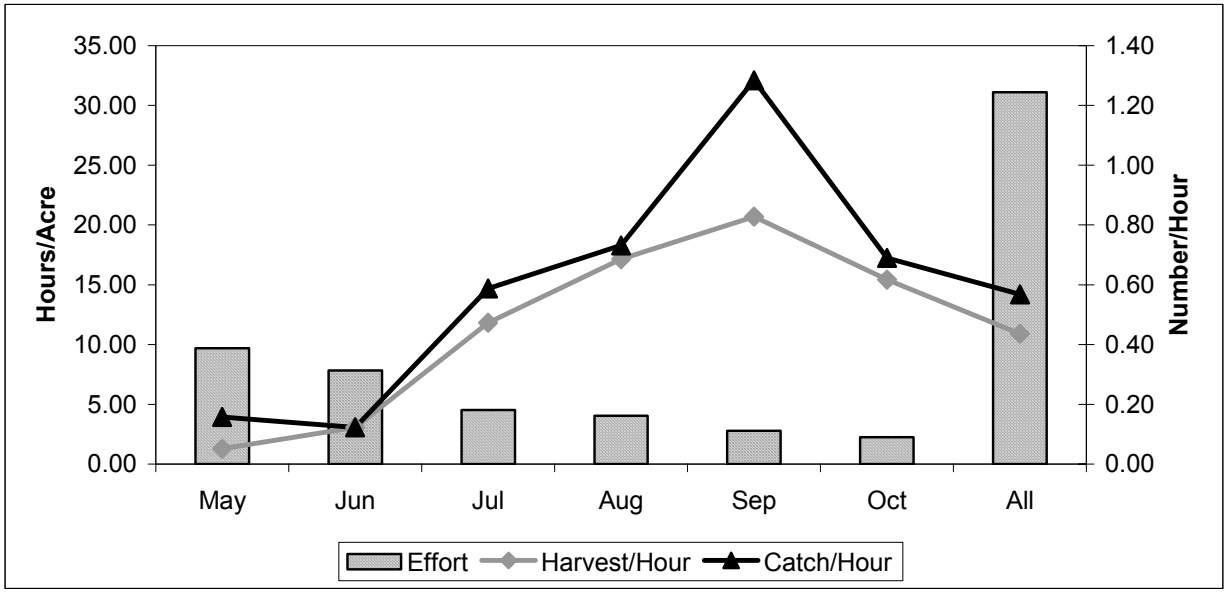

Figure A1. Overall effort and targeting angler catch and harvest rates for black crappie, Buffalo Lake, Minnesota, May 1-October 31, 2003.

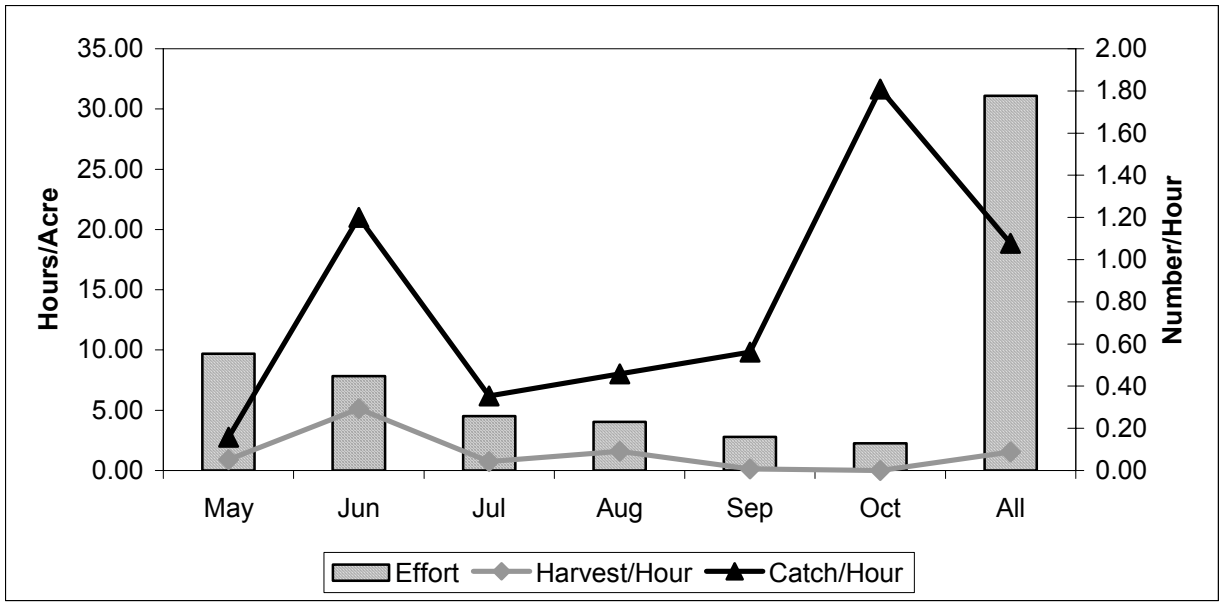

Figure A2. Overall effort and targeting angler catch and harvest rates for largemouth bass, Buffalo Lake, Minnesota, May 1-October 31, 2003.

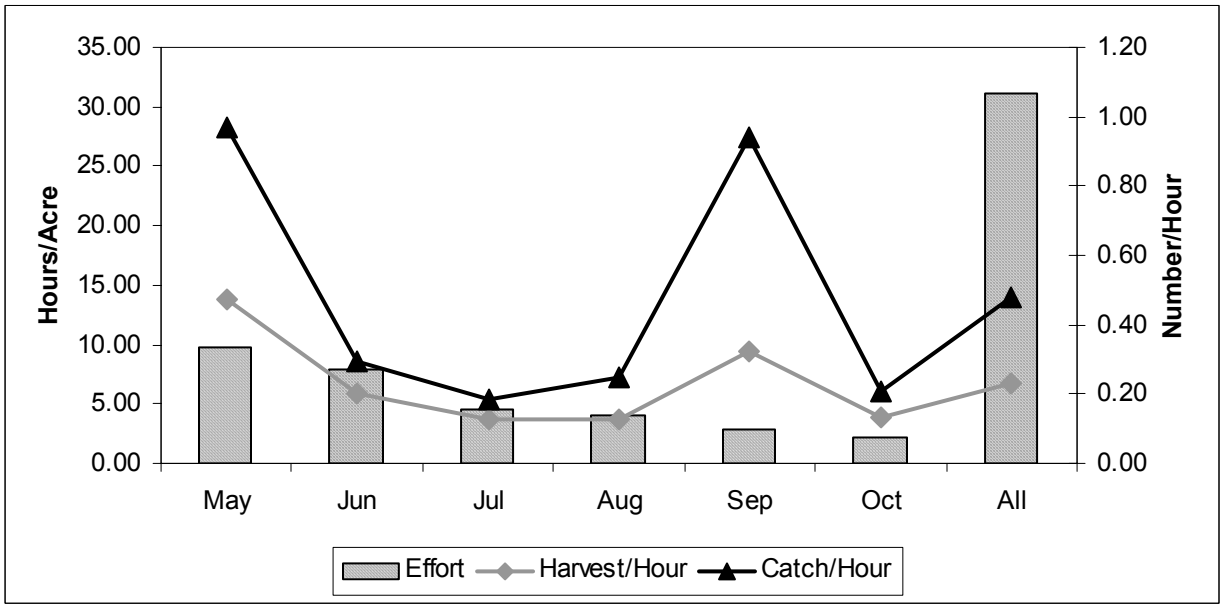

Figure A3. Overall effort and targeting angler catch and harvest rates for northern pike, Buffalo Lake, Minnesota, May 1-October 31, 2003.

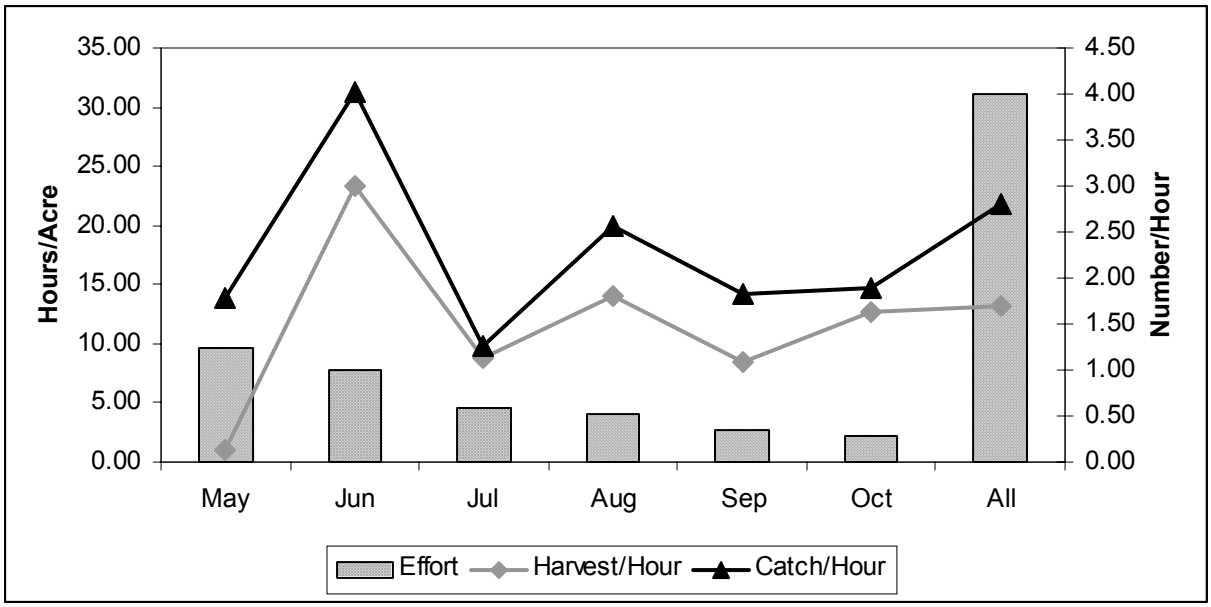

Figure A4. Overall effort and targeting angler catch and harvest rates for sunfish, Buffalo Lake, Minnesota, May 1-October 31, 2003.

Minnesota
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Area 340
Study 4
Job 668
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Minnesota Department of Natural Resources
Division of Fisheries

Completion Report

Buffalo Lake Creel Survey
May 1, 2003 to October 31, 2003

By

Mark Pelham
Completion Report

Approved by: _____
Area Supervisor Date

Approved by: _____
Regional Supervisor Date