

Minnesota
F-29-R(P)-27
Area 315
Study 4
Job 794
April 2008

**Minnesota Department of Natural Resources
Division of Fish and Wildlife
Section of Fisheries**

Completion Report

**Mississippi River Creel Survey
from St. Cloud to Coon Rapids
May 12 to September 30, 2007**

by

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Funded under Federal Aid by the Sport Fish Restoration Act, F-29-R(P)-27

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ABSTRACT

The Mississippi River within the Montrose area encompasses 45 miles (3727 acres) and a total of 60 miles (4922 acres) between St. Cloud Dam and Coon Rapids Dam. This stretch of river represents one of the largest waters within the Montrose fisheries management area and one with significant resources to justify active management. A creel survey was needed to provide information on fishing pressure, sport fish harvest, catch per unit of effort, average size kept, and angler satisfaction. Specific information was needed about the smallmouth bass (Micropterus dolomieu) fishery to properly evaluate an experimental angling regulation. The experimental regulation includes a possession limit of three smallmouth bass with no bass between 12 and 20 inches, and 1 bass over 20 inches. The experimental regulation was implemented in 1990 from Clearwater to Elk River and extended in 2000 from St. Cloud Dam to the confluence with the Crow River in Dayton. This portion of the river has received national recognition for its smallmouth fishery. Interest in the river has led to a new generation of anglers and equipment who can successfully access this reach.

The total angling pressure from May 12 through September 30 was 118,469 angler hours or 24.1 angler hours per acre. Twelve species of fish were caught of which smallmouth bass, channel catfish, carp, northern pike and walleye were caught most frequently. The total estimated harvest of all species was 80,650 fish or 16.3 fish per acre. The majority of anglers (51.6%) were fishing for smallmouth bass, followed by fishing for "all species" (25.5%), walleye (10.4%) and channel catfish (7.8%).

Fishing pressure on the Mississippi River in 2007 was considered moderate over all with 24.1 hours/acre. Harvest of smallmouth bass was minimal as only a little more than two percent of all smallmouth bass caught, were harvested during the entire season. An estimated 1,392 smallmouth bass were harvested during the 2007 creel season, 64% of which were taken legally from the area where the experimental regulation is currently in place (St. Cloud to Dayton). Overall, the population size structure of smallmouth bass caught in regulated and unregulated zones improved since 1992. Average size of smallmouth bass caught from 1992 to 1997 has improved from 12.9 to 13.6 inches. Since 1997, the average size has essentially remained unchanged as smallmouth bass caught during the 2007 season averaged 13.4 inches.

Data from the 1992, 1997 and 2007 creel surveys suggests that the experimental regulation reduced smallmouth bass harvest to some extent, as a trend of reduced harvest appeared to occur over

the same time period. Biological data suggests that the population has significantly improved when comparing the pre 1990 and post 1990 smallmouth bass population structures.

Similarly, observed regulation compliance was high, as all but one fish harvested within the regulation zone were below the slot limit. A total of 13 parties were contacted that harvested smallmouth bass; of those parties, only 17% of the smallmouth bass harvested were in areas outside the regulated zone.

The smallmouth bass experimental regulation appears to be reducing smallmouth bass harvest since the implementation in 1990. With moderate fishing pressure, the popularity of catch and release angling and the noted lack of harvest during 2007, it seems likely the regulation had a significant effect, although, due to confounding issues, it can not be touted as the only reason for the population improvement. Population trends observed since 1979 show notable improvement in the length frequency distribution since the implementation of the regulation in 1990. Comparison of populations between other sections of the Mississippi River (Little Falls, above St. Cloud Dam, etc.) was usually confounded by the different morphological factors of the river itself. A comparison of spring electrofishing length frequencies suggest the adult relative abundance was higher within the stretch from St. Cloud to Coon Rapids, but average length was slightly smaller.

Angling has been thought of as a primary factor affecting successful smallmouth bass recruitment and survival. It seems apparent from electrofishing results that discharge and habitat protection have far greater impact on this population's success' as a whole. However, regulation of the smallmouth bass on the Mississippi River should still be considered a valuable tool in changing angling behavior for the long term good. The regulation had considerable support of 97% of all the anglers contacted along the Mississippi River in 2007. Additionally, anglers favored extending the current regulation downstream to Coon Rapids Dam by a margin of 96%. When anglers within the non-regulated stretch were asked the same two questions, response rates were 93% and 89%, respectively. The social ramifications of a regulation extension to Coon Rapids Dam are important to anglers using the resource between May and September. Based on the information collected in 2007, the current regulation should be considered for extension in 2009 to include the river downstream to Coon Rapids Dam and all tributaries in the regulations stretch from their mouths upstream to the first dam or bridge.

INTRODUCTION

A high quality smallmouth bass fishery exists in the Mississippi River from St. Cloud to Dayton. In 1990, an experimental smallmouth bass regulation was implemented due to local concerns regarding perceived over harvest of larger smallmouth bass in this reach of the river. The experimental regulation includes a possession limit of three smallmouth bass with no more than one smallmouth bass more than 20 inches in length. In addition, the experimental regulation includes a protective slot limit that prohibits the harvest of smallmouth bass from 12 to 20 inches in length. The regulation originally covered waters between the city of Clearwater (Highway 24 bridge) and the city of Elk River (Highway 169-101 bridge). In 1999 an extension was attempted between St. Cloud Dam and Coon Rapids Dam. The regulation was adopted from St. Cloud Dam to the confluence of the Crow River in Dayton in 2000 (Figure 1). A statewide possession limit of six smallmouth bass with no size restrictions is in effect for the remainder of the study area. The goal of the experimental regulation is to reduce harvest and increase the average size of the smallmouth bass.

An initial creel survey was conducted in 1992 on the Mississippi River (St. Cloud-Dayton)(Wang and Diedrich, 1993). A follow-up survey was conducted in 1997 (Sledge, 1998). The objective of the 2007 creel survey was to provide a final report on current trends in fishing pressure and catch/harvest information on the Mississippi River (St. Cloud-Coon Rapids). In addition, we considered the effectiveness of the experimental regulation on changing the smallmouth bass fishery on this stretch of river since its implementation in 1990.

STUDY AREA

The creel study area encompassed 60 miles (4,922 acres) of the Mississippi River from the 10th Street dam in the City of St. Cloud to the Coon Rapids Dam (Figure 1). The study area was stratified into eight river sectors with two distinct clusters. Monticello was the split point between each cluster. The smallmouth bass experimental regulation zone covered 47 river miles (St. Cloud Dam to the confluence with the Crow River in Dayton, 3,557 acres) and the non-regulated area included sectors 7 and 8 from the confluence with the Crow River to Coon Rapids Dam(1,365 acres) (Figure 2 and Table 1).

METHODS

This survey incorporated a roving design with stratified random sampling. The strata are: day type (weekday/weekend), area fished (sampling cluster), and angler type (boat angler or bank angler). Two Mississippi River sampling clusters were divided into a total of eight sectors (Figure 2, Table 1). Sectors within clusters were sampled with non-uniform probability, based on past activity data.

During each work shift, the clerk used a jet-powered boat to traverse a route consisting of all of the sectors in one cluster. The cluster (A or B) sampled, start location (Sector 1,2, 3 or 4) and the shift (early or late) sampled, were selected at random for the first sample day of each grouping of sample days (randomly selected). Subsequent to the randomly selected "first sampling period" the sector sampled and the shift sampled were systematically selected. Systematic scheduling was necessary to accommodate the collection of adequate data from each strata and to accommodate union work rules.

Start or launching position (upstream or downstream end of the cluster) was randomly selected along with the starting sector for the cluster. Each sector thereafter was selected in a sequence most practical to minimize fuel consumption and distance traveled. All sectors within a cluster were visited on each day that the cluster was sampled. The clerk followed a regimented schedule that included the amount of time allotted to sample each sector on that day. The amount of time allocated to each sector within a cluster was not always equal. The clerk conducted a progressive count of bank anglers, and of boat anglers, as he traversed each sector. It was assumed that this activity count, regardless of which shift it was collected from, was representative for the day.

All weekend/Holiday days were sampled as well as two randomly chosen weekdays during each week from May 12 to September 30, 2007. The sampling day (on water) was divided into two non-overlapping shifts from 0600 hours to 1330 hours and 1330 hours to 2100 hours accounting for changes in available daylight time. The clerk was stationed at Lake Mariah SP (near Monticello) and had somewhat variable total shift lengths depending on launch site for each workday.

Catch and harvest data, along with angler profile information were collected by the clerk while traversing each sampling sector. For bank anglers, each angler was considered a separate party. The clerk interviewed all angler parties, when time permitted. If the clerk was not able to interview all angler parties in a sector, he collected a representative sample from anglers fishing throughout the entire length

of the sector.

In an effort to gain more complete-trip interviews, a postage-paid “complete trip card” was given to most interviewees unless the interview was a completed trip. The anglers were asked to complete the card and return it by mail to the Montrose Area Fisheries Office.

Previous creel surveys have included an aerial component for instantaneous counts of anglers. During the 2007 survey, a progressive count design was used to eliminate a need for the high cost of aerial count data by incorporating several formulae as follows:

Angling pressure estimation

The formulas for data analysis, and the data analysis program using SAS software, were developed by Heinrich (2002).

Daily boat counts for each sector within a cluster were summed to produce daily cluster totals. Mean daily totals for each cluster were calculated from these (Equation 1). The standard error of the mean daily cluster boat count was calculated as in Equation 2.

$$(1) \quad \bar{b} = \frac{\sum b_i}{n}$$

$$(2) \quad SE_b = \sqrt{\frac{\sum (b_i - \bar{b})^2}{n(n-1)}}$$

Where:

\bar{b}	=	mean daily cluster boat count
b_i	=	daily cluster sum of sector boat counts
SE_b	=	standard error of the mean daily cluster boat count
n	=	sample size

The mean daily number of boats was expanded to the total number of boats in a stratum by multiplying the mean daily number of boats by the number of days in the stratum.

Party-size data was collected by the creel clerk during angler interviews. Mean party size was defined as the mean number of anglers per boat, calculated by stratum. The standard error of the mean party size was calculated as in Equation 2. The number of boat anglers, by stratum, was calculated by

multiplying the number of boats by the mean party size (Equation 3). For the standard error of the number of boat anglers, it was assumed that there is no covariance between party size and the number of fishing boats (Equation 4).

The total number of anglers, and the standard error of the total number of anglers, was expanded to angler-hours of pressure and standard error of the angler hours, by multiplying the number of anglers by the length of the fishing day (14 hours in July and August).

$$(3) \quad A_{Tot} = \bar{S} * B_{Tot}$$

$$(4) \quad SE_{A_{Tot}} = \sqrt{(\bar{S}^2 * SE_{B_{Tot}}^2) + (B_{Tot}^2 * SE_S^2) + (SE_{B_{Tot}}^2 * SE_S^2)}$$

Where:

A_{Tot} = The total number of boat anglers in a stratum.

\bar{S} = Mean party size.

B_{Tot} = The total number of fishing boats in a stratum.

$SE_{A_{Tot}}$ = Standard error of the number of boat anglers.

$SE_{B_{Tot}}$ = Standard error of the total number of boat anglers in a stratum.

SE_S = Standard error of the mean party size.

Bank angler expansions are calculated in the same manner as that for boats, but since all bank anglers are counted, it is not necessary to expand the angler count (party size is always equal to one).

Harvest Estimation

Harvest rate (HPUE), was the number of fish harvested per angler, divided by hours fished. Formulas for HPUE and the associated standard error are described in Equations 5 through 8. The HPUE data set only includes parties that were fishing longer than thirty minutes at the time they were interviewed.

Harvested number, by fish species, was calculated by multiplying the mean non-targeted harvest rate by total pressure (angler hours). Harvested number, and the associated standard error, are described in Equations 9–10. No covariance is assumed between angler pressure and harvest rate.

$$(5) \quad AH_i = P_i * T_i$$

$$(6) \quad HPUE_i = \frac{F_i}{AH_i}$$

$$(7) \quad \overline{HPUE} = \frac{\sum(HPUE_i)}{n}$$

$$(8) \quad SE_{HPUE} = \sqrt{\frac{\sum(HPUE_i - \overline{HPUE})^2}{n(n-1)}}$$

$$(9) \quad HARVEST = Pr * \overline{HPUE}$$

$$(10) \quad SE_{Harvest} = \sqrt{(Pr^2 * SE_{HPUE}^2) + (\overline{HPUE}^2 * SE_{Pr}^2) + (SE_{HPUE}^2 * SE_{Pr}^2)}$$

Where:

AH_i = a party's angler hours

P_i = the number of anglers in a party

T_i = the amount of time a party had been fishing

$HPUE_i$ = a party's harvest rate

F_i = the number of fish, of a species, caught by a party

\overline{HPUE} = mean harvest rate of a species

SE_{HPUE} = Standard error of the mean harvest rate

$HARVEST$ = the number of fish, of a species, harvested in a stratum

Pr = pressure, in angler hours

SE_{Pr} = standard error of pressure

The estimated weight of harvested fish was generated using length-weight relationships. Length-weight relationships for smallmouth bass, channel catfish and walleye were developed from annual Mississippi River Electrofishing (1999-2005). Length-weight relationships from Carlander (1969) were used for black crappie, redhorse spp., rock bass and northern pike. The length-weight relationships used to calculate a weight for each species were as follows:

$$\text{Black Crappie} \quad \text{Weight}(\text{pounds}) = \frac{10^{-5.630+3.35(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Channel catfish} \quad \text{Weight}(\text{pounds}) = \frac{10^{-5.5855+3.2138(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Northern Pike} \quad \text{Weight}(\text{pounds}) = \frac{10^{-5.536+3.12(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Sucker spp} \quad \text{Weight}(\text{pounds}) = \frac{10^{-4.881+2.975(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Rock bass} \quad \text{Weight}(\text{pounds}) = \frac{10^{-4.92+3.055(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Smallmouth Bass} \quad \text{Weight}(\text{pounds}) = \frac{10^{-4.84+2.9957(\log(\text{len}(\text{inch})*25.4))}}{454}$$

$$\text{Walleye} \quad \text{Weight}(\text{pounds}) = \frac{10^{-5.2584+3.0807(\log(\text{len}(\text{inch})*25.4))}}{454}$$

Calculations for the total weight of harvested fish along with the associated standard error were defined in Equations 11-12. No covariance was assumed between mean weight and the number of fish harvested.

$$(11) \quad \text{WEIGHT} = \text{HARVEST} * \overline{Wt}$$

$$(12) \quad SE_{\text{Weight}} = \sqrt{(\text{HARVEST}^2 * SE_{Wt}^2) + (\overline{Wt}^2 * SE_{\text{Harvest}}^2) + (SE_{Wt}^2 * SE_{\text{Harvest}}^2)}$$

Sucker and redhorse species were combined because anglers were likely to misidentify these species. Angler demographic information was also collected during the interview. To assess angler satisfaction, Anglers were asked “On a scale of one to ten, with one being lowest and ten being highest, how would you rate the fishing quality today?” Anglers were also asked the following series of questions related to the overall quality of the fishing on the Mississippi River and specifically the smallmouth bass regulation on the river if it was their first time interviewed: Do you feel the fishery between St. Cloud and Coon Rapids has improved over the last ten years? Do you support the existing 12-20” protected slot, three fish daily bag limit regulation for smallmouth bass? In addition, would you support extending the current regulation down to Coon Rapids Dam?

RESULTS AND DISCUSSION

Fishing Pressure and Recreational Use

A total of 302 activity counts and 743 interviews accounting for 1285 anglers were conducted between May 12 and September 30, 2007 (Table 2). Of the 743 interviews, 16.1% were completed trip interviews overall. Completed trips varied between a low of 1.3% in June to a high of 35.3% in September. Bank anglers (which included wade anglers) accounted for 52.5% of all interviews while boat anglers (canoe, prop, jet, and drift boats) accounted for 47.5% (Table 3). Anglers that fished the Mississippi River between St. Cloud and Coon Rapids were predominantly from Central Minnesota and the Twin Cities Metropolitan Area (Figure 3). Minnesota anglers generally traveled less than 40 miles to reach the river while anglers from outside of Minnesota traveled up to 1552 miles to angle on the Mississippi River (Table 4 and Table 5)

The estimated total season fishing pressure was 118,469 angler hours or 24.1 angler hours per acre (Table 6). This was slightly higher than the 1992 estimate of 23.4 angler hours per acre and substantially higher than the estimate of 15.1 hours per acre in 1997 (Wang and Diedrich 1992, Sedge 1997). A summary of year comparisons can be found in Table 2. Some of the difference of pressure between years may be attributed to navigable reaches with higher than average discharge recorded at St.

Cloud Dam during 1997 while in 1992 more normal discharges were recorded. During 2007 lower than average discharge conditions were reported and increased pressure by wade and shore anglers was prevalent. A comparison of discharge by month for all three sampling years can be found in [Figure 4](#). Additionally, differences in angling pressure may be attributed to including more water resources in the survey. In 2007 the reach from Dayton downstream to Coon Rapids Dam added 1,365 acres of angling and recreational water yet, accounted for 25,142 hour or 18.4 hours/acre of pressure ([Table 6](#)). Although, when similar regulated areas were compared for both 1997 and 2007 creel surveys, pressure was still higher in 2007 with 29.3 hours/acre compared to 11.9 hours/acre in 1997.

Boat angler pressure estimates peaked in August (10,040 angler hours), whereas bank angler use peaked in June (8,536 angler hours). The highest combined fishing pressure occurred in June (15,780 angler hours or 4.44 angler hours per acre). Seasonal pressure estimates are shown in [Table 6](#). The majority of the season fishing pressure occurred in the Elk River to Monticello Area as compared to the 1997 survey results where St. Cloud-Clearwater section had the highest fishing pressure. With water levels lower than normal during 2007 ([Figure 4](#)), access to the river may have presented a significant restriction to boaters other than in areas where more “pool-like” habitat was available. The area near Elk River has two very large pool areas easily accessible to boaters in low flow conditions.

In previous creel surveys, recreational use on the Mississippi River was often an overlooked component of the users on this stretch. During this creel survey users such as tubers, canoers and general recreational boating were commonly observed in counts. Seasonal use estimates were calculated using a 4.9 hour average trip length (OMBS, MNDNR 2004) and accounted for 311,595 hours. With pressure estimates highest during June (126,189 hours) and July (125,067 hours). Sections with the most use included Sector 5 (Monticello Area downstream) with 53,581 hours and Sector 2 (Clearwater area) with 45,329 hours ([Table 8](#)). This indicates that recreational use aside from angling was also a significant portion of the pressure that occurred on the Mississippi River between St. Cloud and Coon Rapids during 2007.

Catch and Harvest

An estimated 80,650 fish or 16 fish per acre were caught between St. Cloud Dam and Coon Rapids Dam in the 2007 creel season on the Mississippi River. This was more than double that of the

1997 creel season (38,760 fish or 10.9 fish per acre). Twelve fish species were represented in the catch. Smallmouth bass were caught in the greatest numbers accounting for 51% of the total catch, followed by “all” species (21%), walleye (11%) and channel catfish. The highest total catch estimates were in June (9,607) and August (9,623)([Table A-5](#)).

The estimated total harvest of all species was 6,198 fish or 1.3 fish per acre ([Table 2](#)). Channel catfish were harvested in the greatest numbers accounting for 34.9% of the total harvest, followed by smallmouth bass (22.4%). Total harvest was lower than in both 1992 and 1997 with 8,799 and 9,413 fish, respectively.

During the 2007 Mississippi River creel season, an estimated total of 6,141 common carp were caught of which 11.8% were harvested ([Table A-5](#)). The mean length of harvested carp for the creel season was 21.4 inches while the mean length released was 22.2 ([Table 9](#)). The length frequency of carp harvested and released can be found in [Figure 5](#). Other species of interest recorded during the creel survey included sunfish and sucker species (Combined due to potential misidentification), rock bass, bullhead and bowfin, although, total catch, harvest and release numbers were low ([Table 2](#)). A length frequency of sunfish ([Figure 7](#)) and sucker species ([Figure 9](#)) demonstrate the limited catch and harvest for the entire creel season.

During the 2007 Mississippi River creel season, an estimated total of 7,631 channel catfish were caught of which 28.4% were harvested ([Table A-5](#)). The season catch rate for the entire study area was 0.292 fish per hour for anglers targeting channel catfish and 0.996 fish per hour for non-targeting anglers ([Table A1](#)). Some of the higher catch rates for non-targeting anglers may be attributed to a low number of anglers targeting channel catfish other than the early part of the creel season. The mean length of harvested channel catfish for the creel season was 18.7 inches ([Table 9](#)). The length frequency of channel catfish harvested and released can be found in [Figure 6](#).

An estimated total of 2,792 northern pike were caught during the 2007 creel season of which 7.3% were harvested ([Table A-5](#)). The season catch rate for the entire study area was 0.007 fish per hour for targeting anglers and 0.044 fish per hour for non-targeting anglers ([Table A-2](#)). Some of the higher catch rates for non-targeting anglers may be attributed to a low number of anglers targeting northern pike other than the early part of the creel season. The mean length of harvested northern pike for the creel season

was 20.9 inches, whereas the mean length of released northern pike was 19.8 inches (Table 9, Figure 8).

An estimated 57,809 smallmouth bass were caught during the 2007 creel season of which 2.4% (1,392) were harvested (Table A-5). The season catch rate for the entire study area was 2.99 fish per hour for anglers seeking smallmouth bass and 0.996 fish per hour for non-targeting anglers (Table A-3). The mean length of harvested smallmouth bass was 10.3 inches (Table 9 and Figure 10). Smallmouth bass catch rates peaked in September for both targeting and non-targeting anglers (Figure 14). Over 300 “complete trip cards” were handed out with 110 returned, and only 78 were returned with useable information. Completed trip card information did not significantly affect the overall harvest, catch or release rates and numbers and were not included in the overall analysis.

Sixty-five percent of the estimated total of 1,477 walleye that were caught during the 2007 Mississippi River creel season were harvested (Table A-5). The season catch rate for the entire study area was 0.054 fish per hour for anglers targeting walleye and 0.021 fish per hour for non-targeting anglers (Table A-4). The mean length of harvested walleye for the creel season was 16.5 inches, whereas the mean length of released walleye was 15.0 inches (Table 9 and Figure 11).

Smallmouth Bass Regulation Analysis

Ninety-eight percent of all anglers did not harvest a smallmouth bass in the Mississippi River from St. Cloud to Coon Rapids, and no party harvested more than four smallmouth bass (Table 10). While the data suggest that the reduced bag limit (3) and protected slot limit in the regulations zone had limited biological effect of reducing smallmouth bass harvest; it was apparent that the lack of harvest whether due to regulation or the interest in catch and release angling has modified the population structure in the past 17 years (Figure 16). A higher incidence of complete trip interviews (16.1% overall) and data collected from valid return cards suggest that the lack of harvest is real. Length frequencies of harvested and released fish within the regulation zone and out of the regulation zone were not significantly different (Table 12). Although, the average size released by anglers in the regulation area (13.4 inches) was somewhat higher than the non-regulated zone (13.0 inches).

The estimated season fishing pressure for the smallmouth bass experimental regulation zone was

93,331 angling hours or 26.2 angling hours per acre, whereas the pressure was 25,142 angling hours or 18.4 angling hours per acre for the non regulated zone (Table 11). In comparison, Wang and Deidrich (1993) reported 23 angling hours per acre in the experimental regulation zone in 1992, and Sledge (1998) reported 20.4 hours per acre for 1997 (Table 13). Within the smallmouth bass experimental regulation zone of the Mississippi River in 1997, 44.5% of the interviewed parties were fishing for smallmouth bass (n=476), whereas 51% of the parties interviewed in the regulated zone in 2007 were fishing for smallmouth bass (n=386)(Table 14). This increased pressure has influenced the overall catch of smallmouth bass (Table 2). The fishing pressure on the Mississippi River in 1997 was considered light in the smallmouth bass experimental regulation zone and light-moderate in the non regulated zone. While in 2007 fishing pressure was likely considered moderate overall and light in the non-regulated zone.

An estimated 9,296 smallmouth bass or 4.21 bass per acre were caught in the smallmouth bass experimental regulation zone during the 1997 Mississippi River creel season (Table 13) and an estimated 7,123 smallmouth bass or 5.28 bass per acre were caught in the non-regulated zone during 1997. During 2007, an estimated 46,322 smallmouth bass or 13.02 bass per acre were caught in the experimental regulation zone. This was a significant increase in catch and pressure since 1997. Yet, within the non-regulated area a noticeable decrease in percent of catch harvested was observed between 1992, 1997 and 2007 with 13.1, 2.4, and 0.6, respectively (Table 13). Bublitz (1997) reported an estimated 16% of the smallmouth bass catch was harvested in Mississippi River from Little Falls to Brainerd which is covered by statewide regulations. Between 1974 and 1982 (Xcel energy data), an average of 43% (n=7) of the smallmouth bass catch was harvested in the Mississippi River (Brad Carlson, unpublished data). The harvest rates of smallmouth bass in 2007 were lower than 1997 in both zones, which suggests the current smallmouth bass fishery in the Mississippi River from St. Cloud to Coon Rapids is disposed toward catch and release angling. The smallmouth experimental regulation, changes in angler demographics, increased access, and increased acceptance of catch and release as a management strategy may have influenced the change from a harvest oriented fishery of the past to a catch and release fishery.

The smallmouth bass catch rate for non-targeting anglers for the creel season was 0.4964 fish per hour in the experimental regulation zone and 0.4566 fish per hour in the non-regulated zone (Table 13). While targeting angler catch rates for the regulation zone (2.924) and non-regulation zone (3.223), were

essentially the opposite (Table A-3). The data suggests angling has improved in the non-regulated areas as well. This may be attributed to the mobile nature of smallmouth bass in the Mississippi River within this reach. With documented migrations up and downstream across the regulation boundary (Altena, 2003), there were likely fish protected by the regulation that migrated and were caught in the non-regulated areas.

During the 1997 creel survey anglers in the non regulated zone harvested a higher proportion of the catch and harvested somewhat larger smallmouth bass than anglers in the experimental regulation zone. In 2007, smallmouth bass harvest rates were low in both zones with the larger component of the harvest occurring legally within the experimental regulation zone. Similarly, larger average size smallmouth bass (13.4 inches) were caught in the regulation zone than in the non-regulated area (13.0 inches)(Table 12). However, the percent of catch harvested was lower than in both 1992 and 1997 (2.4%) suggesting the experimental regulation may influence angler harvest decisions in the non-regulated zone.

True differences in size structure between zones may be impossible to determine since the experimental regulation zone is not a closed system. Movement of smallmouth bass between all accessible areas within this 60 mile stretch of river occurs seasonally. In 2001-2002 a telemetry study demonstrated seasonal migrations of up 35 km to spawning habitat and wintering areas, and movement across the regulation boundary line.

During 2007 the length frequency of all smallmouth bass caught was fairly balanced with the most abundant individuals between 10 and 15 inches. The size structure of angler caught smallmouth bass improved since 1992 however, it appears unchanged since 1997. During the 1992 creel survey, the average length of caught smallmouth bass for the entire creel area was 12.9 inches, while in 1997 and 2007 the average length was 13.6 inches. Only 33% of the total smallmouth bass catch was over 12 inches in length during the 1992 creel survey. In 1997, 71% of the total smallmouth bass catch was over 12 inches in length and in 2007, 64.5% were over 12 inches. While this is lower than in 1997, there are year class effects that are driving the percent catch of fish less than 12 inches. Decreased Proportional Stock Density (PSD) of smallmouth bass has been observed in the electrofishing catch due to large year classes of smallmouth bass in 2004-2006.

In conclusion, the smallmouth bass experimental regulation appears to be reducing smallmouth

bass harvest to the point that the regulation in effect acts as a catch and release regulation. Changes in population dynamic parameters such as size structure and abundance have been observed with the long term monitoring approach of both the DNR and Xcel Energy. Evidence from the 1997 creel survey suggested that the length frequency distribution of caught smallmouth bass had improved since 1992 and this was attributed to a strong year class moving through the population. Continuous improvement in size structure, abundance and recruitment since the early 1990s suggest the improvement may be unique. While other areas of the Mississippi River have seen variable abundance, recruitment, and unstable length frequency, the stretch from St. Cloud to Coon Rapids has experienced significant improvement in most population indices. The benefit that the regulation may have on the non-regulated area if it were extended in 2009 is truly unknown. The estimated value of the fishery was \$2.1 million in 2007. Technological advances such as jet boats have made the river easily accessible by increasing number of anglers. Extending the regulation downstream to the Coon Rapids Dam should provide increased protection to that area, and it appears reasonable to suggest additional economic benefit would be gained.

Demographics and Fishing Quality

The majority of anglers interviewed during the 2007 creel season were fishing for smallmouth bass (51%) and walleye (26%)(Table 14). Most anglers were male and resided within 10 miles of the river (Table 4, Table 15). The mean fishing quality rating for all parties fishing the Mississippi River was 4.0 while parties fishing from jet boats, drift boats and canoes had mean ratings greater than 5.0 (Table 16). Similarly, anglers fishing for smallmouth bass and walleye had higher ratings than those fishing for northern pike and channel catfish. In addition, anglers were slightly more satisfied in the regulation zone (Average rating = 4.19) compared to the non-regulation zone (Average rating = 3.61)(Table 17), although, overall satisfaction was not favorable as catch rates would indicate.

Anglers were also asked the following series of questions related to the overall quality of the fishing on the Mississippi River and specifically the smallmouth bass regulation on the river during only their first interview: Do you feel the fishery between St. Cloud and Coon Rapids has improved over the last ten years? Do you support the existing 12-20" protected slot, three fish daily bag limit regulation for smallmouth bass? In addition, would you support extending the current regulation down to Coon Rapids

Dam?

Responses to the question “Do you feel the fishery between St. Cloud and Coon Rapids has improved over the last ten years?” resulted in 72.3% of anglers stating that the fishery had improved with 73.9% and 63.5% in the regulated and non-regulated zones, respectively (Table 18). Responses to the question “Do you support the existing 12-20” protected slot, three fish daily bag limit regulation for smallmouth bass?” revealed that anglers had overwhelming support for the current regulation. Anglers supported the regulation overall, by answering “yes” with 95.7% of parties and support was noticed in both the regulation zone and non-regulation zone with 96.8% and 93.1%, respectively (Table 19).

Anglers were also asked, “Would you support extending the current regulation down to Coon Rapids Dam?”. Responses from this question were also favorable to extending the regulation with 94.1% of parties answering “yes”. Parties in the regulation zone answered “yes” 96.1% of the interviews, while parties in the non-regulation zone answered “yes” in 89.2% of the interviews (Table 20). The responses from the regulation questions suggest positively that anglers who used the Mississippi River between St. Cloud and Coon Rapids, between May and September, were in favor of the current regulations and would support extending the current regulation to Coon Rapids Dam. Based on the information collected in 2007 the current regulation should be considered for extension in 2009 to include the river downstream to Coon Rapids Dam and all tributaries in the regulations stretch from their mouths upstream to the first dam or bridge.

ACKNOWLEDGMENTS

This project was funded by the Federal Aid in Sport Fish Restoration (Dingell-Johnson) Program. The survey was designed by Tom Heinrich along with Dennis Topp and reviewed for statistical validity. Les Lee and Mark Pelham conducted creel interviews and participated in data entry. Paul Diedrich, Joe Stewig, Chris Gelner, Jason Neuman, Jan Ouren and Mark Pelham were essential contributors in the completion of this report.

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Mississippi River Creel Area 2007

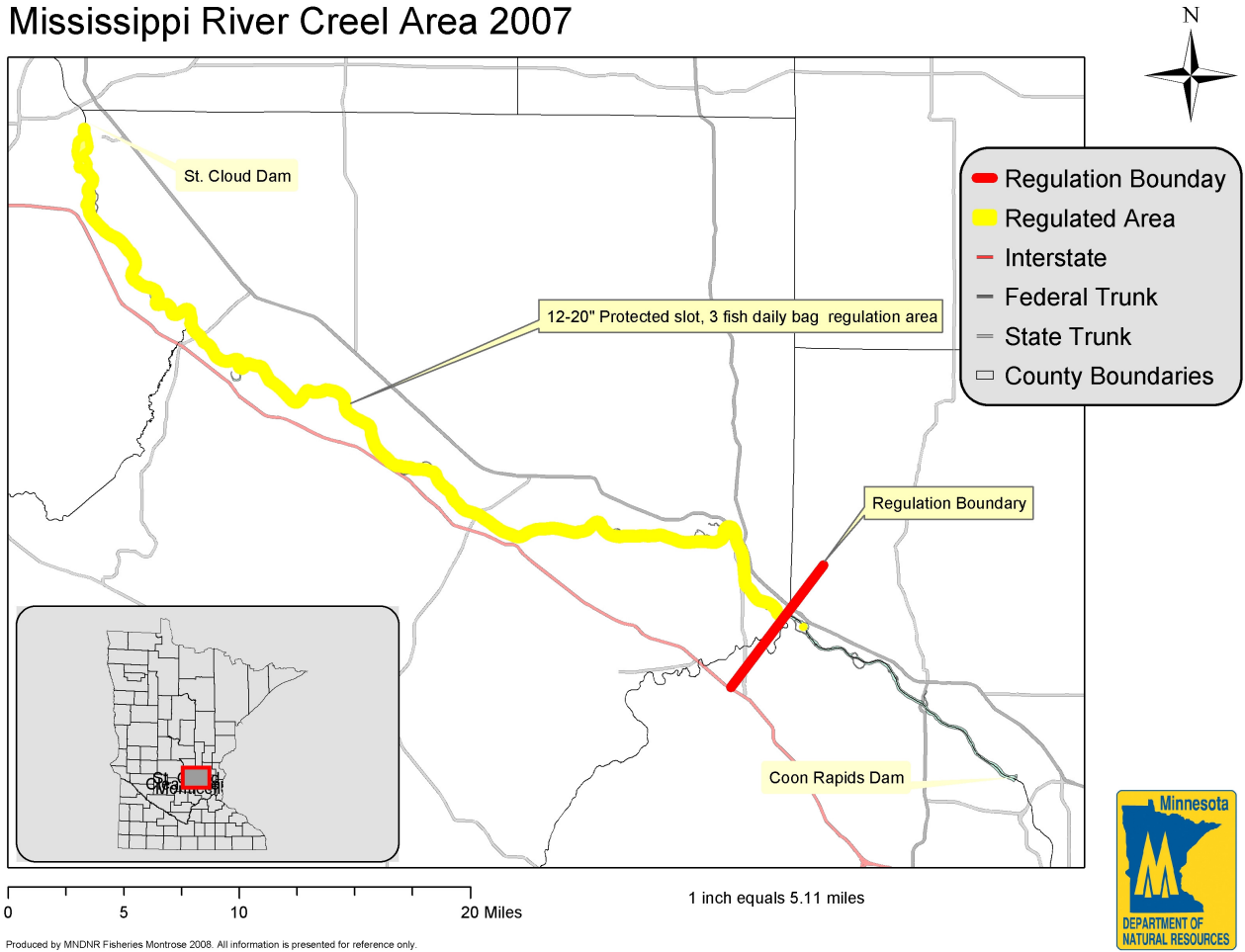


Figure 1. Mississippi River between St. Cloud and Coon Rapids showing the regulated and non regulated portions of the river sampled in the 2007 creel survey.

Mississippi River Creel Sectors 2007

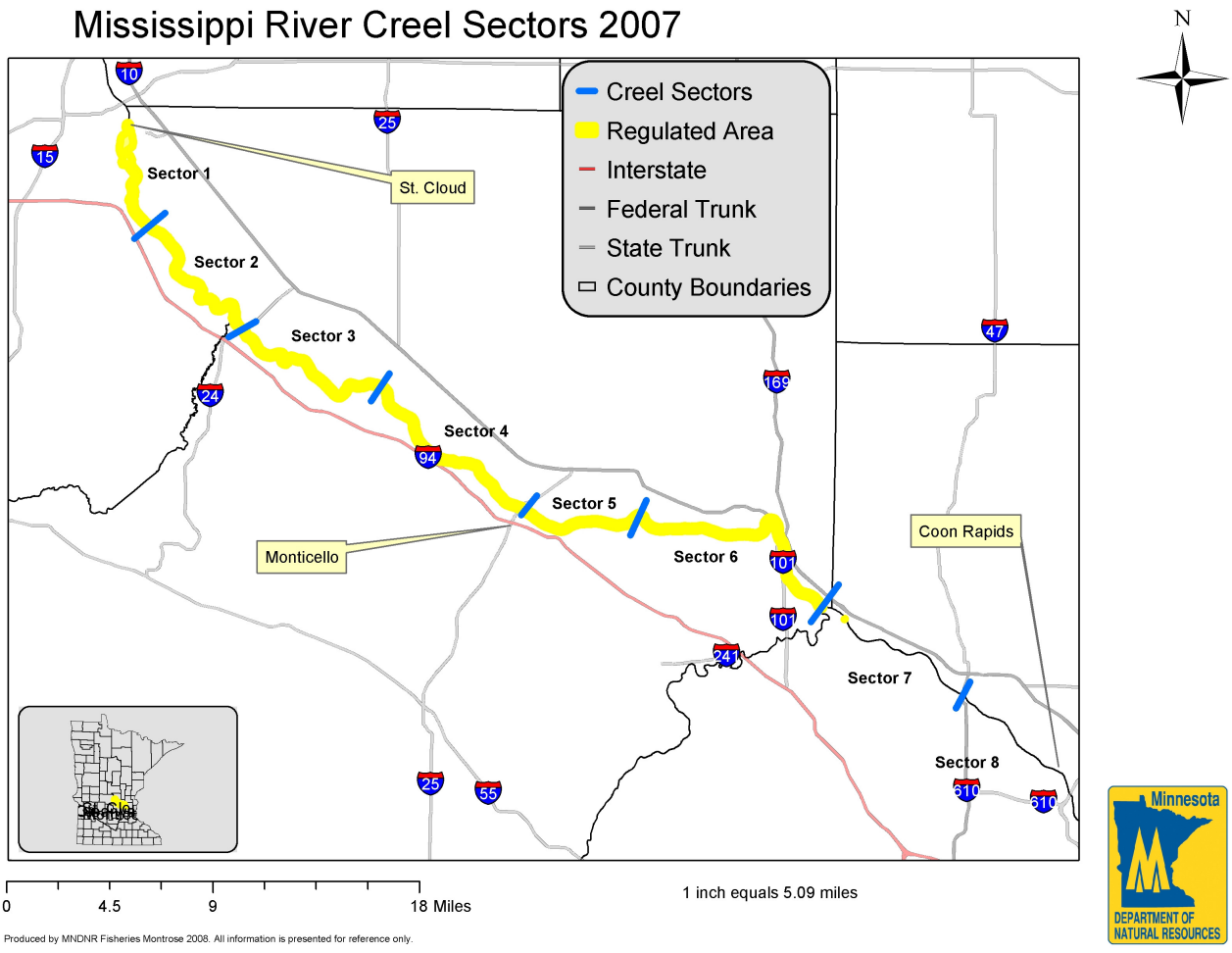


Figure 2. Creel sectors used for sampling the Mississippi River between St. Cloud and Coon Rapids, MN May 12 through September 30, 2007.

Mississippi River Creel Area 2007, Zip Codes

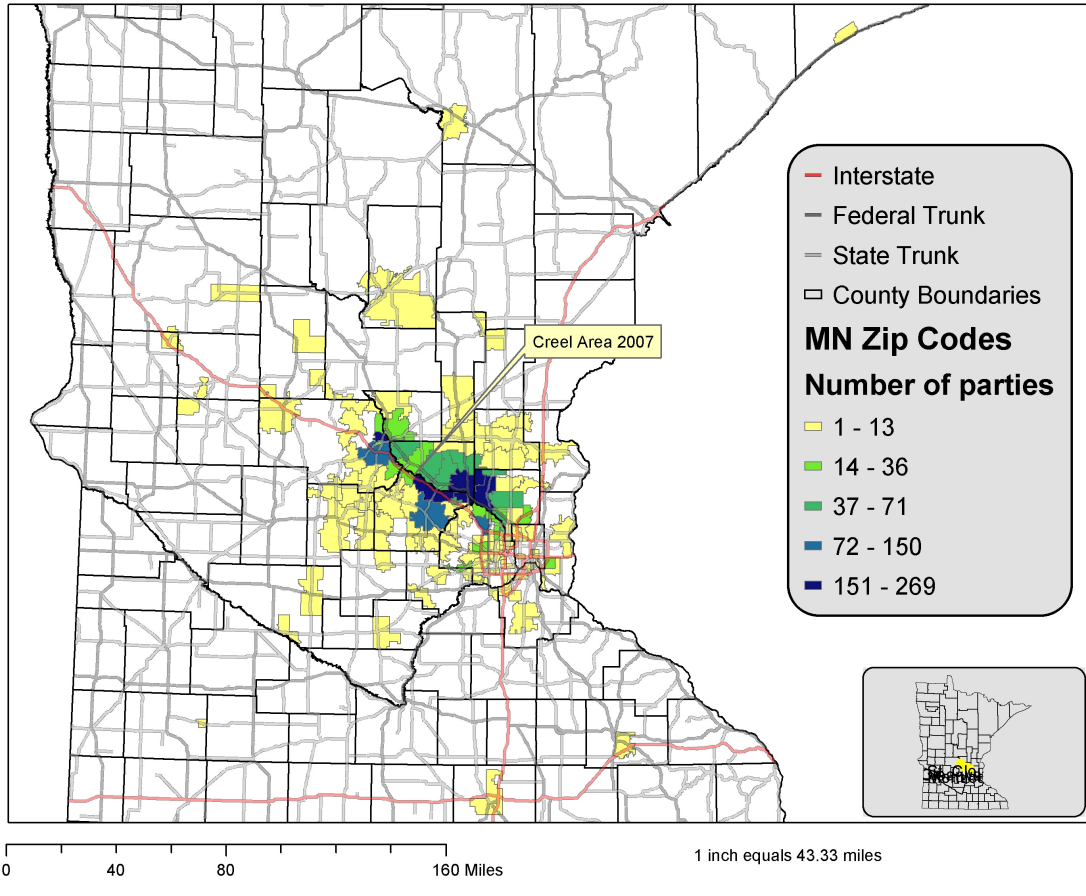


Figure 3. Number of anglers interviewed from Minnesota Zip codes during the 2007 creel survey of the Mississippi River between St. Cloud and Coon Rapids MN May 12 through September 30, 2007.

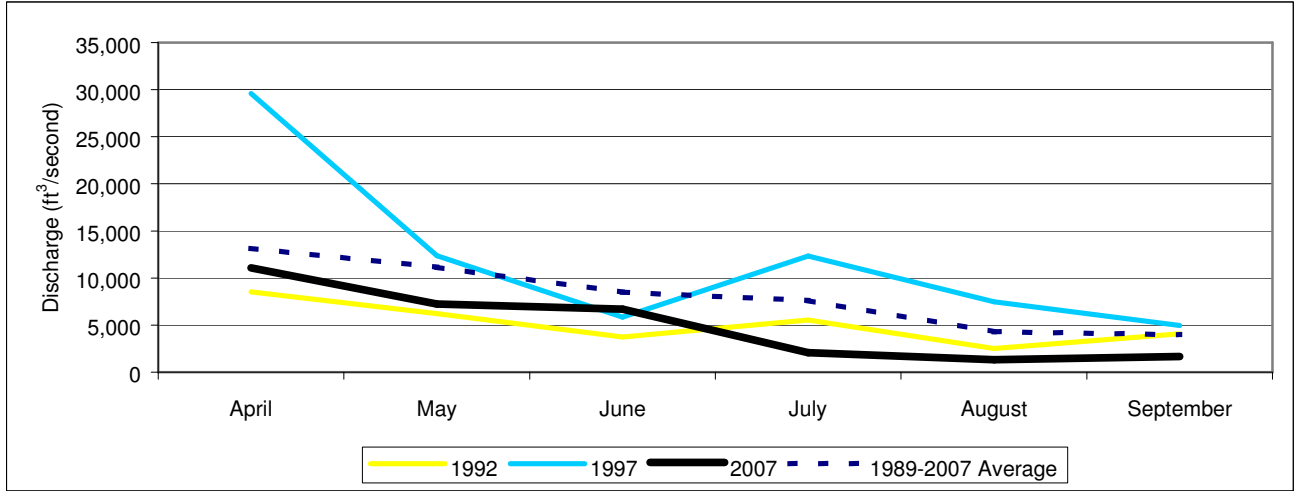


Figure 4. Mississippi River discharge (ft³/second) recorded at St. Cloud Dam for April through September 1992, 1997, 2007 and the 1989-2007 average.

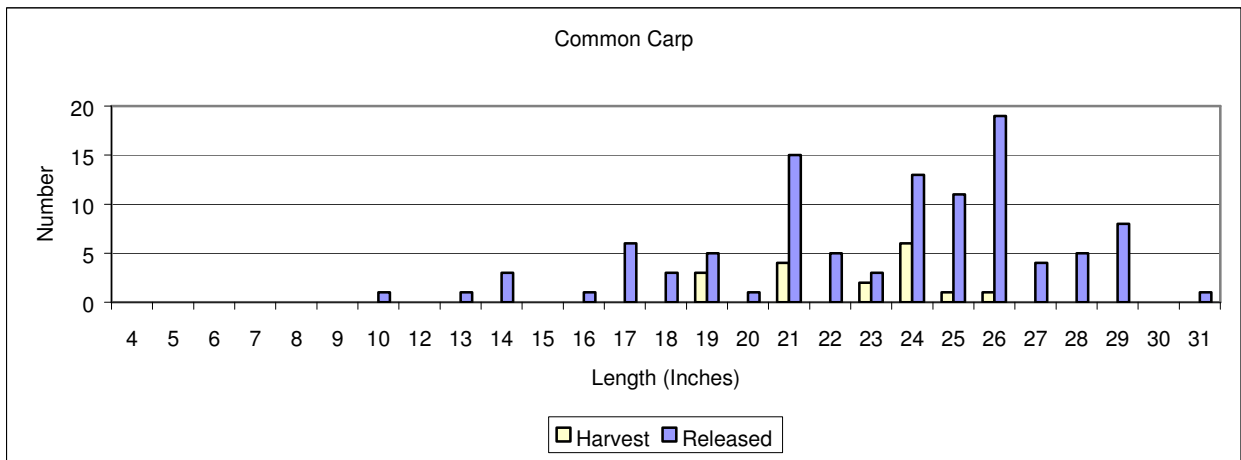


Figure 5. Common carp harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

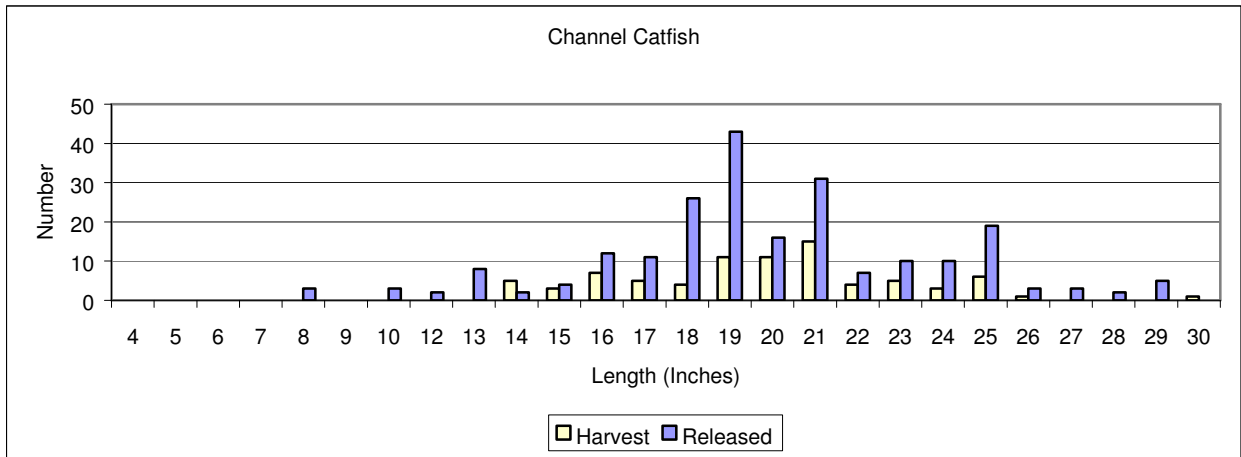


Figure 6. Channel catfish harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

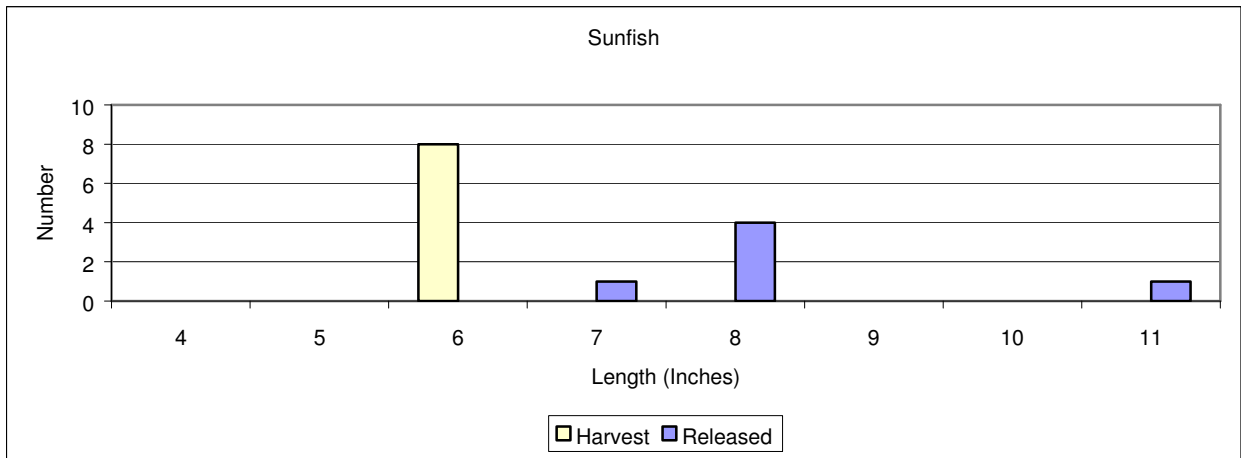


Figure 7. Sunfish harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

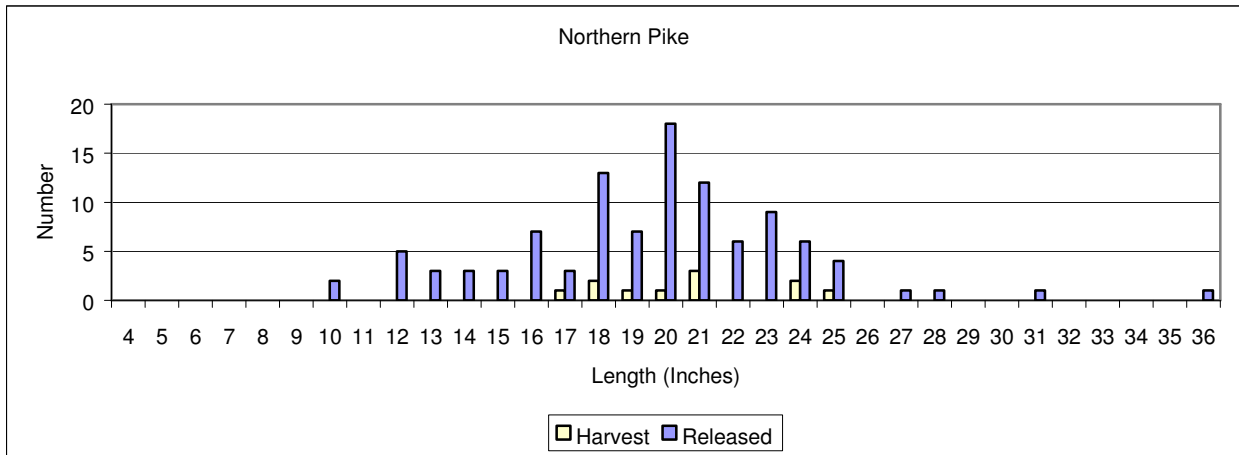


Figure 8. Northern pike harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

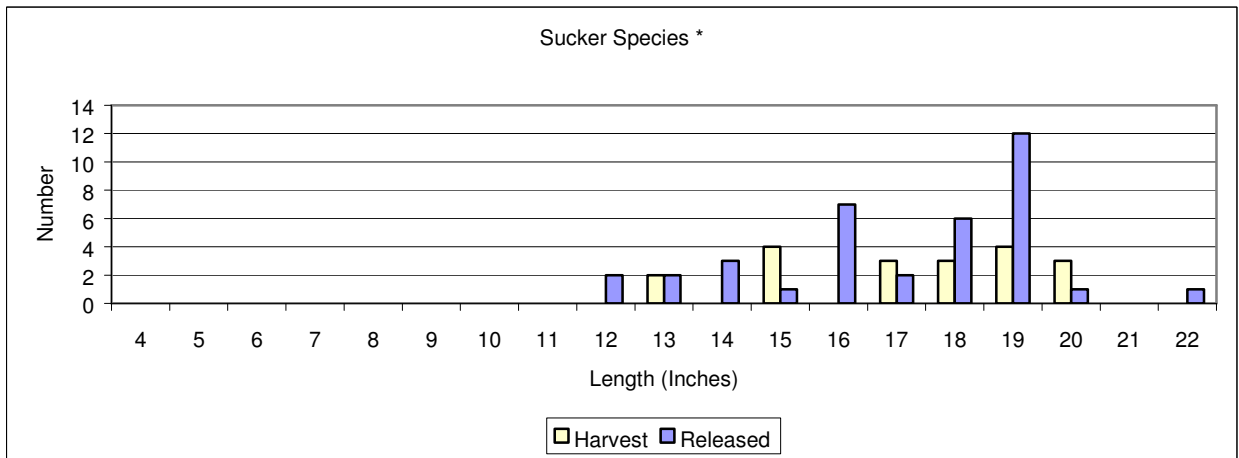


Figure 9. Sucker species harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

* - Includes white sucker, redhorse spp and northern hog sucker.

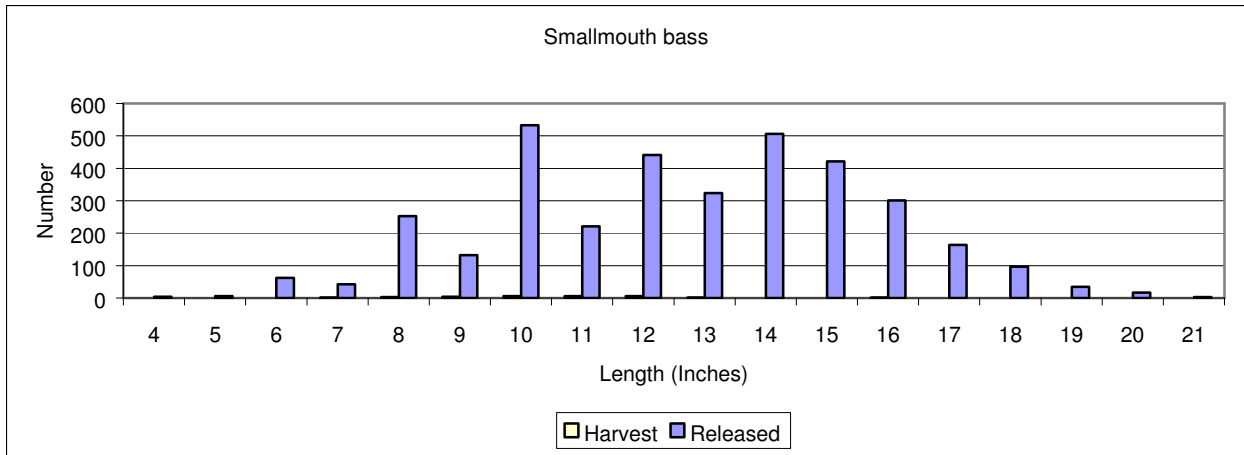


Figure 10. Smallmouth bass harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

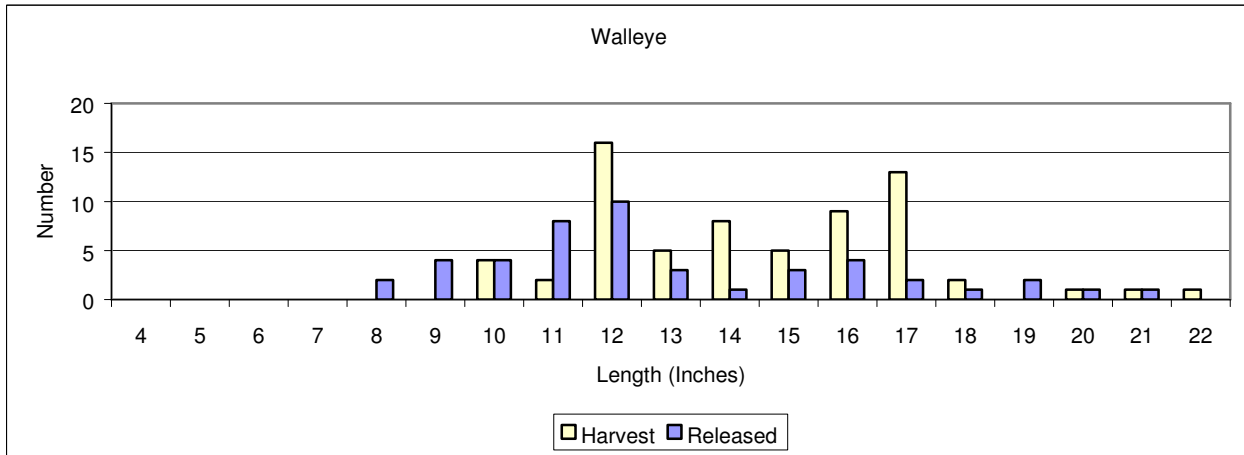


Figure 11. Walleye harvest and release length frequency recorded during the creel survey on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

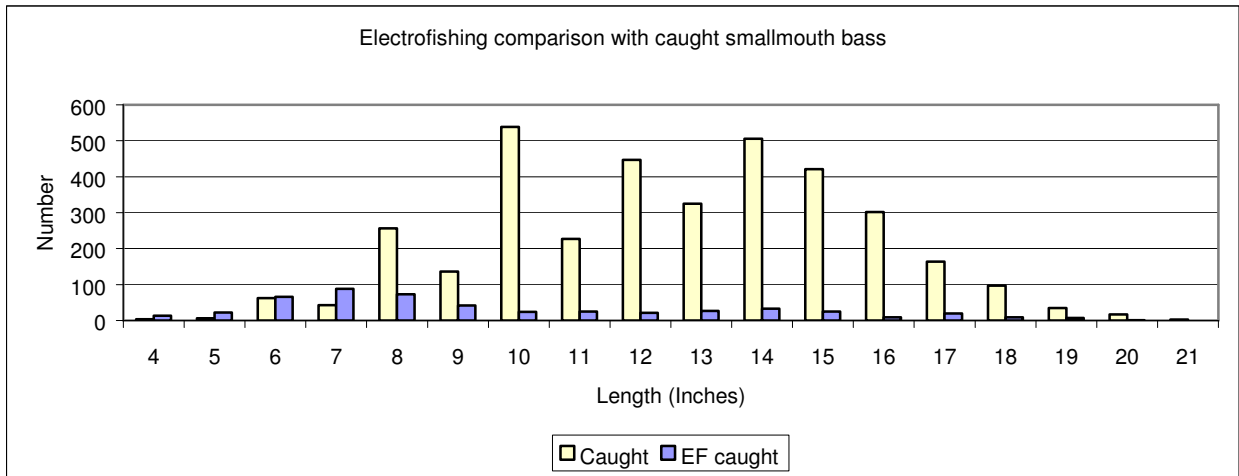


Figure 12. Smallmouth bass angler catch and electrofishing length frequency recorded during the creel and electrofishing survey and on the Mississippi River between St. Cloud and Coon Rapids, MN 2007.

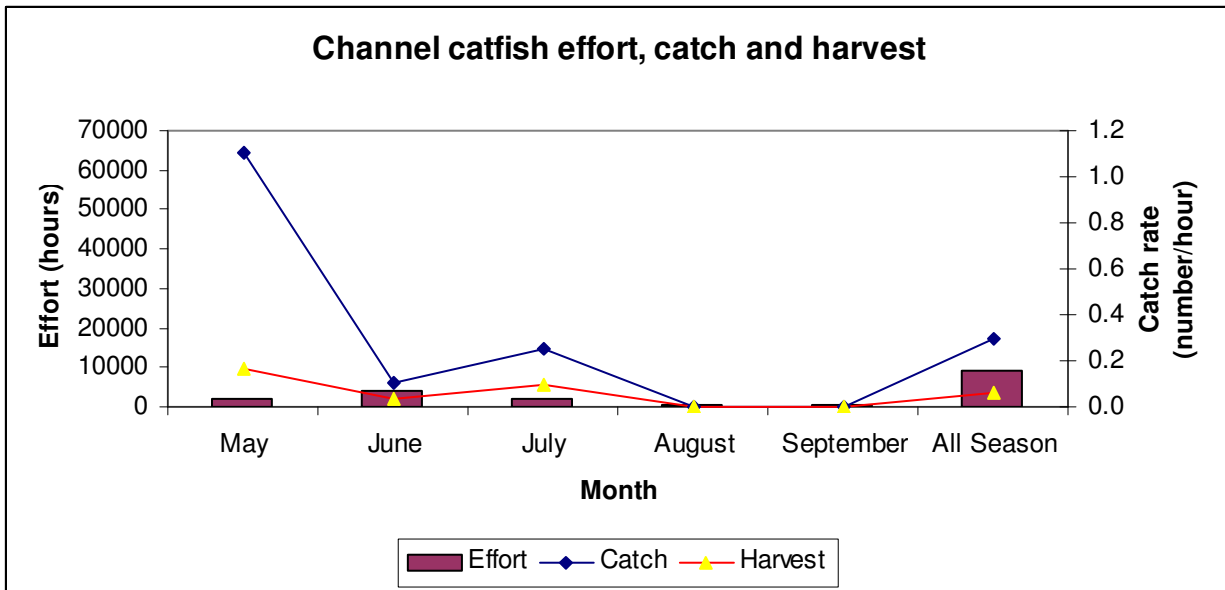


Figure 13. Channel catfish angler effort, catch and harvest rates recorded on the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

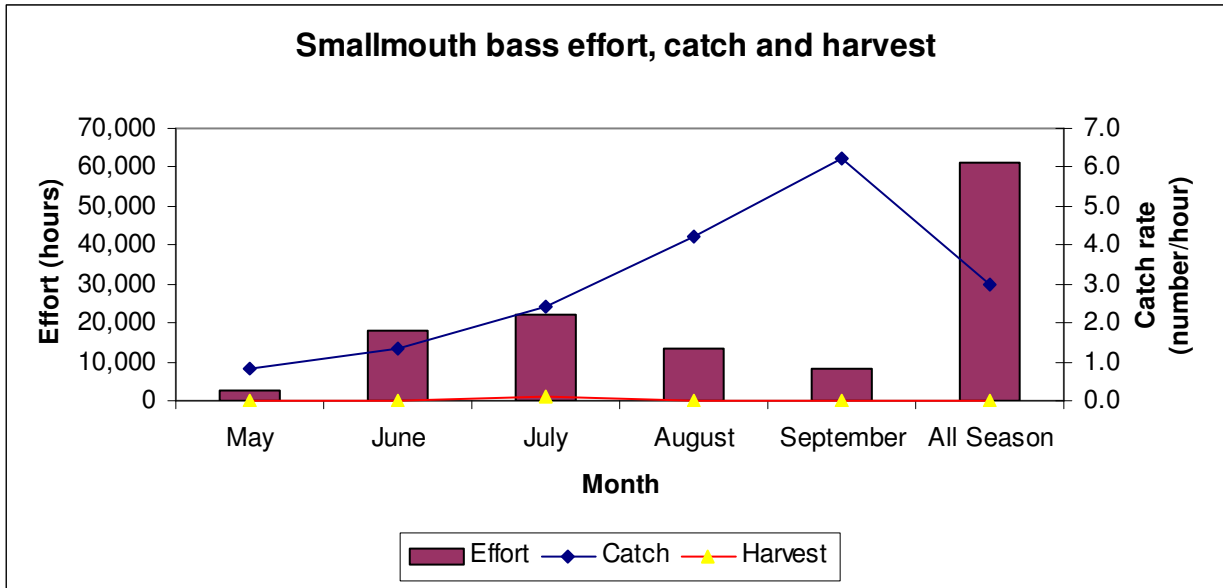


Figure 14. Smallmouth bass angler effort, catch and harvest rates recorded on the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

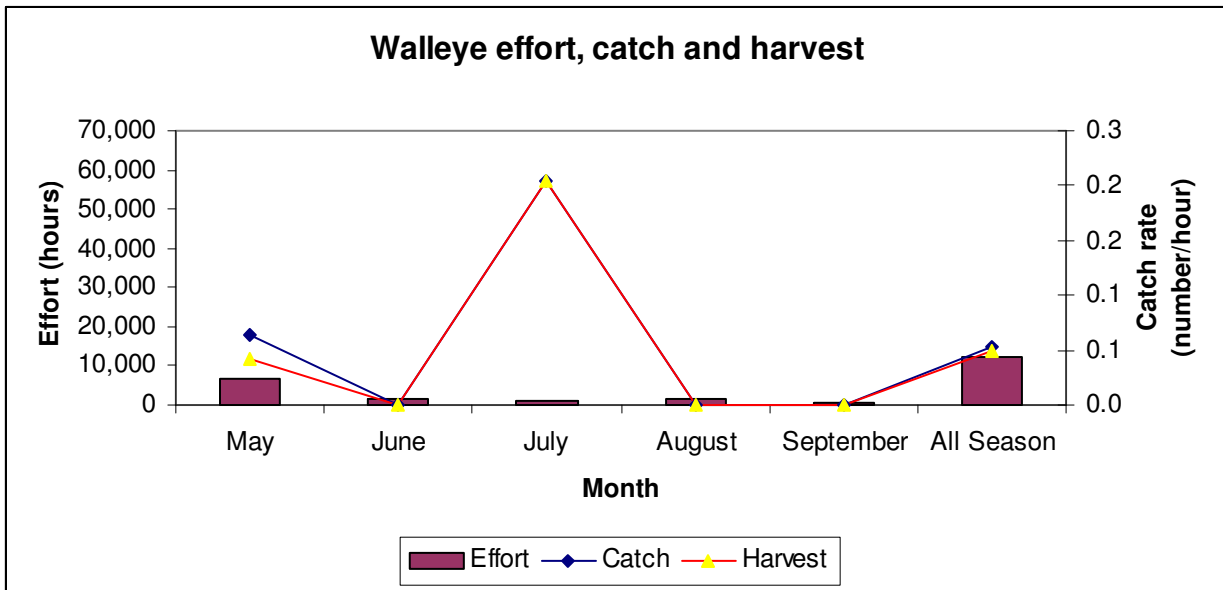


Figure 15. Walleye angler effort, catch and harvest rates recorded on the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

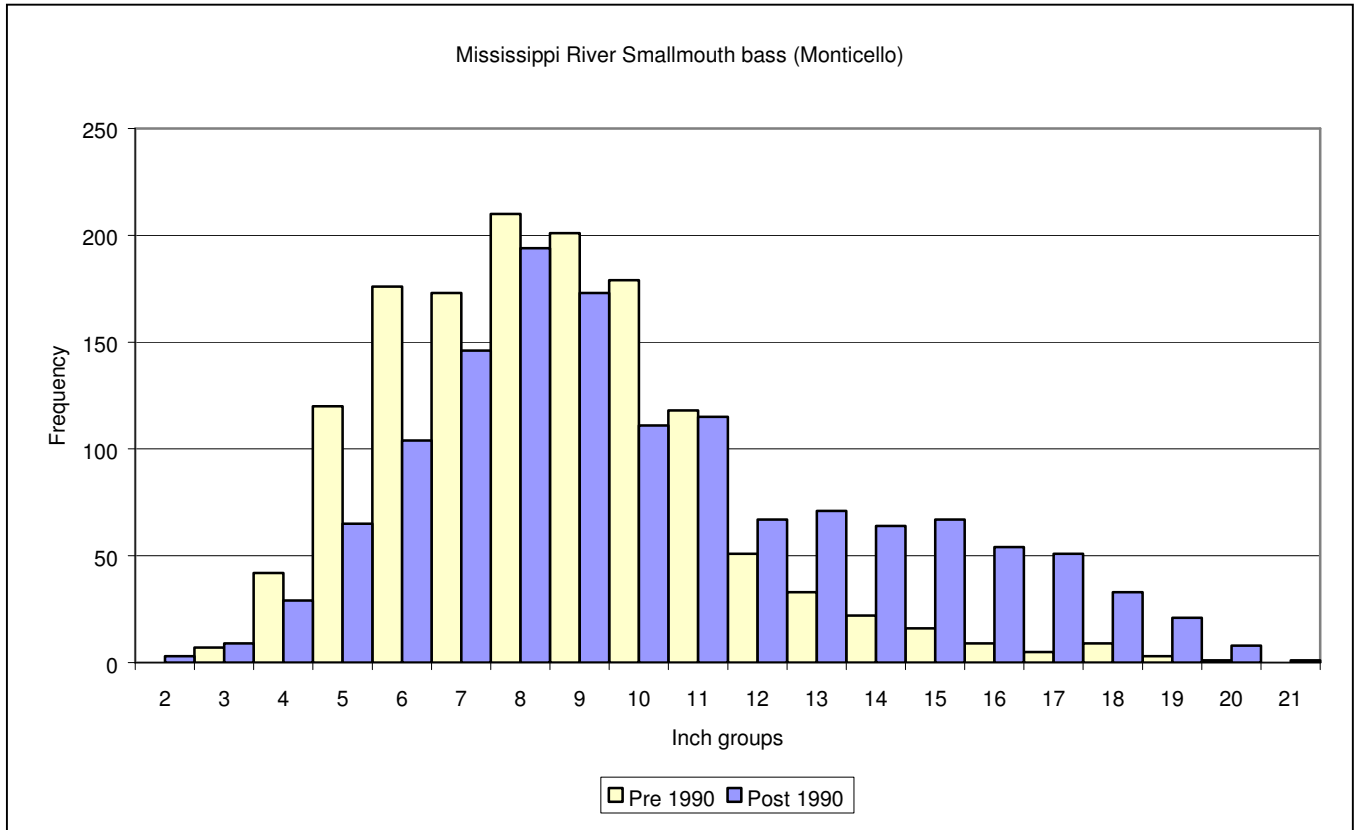


Figure 16. Smallmouth bass compiled length frequency 1979-1989 and 1990-2007 captured by electrofishing on the Mississippi River near Monticello MN.

Table 1. Creel sectors and clusters where interviews were conducted on the Mississippi River (St. Cloud to Coon Rapids, MN) May 12- September 30, 2007.

Cluster	Sector	Area Description	Length (miles)
A	1	St. Cloud Dam to the confluence with St. Augusta Creek	5.02
	2	St. Augusta Creek to State Highway 24 Bridge in Clearwater	7.3
	3	Hwy 24 Bridge to Snuffy's Landing in Becker	7.96
	4	Snuffy's Landing to Ellison Park in Monticello	9.21
B	5	Ellison Park to Kadler Avenue access	5.25
	6	Kadler Avenue to Crow River Confluence	11.18
	7	Crow River confluence to State Highway 169 bridge in Anoka/Champlin	7.84
	8	Hwy 169 to Coon Rapids Dam	5.41

Table 2. Comparison of strata statistics for the 1992, 1997 and 2007 Mississippi River creel surveys.

		St. Cloud-Dayton 1992		St. Cloud-Dayton 1997		St. Cloud -Coon Rapids 2007			
Total hours	81,916			53,889			118,469		
Hours/acre	23.03	3557 acres		15.15	3557 acres		24.06	4922 acres	
Mean party				1.79			1.73		
Mean trip length	4.53			2.66			2.83		
N Anglers	-			1160			1152*	*Actual count data	
N Counts	720			67			302		
N interviews	2249			648			748		
% complete	-			3.1			16.84		
Number days	WD	WE		WD	WE		WD	WE	
May	6	6		5	8		7	5	
June	10	7		8	9		8	9	
July	10	6		8	9		8	10	
August	10	8		9	10		9	6	
September	9*	8*		8	9		8	10	
* -Includes -October 5									
Total days sampled	45	35		38	45		40	40	
Species	Catch Number	Harvest Number	Released Number	Catch Number	Harvest Number	Released Number	Catch Number	Harvest Number	Released Number
American Eel	0	0	0	11	0	11	0	0	0
Black Crappie	448	224	224	107	54	53	108	98	10
Bowfin	46	31	15	279	54	225	377	0	377
Carp	7,396	901	6495	4,277	915	3362	6,142	727	5,415
Channel Catfish	4,026	1,228	2,798	2,366	1,234	1132	7,631	2,167	5,464
Northern Pike	1,903	394	1509	1,986	261	1725	2,792	204	2588
Rock Bass	520	0	520	589	54	535	679	0	679
Smallmouth Bass	40,734	2170	38564	17,023	806	16217	57,809	1,392	56,417
Sucker species	10,844	2,225	8,619	7,802	3,880	3922	2,606	636	1,970
Walleye	4,309	1,626	2,683	4,144	2,035	2109	1,477	963	514
White Crappie	0	0	0	120	66	54	0	0	0
Sunfish						0	11	0	11
Bullhead	107	0	107	54	54	0	1,018	11	1007
All Species	70,333	8,799	61,534	38,760	9,413	29347	80,650	6,198	74,452

¹Statistic data were analyzed across all river sections.

²Season totals were analyzed across months.

Table 3. Percent of angler type by month for the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Angler Type*	May	June	July	August	September	All season
Bank	64.2	44.6	23.8	29.7	29.6	39.3
Wade	4.5	9.5	19.0	19.8	16.8	13.2
Canoe	0.7	3.9	13.6	7.2	9.6	6.7
Drift Boat	0.7	2.2	0.0	4.5	6.4	2.5
Jet Boat	3.0	10.4	9.5	9.0	8.8	8.4
Prop Boat	26.9	29.4	34.0	29.7	28.8	29.8

*Includes parties

Table 4. Hometown distances (from Monticello MN) of Minnesota anglers fishing the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Distances (Miles)	Number of Anglers
0-10	489
11-20	881
21-40	1197
41-60	117
61-100	19
101-200	18
Greater than 201	4
All MN Anglers	2725

Table 5. Hometown distances of Non-Minnesota anglers with City and State of origin fishing the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

City, State	Average Distance	Number of anglers
Poplar Bluff, MO	613.3	9
Treloar, MO	479.0	6
Indianapolis, IN	536.9	4
Chesterfield, MO	488.0	4
Valparaiso, IN	429.4	4
Miami, FL	1552.8	3
Bowling Green, FL	1381.8	3
Eloise, FL	1366.0	3
Orlando, FL	1347.1	3
Charlotte, NC	982.1	3
Cerrillos, NM	937.5	3
Hillsboro, MO	513.3	3
Darien, IL	380.4	3
Downers Grove, IL	375.8	3
Wyoming, IA	263.6	3
Bokeelia, FL	1440.7	2
Valley Mills, TX	961.7	2
Pratt, KS	584.7	2
Millersville, MO	579.7	2
Hermitage, MO	511.3	2
Sullivan, MO	504.2	2
Saint Charles, MO	481.5	2
Colona, IL	316.5	2
Rock Island, IL	308.3	2
San Quentin, CA	1558.6	1
Rio Grande City, TX	1322.0	1
Holland, TX	1015.0	1
Needham, IN	564.5	1
Des , Moines, IA	256.6	4
All states	760.4	83

Table 6. Angling pressure estimates for all anglers, by sector and month for the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Sector	May		June		July		August		September		All season
	Angler hours	Error	Angler hours	Error	Angler hours	Error	Angler hours	Error	Angler hours	Error	Angler hours
1	5,576	2,429	2,456	1,064	3,206	1,317	1,848	702	1,534	414	14,620
2	2,309	904	1,536	512	2,357	998	1,134	585	1,166	137	8,502
3	1,828	380	1,248	967	1,418	971	2,441	1,808	1,150	172	8,085
4	3,204	2,051	2,696	1,663	2,184	588	1,022	540	899	124	10,005
5	456	299	4,554	1,217	4,676	1,925	2,688	837	2,063	208	14,437
6	579	437	6,067	1,978	3,959	1,916	4,057	1,090	2,581	201	17,243
7			5,274	1,473	5,149	355	4,562	2,449			14,985
8	1,308	793	11,411	1,698	7,315	2,246	3,154	936	1,954	132	25,142
All	18,303		35,120		30,690		20,834		13,526		118,473*

*Total estimates derived from individual sectors may not equal estimates from grouping sectors.

Table 7. Angling pressure estimates by angler types and month for the Mississippi River (St. Cloud to Coon Rapids), May 12-September 30, 2007.

Month	Boat (Canoe, jet, drift, prop)	Standard Error	Shore (Bank, Wade)	Standard Error	Total	Standard Error
May	6,861	2,135	11,441	1,831	18,302	2,812
June	19,441	1,696	15,678	1,525	35,119	2,281
July	18,513	2,044	12,175	1,396	30,688	2,475
August	13,309	2,674	7,524	1,306	20,833	2,976
September	9,561	-	3,965	522	13,526	522
All season	67,685	-	50,783	-	118,468	5,326

Table 8. Recreational water surface use estimates for the Mississippi River (St. Cloud-Dayton), May 12-September 30, 2007.

Recreation boat counts									
Month	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8	All sectors
May	119	6	63	119	63	62	67	65	564
June	180	237	178	236	540	197	215	198	1,981
July	190	424	309	307	250	196	201	250	2,127
August	35	77	2	59	3	4	22	59	261
September	11	8	10	2	6	8	41	99	185
All Season	535	752	562	723	862	467	546	671	5,118
Recreation use hours*									
May	7,580.3	382.2	4,013.1	7,580.3	4,013.1	3,949.4	4,267.9	4,140.5	35,926.8
June	11,466.0	15,096.9	11,338.6	15,033.2	34,398.0	12,548.9	13,695.5	12,612.6	126,189.7
July	11,172.0	24,931.2	18,169.2	18,051.6	14,700.0	11,524.8	11,818.8	14,700.0	125,067.6
August	2,058.0	4,527.6	117.6	3,469.2	176.4	235.2	1,293.6	3,469.2	15,346.8
September	539.0	392.0	490.0	98.0	294.0	392.0	2,009.0	4,851.0	9,065.0
All season	32,815.3	45,329.9	34,128.5	44,232.3	53,581.5	28,650.3	33,084.8	39,773.3	311,595.9

*Recreational boating hours are adjusted for available daylight and average trip length (4.9 hours).

Table 9. Length frequency distribution¹ of fish harvested and released² for all anglers for the Mississippi River (St.Cloud-Coon Rapids), May 12-September 30, 2007.

TL (inches)	Black Crappie		Channel Catfish		Common Carp		Northern Pike		Rock Bass	
	Harvest	Release	Harvest	Release	Harvest	Release	Harvest	Release	Harvest	Release
4-4.9										
5-5.9										1
6-6.9		1								5
7-7.9										9
8-8.9				3						12
9-9.9										4
10-10.9	1			3		1		2		4
11-11.9				2						
12-12.9	1			8		1		5		3
13-13.9			5	2		3		3		
14-14.9			3	4				3		
15-15.9			7	12		1		3		
16-16.9			5	11		6		7		
17-17.9			4	26		3	1	3		
18-18.9			11	43	3	5	2	13		
19-19.9			11	16		1	1	7		
20-20.9			15	31	4	15	1	18		
21-21.9			4	7		5	3	12		
22-22.9			5	10	2	3		6		
23-23.9			3	10	6	13		9		
24-24.9			6	19	1	11	2	6		
25-25.9			1	3	1	19	1	4		
26-26.9				3		4				
27-27.9				2		5		1		
28-28.9				5		8		1		
29-29.9			1							
30-30.9						1				
31-31.9								1		
32-32.9										
33-33.9										
34-34.9										
35-35.9										
> 36.0								1		
Total (N)			81	220	17	105	11	105	0	38
Mean length	11.1	6.0	18.7	18.8	21.4	22.2	20.9	19.8	8.2	8.2
SE	0.00	-	1.08	2.49	0.79	1.26	0.30	1.07	-	1.43

¹Data summarized across months and river sections.

²Lengths estimated by anglers.

Table 9. Length frequency distribution¹ continued of fish harvested and released² for all anglers for the Mississippi River (St.Cloud-Coon Rapids), May 12-September 30, 2007.

TL (inches)	Smallmouth Bass		Sunfish		Sucker Species		Walleye	
	Harvest	Release	Harvest	Release	Harvest	Release	Harvest	Release
4-4.9		4						
5-5.9		6						
6-6.9		62	8					
7-7.9	1	42		1				
8-8.9	3	253		4				2
9-9.9	4	132						4
10-10.9	6	533					4	4
11-11.9	6	221		1			2	8
12-12.9	6	441					16	10
13-13.9	1	324					5	3
14-14.9		506				2	8	1
15-15.9		421			2	2	5	3
16-16.9	1	301				3	9	4
17-17.9		164			4	1	13	2
18-18.9		97				7	2	1
19-19.9		35			3	2		2
20-20.9		17			3	6	1	1
21-21.9		3			4	12	1	1
22-22.9					3	1	1	
23-23.9								
24-24.9						1		
25-25.9								
26-26.9								
27-27.9								
28-28.9								
29-29.9								
30-30.9								
31-31.9								
32-32.9								
33-33.9								
34-34.9								
35-35.9								
> 36.0								
Total (N)	28	3,562	8	6	19	37	67	46
Mean length	10.4	13.4	5.9	8.5	19.0	18.5	16.5	15.0
SE	0.82	43.40	-	1.00	0.31	1.14	1.44	0.72

¹Data summarized across months and river sections.

²Lengths estimated by anglers.

Table 10. Percent of anglers¹ who harvested a given number of fish from the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Species ²	Number of Fish Harvested per Angler						
	0	1	2	3	4	5	6
Channel Catfish	24.4	62.2	12.2	1.1	0.0	0.0	0.0
Northern Pike	90.0	7.8	2.2	0.0	0.0	0.0	0.0
Smallmouth Bass ³	82.2	8.9	4.4	4.4	0.0	0.0	0.0
Walleye	38.9	52.2	4.4	4.4	0.0	0.0	0.0

¹Data from complete and incomplete interviews with angling time greater than one hour, expanded/combined by angler type, month, and section

²Bag limits: channel catfish = 5, northern pike = 3, smallmouth bass = 6, walleye = 6.

³Smallmouth bass bag limit = 3 in the experimental regulation zone (St. Cloud- Dayton).

Table 11. Angling pressure estimates for all anglers by month (smallmouth bass experimental regulation zone versus non-regulated zone) for the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Area	Month											
	May		June		July		August		September		All Season	
	Angler Hours	Std Error	Angler Hours	Std Error	Angler Hours	Std Error	Angler Hours	Std Error	Angler Hours	Std Error	Angler Hours	Std Error
SMB Regulation Zone	16,995	6,152	23,709	4,806	23,375	4,815	17,680	5,454	11,572	861	93,331	2,845
Non-regulated Zone	1,308	653	11,411	1,213	7,315	1,737	3,154	936	1,954	132	25,142	1,871
Entire Creel Area	18,303	6,805	35,120	6,019	30,690	6,552	20,834	6,390	13,526	993	11,8473	5,326
	Angler Hours per Acre											
SMB Regulation Zone		4.78		6.67		6.57		4.97		3.25		26.24
Non-regulated Zone		0.96		8.36		5.36		2.31		1.43		18.42
Entire Creel Area		3.72		7.14		6.24		4.23		2.75		24.07

Table 12. Length frequency distribution¹ of smallmouth bass caught for all anglers (smallmouth bass experimental regulation zone versus non-regulated zone) for the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

TL (Inches)	Non-Regulated	Regulated	Total
4-4.9	1	3	4
5-5.9		6	6
6-6.9	11	51	62
7-7.9	18	25	43
8-8.9	63	193	256
9-9.9	13	123	136
10-10.9	64	475	539
11-11.9	27	200	227
12-12.9	68	379	447
13-13.9	51	274	325
14-14.9	89	417	506
15-15.9	76	345	421
16-16.9	41	261	302
17-17.9	23	141	164
18-18.9	13	84	97
19-19.9	5	30	35
20-20.9	3	14	17
21-21.9		3	3
Total (N)	566	3024	3590
Mean Length	13.049	13.438	13.4
SE	0.138	0.057	43.40

¹Data analyzed across months.

²Lengths were estimated by anglers.

³SMB experimental regulation zone was analyzed across months. ⁴Non-regulated zone was analyzed across months.

⁵Entire creel area was analyzed across all sections (St. Cloud-Coon Rapids).

Table 14. Species sought by parties (percent) by month for the Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Species Sought	May	June	July	August	September	Overall
ALL	27.6	26.8	15.6	27.0	31.2	25.5
BLC	2.2	0.0	0.0	0.0	0.0	0.4
CAP	5.2	4.8	0.7	0.9	0.8	2.8
CCF	11.9	11.7	6.1	2.7	3.2	7.9
MUE	0.0	0.0	0.7	0.0	0.0	0.1
NOP	2.2	0.4	0.7	0.0	0.0	0.7
SMB	12.7	50.6	72.1	63.1	60.8	51.6
WAE	37.3	4.8	3.4	6.3	4.0	10.4
WTS	0.0	0.4	0.0	0.0	0.0	0.1
SUN	0.7	0.4	0.7	0.0	0.0	0.4

Table 15. Percent distributions by age and sex of anglers, Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Age group	Male	Female	Combined
<15	77.01	22.99	6.71
16-30	91.12	8.88	33.85
31-50	92.93	7.07	50.19
51-65	96.77	3.23	7.17
65+	100.00	0.00	2.08
All age groups	91.67	8.33	1297

Table 16. Fishing quality ratings¹ from parties interviewed, by angler type, Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Angler group	Mean Rating	No. Parties
Bank	3.6	294
Canoe	5.1	50
Drift Boat	5.3	19
Jet Boat	5.3	63
Prop Boat	4.1	223
Wade	3.5	99
All groups	4.0	748
Parties seeking²		
Channel Catfish	3.54	74
Northern Pike	2.99	12
Smallmouth Bass	4.51	398
Walleye	4.58	97

¹Mean response of fishing parties to the question, "On a scale of one to ten, with one being low and ten being highest, how would you rate fishing quality today on the Mississippi River?"

²Some parties gave multiple responses.

Table 17. Fishing quality ratings¹ from parties interviewed within and out of the regulation zone, Mississippi River (St. Cloud-Coon Rapids), May 12-September 30, 2007.

Response	Regulated Zone		Non-Regulated Zone		Combined	
	Number	Percent	Number	Percent	Number	Percent
0	3	0.6	2	0.9	5	0.7
1	120	22.6	56	25.7	176	23.5
2	66	12.5	35	16.1	101	13.5
3	72	13.6	31	14.2	103	13.8
4	39	7.4	19	8.7	58	7.8
5	53	10.0	28	12.8	81	10.8
6	47	8.9	15	6.9	62	8.3
7	49	9.2	12	5.5	61	8.2
8	43	8.1	8	3.7	51	6.8
9	17	3.2	4	1.8	21	2.8
10	21	4.0	8	3.7	29	3.9
Average rating		4.19		3.61		4.02

¹Mean response of fishing parties to the question, "On a scale of one to ten, with one being low and ten being highest, how would you rate fishing quality today on the Mississippi River?"

Table 18. Responses from anglers¹ when asked “Do you feel the fishery between St. Cloud and Coon Rapids has improved over the last ten years?” on the Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Response	Regulated Zone		Non-Regulated Zone		Combined	
	Number	Percent	Number	Percent	Number	Percent
NO	70	26.1	35	31.5	105	27.7
YES	198	73.9	76	68.5	274	72.3
Grand Total	268	100.0	111	100.0	379	100.0

¹ Anglers were only asked the question the initial time they were interviewed by the creel clerk.

Table 19. Responses from all anglers¹ when asked “Do you support the existing 12-20” protected slot limit, three fish daily bag limit regulation for smallmouth bass?” on the Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Response	Regulated Zone		Non-Regulated Zone		Combined	
	Number	Percent	Number	Percent	Number	Percent
No	12	3.2	11	6.9	23	4.3
Yes	360	96.8	148	93.1	508	95.7
Grand Total	372	100.0	159	100.0	531	100.0

¹ Anglers were only asked the question the initial time they were interviewed by the creel clerk.

Table 20. Responses from all anglers¹ when asked “Would you support extending the current regulation down to Coon Rapids Dam?” on the Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Response	Regulated Zone		Non-Regulated Zone		Combined	
	Number	Percent	Number	Percent	Number	Percent
No	14	3.8	17	10.8	31	5.9
Yes	354	96.2	141	89.2	495	94.1
Grand Total	368	100.0	158	100.0	526	100.0

¹ Anglers were only asked the question the initial time they were interviewed by the creel clerk.

APPENDIX

Table A-1. Channel catfish harvest, release and catch rates estimated for the Mississippi River between St. Cloud and Coon Rapids MN, May 12-September 30, 2007.

Month	Area	Non-targeting					Targeting				
		St. Cloud-Clearwater	Clearwater-Kadler	Kadler-Dayton	Dayton-Coon Rapids*	All areas mean	St. Cloud-Clearwater	Clearwater-Kadler	Kadler-Dayton	Dayton-Coon Rapids*	All areas mean
May	Harvest	0.005	0.000	0.000	0.220	0.056	0.645	0.000	0.000	0.000	0.161
	Release	0.344	0.285	0.877	0.565	0.518	0.037	0.550	3.172	0.000	0.940
	Catch	0.349	0.285	0.877	0.785	0.574	0.682	0.550	3.172	0.000	1.101
June	Harvest	0.000	0.000	0.003	0.000	0.001	0.033	0.000	0.094	0.000	0.032
	Release	0.157	0.526	0.289	0.315	0.322	0.000	0.000	0.000	0.285	0.071
	Catch	0.157	0.526	0.292	0.315	0.323	0.033	0.000	0.094	0.285	0.103
July	Harvest	0.321	0.000	0.000	0.000	0.080	0.000	0.388	0.000	0.000	0.097
	Release	1.390	0.465	2.771	0.909	1.384	0.000	0.000	0.637	0.000	0.159
	Catch	1.710	0.465	2.771	0.909	1.464	0.000	0.388	0.637	0.000	0.256
August	Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	1.058	1.438	1.810	1.763	1.517	0.000	0.000	0.000	0.000	0.000
	Catch	1.058	1.438	1.810	1.763	1.517	0.000	0.000	0.000	0.000	0.000
September	Harvest	0.000	0.000	0.051	0.000	0.013	0.000	0.000	0.000	0.000	0.000
	Release	1.066	1.630	0.643	1.015	1.089	0.000	0.000	0.000	0.000	0.000
	Catch	1.066	1.630	0.694	1.015	1.101	0.000	0.000	0.000	0.000	0.000
All season mean	Harvest	0.065	0.000	0.011	0.044	0.030	0.136	0.078	0.019	0.000	0.058
	Release	0.803	0.869	1.278	0.913	0.966	0.007	0.110	0.762	0.057	0.234
	Catch	0.868	0.869	1.289	0.957	0.996	0.143	0.187	0.780	0.057	0.292

* Area not covered by regulation

Table A-2. Northern pike harvest, release and catch rates estimated for the Mississippi River between St. Cloud and Coon Rapids MN, May 12-September 30, 2007.

Month	Area	Non-targeting					Targeting				
		St. Cloud-Clearwater	Clearwater-Kadler	Kadler-Dayton	Dayton-Coon Rapids*	All areas mean	St. Cloud-Clearwater	Clearwater-Kadler	Kadler-Dayton	Dayton-Coon Rapids*	All areas mean
May	Harvest	0.025	0.000	0.000	0.000	0.006	0.135	0.000	0.000	0.000	0.034
	Release	0.061	0.015	0.000	0.031	0.027	0.000	0.000	0.000	0.000	0.000
	Catch	0.086	0.015	0.000	0.031	0.033	0.135	0.000	0.000	0.000	0.034
June	Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.013	0.025	0.005	0.070	0.028	0.000	0.000	0.000	0.000	0.000
	Catch	0.013	0.025	0.005	0.070	0.028	0.000	0.000	0.000	0.000	0.000
July	Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.160	0.000	0.022	0.000	0.046	0.000	0.000	0.000	0.000	0.000
	Catch	0.160	0.000	0.022	0.000	0.046	0.000	0.000	0.000	0.000	0.000
August	Harvest	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.273	0.000	0.034	0.000	0.077	0.000	0.000	0.000	0.000	0.000
	Catch	0.273	0.019	0.034	0.000	0.081	0.000	0.000	0.000	0.000	0.000
September	Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.036	0.007	0.044	0.038	0.031	0.000	0.000	0.000	0.000	0.000
	Catch	0.036	0.007	0.044	0.038	0.031	0.000	0.000	0.000	0.000	0.000
All season mean	Harvest	0.005	0.004	0.000	0.000	0.001	0.027	0.000	0.000	0.000	0.007
	Release	0.108	0.009	0.021	0.028	0.042	0.000	0.000	0.000	0.000	0.000
	Catch	0.113	0.013	0.021	0.028	0.044	0.027	0.000	0.000	0.000	0.007

* Area not covered by regulation

Table A-3. Smallmouth bass harvest, release and catch rates estimated for the Mississippi River between St. Cloud and Coon Rapids MN, May 12-September 30, 2007.

Area	St. Cloud- Clearwater	Clearwater- Kadler	Kadler- Dayton	Dayton- Coon Rapids*	All areas mean	St. Cloud- Clearwater	Clearwater- Kadler	Kadler- Dayton	Dayton- Coon Rapids*	All areas mean	
Month	Non-targeting					Targeting					
Harvest	0.005	0.000	0.000	0.220	0.056	0.000	0.000	0.000	0.000	0.000	
Release	0.344	0.285	0.877	0.565	0.518	0.741	1.053	0.000	1.490	0.821	
May	Catch	0.349	0.285	0.877	0.785	0.574	0.741	1.053	0.000	1.490	0.821
Harvest	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.000	0.000	0.000	
Release	0.157	0.526	0.289	0.315	0.322	1.542	2.276	0.785	0.662	1.316	
June	Catch	0.157	0.526	0.292	0.315	0.323	1.542	2.276	0.785	0.662	1.316
Harvest	0.321	0.000	0.000	0.000	0.080	0.375	0.000	0.000	0.000	0.094	
Release	1.390	0.465	2.771	0.909	1.384	3.108	1.996	1.996	2.108	2.302	
July	Catch	1.710	0.465	2.771	0.909	1.464	3.483	1.996	1.996	2.108	2.396
Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Release	1.058	1.438	1.810	1.763	1.517	3.729	4.006	4.006	5.156	4.224	
August	Catch	1.058	1.438	1.810	1.763	1.517	3.729	4.006	4.006	5.156	4.224
Harvest	0.000	0.000	0.051	0.000	0.013	0.000	0.000	0.000	0.000	0.000	
Release	1.066	1.630	0.643	1.015	1.089	5.401	6.423	6.423	6.700	6.237	
September	Catch	1.066	1.630	0.694	1.015	1.101	5.401	6.423	6.423	6.700	6.237
Harvest	0.065	0.000	0.011	0.044	0.030	0.075	0.000	0.000	0.000	0.019	
Release	0.803	0.869	1.278	0.913	0.966	2.904	3.151	2.642	3.223	2.980	
All season mean	Catch	0.868	0.869	1.289	0.957	0.996	2.979	3.151	2.642	3.223	2.999

* Area not covered by regulation

Table A-4. Walleye harvest, release and catch rates estimated for the Mississippi River between St. Cloud and Coon Rapids MN, May 12-September 30, 2007.

Month	Area	St. Cloud-	Clearwater-	Kadler-	Dayton-	All areas mean	St. Cloud-	Clearwater-	Kadler-	Dayton-	All areas mean
		Clearwater	Kadler	Dayton	Coon Rapids*		Clearwater	Kadler	Dayton	Coon Rapids*	
		Non-targeting					Targeting				
May	Harvest	0.091	0.008	0.000	0.000	0.025	0.147	0.019	0.000	0.000	0.042
	Release	0.023	0.008	0.000	0.000	0.008	0.074	0.019	0.000	0.000	0.023
	Catch	0.114	0.015	0.000	0.000	0.032	0.221	0.038	0.000	0.000	0.065
June	Harvest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.006	0.000	0.011	0.000	0.004	0.000	0.000	0.000	0.000	0.000
	Catch	0.006	0.000	0.011	0.000	0.004	0.000	0.000	0.000	0.000	0.000
July	Harvest	0.035	0.016	0.005	0.049	0.026	0.279	0.000	0.000	0.538	0.204
	Release	0.000	0.036	0.000	0.019	0.014	0.000	0.000	0.000	0.000	0.000
	Catch	0.035	0.052	0.005	0.068	0.040	0.279	0.000	0.000	0.538	0.204
August	Harvest	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Release	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Catch	0.008	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
September	Harvest	0.000	0.019	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000
	Release	0.033	0.019	0.000	0.038	0.022	0.000	0.000	0.000	0.000	0.000
	Catch	0.033	0.038	0.000	0.038	0.027	0.000	0.000	0.000	0.000	0.000
All season mean	Harvest	0.027	0.009	0.001	0.010	0.011	0.085	0.004	0.000	0.108	0.049
	Release	0.012	0.012	0.002	0.011	0.010	0.015	0.004	0.000	0.000	0.005
	Catch	0.039	0.021	0.003	0.021	0.021	0.100	0.008	0.000	0.108	0.054

* Area not covered by regulation

Table A-5. Estimated number of fish harvested, released and caught from the Mississippi River (St. Cloud-Coon Rapids), May 12- September 30, 2007.

Species	May			June			July			August			September			All Season		
	Har	Rel	Catch	Har	Rel	Catch	Har	Rel	Catch	Har	Rel	Catch	Har	Rel	Catch	Har	Rel	Catch
Channel Catfish	969	1,979	2948	268	1,073	1341	370	1,463	1,833	57	796	853	503	153	656	2,167	5,464	7,631
Common Carp	15	958	973		1,080	1,080		1,998	1,998	288	1,168	1,456	423	211	634	726	5,415	6,141
Northern Pike	140	422	562		684	684		587	587		622	622	65	274	339	205	2,589	2,794
Smallmouth bass	97	3,170	3267	17	6,000	6017	1,120	24,093	25,213		16,271	16,271	159	6,883	7,042	1,393	56,417	57,810
Sucker Species	38	568	606	175	999	1174		334	334			0	423	68	491	636	1,969	2,605
Walleye	450	154	604		71	71	438	159	597	11		11	65	129	194	964	513	1,477

Minnesota Department of Natural Resources
Division of Fish and Wildlife
Section of Fisheries

Completion Report

Mississippi River Creel Survey
from St. Cloud to Coon Rapids
May 12 to September 30, 2007

Eric R. Altena



5-2008

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Date

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