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Completion Report

Angler Creel Survey of a 110 Mile Segment of the Minnesota River
1 May 1998 - 31 October 1998

by
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Abstract

A stratified-random creel survey was conducted on 110.5 miles of the Minnesota River between 1 May and 31 October 1998. The total estimated angling pressure was 49,311 hours (448 hours/mile). Species most sought were channel catfish *Ictalurus punctatus* and flathead catfish *Pylodictis olivaris*. The most frequently caught fish of 19 species were channel catfish, common carp *Cyprinus carpio* and freshwater drum *Aplodinotus grunniens*. While most fish were released (69%), an estimated 53 pounds of fish/mile were harvested. Channel catfish were harvested at an estimated rate of 25 fish/mile and flathead catfish at 6 fish/mile. An estimated \$15,807 was spent by anglers at an average of \$18.00/trip for residents and \$82.00/trip for non-residents. Mean angler satisfaction with number and size of fish caught was low ≤ 3 on a 1 (low) to 10 (high) scale.

Introduction

The Minnesota River is one of the most important aquatic resources in the southern part of the state, providing among other things a notable sport fishery for trophy flathead catfish *Pylodictis olivaris*. It is considered highly polluted, but numerous organizations have focused on watershed efforts to improve water quality. Fish populations and communities can reflect changes in water quality; therefore, regular surveys and assessments should be conducted to document improvements. The primary objective of this creel survey was to estimate base-line rates of angling pressure, catch and harvest during daylight hours for an angling season on the river. Secondary objectives included collecting information on the economic value of the fisheries resources, angler demographics and angler satisfaction.

Study Area

The Minnesota River begins at the outlet of Big Stone Lake and meanders through an oversized valley excavated by Glacial River Warren (Ojakangas and Matsch 1982). The 44,000 km² watershed lies primarily in Minnesota (88%) within the Northern Glaciated Plains, Western Corn Belt Plains and Northern Central Hardwood Forest ecoregions (Fandrei et al. 1988). Agriculture is the dominant land use and the loss of wetlands to drainage have impacted the natural hydrology of the river and its tributaries (Quade and Nielsen 1993). The study segment was somewhat larger than the Hutchinson management area extending from the confluence of the Cottonwood River RM 144.0 to Minnesota Falls at river mile (RM) 254.5.

Methods

A stratified-random creel survey with uniform probabilities was conducted between 1 May and 31 October 1998 on 110.5 miles of the Minnesota River between the Cottonwood River and Minnesota Falls. Stratification was by calendar month, day type (weekday vs. weekend and holiday) and river sector. Three repetitions of each day type-river sector-day period combination were randomly selected each month. Surveys were conducted only during daylight for safety.

The study segment was divided into four sectors based on availability of public access and round-trip motoring distance (Table 1; Kirsch et al. 1985). Start location and interview/count direction were randomly selected within each sector. Shifts were 10 hours in length with one hour at the beginning and end of the shift for preparation and transportation (Table 2). Day length permitted two shifts from May through August, but only one in September and October that began nine hours prior to sunset.

The survey was initially conducted by boat because of the prevalence of shore fishing and scattered private access. It was suspended in August when low flows made the river unnavigable. August data; therefore, was not included in analysis. A land-based design was implemented in September and October based on sites previously identified by boat. Strata and interview/count protocols remained the same.

Interviews and counts were progressive. Data collected included angler type, species of fish sought and caught, number of fish caught and released, lengths of fish, trip start time, number in party, distance traveled, age, gender, trip expenses, and trip satisfaction. Angler estimates of lengths of released fish were recorded. Angler trip satisfaction was determined by responses to

the following: "Based on the number and size of fish you caught today, please rate your fishing satisfaction from 1 (low) to 10 (high)". Counts of non-angling water activity were also recorded.

Only interviews from anglers that had fished at least 30 minutes were used to estimate catch (GenCreel Version 2, Bindman 1997) and angler satisfaction (Excel 2000). Angler ages, distances traveled and expenses per trip were analyzed with Excel 2000 for all interviews. Standard error estimates that were incalculable by GenCreel are presented as dashes.

Results and Discussion

A total of 578 interviews were conducted of which 424 interviews had fished for at least 30 minutes (Table 2). Completed trips accounted for only 19% of total trips analyzed. Angling constituted the majority of recreational use on the river at 95% of total estimated user-hours (Table 3). Other uses were canoeing, pleasure boating, tubing, and wading.

Angling Pressure

The total estimated angling pressure was 49,311 hours or 448 angler-hours per mile (Table 4). Shore angling constituted a much larger segment of anglers on the Minnesota River at 77% of total estimated hours. This supports the need for increased public access areas for shore angling that has been suggested frequently by anglers.

Catch

Fish sought or caught are listed in Table 5. Anglers identified 9 species of fish sought (Table 6). Catfish, either individual species or combined, were identified 72% of the time.

Anglers caught 19 species of which the most frequently caught were channel catfish *Ictalurus punctatus*, common carp *Cyprinus carpio* and freshwater drum *Aplodinotus grunniens* (Table 7). Most fish were released (69%), but almost all sauger *Stizostedion canadense* (91.8%) were harvested. An estimated total of 5,853 fish weighing approximately 19,119 pounds were harvested during the survey (Tables 7-8). This was an estimated average of 53 fish/mile at 174 pounds/mile. Channel catfish were harvested at an estimated rate of 25 fish/mile (67 pounds/mile). Flathead catfish were harvested at an estimated rate of 6 fish/mile (61 pounds/mile). No anglers had caught a limit of fish by the time they were interviewed.

Length frequencies of fish caught are presented in Table 9. Monthly estimates of number and pounds of fish caught, harvested and released are presented in appendices 1-10. Boat and shore angler estimates of number and pounds of fish caught, harvested and released are presented in appendices 11-14.

Angler Demographics, Expenses and Mileage

Male anglers comprised 85% and females anglers 15% of the 1421 total. The largest age group was 35 - 44 years at 26 % (Table 10). Residents drove an average of 25 miles to access the river and spent an average of \$18.00 per trip or \$0.74/mile (Table 11). Non-residents drove an average of 290 miles and spent an average of \$82.00 per trip or \$0.28 per mile. A total of \$15,807 was spent on trips to the river by anglers. Angler satisfaction with number and size of fish caught was low from 3.1 in July to 1.5 in October on a 1 (low) to 10 (high) scale (Table 12).

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Table 1. Selected descriptive characteristics of sectors for the 1998 Minnesota River creel survey.

| DOW number | M55 | | | |
|---------------------------|--|-----------|-------------|-------------|
| Ecological Classification | Class IIE (warmwater gamefish, cosmopolitan) | | | |
| Sector | 1 | 2 | 3 | 4 |
| River Miles | 144-171 | 171-198.5 | 198.5-230.5 | 230.5-254.5 |
| Distance (miles) | 27 | 27.5 | 32 | 24 |
| Number of Public Accesses | 4 | 4 | 2 | 5 |

Table 2. Strata summary statistics for the 1998 Minnesota River creel survey.

| | May | June | July | September | October | Total |
|---|--------------|-------------|--------------|--|--|---------------|
| Dates of Stratum | 1-31 May | 1-30 June | 1-31 July | 1-30 Sep | 1-31 Oct | NA |
| Times of Day Shift | 0500-1400 | 0500-1400 | 0500-1400 | 1100-2100 (1 st -15 th) 1030-2030 (16 th -29 th) 1000-2000 (30 th) | 1000-2000 (1 st -13 th) 0930-1930 (14 th -24 th) 0800-1800 (25 th -31 st) | NA |
| Times of Evening Shift (May-July) | 1200-2200 | 1200-2200 | 1200-2200 | NA | NA | NA |
| Number of Weekday Day Shifts | 12 | 12 | 12 | 12 | 12 | 60 |
| Number of Weekend/Holiday Day Shifts | 12 | 12 | 12 | 12 | 12 | 60 |
| Number of Weekday Evening Shifts | 12 | 12 | 12 | NA | NA | 36 |
| Number of Weekend/Holiday Evening Shifts | 11 | 11 | 11 | NA | NA | 33 |
| Number of Boat Interviews (>30minutes) | 38 | 25 | 43 | 3 | 0 | 109 |
| Number of Boat Anglers | 91 | 68 | 110 | 8 | NA | 277 |
| Average Number of Anglers/Boat | 2.0 | 2.4 | 2.5 | 2.7 | NA | 2.3 |
| Number of Shore Interviews (>30minutes) | 72 | 80 | 122 | 34 | 7 | 315 |
| Number of Shore Anglers | 178 | 232 | 277 | 92 | 12 | 791 |
| Average Number of Anglers/Party | 2.0 | 3.1 | 2.2 | 2.4 | 1.5 | 2.3 |
| Number of Completed Trips (% of Monthly Total) | 10 (9.2%) | 5 (4.8%) | 10 (6.1%) | 9 (24.3%) | 1 (14.3%) | 35 (18.5%) |
| Average Length of Completed Boat Trip (h) | 11.4 (—) | 7.4 (—) | 9.8 (—) | 3.9 (—) | 0.0 (—) | 9.5 (—) |
| Average Length of Completed Shore Trip (h) | 2.2 (—) | 2.0 (—) | 3.9 (—) | 2.1 (—) | 0.7 (0.0) | 2.3 (—) |
| Average Length of All Completed Trips (h) | 6.8 (—) | 3.4 (—) | 7.7 (—) | 2.3 (—) | 0.7 (0.0) | 5.0 (—) |

Table 3. Recreational water surface activity user-hours and user-hours/mile for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Activity | May | June | July | September | October | Total |
|---------------------------------------|--------------------|--------------------|--------------------|-------------------|-----------------|--------------------|
| | | | | | | User-Hours |
| Canoes/Rowboats | 82.0 (71.6) | 360.8 (169.0) | 309.8 (141.4) | 0.0 (—) | 33.0 (33.0) | 785.6 (234.1) |
| Pontoons | 0.0 (—) | 31.9 (31.9) | 12.8 (16.3) | 0.0 (—) | 0.0 (—) | 44.7 (35.8) |
| Runabouts | 320.5 (193.7) | 31.9 (31.9) | 0.0 (—) | 0.0 (—) | 0.0 (—) | 352.5 (196.3) |
| Other ¹ | 421.0 (254.8) | 181.0 (122.8) | 652.0 (300.1) | 0.0 (—) | 0.0 (—) | 1,253.9 (412.4) |
| Total Non-Angling | 823.5 (431.4) | 605.7 (247.6) | 974.5 (331.4) | 0.0 (—) | 33.0 (33.0) | 2,436.6 (599.2) |
| Total Angling | 13,370.5 (2,210.6) | 13,488.2 (2,149.1) | 15,678.1 (1,761.8) | 5,412.0 (1,132.7) | 1,362.2 (412.5) | 49,311.0 (3,750.0) |
| Total Use | 14,194.0 (2,478.2) | 14,093.8 (2,208.3) | 16,652.6 (1,790.3) | 5,412.0 (1,132.7) | 1,395.2 (421.6) | 51,747.6 (3,960.4) |
| Angling Percentage of Total Use | 94.2% | 95.7% | 94.2% | 100.0% | 97.6% | 95.3% |
| User-Hours/Mile | | | | | | |
| Canoes/Rowboats | 0.8 (0.7) | 3.3 (1.5) | 2.8 (1.3) | 0.0 (—) | 0.3 (0.3) | 7.1 (2.1) |
| Pontoons | 0.0 (—) | 0.3 (0.3) | 0.1 (0.2) | 0.0 (—) | 0.0 (—) | 0.4 (0.3) |
| Runabouts | 2.9 (1.8) | 0.3 (0.3) | 0.0 (—) | 0.0 (—) | 0.0 (—) | 3.2 (1.8) |
| Other ¹ | 3.8 (2.3) | 1.7 (1.1) | 5.9 (2.7) | 0.0 (—) | 0.0 (—) | 11.4 (3.8) |
| Total Non-Angling | 7.5 (3.9) | 5.5 (2.3) | 8.9 (3.0) | 0.0 (—) | 0.3 (0.3) | 22.2 (5.5) |
| Total Angling | 121.6 (20.1) | 122.6 (19.5) | 142.5 (16.0) | 49.2 (10.3) | 12.4 (3.8) | 448.3 (34.1) |
| Total Use | 129.0 (22.5) | 128.1 (20.1) | 151.4 (16.3) | 49.2 (10.3) | 12.7 (3.8) | 470.4 (36.0) |

¹ airboats, tubing, and wading

Table 4. Estimated total angler hours and angler hours per mile for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Angler Type | May | June | July | September | October | Total |
|--------------------------|--------------------|--------------------|--------------------|-------------------|-----------------|--------------------|
| Angler-Hours | | | | | | |
| Boat | 4,274.4 (1,129.2) | 2,498.9 (550.4) | 4,124.1 (818.0) | 264.0 (264.0) | 0.0 (0.0) | 11,161.4 (1,522.1) |
| Shore | 9,096.1 (1,585.5) | 10,989.3 (2,132.8) | 11,554.0 (1,344.3) | 5,148.0 (1,101.5) | 1,362.2 (412.5) | 38,149.6 (3,202.1) |
| All | 13,370.5 (2,210.6) | 13,488.2 (2,149.1) | 15,678.1 (1,761.8) | 5,412.0 (1,132.7) | 1,362.2 (412.5) | 49,311.0 (3,750.0) |
| Angler-Hours/Mile | | | | | | |
| Boat | 38.9 (10.3) | 22.7 (5.0) | 37.5 (7.4) | 2.4 (2.4) | 0.0 (—) | 101.5 (13.8) |
| Shore | 82.7 (14.4) | 99.9 (19.4) | 105.0 (12.2) | 46.8 (10.0) | 12.4 (3.8) | 346.8 (29.1) |
| All | 121.6 (20.1) | 122.6 (19.5) | 142.5 (16.0) | 49.2 (10.3) | 12.4 (3.8) | 448.3 (34.1) |

Table 5. Fish species sought or caught during the 1998 Minnesota River creel survey.

| Species | | sought (s) / caught (c) |
|---------------------|------------------------------------|-------------------------|
| bigmouth buffalo | <i>Ictiobus cyprinellus</i> | c |
| black bullhead | <i>Ameiurus melas</i> | c |
| bluegill | <i>Lepomis macrochirus</i> | c |
| blue sucker | <i>Cyclopterus elongatus</i> | c |
| brown bullhead | <i>Ameiurus nebulosus</i> | c |
| common carp | <i>Cyprinus carpio</i> | s/c |
| channel catfish | <i>Ictalurus punctatus</i> | s/c |
| flathead catfish | <i>Pylodictis olivaris</i> | s/c |
| freshwater drum | <i>Aplodinotus grunniens</i> | s/c |
| goldeye | <i>Hiodon alosoides</i> | c |
| largemouth bass | <i>Micropterus salmoides</i> | c |
| mooneye | <i>Hiodon tergisus</i> | c |
| northern pike | <i>Esox lucius</i> | s/c |
| sauger | <i>Stizostedion canadense</i> | c |
| shorthead redhorse | <i>Moxostoma macrolepidotum</i> | c |
| shovelnose sturgeon | <i>Scaphirhynchus platorynchus</i> | c |
| shortnose gar | <i>Lepisosteus platostomus</i> | s/c |
| smallmouth bass | <i>Micropterus dolomieu</i> | c |
| walleye | <i>Stizostedion vitreum</i> | s/c |
| white bass | <i>Morone chrysops</i> | c |
| white sucker | <i>Catostomus commersoni</i> | c |

Table 6. Fish species sought by party and angler during the 1998 Minnesota River creel survey.

| Species | Number of Parties (%) | Number of Anglers (%) |
|---|--------------------------|--------------------------|
| anything | 53 (12.5) | 157 (14.7) |
| shortnose gar | 1 (0.2) | 1 (0.1) |
| northern pike | 1 (0.2) | 1 (0.1) |
| common carp | 4 (0.9) | 10 (0.9) |
| channel catfish | 35 (8.3) | 85 (7.9) |
| flathead catfish | 34 (8.0) | 80 (7.5) |
| walleye | 48 (11.3) | 105 (9.8) |
| northern pike & walleye | 11 (2.6) | 19 (1.8) |
| common carp & channel catfish | 1 (0.2) | 2 (0.2) |
| common carp & flathead catfish | 3 (0.7) | 7 (0.7) |
| common carp & walleye | 1 (0.2) | 3 (0.3) |
| common carp & freshwater drum | 1 (0.2) | 1 (0.1) |
| channel catfish & flathead catfish | 178 (42.0) | 452 (42.2) |
| channel catfish & walleye | 25 (5.9) | 71 (6.6) |
| channel catfish & freshwater drum | 1 (0.2) | 2 (0.2) |
| flathead catfish & walleye | 3 (0.7) | 9 (0.8) |
| largemouth bass & smallmouth bass | 1 (0.2) | 2 (0.2) |
| walleye & freshwater drum | 1 (0.2) | 2 (0.2) |
| common carp, channel catfish & flathead catfish | 2 (0.5) | 4 (0.4) |
| channel catfish, northern pike & walleye | 1 (0.2) | 1 (0.1) |
| channel catfish, flathead catfish & walleye | 17 (4.0) | 46 (4.3) |
| channel catfish, flathead catfish & freshwater drum | 2 (0.5) | 10 (0.9) |
| Total | 424 (100%) | 1,070 (100%) |

Table 7. Estimated total catch, harvest and release number and number per mile by species for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|---------------|-------|------------|-------------|-------|-------------|---------------|-------|-------------|--------------------|
| | Number | % | Number/Mil | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 32.6 (42.6) | 0.2 | 0.3 (0.4) | 0.0 (—) | 0.0 | 0.0 (—) | 32.6 (42.6) | 0.3 | 0.3 (0.4) | 100.0 |
| black bullhead | 238.2 (236.8) | 1.3 | 2.2 (2.2) | 0.0 (—) | 0.0 | 0.0 (—) | 238.2 (236.8) | 1.9 | 2.2 (2.2) | 100.0 |
| bluegill | 18.6 (12.0) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 18.6 (12.0) | 0.1 | 0.2 (0.1) | 100.0 |
| blue sucker | 20.3 (10.8) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 20.3 (10.8) | 0.2 | 0.2 (0.1) | 100.0 |
| brown bullhead | 59.0 (63.3) | 0.3 | 0.5 (0.6) | 0.0 (—) | 0.0 | 0.0 (—) | 59.0 (63.3) | 0.5 | 0.5 (0.6) | 100.0 |
| carp | 3,406.0 (—) | 18.2 | 31.0 (—) | 379.5 (—) | 6.5 | 3.5 (—) | 3,026.5 (—) | 23.6 | 27.5 (—) | 88.8 |
| channel catfish | 7,229.5 (—) | 38.7 | 65.7 (—) | 2,737.1 (—) | 46.8 | 24.9 (—) | 4,492.4 (—) | 35.0 | 40.8 (—) | 62.1 |
| flathead catfish | 1,374.8 (—) | 7.4 | 12.5 (—) | 675.2 (—) | 11.5 | 6.1 (—) | 699.6 (—) | 5.5 | 6.4 (—) | 50.9 |
| freshwater drum | 3,386.8 (—) | 18.1 | 30.8 (—) | 855.6 (—) | 14.6 | 7.8 (—) | 2,531.1 (—) | 19.7 | 23.0 (—) | 74.7 |
| goldeye | 78.0 (35.4) | 0.4 | 0.7 (0.3) | 47.3 (22.5) | 0.8 | 0.4 (0.2) | 30.7 (27.3) | 0.2 | 0.3 (0.3) | 39.4 |
| mooneye | 5.8 (6.5) | <0.1 | 0.1 (0.1) | 5.8 (6.5) | 0.1 | 0.1 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 |
| northern pike | 190.5 (—) | 1.0 | 1.7 (—) | 95.1 (—) | 1.6 | 0.9 (—) | 95.4 (—) | 0.7 | 0.9 (—) | 50.1 |
| sauger | 215.9 (—) | 1.2 | 2.0 (—) | 198.2 (—) | 3.4 | 1.8 (—) | 17.7 (—) | 0.1 | 0.2 (—) | 8.2 |
| shorthead redhorse | 54.4 (52.4) | 0.3 | 0.5 (0.5) | 0.0 (—) | 0.0 | 0.0 (—) | 54.4 (52.4) | 0.4 | 0.5 (0.5) | 100.0 |
| shovelnose sturgeon | 19.2 (13.2) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 19.2 (13.2) | 0.2 | 0.2 (0.1) | 100.0 |
| shortnose gar | 474.8 (—) | 2.5 | 4.3 (—) | 105.6 (—) | 1.8 | 1.0 (—) | 369.2 (—) | 2.9 | 3.4 (—) | 77.8 |
| walleye | 1,719.9 (—) | 9.2 | 15.6 (—) | 688.0 (—) | 11.8 | 6.3 (—) | 1,031.9 (—) | 8.0 | 9.4 (—) | 60.0 |
| white bass | 117.5 (—) | 0.6 | 1.1 (—) | 66.1 (—) | 1.1 | 0.6 (—) | 51.4 (—) | 0.4 | 0.5 (—) | 43.7 |
| white sucker | 42.6 (33.3) | 0.2 | 0.4 (0.3) | 0.0 (—) | 0.0 | 0.0 (—) | 42.6 (33.3) | 0.3 | 0.4 (0.3) | 100.0 |
| Total | 18,684.2 (—) | 100.0 | 169.9 (—) | 5,853.4 (—) | 100.0 | 53.2 (—) | 12,830.8 (—) | 100.0 | 116.6 (—) | 68.7 |

Table 8. Estimated total catch, harvest and release pounds and pounds per mile by species for 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|---------------|-------|-------------|--------------|-------|-------------|--------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 162.6 (—) | 0.4 | 1.5 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 162.6 (—) | 0.6 | 1.5 (—) |
| black bullhead | 26.2 (—) | <0.1 | 0.2 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 26.2 (—) | 0.1 | 0.2 (—) |
| bluegill | 11.0 (—) | <0.1 | 0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 11.0 (—) | <0.1 | 0.1 (—) |
| blue sucker | 30.4 (—) | 0.1 | 0.3 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 30.4 (—) | 0.1 | 0.3 (—) |
| brown bullhead | 3.0 (—) | <0.1 | <0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 3.0 (—) | <0.1 | <0.1 (—) |
| carp | 11,962.7 (—) | 26.0 | 108.8 (—) | 1,641.1 (—) | 8.6 | 14.9 (—) | 10,321.6 (—) | 38.5 | 93.8 (—) |
| channel catfish | 11,657.4 (—) | 25.3 | 106.0 (—) | 7,412.6 (—) | 38.8 | 67.4 (—) | 4,244.7 (—) | 15.9 | 38.6 (—) |
| flathead catfish | 13,578.8 (—) | 29.5 | 123.4 (—) | 6,711.2 (—) | 35.0 | 61.0 (—) | 6,712.3 (—) | 25.1 | 61.0 (—) |
| freshwater drum | 3,646.1 (—) | 7.9 | 33.2 (—) | 767.0 (—) | 4.0 | 7.0 (—) | 2,879.2 (—) | 10.8 | 26.2 (—) |
| goldeye | 92.6 (46.7) | 0.2 | 0.8 (0.4) | 74.5 (37.6) | 0.4 | 0.7 (0.3) | 18.1 (—) | 0.1 | 0.2 (—) |
| mooneye | 4.9 (—) | <0.1 | <0.1 (—) | 4.9 (—) | <0.1 | <0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| northern pike | 1,150.1 (—) | 2.5 | 10.5 (—) | 509.0 (—) | 2.7 | 4.6 (—) | 641.1 (—) | 2.4 | 5.8 (—) |
| sauger | 460.6 (—) | 1.0 | 4.2 (—) | 432.1 (—) | 2.3 | 3.9 (—) | 28.5 (—) | 0.1 | 0.3 (—) |
| shorthead redhorse | 251.4 (275.0) | 0.6 | 2.3 (2.5) | 0.0 (—) | 0.0 | 0.0 (—) | 251.4 (—) | 0.9 | 2.3 (—) |
| shovelnose sturgeon | 34.4 (35.1) | 0.1 | 0.3 (0.3) | 0.0 (—) | 0.0 | 0.0 (—) | 34.4 (—) | 0.1 | 0.3 (—) |
| shortnose gar | 513.8 (—) | 1.1 | 4.7 (—) | 197.7 (—) | 1.0 | 1.8 (—) | 316.2 (—) | 1.2 | 2.9 (—) |
| walleye | 2,322.7 (—) | 5.0 | 21.1 (—) | 1,294.7 (—) | 6.8 | 11.8 (—) | 1,028.0 (—) | 3.8 | 9.4 (—) |
| white bass | 124.4 (—) | 0.3 | 1.1 (—) | 73.9 (—) | 0.4 | 0.7 (—) | 50.5 (—) | 0.2 | 0.5 (—) |
| white sucker | 23.3 (19.1) | 0.1 | 0.2 (0.2) | 0.0 (—) | 0.0 | 0.0 (—) | 23.3 (—) | 0.1 | 0.2 (—) |
| Total | 46,056.5 (—) | 100.0 | 418.7 (—) | 19,118.7 (—) | 100.0 | 173.8 (—) | 26,782.5 (—) | 100.0 | 243.5 (—) |

Table 9. Length frequency distribution of harvested and released fish for the 1998 Minnesota River creel survey.

| Length Inches | Bigmouth Buffalo | | Black Bullhead | | Bluegill | | Blue Sucker | | Brown Bullhead | |
|---------------------|------------------|---------|----------------|---------|----------|---------|-------------|---------|----------------|---------|
| | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release |
| 4.0 - 4.9 | | | | | | | | | | |
| 5.0 - 5.9 | | | | | | | | | | |
| 6.0 - 6.9 | | | | 13 | | | | | | 1 |
| 7.0 - 7.9 | | | | | | | | | | |
| 8.0 - 8.9 | | | | | | | | | | |
| 9.0 - 9.9 | | | | | | | 1 | | | |
| 10.0 - 10.9 | | | | | | | | | | |
| 11.0 - 11.9 | | | | | | | | | | |
| 12.0 - 12.9 | | | | | | | | | | |
| 13.0 - 13.9 | | | | | | | | | | |
| 14.0 - 14.9 | | | | | | | | | | |
| 15.0 - 15.9 | | | | | | | | | | |
| 16.0 - 16.9 | | | | | | | | | | |
| 17.0 - 17.9 | | | | | | | | | | |
| 18.0 - 18.9 | | | | | | | | | 1 | |
| 19.0 - 19.9 | | | | | | | | | | |
| 20.0 - 20.9 | | 2 | | | | | | | | |
| 21.0 - 21.9 | | | | | | | | | | |
| 22.0 - 22.9 | | | | | | | | | | |
| 23.0 - 23.9 | | | | | | | | | | |
| 24.0 - 24.9 | | | | | | | | | | |
| 25.0 - 25.9 | | | | | | | | | | |
| 26.0 - 26.9 | | | | | | | | | | |
| 27.0 - 27.9 | | | | | | | | | | |
| 28.0 - 28.9 | | | | | | | | | | |
| 29.0 - 29.9 | | | | | | | | | | |
| 30.0 - 30.9 | | | | | | | | | | |
| 31.0 - 31.9 | | | | | | | | | | |
| 32.0 - 32.9 | | | | | | | | | | |
| 33.0 - 33.9 | | | | | | | | | | |
| 34.0 - 34.9 | | | | | | | | | | |
| 35.0 - 35.9 | | | | | | | | | | |
| 36.0 - 36.9 | | | | | | | | | | |
| 37.0 - 37.9 | | | | | | | | | | |
| 38.0 - 38.9 | | | | | | | | | | |
| 39.0 - 39.9 | | | | | | | | | | |
| 40.0 and up | | | | | | | | | | |
| Total | 0 | 2 | 0 | 13 | 0 | 1 | 0 | 1 | 0 | 1 |
| Mean Length (in) | — | 20.0 | — | 6.0 | — | 9.0 | — | 18.1 | — | 5.0 |
| STD | — | 0.0 | — | 0.0 | — | 0.0 | — | 0.0 | — | 0.0 |
| Minimum Length (in) | — | 20.0 | — | 6.0 | — | 9.0 | — | 18.1 | — | 5.0 |
| Maximum Length (in) | — | 20.0 | — | 6.0 | — | 9.0 | — | 18.1 | — | 5.0 |
| Mean Weight (lbs) | — | 5.0 | — | 0.1 | — | 0.6 | — | 1.5 | — | 0.1 |
| STD | — | 0.0 | — | 0.0 | — | 0.0 | — | 0.0 | — | 0.0 |

Table 9 continued.

| Length Inches | Common Carp | | Channel Catfish | | Flathead Catfish | | Freshwater Drum | | Goldeye | |
|---------------------|-------------|---------|-----------------|---------|------------------|---------|-----------------|---------|---------|---------|
| | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release |
| 4.0 - 4.9 | | | | 3 | | | | | 2 | |
| 5.0 - 5.9 | | 1 | 1 | 41 | | | | | 1 | |
| 6.0 - 6.9 | | 3 | 1 | 25 | | | 5 | 2 | | |
| 7.0 - 7.9 | | | | 5 | | | | | 2 | |
| 8.0 - 8.9 | | | | 40 | | 1 | 2 | 9 | | |
| 9.0 - 9.9 | | | 2 | 11 | | | | | 6 | |
| 10.0 - 10.9 | | 3 | 6 | 24 | | | 9 | 21 | | |
| 11.0 - 11.9 | | | 1 | 3 | | | 6 | 3 | | |
| 12.0 - 12.9 | | 6 | 8 | 41 | | 1 | 11 | 15 | | 2 |
| 13.0 - 13.9 | | | 7 | 3 | | | 4 | 13 | | |
| 14.0 - 14.9 | | 6 | 11 | 10 | | | 1 | 27 | | |
| 15.0 - 15.9 | 1 | 9 | 17 | 12 | | 10 | 8 | 8 | | |
| 16.0 - 16.9 | 1 | 14 | 13 | 4 | 1 | 1 | | 7 | | 2 |
| 17.0 - 17.9 | 1 | 5 | 9 | 2 | | | 1 | 1 | | |
| 18.0 - 18.9 | 5 | 32 | 11 | 15 | 2 | | | 7 | | 1 |
| 19.0 - 19.9 | 1 | 4 | 9 | 1 | 2 | 1 | | | | |
| 20.0 - 20.9 | 6 | 18 | 22 | 15 | 5 | 4 | 2 | 3 | | |
| 21.0 - 21.9 | | 2 | 13 | 3 | 4 | | | 2 | | |
| 22.0 - 22.9 | 8 | 8 | 14 | 10 | 8 | 5 | | 2 | | |
| 23.0 - 23.9 | | | 6 | 4 | 1 | | | | | |
| 24.0 - 24.9 | 4 | 16 | 13 | 10 | 11 | 3 | | | | |
| 25.0 - 25.9 | 1 | 5 | 5 | 3 | 1 | 8 | | 1 | | |
| 26.0 - 26.9 | | 10 | 5 | 1 | 3 | | | | | |
| 27.0 - 27.9 | | | 5 | 1 | 2 | | | | | |
| 28.0 - 28.9 | 1 | | 1 | 2 | 1 | 3 | | | | |
| 29.0 - 29.9 | | | 2 | | 1 | 2 | | | | |
| 30.0 - 30.9 | | 2 | 5 | 1 | 3 | 1 | | | | |
| 31.0 - 31.9 | | | | | 1 | | | | | |
| 32.0 - 32.9 | | | | 2 | 2 | 1 | | | | |
| 33.0 - 33.9 | | | | | 3 | 1 | | | | |
| 34.0 - 34.9 | | | | | 3 | 2 | | | | |
| 35.0 - 35.9 | | | | | | | | | | |
| 36.0 - 36.9 | | | | | 1 | 2 | | | | |
| 37.0 - 37.9 | | | | | 3 | | | | | |
| 38.0 - 38.9 | | | | | 2 | 1 | | | | |
| 39.0 - 39.9 | | | | | | | | | | |
| 40.0 and up | | | | | 1 | 4 | | | | |
| Total | 29 | 144 | 189 | 290 | 61 | 51 | 49 | 132 | 3 | 2 |
| Mean Length (in) | 20.8 | 19.0 | 19.2 | 12.0 | 26.5 | 24.8 | 12.0 | 12.9 | 16.7 | 12.0 |
| STD | 2.9 | 4.7 | 5.1 | 6.1 | 6.2 | 8.7 | 3.2 | 3.8 | 0.9 | 0.0 |
| Minimum Length (in) | 15.0 | 5.0 | 5.0 | 4.0 | 16.0 | 8.0 | 6.0 | 4.0 | 16.0 | 12.0 |
| Maximum Length (in) | 28.0 | 30.0 | 32.5 | 30.0 | 44.0 | 45.0 | 20.4 | 25.0 | 18.0 | 12.0 |
| Mean Weight (lbs) | 4.4 | 3.7 | 2.8 | 1.1 | 9.6 | 9.4 | 1.0 | 1.3 | 1.6 | 0.6 |
| STD | 1.7 | 2.3 | 2.2 | 1.5 | 7.4 | 10.0 | 0.8 | 1.2 | 0.3 | 0.0 |

Table 9 continued.

| Length Inches | Mooneye | | Northern Pike | | Sauger | | Shorthead Redhorse | | Shovelnose Sturgeon | |
|---------------------|---------|---------|---------------|---------|---------|---------|--------------------|---------|---------------------|---------|
| | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release |
| 4.0 - 4.9 | | | | | | | | | | |
| 5.0 - 5.9 | | | | | | | | | | |
| 6.0 - 6.9 | | | | | | | | | | |
| 7.0 - 7.9 | | | | | | | | | | |
| 8.0 - 8.9 | | | | | | | | | | |
| 9.0 - 9.9 | | | | | | | | | | |
| 10.0 - 10.9 | | | | | | | | | | |
| 11.0 - 11.9 | | | | | | | | | | |
| 12.0 - 12.9 | | | | | | | | | | |
| 13.0 - 13.9 | | | | | | | | | | |
| 14.0 - 14.9 | | | | | 2 | | | | | |
| 15.0 - 15.9 | | | | 1 | | | | | 1 | |
| 16.0 - 16.9 | 1 | | | | 1 | 1 | | | | |
| 17.0 - 17.9 | | | | | | | | | | |
| 18.0 - 18.9 | | | | | | 1 | | | | |
| 19.0 - 19.9 | | | | | 1 | | | | | |
| 20.0 - 20.9 | | | | 1 | | | | | | |
| 21.0 - 21.9 | | | | | | | | | | |
| 22.0 - 22.9 | | | 1 | | | | | | | |
| 23.0 - 23.9 | | | 1 | | | | | | 1 | |
| 24.0 - 24.9 | | | | 1 | | | | | | 1 |
| 25.0 - 25.9 | | | | | | | | | | |
| 26.0 - 26.9 | | | | | | | | | | |
| 27.0 - 27.9 | | | | | | | | | | |
| 28.0 - 28.9 | | | | | | | | | | |
| 29.0 - 29.9 | | | 1 | | | | | | | |
| 30.0 - 30.9 | | | | | | | | | | 1 |
| 31.0 - 31.9 | | | 1 | | | | | | | |
| 32.0 - 32.9 | | | 1 | | | | | | | |
| 33.0 - 33.9 | | | | | | | | | | |
| 34.0 - 34.9 | | | | | | | | | | |
| 35.0 - 35.9 | | | | | | | | | | |
| 36.0 - 36.9 | | | | 1 | | | | | | |
| 37.0 - 37.9 | | | | | | | | | | |
| 38.0 - 38.9 | | | | | | | | | | |
| 39.0 - 39.9 | | | | | | | | | | |
| 40.0 and up | | | | | | | | | | |
| Total | 1 | 0 | 5 | 4 | 4 | 2 | 0 | 2 | 0 | 2 |
| Mean Length (in) | 16.0 | — | 27.8 | 23.8 | 16.0 | 17.0 | — | 19.3 | — | 27.0 |
| STD | 0.0 | — | 4.0 | 7.8 | 2.3 | 1.0 | — | 4.3 | — | 3.0 |
| Minimum Length (in) | 16.0 | — | 22.7 | 15.0 | 14.0 | 16.0 | — | 15.0 | — | 24.0 |
| Maximum Length (in) | 16.0 | — | 32.5 | 36.0 | 19.5 | 18.0 | — | 23.5 | — | 30.0 |
| Mean Weight (lbs) | 0.9 | — | 5.1 | 4.0 | 1.4 | 1.6 | — | 3.2 | — | 0.9 |
| STD | 0.0 | — | 2.0 | 3.8 | 0.6 | 0.3 | — | 1.9 | — | 1.9 |

Table 9 continued.

| Length Inches | Shortnose Gar | | Walleye | | White Bass | | White Sucker | |
|---------------------|---------------|---------|---------|---------|------------|---------|--------------|---------|
| | Harvest | Release | Harvest | Release | Harvest | Release | Harvest | Release |
| 4.0 - 4.9 | | | | 1 | | | | |
| 5.0 - 5.9 | | | | 1 | | | | |
| 6.0 - 6.9 | | | | 5 | | | | |
| 7.0 - 7.4 | | | | 1 | | | | |
| 8.0 - 8.9 | 3 | | | | | 1 | | |
| 9.0 - 9.9 | | | | | | | | |
| 10.0 - 10.9 | | | 3 | 10 | | 1 | | 1 |
| 11.0 - 11.9 | | | | 1 | 1 | 1 | | |
| 12.0 - 12.9 | 5 | | 4 | 10 | | 2 | | |
| 13.0 - 13.9 | | | 1 | 4 | 1 | | | 1 |
| 14.0 - 14.9 | 1 | | 6 | 8 | 2 | | | |
| 15.0 - 15.9 | | | 5 | 6 | | | | |
| 16.0 - 16.9 | | | 5 | 3 | | 1 | | |
| 17.0 - 17.9 | | | 1 | 1 | | | | |
| 18.0 - 18.9 | | | 6 | 1 | | | | |
| 19.0 - 19.9 | | 2 | | | | | | |
| 20.0 - 20.9 | 3 | | | | | | | |
| 21.0 - 21.9 | 1 | | | 1 | | | | |
| 22.0 - 22.9 | 2 | | | | | | | |
| 23.0 - 23.9 | 2 | | | | | | | |
| 24.0 - 24.9 | | 3 | | | | | | |
| 25.0 - 25.9 | | | | 1 | | | | |
| 26.0 - 26.9 | 1 | | | | | | | |
| 27.0 - 27.9 | | | 2 | | | | | |
| 28.0 - 28.9 | 1 | | | 1 | | | | |
| 29.0 - 29.9 | | | | | | | | |
| 30.0 - 30.9 | | 2 | | | | | | |
| 31.0 - 31.9 | 1 | | | | | | | |
| 32.0 - 32.9 | | | | | | | | |
| 33.0 - 33.9 | | | | | | | | |
| 34.0 - 34.9 | | | | | | | | |
| 35.0 - 35.9 | | | | | | | | |
| 36.0 - 36.9 | | | | | | | | |
| 37.0 - 37.9 | | | | | | | | |
| 38.0 - 38.9 | | | | | | | | |
| 39.0 - 39.9 | | | | | | | | |
| 40.0 and up | | | | | | | | |
| Total | 7 | 18 | 37 | 55 | 4 | 6 | 0 | 2 |
| Mean Length (in) | 25.2 | 17.3 | 16.0 | 12.5 | 13.1 | 11.5 | — | 11.7 |
| STD | 6.4 | 6.9 | 3.8 | 4.4 | 1.3 | 2.4 | — | 1.7 |
| Minimum Length (in) | 22.0 | 8.0 | 10.0 | 4.0 | 11.0 | 8.0 | — | 10.0 |
| Maximum Length (in) | 31.0 | 30.0 | 27.4 | 28.0 | 14.5 | 16.0 | — | 13.3 |
| Mean Weight (lbs) | 2.3 | 1.0 | 1.7 | 1.0 | 1.1 | 0.9 | — | 0.6 |
| STD | 1.4 | 1.0 | 1.6 | 1.3 | 0.3 | 0.6 | — | 0.2 |

Table 10. Angler ages for the 1998 Minnesota River creel survey.

| 0-15 | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65 + | Total |
|------|---------|---------|---------|---------|---------|------|-------|
| 49 | 82 | 111 | 138 | 73 | 52 | 29 | 534 |
| 9.2% | 15.4% | 20.8% | 25.8% | 13.7% | 9.7% | 5.4% | 100% |

Table 11. Resident and non-resident angler expenses and distance traveled for the 1998 Minnesota River creel survey.

| | Residents | Non-Residents | Total |
|--------------------|------------------|-----------------|-------------|
| Interviews | 510 ¹ | 81 ² | 578 |
| Total Anglers | 1,237 | 184 | 1,421 |
| Mean Number/Party | 2.5 | 2.5 | 2.5 |
| STD | 1.4 | 0.8 | 1.3 |
| Mean Expenses/Trip | \$17.96 | \$82.06 | \$27.35 |
| STD | \$33.47 | \$94.04 | \$52.46 |
| Mean Miles/Trip | 24.5 | 289.8 | 62.1 |
| STD | 36.7 | 455.8 | 203.5 |
| Total Expenses | \$9,161.00 | \$6,647.00 | \$15,807.00 |
| Expenses/Mile | \$0.74 | \$0.28 | \$0.44 |

¹ interviews with residents only

² interviews with non-residents or included residents

Table 12. Angler satisfaction response to the statement "based on the number and size of fish you caught today, please rate your fishing satisfaction from 1 (low) to 10 (high)" for the 1998 Minnesota River creel survey.

| | Mean | STD |
|-----------|------|-----|
| May | 3.0 | 2.7 |
| June | 2.7 | 2.6 |
| July | 3.1 | 2.8 |
| September | 2.0 | 1.7 |
| October | 1.5 | 1.3 |
| Total | 3.1 | 2.7 |

Appendix 1.

Estimated catch, harvest and release number and number per mile by species for May of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Number | Catch % | Number/Mile | Harvest | | | Number | Release % | Number/Mile | % of Fish Released |
|---------------------|-----------------|---------|-------------|---------------|-------|-------------|-----------------|-----------|-------------|--------------------|
| | | | | Number | % | Number/Mile | | | | |
| bigmouth buffalo | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| black bullhead | 216.2 (234.2) | 3.1 | 2.0 (2.1) | 0.0 (—) | 0.0 | 0.0 (—) | 216.2 (234.2) | 4.1 | 2.0 (2.1) | 100.0 |
| bluegill | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| blue sucker | 20.3 (10.8) | 0.3 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 20.3 (10.8) | 0.4 | 0.2 (0.1) | 100.0 |
| brown bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| carp | 1,720.3 (528.7) | 24.6 | 15.6 (4.8) | 195.1 (101.7) | 11.3 | 1.8 (0.9) | 1,525.2 (516.2) | 29.0 | 13.9 (4.7) | 88.7 |
| channel catfish | 2,224.8 (—) | 31.8 | 20.2 (—) | 627.8 (—) | 18.9 | 5.7 (—) | 1597.0 (—) | 30.4 | 14.5 (—) | 71.8 |
| flathead catfish | 329.5 (—) | 4.7 | 3.0 (—) | 111.8 (—) | 6.5 | 1.0 (—) | 217.7 (—) | 4.1 | 2.0 (—) | 66.1 |
| freshwater drum | 668.4 (—) | 9.6 | 6.1 (—) | 89.2 (—) | 5.2 | 0.8 (—) | 579.3 (—) | 11.0 | 5.3 (—) | 86.7 |
| goldeye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| mooneye | 5.8 (6.5) | 0.1 | 0.1 (0.1) | 5.8 (6.5) | 0.3 | 0.1 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 |
| northern pike | 156.2 (70.1) | 2.2 | 1.4 (0.6) | 87.6 (54.8) | 5.1 | 0.8 (0.5) | 68.6 (43.7) | 1.3 | 0.6 (0.4) | 43.9 |
| sauger | 24.5 (13.7) | 0.4 | 0.2 (0.1) | 24.5 (13.7) | 1.4 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 |
| shortnose redhorse | 54.4 (52.4) | 0.8 | 0.5 (0.5) | 0.0 (—) | 0.0 | 0.0 (—) | 54.4 (52.4) | 1.0 | 0.5 (0.5) | 100.0 |
| shovelnose sturgeon | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| shortnose gar | 22.6 (—) | 0.3 | 0.2 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 22.6 (—) | 0.4 | 0.2 (—) | 100.0 |
| walleye | 1,422.4 (545.6) | 20.4 | 12.9 (5.0) | 524.6 (205.3) | 30.3 | 4.8 (1.9) | 897.9 (384.5) | 17.1 | 8.2 (3.5) | 63.1 |
| white bass | 79.4 (31.8) | 1.1 | 0.7 (0.3) | 66.1 (26.2) | 3.8 | 0.6 (0.2) | 13.3 (10.4) | 0.3 | 0.1 (0.1) | 16.8 |
| white sucker | 42.6 (33.3) | 0.6 | 0.4 (0.3) | 0.0 (—) | 0.0 | 0.0 (—) | 42.6 (33.3) | 0.8 | 0.4 (0.3) | 100.0 |
| Total | 6,987.4 (—) | 100.0 | 63.5 (—) | 1,732.4 (—) | 100.0 | 15.8 (—) | 5,255.0 (—) | 100.0 | 47.8 (—) | 75.2 |

Appendix 2.

Estimated catch, harvest and release number and number per mile by species for June of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|-------------|-------|-------------|-----------|-------|-------------|-------------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| black bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| bluegill | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| brown bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| carp | 593.0 (-) | 18.8 | 5.4 (-) | 40.2 (-) | 4.4 | 0.4 (-) | 552.9 (-) | 24.6 | 5.0 (-) | 93.2 |
| channel catfish | 961.0 (-) | 30.4 | 8.7 (-) | 455.5 (-) | 50.0 | 4.1 (-) | 505.6 (-) | 22.5 | 4.6 (-) | 52.6 |
| flathead catfish | 224.1 (-) | 7.1 | 2.0 (-) | 144.6 (-) | 15.9 | 1.3 (-) | 79.5 (-) | 3.5 | 0.7 (-) | 35.5 |
| freshwater drum | 1,216.0 (-) | 38.5 | 11.1 (-) | 218.6 (-) | 24.0 | 2.0 (-) | 997.5 (-) | 44.4 | 9.1 (-) | 82.0 |
| goldeye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| mooneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| northern pike | 17.9 (11.7) | 0.6 | 0.2 (0.1) | 7.4 (5.0) | 0.8 | 0.1 (0.1) | 10.5 (10.5) | 0.5 | 0.1 (0.1) | 58.7 |
| sauger | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shorthead redhorse | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shovelnose sturgeon | 10.5 (10.5) | 0.3 | 0.1 (0.1) | 0.0 | 0.0 | 0.0 (-) | 10.5 (10.5) | 0.5 | 0.1 (0.1) | 100.0 |
| shortnose gar | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| walleye | 115.3 (-) | 3.7 | 1.1 (-) | 45.7 (-) | 5.0 | 0.4 (-) | 69.7 (-) | 3.1 | 0.6 (-) | 60.5 |
| white bass | 20.3 (-) | 0.6 | 0.2 (-) | 0.0 | 0.0 | 0.0 (-) | 20.3 (-) | 0.9 | 0.2 (-) | 100.0 |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| Total | 3,158.3 (-) | 100.0 | 28.7 (-) | 911.8 (-) | 100.0 | 8.3 (-) | 2,246.4 (-) | 100.0 | 20.4 (-) | 71.1 |

Appendix 3.

Estimated catch, harvest and release number and number per mile by species for July of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|-----------------|-------|-------------|---------------|-------|-------------|---------------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 32.6 (42.6) | 0.5 | 0.3 (0.4) | 0.0 (—) | 0.0 | 0.0 (—) | 32.6 (42.6) | 0.8 | 0.3 (0.4) | 100.0 |
| black bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| bluegill | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| blue sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| brown bullhead | 59.0 (63.3) | 0.9 | 0.5 (0.6) | 0.0 (—) | 0.0 | 0.0 (—) | 59.0 (63.3) | 1.5 | 0.5 (0.6) | 100.0 |
| carp | 562.6 (242.6) | 8.9 | 5.1 (2.2) | 41.6 (22.5) | 1.7 | 0.4 (0.2) | 521.0 (239.3) | 13.3 | 4.7 (2.2) | 92.6 |
| channel catfish | 3,087.5 (—) | 48.9 | 28.1 (—) | 1,270.9 (—) | 53.2 | 11.6 (—) | 1,816.6 (—) | 46.3 | 16.5 (—) | 58.8 |
| flathead catfish | 821.2 (—) | 13.0 | 7.5 (—) | 418.8 (—) | 17.5 | 3.8 (—) | 402.4 (—) | 10.3 | 3.7 (—) | 49.0 |
| freshwater drum | 1,009.8 (371.4) | 16.0 | 9.2 (3.4) | 394.0 (211.8) | 16.5 | 3.6 (1.9) | 615.9 (298.2) | 15.7 | 5.6 (2.7) | 61.0 |
| goldeye | 63.3 (33.9) | 1.0 | 0.6 (0.3) | 32.6 (20.2) | 1.4 | 0.3 (0.2) | 30.7 (27.3) | 0.8 | 0.3 (0.3) | 48.5 |
| mooneye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| northern pike | 16.3 (21.3) | 0.3 | 0.2 (0.2) | 0.0 (—) | 0.0 | 0.0 (—) | 16.3 (21.3) | 0.4 | 0.2 (0.2) | 100.0 |
| sauger | 26.4 (22.9) | 0.4 | 0.2 (0.2) | 8.7 (8.2) | 0.4 | 0.1 (0.1) | 17.7 (21.4) | 0.5 | 0.2 (0.2) | 67.1 |
| shorthead redhorse | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| shovelnose sturgeon | 8.7 (8.0) | 0.1 | 0.1 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 8.7 (8.0) | 0.2 | 0.1 (0.1) | 100.0 |
| shortnose gar | 430.2 (300.5) | 6.8 | 3.9 (2.7) | 105.6 (78.6) | 4.4 | 1.0 (0.7) | 324.6 (227.9) | 8.3 | 3.0 (2.1) | 75.5 |
| walleye | 182.1 (149.5) | 2.9 | 1.7 (1.4) | 117.8 (146.2) | 4.9 | 1.1 (1.3) | 64.3 (48.1) | 1.6 | 0.6 (0.4) | 35.3 |
| white bass | 17.7 (21.4) | 0.3 | 0.2 (0.2) | 0.0 (—) | 0.0 | 0.0 (—) | 17.7 (21.4) | 0.5 | 0.2 (0.2) | 100.0 |
| white sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| Total | 6,317.5 (—) | 100.0 | 57.4 (—) | 2,389.9 (—) | 100.0 | 21.7 (—) | 3,927.6 (—) | 100.0 | 35.7 (—) | 62.2 |

Appendix 4.

Estimated catch, harvest and release number and number per mile by species for September of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|---------------|-------|-------------|---------------|-------|-------------|--------------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| black bullhead | 22.0 (35.1) | 1.2 | 0.2 (0.3) | 0.0 (-) | 0.0 | 0.0 (-) | 22.0 (35.1) | 1.8 | 0.2 (0.3) | 100.0 |
| bluegill | 18.6 (12.0) | 1.0 | 0.2 (0.1) | 0.0 (-) | 0.0 | 0.0 (-) | 18.6 (12.0) | 1.6 | 0.2 (0.1) | 100.0 |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| brown bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| carp | 332.0 (139.6) | 18.2 | 3.0 (1.3) | 102.6 (132.6) | 16.6 | 0.9 (1.2) | 229.4 (43.6) | 19.1 | 2.1 (0.4) | 69.1 |
| channel catfish | 920.7 (-) | 50.5 | 8.4 (-) | 347.4 (-) | 56.2 | 3.2 (-) | 573.2 (-) | 47.6 | 5.2 (-) | 62.3 |
| flathead catfish | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| freshwater drum | 492.5 (-) | 27.0 | 4.5 (-) | 153.9 (-) | 24.9 | 1.4 (-) | 338.5 (-) | 28.1 | 3.1 (-) | 68.7 |
| goldeye | 14.7 (10.0) | 0.8 | 0.1 (0.1) | 14.7 (10.0) | 2.4 | 0.1 (0.1) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 |
| mooneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| northern pike | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| sauger | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shorthead redhorse | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shovelnose sturgeon | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shortnose gar | 22.0 (34.0) | 1.2 | 0.2 (0.3) | 0.0 (-) | 0.0 | 0.0 (-) | 22.0 (34.0) | 1.8 | 0.2 (0.3) | 100.0 |
| walleye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| white bass | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| Total | 1,822.5 (-) | 100.0 | 16.6 (-) | 618.7 (-) | 100.0 | 5.6 (-) | 1,203.8 (-) | 100.0 | 10.9 (-) | 66.1 |

Appendix 5.

Estimated catch, harvest and release number and number per mile by species for October of the 1998 Minnesota River creek survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|-----------|-------|-------------|-----------|-------|-------------|---------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| black bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| bluegill | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| brown bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| carp | 198.0 (-) | 49.7 | 1.8 (-) | 0.0 | 0.0 | 0.0 (-) | 198.0 | 100.0 | 1.8 (-) | 100.0 |
| channel catfish | 35.5 (-) | 8.9 | 0.3 (-) | 35.5 | 17.7 | 0.3 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 |
| flathead catfish | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| freshwater drum | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| goldeye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| mooneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| northern pike | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| sauger | 165.0 (-) | 41.4 | 1.5 (-) | 165.0 | 82.3 | 1.5 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 |
| shorthead redhorse | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shovelnose sturgeon | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shortnose gar | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| walleye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| white bass | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| Total | 398.5 (-) | 100.0 | 3.6 (-) | 200.5 (-) | 100.0 | 1.8 (-) | 198.0 | 100.0 | 1.8 (-) | 49.7 |

Appendix 6.

Estimated catch, harvest and release pounds and pounds per mile by species for May of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|-------------------|-------|-------------|---------------|-------|-------------|-------------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| black bullhead | 23.8 (—) | 0.1 | 0.2 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 23.8 (—) | 0.2 | 0.2 (—) |
| bluegill | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| blue sucker | 30.4 (—) | 0.2 | 0.3 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 30.4 (—) | 0.3 | 0.3 (—) |
| brown bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| carp | 4,976.4 (2,040.4) | 29.9 | 45.2 (18.6) | 634.9 (582.9) | 9.6 | 5.8 (5.3) | 4,341.5 (1,919.6) | 43.4 | 39.5 (17.5) |
| channel catfish | 3,810.5 (—) | 22.9 | 34.6 (—) | 2,230.8 (—) | 33.7 | 20.3 (—) | 1,579.7 (—) | 15.8 | 14.4 (—) |
| flathead catfish | 3,844.2 (—) | 23.1 | 35.0 (—) | 2,108.7 (—) | 31.8 | 19.2 (—) | 1,735.4 (—) | 17.3 | 15.8 (—) |
| freshwater drum | 676.3 (—) | 4.1 | 6.2 (—) | 75.8 (—) | 1.1 | 0.7 (—) | 600.5 (—) | 6.0 | 5.5 (—) |
| goldeye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| mooneye | 4.9 (—) | <0.1 | <0.1 (—) | 4.9 (—) | 0.1 | <0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| northern pike | 1,087.8 (777.0) | 6.5 | 9.9 (7.1) | 490.1 (611.1) | 7.4 | 4.5 (5.6) | 597.7 (493.4) | 6.0 | 5.4 (4.5) |
| sauger | 21.8 (12.2) | 0.1 | 0.2 (0.1) | 21.8 (12.2) | 0.3 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) |
| shorthead redhorse | 251.4 (275.0) | 1.5 | 2.3 (2.5) | 0.0 (—) | 0.0 | 0.0 (—) | 251.4 (275.0) | 2.5 | 2.3 (2.5) |
| shovelnose sturgeon | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shortnose gar | 40.8 (—) | 0.3 | 0.4 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 40.8 (—) | 0.4 | 0.4 (—) |
| walleye | 1,742.8 (—) | 10.5 | 15.8 (—) | 983.0 (771.8) | 14.8 | 8.9 (7.0) | 759.9 (704.2) | 7.6 | 6.9 (6.4) |
| white bass | 100.9 (51.0) | 0.6 | 0.9 (0.5) | 73.9 (32.5) | 1.1 | 0.7 (0.3) | 27.0 (22.5) | 0.3 | 0.3 (0.2) |
| white sucker | 23.3 (19.1) | 0.1 | 0.2 (0.2) | 0.0 (—) | 0.0 | 0.0 (—) | 23.3 (19.1) | 0.2 | 0.2 (0.2) |
| Total | 16,635.4 (—) | 100.0 | 151.2 (—) | 6,624.0 (—) | 100.0 | 60.2 (—) | 10,011.4 (—) | 100.0 | 91.0 (—) |

Appendix 7.

Estimated catch, harvest and release pounds and pounds per mile by species for June of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|-------------|-------|-------------|-------------|-------|-------------|-------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| black bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| bluegill | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| blue sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| brown bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| carp | 2,193.7 (—) | 31.0 | 19.9 (—) | 215.0 (—) | 8.3 | 2.0 (—) | 1,978.6 (—) | 44.0 | 18.0 (—) |
| channel catfish | 1,491.2 (—) | 21.1 | 13.6 (—) | 97.0.7 (—) | 37.6 | 8.8 (—) | 520.5 (—) | 11.6 | 4.7 (—) |
| flathead catfish | 1,937.9 (—) | 27.4 | 17.6 (—) | 1,147.8 (—) | 44.5 | 10.4 (—) | 790.1 (—) | 17.6 | 7.2 (—) |
| freshwater drum | 1,223.0 (—) | 17.3 | 11.1 (—) | 127.3 (—) | 4.9 | 1.2 (—) | 1,095.6 (—) | 24.4 | 10.0 (—) |
| goldeye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| mooneye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| northern pike | 50.6 (51.5) | 0.7 | 0.5 (0.5) | 18.9 (19.7) | 0.7 | 0.2 (0.2) | 31.7 (51.7) | 0.7 | 0.3 (0.5) |
| sauger | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shorthead redhorse | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shovelnose sturgeon | 12.6 (23.7) | 0.2 | 0.1 (0.2) | 0.0 (—) | 0.0 | 0.0 (—) | 12.6 (23.7) | 0.3 | 0.1 (0.2) |
| shortnose gar | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| walleye | 154.4 (—) | 2.2 | 1.4 (—) | 101.3 (—) | 3.9 | 0.9 (—) | 53.0 (—) | 1.2 | 0.5 (—) |
| white bass | 10.3 (—) | 0.2 | 0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 10.3 (—) | 0.2 | 0.1 (—) |
| white sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| Total | 7,073.6 (—) | 100.0 | 64.3 (—) | 2,581.1 (—) | 100.0 | 23.5 (—) | 4,492.5 (—) | 100.0 | 40.8 (—) |

Appendix 8.

Estimated catch, harvest and release pounds and pounds per mile by species for July of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|---------------|-------|-------------|---------------|-------|-------------|-------------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 162.6 (-) | 0.9 | 1.5 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 162.6 (-) | 1.6 | 1.5 (-) |
| black bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| bluegill | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| brown bullhead | 3.0 (-) | <0.1 | <0.1 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 3.0 (-) | <0.1 | <0.1 (-) |
| carp | 2,901.5 (-) | 16.0 | 26.4 (-) | 221.6 (131.2) | 2.8 | 2.0 (1.2) | 2,679.9 (2,314.5) | 26.2 | 24.4 (21.0) |
| channel catfish | 5,278.9 (-) | 29.0 | 48.0 (-) | 3,360.7 (-) | 43.0 | 30.6 (-) | 1,918.2 (-) | 18.8 | 17.4 (-) |
| flathead catfish | 7,796.8 (-) | 42.9 | 70.9 (-) | 3,454.7 (-) | 44.2 | 31.4 (-) | 4,186.8 (-) | 41.0 | 38.1 (-) |
| freshwater drum | 1,015.4 (-) | 5.6 | 9.2 (-) | 307.2 (-) | 3.9 | 2.8 (-) | 708.1 (-) | 6.9 | 6.4 (-) |
| goldeye | 72.4 (43.9) | 0.4 | 0.7 (0.4) | 54.3 (34.7) | 0.7 | 0.5 (0.3) | 18.1 (-) | 0.2 | 0.2 (-) |
| mooneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| northern pike | 11.7 (51.1) | 0.1 | 0.1 (0.5) | 0.0 (-) | 0.0 | 0.0 (-) | 11.7 (65.1) | 0.1 | 0.1 (0.6) |
| sauger | 41.2 (37.9) | 0.2 | 0.4 (0.3) | 12.7 (13.1) | 0.2 | 0.1 (0.1) | 28.5 (34.8) | 0.3 | 0.3 (0.3) |
| shorthead redhorse | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| shovelnose sturgeon | 21.8 (26.0) | 0.1 | 0.2 (0.2) | 0.0 (-) | 0.0 | 0.0 (-) | 21.8 (26.0) | 0.2 | 0.2 (0.2) |
| shortnose gar | 451.2 (350.5) | 2.5 | 4.1 (3.2) | 197.7 (230.1) | 2.5 | 1.8 (2.1) | 253.6 (195.5) | 2.5 | 2.3 (1.8) |
| walleye | 425.5 (302.9) | 2.3 | 3.9 (2.8) | 210.4 (308.2) | 2.7 | 1.9 (2.8) | 215.1 (190.9) | 2.1 | 2.0 (1.7) |
| white bass | 13.2 (18.3) | 0.1 | 0.1 (0.2) | 0.0 (-) | 0.0 | 0.0 (-) | 13.2 (18.9) | 0.1 | 0.1 (0.2) |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| Total | 18,195.1 (-) | 100.0 | 165.4 (-) | 7,819.2 (-) | 100.0 | 71.1 (-) | 10,220.7 (-) | 100.0 | 92.9 (-) |

Appendix 9.

Estimated catch, harvest and release pounds and pounds per mile by species for September of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|-------------|-------|-------------|-----------------|-------|-------------|-------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| black bullhead | 2.4 (—) | 0.1 | <0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 2.4 (—) | 0.1 | <0.1 (—) |
| bluegill | 11.0 (—) | 0.3 | 0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 11.0 (—) | 0.5 | 0.1 (—) |
| blue sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| brown bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| carp | 1,867.4 (—) | 50.5 | 17.0 (—) | 569.6 (2,232.4) | 34.3 | 5.2 (20.3) | 1,297.8 (—) | 63.8 | 11.8 (—) |
| channel catfish | 1,042.0 (—) | 28.2 | 9.5 (—) | 815.6 (—) | 49.1 | 7.4 (—) | 226.3 (—) | 11.1 | 2.1 (—) |
| flathead catfish | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| freshwater drum | 731.5 (—) | 19.8 | 6.7 (—) | 256.6 (—) | 15.4 | 2.3 (—) | 474.9 (—) | 23.3 | 4.3 (—) |
| goldeye | 20.2 (15.8) | 0.6 | 0.2 (0.1) | 20.2 (15.8) | 1.2 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) |
| mooneye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| northern pike | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| sauger | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shortnose redhorse | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shovelnose sturgeon | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shortnose gar | 21.8 (43.4) | 0.6 | 0.2 (0.4) | 0.0 (—) | 0.0 | 0.0 (—) | 21.8 (43.4) | 1.1 | 0.2 (0.4) |
| walleye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| white bass | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| white sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| Total | 3,696.3 (—) | 100.0 | 33.6 (—) | 1,662.0 (—) | 100.0 | 15.1 (—) | 2,034.3 (—) | 100.0 | 18.5 (—) |

Appendix 10.

Estimated catch, harvest and release pounds and pounds per mile by species for October of the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|-----------|-------|-------------|-----------|-------|-------------|----------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| black bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| bluegill | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| brown bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| carp | 23.8 (-) | 5.2 | 0.2 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 23.8 (-) | 100.0 | 0.2 (-) |
| channel catfish | 34.8 (-) | 7.6 | 0.3 (-) | 34.8 (-) | 8.0 | 0.3 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| flathead catfish | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| freshwater drum | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| goldeye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| maoneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| northern pike | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| sauger | 397.7 (-) | 87.2 | 3.6 (-) | 397.7 (-) | 92.0 | 3.6 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| shorthead redhorse | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| shovelnose sturgeon | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| shorthnose gar | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| walleye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| white bass | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| Total | 456.2 (-) | 100.0 | 4.2 (-) | 432.5 (-) | 100.0 | 3.9 (-) | 23.8 (-) | 100.0 | 0.2 (-) |

Appendix 11.

Estimated catch, harvest and release number and number per mile by species for boat anglers for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|-------------|-------|-------------|-------------|-------|-------------|-------------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| black bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| bluegill | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| blue sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| brown bullhead | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| carp | 633.7 (-) | 16.1 | 5.8 (-) | 23.5 (-) | 1.4 | 0.2 (-) | 610.3 (-) | 26.6 | 5.6 (-) | 96.3 |
| channel catfish | 1,821.8 (-) | 46.4 | 16.6 (-) | 1,006.7 (-) | 61.7 | 9.2 (-) | 815.1 (-) | 35.5 | 7.4 (-) | 44.7 |
| flathead catfish | 683.2 (-) | 17.4 | 6.2 (-) | 375.8 (-) | 23.0 | 3.4 (-) | 307.3 (-) | 13.4 | 2.8 (-) | 45.0 |
| freshwater drum | 133.1 (-) | 3.4 | 1.2 (-) | 18.0 (-) | 1.1 | 0.2 (-) | 115.0 (-) | 5.0 | 1.1 (-) | 86.4 |
| goldeye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| mooneye | 5.8 (6.5) | 0.2 | 0.1 (0.1) | 5.8 (6.5) | 0.4 | 0.1 (0.1) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 |
| northern pike | 13.3 (10.4) | 0.3 | 0.1 (0.1) | 0.0 (-) | 0.0 | 0.0 (-) | 13.3 (10.4) | 0.6 | 0.1 (0.1) | 100.0 |
| sauger | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shortnose redhorse | 5.5 (7.7) | 0.1 | 0.1 (0.1) | 0.0 (-) | 0.0 | 0.0 (-) | 5.5 (7.7) | 0.2 | 0.1 (0.1) | 100.0 |
| shovelnose sturgeon | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| shortnose gar | 64.7 (-) | 1.7 | 0.6 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 64.7 (-) | 2.8 | 0.6 (-) | 100.0 |
| walleye | 527.0 (-) | 13.4 | 4.8 (-) | 187.6 (-) | 11.5 | 1.7 (-) | 339.3 (-) | 14.8 | 3.1 (-) | 64.4 |
| white bass | 39.5 (-) | 1.0 | 0.4 (-) | 13.3 (-) | 0.8 | 0.1 (-) | 26.2 (-) | 1.1 | 0.2 (-) | 66.3 |
| white sucker | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | 0.0 | 0.0 | 0.0 (-) | — |
| Total | 3,927.6 (-) | 100.0 | 35.7 (-) | 1,630.8 (-) | 100.0 | 14.8 (-) | 2,296.8 (-) | 100.0 | 20.9 (-) | 8.5 |

Appendix 12.

Estimated angling catch, harvest and release number and number per mile by species for shore anglers for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | | % of Fish Released |
|---------------------|---------------|-------|-------------|--------------|-------|-------------|---------------|-------|-------------|--------------------|
| | Number | % | Number/Mile | Number | % | Number/Mile | Number | % | Number/Mile | |
| bigmouth buffalo | 32.6 (42.6) | 0.2 | 0.3 (0.4) | 0.0 (—) | 0.0 | 0.0 (—) | 32.6 (42.6) | 0.3 | 0.3 (0.4) | 100.0 |
| black bullhead | 238.2 (236.8) | 1.6 | 2.2 (2.2) | 0.0 (—) | 0.0 | 0.0 (—) | 238.2 (236.8) | 2.3 | 2.2 (2.2) | 100.0 |
| bluegill | 18.6 (12.0) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 18.6 (12.0) | 0.2 | 0.2 (0.1) | 100.0 |
| blue sucker | 20.3 (10.8) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 20.3 (10.8) | 0.2 | 0.2 (0.1) | 100.0 |
| brown bullhead | 59.0 (63.3) | 0.4 | 0.5 (0.6) | 0.0 (—) | 0.0 | 0.0 (—) | 59.0 (63.3) | 0.6 | 0.5 (0.6) | 100.0 |
| carp | 2,772.3 (—) | 18.8 | 25.2 (—) | 356.0 (—) | 8.4 | 3.2 (—) | 2,416.3 (—) | 22.9 | 22.0 (—) | 87.2 |
| channel catfish | 5,407.7 (—) | 36.7 | 49.2 (—) | 1,730.4 (—) | 41.0 | 15.7 (—) | 3,677.4 (—) | 34.9 | 33.4 (—) | 68.0 |
| flathead catfish | 691.6 (—) | 4.7 | 6.3 (—) | 299.4 (—) | 7.1 | 2.7 (—) | 392.3 (—) | 3.7 | 3.6 (—) | 56.7 |
| freshwater drum | 3,253.7 (—) | 22.1 | 29.6 (—) | 837.6 (—) | 19.8 | 7.6 (—) | 2,416.1 (—) | 22.9 | 22.0 (—) | 74.3 |
| goldeye | 78.0 (35.4) | 0.5 | 0.7 (0.3) | 47.3 (22.5) | 1.1 | 0.4 (0.2) | 30.7 (27.3) | 0.3 | 0.3 (0.3) | 39.4 |
| mooneye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | — |
| northern pike | 177.1 (—) | 1.2 | 1.6 (—) | 95.1 (—) | 2.3 | 0.9 (—) | 82.1 (—) | 0.8 | 0.8 (—) | 46.4 |
| sauger | 215.9 (—) | 1.5 | 2.0 (—) | 198.2 (—) | 4.7 | 1.8 (—) | 17.7 (—) | 0.2 | 0.2 (—) | 8.2 |
| shortnose redhorse | 48.8 (51.8) | 0.3 | 0.4 (0.5) | 0.0 (—) | 0.0 | 0.0 (—) | 48.8 (51.8) | 0.5 | 0.4 (0.5) | 100.0 |
| shovelnose sturgeon | 19.2 (13.2) | 0.1 | 0.2 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 19.2 (13.2) | 0.2 | 0.2 (0.1) | 100.0 |
| shortnose gar | 410.0 (301.8) | 2.8 | 3.7 (2.7) | 105.6 (78.6) | 2.5 | 1.0 (0.7) | 304.5 (229.6) | 2.9 | 2.8 (2.1) | 74.3 |
| walleye | 1,192.9 (—) | 8.1 | 10.8 (—) | 500.4 (—) | 11.8 | 4.6 (—) | 692.5 (—) | 6.6 | 6.3 (—) | 58.1 |
| white bass | 77.9 (33.8) | 0.5 | 0.7 (0.3) | 52.8 (24.0) | 1.3 | 0.5 (0.2) | 25.1 (23.8) | 0.2 | 0.2 (0.2) | 32.2 |
| white sucker | 42.6 (33.3) | 0.3 | 0.4 (0.3) | 0.0 (—) | 0.0 | 0.0 (—) | 42.6 (33.3) | 0.4 | 0.4 (0.3) | 100.0 |
| Total | 14,756.6 (—) | 100.0 | 134.2 (—) | 4,222.6 (—) | 100.0 | 38.4 (—) | 10,534.0 (—) | 100.0 | 95.8 (—) | 71.4 |

Appendix 13.

Estimated catch, harvest and release pounds and pounds per mile by species for boat anglers for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|--------------|-------|-------------|-------------|-------|-------------|-------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| black bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| bluegill | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| blue sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| brown bullhead | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| carp | 2,387.1 (—) | 16.1 | 21.7 (—) | 107.4 (—) | 1.6 | 1.0 (—) | 2,279.6 (—) | 29.3 | 20.7 (—) |
| channel catfish | 4,553.2 (—) | 30.7 | 41.4 (—) | 3,132.1 (—) | 45.3 | 28.5 (—) | 1,421.1 (—) | 18.3 | 12.9 (—) |
| flathead catfish | 6,661.3 (—) | 44.9 | 60.6 (—) | 3,434.6 (—) | 49.6 | 31.2 (—) | 3,071.3 (—) | 39.5 | 27.9 (—) |
| freshwater drum | 213.4 (—) | 1.4 | 1.9 (—) | 14.0 (—) | 0.2 | 0.1 (—) | 199.5 (—) | 2.6 | 1.8 (—) |
| goldeye | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| mooneye | 4.9 (—) | <0.1 | <0.1 (—) | 4.9 (—) | 0.1 | <0.1 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| northern pike | 23.2 (43.7) | 0.2 | 0.2 (0.4) | 0.0 (—) | 0.0 | 0.0 (—) | 23.2 (43.7) | 0.3 | 0.2 (0.4) |
| sauger | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shortnose redhorse | 7.2 (14.4) | 0.1 | 0.1 (0.1) | 0.0 (—) | 0.0 | 0.0 (—) | 7.2 (14.4) | 0.1 | 0.1 (0.1) |
| shovelnose sturgeon | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| shortnose gar | 189.5 (—) | 1.3 | 1.7 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 189.5 (—) | 2.4 | 1.7 (—) |
| walleye | 757.2 (—) | 5.1 | 6.9 (—) | 206.4 (—) | 3.0 | 1.9 (—) | 550.8 (—) | 7.1 | 5.0 (—) |
| white bass | 55.6 (—) | 0.4 | 0.5 (—) | 20.1 (—) | 0.3 | 0.2 (—) | 35.5 (—) | 0.5 | 0.3 (—) |
| white sucker | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) | 0.0 (—) | 0.0 | 0.0 (—) |
| Total | 14,852.6 (—) | 100.0 | 135.0 (—) | 6,919.6 (—) | 100.0 | 62.9 (—) | 7,777.7 (—) | 100.0 | 70.7 (—) |

Appendix 14.

Estimated catch, harvest and release pounds and pounds per mile by species for shore anglers for the 1998 Minnesota River creel survey. Standard errors are presented in parentheses.

| Species | Catch | | | Harvest | | | Release | | |
|---------------------|---------------|-------|-------------|---------------|-------|-------------|---------------|-------|-------------|
| | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile | Pounds | % | Pounds/Mile |
| bigmouth buffalo | 162.6 (-) | 0.5 | 1.5 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 162.6 (-) | 0.9 | 1.5 (-) |
| black bullhead | 26.2 (-) | 0.1 | 0.2 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 26.2 (-) | 0.1 | 0.2 (-) |
| bluegill | 11.0 (-) | <0.1 | 0.1 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 11.0 (-) | 0.1 | 0.1 (-) |
| blue sucker | 30.4 (-) | 0.1 | 0.3 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 30.4 (-) | 0.2 | 0.3 (-) |
| brown bullhead | 3.0 (-) | <0.1 | <0.1 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 3.0 (-) | <0.1 | <0.1 (-) |
| carp | 9,575.7 (-) | 30.7 | 87.1 (-) | 1,533.7 (-) | 12.6 | 13.9 (-) | 8,042.0 (-) | 42.2 | 73.1 (-) |
| channel catfish | 7,104.2 (-) | 22.8 | 64.6 (-) | 4,280.6 (-) | 35.1 | 38.9 (-) | 2,823.6 (-) | 14.9 | 25.7 (-) |
| flathead catfish | 6,917.5 (-) | 22.2 | 62.9 (-) | 3,276.6 (-) | 26.9 | 29.8 (-) | 3,641.0 (-) | 19.2 | 33.1 (-) |
| freshwater drum | 3,432.7 (-) | 11.0 | 31.2 (-) | 753.0 (-) | 6.2 | 6.9 (-) | 2,679.7 (-) | 14.1 | 24.4 (-) |
| goldeye | 92.6 (46.7) | 0.3 | 0.8 (0.4) | 74.5 (37.6) | 0.6 | 0.7 (0.3) | 18.1 (-) | 0.1 | 0.2 (-) |
| mooneye | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) | 0.0 (-) | 0.0 | 0.0 (-) |
| northern pike | 1,127.0 (-) | 3.6 | 10.3 (-) | 509.0 (-) | 4.2 | 4.6 (-) | 617.9 (-) | 3.3 | 5.6 (-) |
| sauger | 460.6 (-) | 1.5 | 4.2 (-) | 432.1 (-) | 3.5 | 3.9 (-) | 28.5 (-) | 0.2 | 0.3 (-) |
| shorthead redhorse | 244.1 (274.6) | 0.8 | 2.2 (2.5) | 0.0 (-) | 0.0 | 0.0 (-) | 244.1 (274.6) | 1.3 | 2.2 (2.5) |
| shovelnose sturgeon | 34.4 (35.1) | 0.1 | 0.3 (0.3) | 0.0 (-) | 0.0 | 0.0 (-) | 34.4 (35.1) | 0.2 | 0.3 (0.3) |
| shortnose gar | 324.4 (342.8) | 1.0 | 3.0 (3.1) | 197.7 (230.1) | 1.6 | 1.8 (2.1) | 126.7 (182.2) | 0.7 | 1.2 (1.7) |
| walleye | 1,565.5 (-) | 5.0 | 14.2 (-) | 1,088.3 (-) | 8.9 | 9.9 (-) | 477.2 (-) | 2.5 | 4.3 (-) |
| white bass | 68.7 (37.7) | 0.2 | 0.6 (0.3) | 53.8 (28.1) | 0.4 | 0.5 (0.3) | 15.0 (19.5) | 0.1 | 0.1 (0.2) |
| white sucker | 23.3 (19.1) | 0.1 | 0.2 (0.2) | 0.0 (-) | 0.0 | 0.0 (-) | 23.3 (19.1) | 0.1 | 0.2 (0.2) |
| Total | 31,203.9 (-) | 100.0 | 283.7 (-) | 12,199.2 (-) | 100.0 | 110.9 (-) | 19,004.8 (-) | 100.0 | 172.8 (-) |

Minnesota
F29-R(P)-18
Area 410
Job 466
8 May 2001

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISHERIES

Completion Report

Angler Creel Survey of a 110 Mile Segment of the Minnesota River
1 May 1998 - 31 October 1998

by
Bobbi Chapman
Fisheries Specialist
Hutchinson, Minnesota

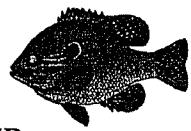
Approved by: _____ Date: _____
(Area Fisheries Supervisor)

Approved by: _____ Date: _____
(Regional Fisheries Manager)

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISHERIES

CREEL SURVEY HARVEST SUMMARY FOR MINNESOTA RIVER



| DOW number: | M55 | Ecological Class: IIIE, cosmopolitan | | Fish Management Area: Hutchinson | | | | Miles: 110.5 | | Year Surveyed: 1998 | | | |
|-------------------------------------|-------------|--------------------------------------|-------------|----------------------------------|-------------|-------------|-------------|--------------|-------------|---------------------|-------------|-------------|--|
| | | MAY | | JUNE | | JULY | | SEPTEMBER | | OCTOBER | | TOTAL | |
| Angler-Hours | | 13,370.50 | | 13,488.20 | | 15,678.10 | | 5,412.00 | | 1,362.20 | | 4,9311.00 | |
| Angler-Hours per Mile | | 121.55 | | 122.62 | | 142.53 | | 49.20 | | 12.38 | | 448.28 | |
| Ave. Party Size | | 1.97 | | 2.87 | | 2.30 | | 2.47 | | 1.46 | | 2.26 | |
| Ave.Trip Length (h) | | 6.84 | | 3.44 | | 7.70 | | 2.34 | | 0.67 | | 4.95 | |
| Harvest by Species for All Anglers: | Number | Pounds | Number | Pounds | Number | Pounds | Number | Pounds | Number | Pounds | Number | Pounds | |
| carp | 195.1 | 634.9 | 40.2 | 215.0 | 41.6 | 221.6 | 102.6 | 569.6 | 0.0 | 0.0 | 379.5 | 1,641.1 | |
| channel catfish | 627.8 | 2,230.8 | 455.5 | 970.7 | 1,270.9 | 3,360.7 | 347.4 | 815.6 | 35.5 | 34.8 | 2,737.1 | 7,412.6 | |
| flathead catfish | 111.8 | 2,108.7 | 144.6 | 1,147.8 | 418.8 | 3,454.7 | 0.0 | 0.0 | 0.0 | 0.0 | 675.2 | 6,711.2 | |
| freshwater drum | 89.2 | 75.8 | 218.6 | 127.3 | 394.0 | 307.2 | 153.9 | 256.6 | 0.0 | 0.0 | 855.6 | 767.0 | |
| goldeye | 0.0 | 0.0 | 0.0 | 0.0 | 32.6 | 54.3 | 14.7 | 20.2 | 0.0 | 0.0 | 47.3 | 74.5 | |
| mooneye | 5.8 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 4.9 | |
| northern pike | 87.6 | 490.1 | 7.4 | 18.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 95.1 | 509.0 | |
| sauger | 24.5 | 21.8 | 0.0 | 0.0 | 8.7 | 12.7 | 0.0 | 0.0 | 165.0 | 397.7 | 198.2 | 432.1 | |
| shortnose gar | 0.0 | 0.0 | 0.0 | 0.0 | 105.6 | 197.7 | 0.0 | 0.0 | 0.0 | 0.0 | 105.6 | 197.7 | |
| walleye | 524.6 | 983.0 | 45.7 | 101.3 | 117.8 | 210.4 | 0.0 | 0.0 | 0.0 | 0.0 | 688.0 | 1,294.7 | |
| white bass | 66.1 | 73.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 66.1 | 73.9 | |
| All Species | 1,732.4 | 6,624.0 | 911.8 | 2,581.1 | 2,389.9 | 7,819.2 | 618.7 | 1,662.0 | 200.5 | 432.5 | 5,853.4 | 19,118.7 | |
| Harvest by Species for All Anglers: | Number/Hour | Pounds/Mile | Number/Hour | Pounds/Mile | Number/Hour | Pounds/Mile | Number/Hour | Pounds/Mile | Number/Hour | Pounds/Mile | Number/Hour | Pounds/Mile | |
| carp | 0.01 | 5.77 | <0.01 | 1.95 | <0.01 | 2.01 | 0.02 | 5.18 | 0.00 | 0.00 | 0.01 | 14.92 | |
| channel catfish | 0.05 | 20.28 | 0.03 | 8.82 | 0.08 | 30.55 | 0.06 | 7.41 | 0.03 | 0.32 | 0.06 | 67.39 | |
| flathead catfish | 0.01 | 19.17 | 0.01 | 10.43 | 0.03 | 31.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 61.01 | |
| freshwater drum | 0.01 | 0.69 | 0.02 | 1.16 | 0.03 | 2.79 | 0.03 | 2.33 | 0.00 | 0.00 | 0.02 | 6.97 | |
| goldeye | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | 0.49 | <0.01 | 0.18 | 0.00 | 0.00 | <0.01 | 0.68 | |
| mooneye | <0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | 0.04 | |
| northern pike | 0.01 | 4.46 | <0.01 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | 4.63 | |
| sauger | <0.01 | 0.20 | 0.00 | 0.00 | <0.01 | 0.12 | 0.00 | 0.00 | 0.12 | 3.62 | <0.01 | 3.93 | |
| shortnose gar | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 1.80 | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | 1.80 | |
| walleye | 0.04 | 8.94 | <0.01 | 0.92 | 0.01 | 1.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 11.77 | |
| white bass | <0.01 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | 0.67 | |
| All Species | 0.13 | 60.22 | 0.07 | 23.46 | 0.15 | 71.08 | 0.11 | 15.11 | 0.15 | 3.93 | 0.12 | 173.81 | |

Creel Survey Harvest Summary for Minnesota River

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| Harvest by Species for Targeting Anglers: | MAY | | JUNE | | JULY | | SEPTEMBER | | OCTOBER | | TOTAL | |
|--|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| | Number/ Hour | Mean Weight |
| carp | 0.07 | 3.98 | 0.00 | 0.00 | 0.00 | 0.00 | — | — | — | — | 0.03 | 3.98 |
| channel catfish | 0.04 | 4.72 | 0.04 | 2.84 | 0.10 | 2.85 | 0.06 | 2.23 | 0.05 | 0.98 | 0.06 | 3.08 |
| flathead catfish | 0.01 | 13.85 | 0.02 | 5.74 | 0.03 | 7.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 7.91 |
| freshwater drum | 0.00 | 0.00 | 0.19 | 0.78 | 1.06 | 0.97 | 0.25 | 1.07 | — | — | 0.34 | 0.95 |
| largemouth bass | 0.00 | 0.00 | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| northern pike | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| smallmouth bass | 0.00 | 0.00 | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| shortnose gar | — | — | — | — | 2.00 | 1.36 | — | — | — | — | 2.00 | 1.36 |
| walleye | 0.13 | 1.46 | 0.01 | 2.02 | 0.06 | 1.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 1.65 |

Comments:

Citation:

Creel Survey Harvest Summary for Minnesota River

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Length Frequency Summary for Harvested Fish (Inch Groups)

| Strata / Species | 0 - 4 | 5 - 8 | 9 - 12 | 13 - 16 | 17 - 20 | 21 - 24 | 25 - 29 | 30 + |
|------------------|-------|-------|--------|---------|---------|---------|---------|------|
| MAY | | | | | | | | |
| carp | | | | 2 | 11 | 1 | | |
| channel catfish | | | 7 | 3 | 6 | 13 | 5 | 2 |
| flathead catfish | | | | | 1 | | 2 | 5 |
| freshwater drum | | | 3 | 1 | | | | |
| mooneye | | | | 1 | | | | |
| northern pike | | | | | | 1 | 1 | 2 |
| sauger | | | | 2 | | | | |
| walleye | | | 7 | 14 | 5 | | 2 | |
| white bass | | | 1 | 3 | | | | |
| JUNE | | | | | | | | |
| carp | | | | | | 4 | | |
| channel catfish | | | 4 | 18 | 5 | 5 | 1 | 1 |
| flathead catfish | | | | | 1 | 7 | 2 | 3 |
| freshwater drum | | | 5 | 2 | | | | |
| northern pike | | | | | | 1 | | |
| walleye | | | | 2 | 4 | | | |
| JULY | | | | | | | | |
| carp | | | | | 2 | 1 | 1 | |
| channel catfish | | | 2 | 21 | 32 | 25 | 12 | 3 |
| flathead catfish | | | | 1 | 7 | 17 | 4 | 11 |
| freshwater drum | 5 | 10 | 12 | 1 | | | | |
| goldeye | | | | 1 | 1 | | | |
| sauger | | | | 1 | | | | |
| shortnose gar | | | | | | 4 | 2 | 1 |
| walleye | | | | 1 | 2 | | | |
| SEPTEMBER | | | | | | | | |
| carp | | | | | | 6 | 1 | |
| channel catfish | | 2 | | 9 | 8 | | 3 | 1 |
| freshwater drum | 1 | 3 | 4 | 2 | | | | |
| goldeye | | | | 1 | | | | |
| OCTOBER | | | | | | | | |
| channel catfish | | | | 1 | | | | |
| sauger | | | | | 1 | | | |

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by
Bobbi Chapman
Fisheries Specialist
Hutchinson, Minnesota

Approved by: Lee J. Shad Date: 5/7/01
(Area Fisheries Supervisor)

Approved by: J. H. Ralby Date: 05/15/01
(Regional Fisheries Manager)