MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND WILDLIFE

SECTION OF FISHERIES

STREAM SURVEY REPORT

MAJOR RIVER SURVEY,

UPPER MISSISSIPPI RIVER

POOLS 3, 4, 5, 5A, 6, 7, UPPER 9,

AND LOWER VERMILLION RIVER, 2008

BY

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INTRODUCTION

This report is a compilation of aquatic habitat and fisheries information collected from the Upper Mississippi River (UMR) during 2008. Annual monitoring of aquatic habitat and fish populations in navigation Pools 3, 5, 5a, 6, 7, the MN portion of Pool 9 and the Lower Vermillion River (LVR) has been conducted since 1995 and in some pools since 1993. The objective of annual and long-term monitoring is to maintain a temporally current knowledge base while improving our long-term perspective and understanding of how climatic, geomorphological, and biotic variables affect habitat and fish populations in the UMR. A more detailed description of monitoring efforts and pool descriptions can be found in the 1994 Major River Survey Report (Dieterman 1994).

STUDY AREA

Areas sampled during 2008 are listed below and geographically shown on maps included in the list of Figures. Sampling sites were selected if at least two of the following criteria were met: 1) having potential to sustain both annual and long-term sampling objectives; 2) representative of the spatial diversity of aquatic floodplain habitats within each respective pool; and 3) historically having high quality centrarchid fisheries.

In Pool 3, sampling was conducted throughout the lower ten miles, (RM 797 – 807) including North and Sturgeon Lakes (Figure 1). In Pool 5, sampling was conducted in Finger Lakes, Mosiman's Slough, Island 42 Complex, Mule Bend, Probst Slough, Kruger Slough/Fischer Island Complex, Weaver Bottoms, Lost Island Complex, Spring Lake and the Minneiska Islands (Figures 3 - 4). In Pool 5A, sampling was conducted in

Keiselhorse Bay, Fountain City Bay, Thorpe’s WMA, Schneider's Lakes, Twin Lakes, Burleigh Slough, Crooked Slough, and Polander Lake (Figures 6 - 7). In Pool 6, sampling was conducted in Blackbird Slough, Yeoman's Pond, Bathhouse Slough, Dugout Slough, Sam Gordy's Slough, Swift Creek/Blacksmith Slough Complex, LaMoille Island and the lower pool impounded area, containing Trempealeau Island (Figures 9 - 11). In Pool 7, sampling was conducted in and around Richmond Island, Pigeon Island, Big Marsh, Bullet Chute, Sommers Chute, Lake Onalaska, and the lower pool island complex between Dakota and Dresbach, MN (Figures 13 - 14). In the MN portion of Pool 9 sampling was conducted throughout the Reno Bottoms Area including Running Slough, Pickeral Slough, Hayshore Lake, Ice Haul Slough, Visgar's Slough, and Minnesota Slough (Figure 16). In the LVR, sampling was conducted in Duschene’s Slough, Upper and Lower Clear Lakes, Goose Lake, Indian Slough, Nelson Lake, Birch Lake, Catfish Slough, Buffalo Slough, and Pickerel Lake (Figures 18 – 20). (Vermillion River study area and sampling locations are further described in the "Lower Vermillion River Aquatic Habitat Survey"- Dieterman 1995).

METHODS

Habitat Sampling

Habitat sampling was conducted in Pools 3, 5, 5a, 6, 7, upper 9 and LVR June 26 to July 28. Late June through early August represents the period of peak biomass for most aquatic and semi-aquatic vegetation in this part of the UMR. An Aquatic Habitat Quality Index (AHQI) was developed in 2001 to better quantify habitat quality and to provide a method for evaluating long-term changes within a relatively large geographical portion of the UMR (Dieterman 2001). Habitat assessments from 1993 – 2000 were conducted similar to assessments made from 2001 - 2008, and fitted to the AHQI to provide a more consistent long-term perspective. This index is based on a qualitative assessment of submerged and floating aquatic and semi-aquatic vegetation species diversity and density, bathymetric diversity, substrate composition, and water quality within a predetermined area (sector). Using this method, it is possible to determine aquatic habitat quality in many areas in a relatively short time frame. AHQI scores have also been applied to a descriptive rating curve. Ranges of AHQI scores and associated aquatic habitat quality measures are provided below.

Aquatic Habitat Quality	AHQI Scores
Excellent	18 - 22
Good	14 - 17
Fair	9 - 13
Poor	5 - 8
Very Poor	0 - 4

Fish Sampling

Shoreline seining was conducted August 11 – 23 in Pools 3, 5, 5a, 6, 7, 9 and LVR Using a 1/8" mesh, 50' x 6' bag seine. Seining procedures and data collection followed the instructions provided in the 1992 MN DNR Lake Survey Manual (Schlagenhaft et al. 1993). All fish collected were identified and counted. All gamefish and gizzard shad, including young-of-the-year (YOY), were measured in millimeters. This effort is conducted annually to provide information on fish recruitment, relative abundance (number/acre seined), and species richness.

A catfish sampling effort utilizing low-frequency electrofishing (EF) was initiated in 2007. Individual pools are sampled on rotation every two years. Electrofishing was conducted using a boat equipped with Smith-Root components operating pulsed direct current (DC), set at 10 – 15 pulses per second (pps), 30% duty cycle, producing 1 - 2 amps. A 2-foot diameter array of dropper cables attached to fiberglass poles extending from the front of the boat functioned as anodes, and the hull of the boat functioned as the cathode. In 2008, sampling was conducted along secondary and main channel border habitats in Pool 5A during daylight hours on June 2 and 3 at water temperatures ranging from 68 – 70 degrees Fahrenheit (°F). Sampling stations were one-half mile in length and were chosen randomly at a ratio of 1:4 or 1:5 from all available one-half mile long stations along both left and right descending banks in secondary and main channel habitats (Figures 6 – 7). Catch data and catch per unit of effort (CPUE), reported as number/mile were used to determine length frequency distributions and relative abundance. All flathead and channel catfish collected were measured in millimeters (mm) and weighed in grams (g).

Sturgeon sampling with trammel nets and angling gear was initiated in 2007 to increase our knowledge and understanding of relatively unexploited populations of shovelnose sturgeon and recovering populations of lake sturgeon. In 2008, multifilament trammel nets (100’ x 6’) with outer and inner panels consisting of 1 foot and 2-inch mesh, respectively, were used below Lock and Dam 2 from September 23 - 30, and below Lock and Dam 3 from August 4 - 8. Nets were drifted for 10-15 minutes in the tailwater area below the dams where flow is most concentrated. The net was aided in drift by the use of “mules” (wooden structures designed to catch the current and pull the net). The trammel net was fished in the same location multiple times during the day. After each net drift all sturgeon were measured and weighed. Sampling with terminal tackle was conducted in upper Pool 4 on 7 sampling days for 58 hours of effort. All lake sturgeon were measured and weighed and tagged near the dorsal fin using disc-dangler tags. Catch data was reported as number/set or number/hr, and was also used to develop length frequency distributions. Pectoral fin rays were removed from a subsample of fish for age and growth analysis (Koch and Quist 2007) (Koch et. al. 2008).

In Pools 3, 5, 5A, 6, 9, and LVR, fish were sampled by EF October 31 – November 17. Fall EF was conducted using the same boat and component configuration as mentioned for the catfish sampling effort, however, sampling during this effort was conducted using pulsed DC set at 40 pps at 25% duty cycle, producing 3 – 6 amps. Electrofishing was conducted during daylight hours at water temperature ranging from 38 to 43 °F. Sampling was conducted for either a predetermined distance or time interval, and the time was recorded for each run. All sizes of fish from the families: Esocidae, Percidae, Centrarchidae and Ictaluridae were collected and measured in millimeters (mm). Catch data and CPUE were used to determine length frequency distributions and relative abundance. Relative stock densities (Anderson and Nuemann 1996) of bluegill from both the MN and WI sides of Pools 5 and 5A were also calculated from catch data since 2002. Scale and otolith samples were taken from bluegills captured in Pool 5 and 5A for use in growth analysis, and to aid in the evaluation of experimental regulations. The following table summarizes electrofishing effort by pool:

Electrofishing –November 2008

Pool	# runs	Temp.(°F)	Total run time (hrs.)
3	4	39-40	1.2
5	7	38-39	2.7
5a	6	34-35	1.8
6	6	41-43	1.5
7	Did not sample in 2008		
9	5	39-40	1.3
LVR	5	42-43	1.2

Maps for all locations surveyed were made from 2000 Land Cover/Land Use maps using ArcMap 9.2. Habitat sectors and fisheries sampling locations are identified on each figure. Daily discharge measurements from U.S. Army Corps of Engineers (USACE) gauges at locks and dams were used to develop hydrographs.

RESULTS AND DISCUSSION

Climatic conditions throughout the region were colder and wetter than normal during winter and early spring 2008. The spring flood in our study reach peaked at levels near the historic average, but occurred on or near May 10, which was 2 - 3 weeks later than average (Figures 2, 5, 8, 12, 15, 17). However, extensive widespread and historic rainfall and flooding during June occurred in much of the watershed south of our study reach, including much of Iowa, southern Wisconsin and Illinois. Water temperatures during the spring flood (mid-April to mid-May) were generally below normal for this time of year. Below average temperatures during and after peak spawning for many species of fish had a profound effect on their recruitment in 2008. Relatively poor survival and recruitment of YOY gizzard shad, emerald shiner, bullhead minnow and walleye were documented during seining efforts in August and electrofishing in October and November. Precipitation and temperature patterns during summer and fall were generally normal and ambient water temperatures were near optimal for growth of most fish species. Ice first formed in backwaters during the last week of November and ice-anglers were fishing the smaller, more isolated backwater areas by December 1. November and December were wetter and colder than normal.

Fish populations between Hastings, MN and the Iowa border are generally in good to excellent shape. Annual recruitment and growth of most fish species has been generally good since 1994. However, seining CPUE for YOY bluegill and some important forage species (ie. gizzard shad, emerald shiner, and bullhead minnow) were below the 16-year mean in almost all pools surveyed in 2008 (Tables 1, 8, 13, 19, 22, 27, 30). Low frequency EF in Pool 5A during early June revealed a healthy population of flathead catfish, with a CPUE of 8.6/mi (Table 2). Trammel netting proved very effective for sampling adult shovelnose sturgeon and juvenile lake sturgeon in the tailwaters of LD 2 (Pool 3) and LD 3 (Pool 4) (Table 31). Combined with angling catch, a total of fifty-seven lake sturgeon were collected and tagged in Pool 4 (Table 32). Fall electrofishing CPUE for bluegill and largemouth bass was above the sixteen-year mean in all pools sampled (Tables 3 - 4).

Habitats and general locations, diseases, and species of concern include: the entire MN/WI border waters for the imminent threat of Asian carp, specifically bighead and silver carp, which were captured in a commercial seine haul in Pool 8 (2 bigheads and 1 silver) in November and in additional seine hauls from pools 5A, 8, and 9 in January and March 2009; Pool 3 and LVR backwaters and centrarchid populations, which continue to reflect poor habitat conditions; potential impacts of large cormorant and pelican populations; Cyprinid populations, which are susceptible to infection by Spring Viremia, previously found in common carp in 2002; Largemouth bass virus (LMBV), which has been documented in pools 3, 7, 8, 10 and 11, is associated with high mortality rates in confined groups of largemouth bass (i.e. tournament weigh-ins); and Viral Hemorrhagic Septicemia (VHS) which has been responsible for large fish kills and has been documented in the Great Lakes and inland waters of Wisconsin.

The following information provides a general description of habitat conditions and fish populations sampled in each pool in 2008.

POOL 3

Deltaic activity and the formation of islands, sand bars, mud flats, flowing channels and protected bays at the outlets of secondary channels in North and Sturgeon lakes produced a diversity of habitat types and conditions that were utilized by many fish and wildlife species. Aquatic habitat conditions appear to have stabilized somewhat after three consecutive years of slight improvements. Submerged aquatic vegetation abundance and diversity is predominantly limited to the more isolated bays and delta areas in North and Sturgeon lakes. The mean AHQI score for North Lake was 12.8 (Table 6), which places it in the “Fair” category.

Twenty-six species of fish were collected by shoreline seining from twelve locations (Figure 1 and Table 1). Seining CPUE for YOY bluegill, black crappie and largemouth bass improved somewhat in 2008, but was still considered relatively poor (Table 8). Electrofishing CPUE for adult bluegill, crappie and largemouth bass was above the long-term mean and is likely responsible for the observed increase in seining CPUE for YOY centrarchids as well (Table 4).

POOL 5

Aquatic habitat conditions were generally good to excellent throughout the pool. Submerged aquatic vegetation was moderate - dense and highly diverse in most aquatic areas surveyed. Mean AHQI scores from geographically defined areas larger than 100 acres surpassed the highest scores recorded since sampling began in 1993 for the second straight year, and ranged from 16 in the Minneiska Flats to 19.3 in the Lost Island area (Table 9). Species diversity was greatest in partially isolated backwaters and in shallow water (< 3 feet) where substrates and flows were variable. Active tertiary channel migration and subsequent sediment deposition and scour were prevalent throughout middle and lower portions of the pool (i.e. Weaver-sectors B and C, Kruger Slough-sectors F and G).

Twenty-nine species of fish were collected by shoreline seining from twenty-four locations (Figures 3, 4 and Table 1). Of particular interest was the relative absence of important forage species (i.e. gizzard shad, emerald shiner and bullhead minnows) that are usually the most abundant group of fishes collected (Table 13). Electrofishing CPUE for bluegill, largemouth bass and yellow perch was higher than the long-term mean for the 6th consecutive year, but CPUE for black crappie was lower than the long-term mean for the 2nd consecutive year (Table 4). Adult bluegill populations were dominated by age 2 and 3 year-old fish, but all ages up to 8 years old were represented

(Tables 11 and 12). Relative Stock Density (RSD) values for bluegill > 7 inches improved in 2008 to 31 in MN waters and 25 in WI waters (Table 5).

POOL 5A

Aquatic habitat conditions throughout the pool were good to excellent. Previously surveyed areas containing submerged and emergent vegetation remain relatively unchanged, and vegetation beds were similar in diversity and spatial distribution. Mean AHQI scores from geographically defined areas larger than 100 acres ranged from 12.0 in Denzer's Meadow to 18.8 in the Twin Lakes complex (Table 14). Active tertiary channel migration and subsequent sediment deposition and scour were prevalent throughout the Twin Lakes and upper Polander Lake complex.

Twenty-four species of fish were collected by shoreline seining from sixteen locations (Figures 6, 7 and Table 1). Seining CPUE for bluegill, largemouth bass, and all species combined was near the 16-year mean, but was very low for important forage species (i.e. gizzard shad, emerald shiner and bullhead minnow) (Table 19). Electrofishing CPUE was affected by a significant cold front that formed ice in many locations and prevented sampling in many stations. However, length frequency distributions of fish captured by both electrofishing and angling from a few locations indicate healthy populations of bluegill, largemouth bass and crappie (Table 3). Similar to Pool 5, the adult bluegill population is dominated by age 2 and 3 year-old fish, but only fish up to 5 years of age were represented in the sample (Tables 17 and 18).

POOL 6

Aquatic habitat conditions throughout Pool 6 were generally excellent. An extensive flood control levee system surrounding Winona, MN, and the Burlington

Northern Railroad, which bisects the floodplain along the Wisconsin border, have constricted the floodplain so that much of the aquatic habitat in Pool 6 is lotic in nature. Good water quality and active secondary and tertiary channel migration and subsequent sediment deposition and scour were prevalent within middle and lower portions of the pool, resulting in abundant and diverse aquatic and semi-aquatic vegetation and habitat. Mean AHQI scores for delineated backwater areas larger than 40 acres were collectively very similar to the all time high measured in 2006, and ranged from 13.0 in Blackbird Slough to a 21.0 in Blacksmith Slough (Table 20).

Twenty species of fish were collected by shoreline seining from fourteen locations (Figures 9, 10, 11 and Table 1). Seining CPUE for bluegill, black crappie and largemouth bass was well below the 16-year mean for each species, and was the fourth consecutive year in which this has been observed (Table 22). As in Pools 5 and 5A, CPUE for important forage species was also very low, and in the case of gizzard shad and emerald shiners, none were sampled. Populations of forage species will be closely monitored in 2009 and if CPUE remains low, factors affecting these populations will be examined further. Electrofishing CPUE for adult bluegill, largemouth bass, and yellow perch however, was above the 16-year mean for the third consecutive year, suggesting that either the seining effort is grossly under sampling year classes, or that fish are emigrating into the pool from adjacent pools or non-sampled connected areas (i.e. Airport Lake complex and/or Mud Lake complex) (Table 4).

POOL 7

Pool 7 contained a very diverse submerged and emergent vegetation community and aquatic habitat conditions were excellent throughout the pool. Mean AHQI scores for delineated backwater areas larger than 40 acres ranged from 13.5 in Web Slough to 21.0 in the interior of Pigeon Island (Table 23). The only fisheries monitoring conducted in 2008 was seining, in which twenty species of fish were collected from eleven locations (Figures 13 – 14 and Table 24). As in other upstream pools, CPUE for important forage species was low.

POOL 9

Contiguous backwater areas in upper Pool 9 continue to fill with sand and silt, a result of an elevation difference between the main channel and backwaters of Reno Bottoms. High water events in 1993, 1997, and 2001 breached the natural levee along the main channel and caused extensive erosion within high-flow channels. As a result of the difference in head, substantial head cutting also occurred. This hydraulic change allowed the formation of larger tertiary channels capable of transporting more flow and sediment. These tertiary channels deposited a large amount of sand into backwater lakes of the Reno bottoms. With the addition of larger diameter sediment particles and increased flow, problems associated with re-suspension of fine sediments were reduced. A reduction in suspended solid concentrations allowed for better light penetration and increased coverage and density of submerged aquatic vegetation.

Mean AHQI scores for contiguous backwater areas larger than 50 acres ranged from 12.0 in Ice Haul Slough to 14.2 in Hayshore Lake (Table 25). The MN portion of upper Pool 9 contains diverse habitats capable of supporting good populations of fish assemblages favoring both lotic and lentic environments. However, lentic habitat, in the form of contiguous backwater lakes and sloughs, is shrinking rapidly due to the effects of sedimentation.

Twenty-three species of fish were collected by shoreline seining from eight locations (Figure 16 and Table 1). Seining CPUE for bluegill and black crappie was below the 15-year mean for the second consecutive year, and as in upstream pools, low for gizzard shad and emerald shiners (Table 27). Electrofishing CPUE for gamefish commonly found in these waters, including bluegill, largemouth bass, northern pike, yellow perch, and walleye was above the 15-year mean (Table 4). Based on CPUE and length frequency distribution tables, healthy populations with multiple age classes exist in upper Pool 9.

Lower Vermillion River

Habitat conditions were similar to what has been observed since annual monitoring began in 1995. Water quality within the channel and in contiguous backwaters continues to reflect problems associated with fine sediment deposition and frequent re-suspension of sediments due to wind/wave action and fish activity. AHQI scores from contiguous backwater areas ranged from 4.0 in Pickerel Lake to 7.0 in Catfish slough (Table 28). In contrast, isolated backwater areas are not as subject to the causes of sediment re-suspension, and abundant and diverse submerged aquatic and emergent exists. Mean AHQI scores from isolated backwater areas typically range from 14 – 17, and in 2008 the only site surveyed (Nelson Lake) scored 16 (Table 28).

Fish populations in 2008, as measured by EF, were above average and represented by a diverse assemblage. Annual and seasonal movement of fish within the immediate floodplain and between this complex and upper Pool 4 and Pool 3 helps maintain the fishery and demonstrates the importance of lateral and longitudinal floodplain and tributary connectivity in large floodplain rivers. Thirteen species of fish were collected by shoreline seining from ten locations (Figure 20 and Table 1). Seining

CPUE for YOY bluegill, black and white crappie and important forage species (i.e. gizzard shad, emerald shiners, and bullhead minnows), was below the 14-year mean, however, CPUE for YOY northern pike was above the mean (Table 30). Electrofishing CPUE for gamefish (i.e. northern pike, bluegill, largemouth bass, yellow perch and walleye) was above the 14-year mean (Table 4).

SUMMARY

Aquatic and floodplain habitat conditions throughout Pools 5 – 9 were generally good to excellent, and similar to what has been observed and measured over the past few years. Gamefish populations are generally healthy and abundant. Substantial flooding and high base flows throughout the 1990’s and early 2000’s, coupled with relatively low water levels during the start of the growing season in recent years appears to have played a significant role in the relatively healthy ecological condition that currently exists on much of the UMR bordering Minnesota, Wisconsin, and Iowa. The large floods in 1993, 1997 and 2001 significantly redistributed sediments and nutrients, stimulating biological productivity in shallow aquatic and semi-aquatic habitat.

Seasonal hydrologic variation produces dynamic and diverse spatial and temporal habitat that is critical in sustaining the ecological health of the UMR. The existing system is predominantly managed to maintain consistent depths, which support navigation but restrict seasonal hydrologic variation. Water level management is an alternative that allows resource managers to emulate summer low-flow conditions and promotes hydrologic variation. Continued annual sampling will improve our ability to identify and analyze trends, and information will be presented to citizens and decision makers so that informed decisions are made when management issues arise.

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Table 1. Seining CPUE, Pools 3, 5, 5A, 6, 7, 9 and LVR for 2008

	Pool 3	Pool 5	Pool 5A	Pool 6	Pool 7	Pool 9	VB
Acres seined	0.67	0.7	0.36	0.55	0.23	0.24	0.28
Species	No./acre	No./acre	No./acre	No./acre	No./acre	No./acre	No./acre
Bullhead minnow	91	40	100	2	48	421	14
Bigmouth buffalo	0	0	0	0	0	0	0
Brook silverside	52	61	8	5	17	17	43
Black bullhead (yoy)	0	0	0	0	0	0	0
Black crappie (yoy)	24	167	54	2	0	29	50
Black crappie (adult)	0	1	0	0	0	0	0
Bluegill (yoy)	593	1784	1097	362	696	1104	821
Bluegill (adult)	7	253	222	87	35	175	25
Bowfin	0	1	0	0	0	0	0
Carp (yoy)	9	0	0	0	0	0	0
Carp (adult)	1	0	0	0	0	0	0
Channel catfish (yoy)	0	0	0	0	0	0	0
Carpsucker sp. (yoy)	6	1	6	0	0	0	0
Central mudminnow	0	0	0	2	0	0	0
Emerald shiner	12	97	0	0	9	4	21
Fathead minnow	0	0	0	0	0	0	0
Flathead catfish (yoy/juv.)	0	0	0	0	0	0	0
Freshwater drum	6	0	0	0	0	4	0
Gizzard shad (yoy)	54	9	47	0	0	196	204
Golden shiner	0	9	6	0	0	175	0
Green sunfish (yoy)	1	3	0	2	0	0	7
Green sunfish (adult)	1	0	0	0	1	0	0
Hybrid sunfish	0	0	3	0	0	0	0
Johnny darter	3	0	3	9	4	29	43
Logperch	3	16	47	7	17	29	4
Largemouth bass (yoy)	21	437	450	131	370	400	129
Largemouth bass (ad.)	0	7	8	2	0	8	0
Longnose gar (yoy)	0	3	0	0	0	0	0
Longnose gar (adult)	0	0	0	0	0	0	0
Mud darter	0	10	8	2	26	88	0
Mimic shiner	0	3	3	0	0	0	0
Mooneye	0	0	0	0	0	0	0
Northern pike (yoy)	1	7	11	9	17	29	57
Northern pike (adult)	0	1	0	0	0	0	0
Orange-spotted sunfish (yoy)	20	0	0	0	0	0	0
Orange-spotted sunfish (ad.)	0	0	0	0	0	4	0
Pirate perch	0	0	0	0	35	0	0
Pugnose minnow	0	0	0	0	0	0	0
Pumpkinseed (all)	0	3	3	0	4	4	0
Quillback (adult)	0	4	0	0	0	0	0

Table 1. (cont.)

	Pool 3	Pool 5	Pool 5A	Pool 6	Pool 7	Pool 9	VB
Acres seined	0.67	0.7	0.36	0.55	0.23	0.24	0.28
Species	No./acre	No./acre	No./acre	No./acre	No./acre	No./acre	No./acre
Redhorse sp. (yoy)	6	4	1	2	0	0	0
River shiner	0	19	3	0	0	0	0
Rockbass (yoy)	1	30	3	11	17	4	0
Rockbass (ad.)	0	1	3	2	0	0	0
Smallmouth buffalo (yoy)	10	0	0	0	0	0	0
Sauger (yoy)	0	0	0	0	0	13	0
Sauger (adult)	0	0	0	0	0	4	0
Sand shiner	0	0	0	2	0	0	0
Slenderhead darter	0	0	0	0	0	0	0
Smallmouth bass (yoy)	4	4	8	2	4	0	0
Smallmouth bass (ad.)	0	0	0	0	0	0	0
Spotfin shiner	57	57	153	36	0	4	0
Spottail shiner	13	223	81	0	178	242	0
Spotted sucker (yoy)	0	6	0	4	9	0	0
Spotted sucker (adult)	0	1	0	0	0	0	0
Silver chub	0	0	0	0	0	0	0
Tadpole madtom	1	9	14	7	22	13	4
Walleye (yoy)	0	0	0	0	0	4	0
Warmouth	0	0	0	0	0	0	0
Weed shiner	0	19	25	2	52	267	0
Western sand darter	0	0	0	0	22	0	0
White bass (yoy)	1	0	0	0	0	0	0
White bass (adult)	0	0	0	0	0	0	0
White crappie (yoy)	1	0	0	0	0	0	0
White crappie (adult)	0	0	0	0	0	0	0
White sucker (yoy)	1	0	0	0	0	0	0
Yellow bullhead	0	0	0	0	0	0	0
Yellow perch (yoy)	10	9	3	16	9	92	11
Yellow perch (adult)	0	0	0	0	0	0	0
Total (all fish)	**1010**	**3299**	**2370**	**706**	**1592**	**3359**	**1433**
# Species	**26**	**28**	**24**	**20**	**20**	**23**	**13**

Table 2. Low-Frequency Electrofishing CPUE, Pool 5A, 2008

Main Channel Habitat

Species	Pool 5A
EF effort (miles)	3.0
Flathead catfish (no./mile)	10.0
Channel catfish (no./mile)	1.3
Total (fish/mi)	**11.3**

Side Channel Habitat

Species	Pool 5A
EF effort (miles)	4.0
Flathead catfish (no./mile)	7.5
Channel catfish (no./mile)	2.8
Total (fish/mi)	**10.3**

Table 3. Fall Electrofishing CPUE, Pools 3, 5, 5A, 6, 9, and LVR, for 2008

Species	Pool 3 No./hr.	Pool 5 No./hr	Pool 5A No./hr	Pool 6 No./hr	Pool 7 No./hr	Pool 9 No./hr	LVR No./hr
EF effort (hours)	1.2	2.7	1.8	1.5		1.3	1.2
Black bullhead	0.0	0.0	0.0	0.0		0.0	0.0
Black crappie	18.9	12.0	5.0	5.0		10.9	45.4
Bluegill	71.5	330.2	176.3	311.5		197.1	130.3
Brown bullhead	0.0	0.0	0.0	0.0		1.6	0.0
Channel catfish	0.0	0.0	0.0	0.7		0.0	0.9
Flathead catfish	0.0	0.0	0.0	0.0		0.0	0.9
Green sunfish	0.0	0.0	0.0	0.0		0.0	0.9
Hybrid crappie	0.0	0.0	0.0	0.0		0.0	0.0
Hybrid sunfish	0.8	0.8	0.0	0.0		0.0	1.7
Largemouth bass	19.7	83.3	36.5	132.2		180.0	40.3
Northern pike	0.0	8.2	2.2	2.8		4.7	9.4
Orange-spotted sunfish	0.0	0.0	0.0	0.0		0.0	0.0
Pumpkinseed	0.0	0.8	0.6	0.0		0.0	0.0
Rockbass	0.0	0.4	0.6	0.0		0.8	0.9
Sauger	0.0	0.0	0.0	2.1		1.6	0.9
Smallmouth bass	0.8	0.0	0.0	0.0		0.8	0.0
Walleye	0.0	3.0	2.2	20.1		15.6	15.4
Warmouth	0.0	0.0	0.0	0.0		0.0	0.0
White bass	0.0	0.0	0.0	0.7		8.6	4.3
White crappie	4.1	0.0	0.0	0.0		3.9	17.1
Yellow bass	0.0	0.0	0.0	0.0		0.8	0.0
Yellow bullhead	0.0	0.0	0.0	0.0		0.0	0.0
Yellow perch	3.3	10.1	0.6	19.4		5.5	1.7
Total (fish/hr)	**119**	**449**	**224**	**495**		**432**	**270**
# of Species	**7**	**9**	**8**	**9**		**13**	**14**

Table 4. Fall Electrofishing CPUE (No./hour) Summary, Pools 3, 5, 5A, 6, 7, 9, and LVR, 2003 - 2008

Vermillion Bottoms Species	Historical Mean 1995 - 2008	SD	2008	2007	2006	2005	2004	2003
Northern pike	**4.2**	**2.4**	9.4	4.4	3.4	7.5	4.3	3.3
Bluegill	**67.5**	**41.7**	130.3	83.3	165.7	27.5	54.3	66.0
Black crappie	**29.9**	**24.1**	45.4	57.5	89.7	29.3	32.9	40.0
Largemouth bass	**36.3**	**25.2**	40.3	91.4	85.4	26.9	31.4	17.3
Yellow perch	**0.4**	**0.6**	1.7	0.0	0.0	0.6	0.0	0.0
Walleye	**14.2**	**28.7**	15.4	3.0	1.7	7.5	108.6	8.7

Pool 3 Species	Historical Mean 1993 - 2008	SD	2008	2007	2006	2005	2004	2003
Northern pike	**0.2**	**0.5**	0.0		0.0	0.0	0.0	0.0
Bluegill	**37.8**	**31.9**	71.5		24.8	97.0	36.0	48.5
Black crappie	**7.4**	**9.1**	18.9		18.4	30.0	10.0	9.5
Largemouth bass	**14.6**	**13.5**	19.7		0.0	45.8	14.0	14.5
Yellow perch	**0.6**	**1.1**	3.3		2.8	0.0	0.0	0.0
Walleye	**3.9**	**6.5**	0.0		0.0	0.0	0.0	2.5

Pool 5 Species	Historical Mean 1993 - 2008	SD	2008	2007	2006	2005	2004	2003
Northern pike	**2.7**	**2.4**	8.2	4.2	7.2	2.2	3.3	3.1
Bluegill	**170.6**	**162.7**	330.2	616.9	380.0	216.7	197.1	193.7
Black crappie	**21.9**	**12.4**	12.0	15.8	31.0	45.6	43.3	15.1
Largemouth bass	**53.1**	**28.4**	83.3	97.4	103.3	71.1	74.5	75.1
Yellow perch	**7.9**	**6.2**	10.1	13.1	19.5	17.4	16.4	13.1
Walleye	**3.9**	**4**	3.0	1.5	1.4	1.1	1.0	2.6

Pool 5A Species	Historical Mean 1993 - 2008	SD	2008	2007	2006	2005	2004	2003
Northern pike	**3.2**	**2**	2.2	3.0	8.5	3.2	2.9	1.8
Bluegill	**130.9**	**84.2**	176.3	268.0	311.0	156.8	199.1	188.6
Black crappie	**9.8**	**8.3**	5.0	22.9	25.2	11.4	7.4	12.7
Largemouth bass	**54.6**	**36.8**	36.5	148.1	104.4	61.8	76.5	105.9
Yellow perch	**3.9**	**3.8**	0.6	3.1	6.3	5.0	15.3	8.2
Walleye	**4.9**	**3.3**	2.2	2.6	3.2	0.0	5.0	2.7

Table 4. (cont.) Fall Electrofishing CPUE (No./hour) Summary, Pools 3, 5, 5A, 6, 7, 9, and LVR, 2003 - 2008

Pool 6	Species	Historical Mean 1993 - 2008	SD	2008	2007	2006	2005	2004	2003
	Northern pike	**2.6**	**1.5**	2.8	4.6	3.3	2.2	1.4	2.7
	Bluegill	**120.7**	**86**	311.5	228.0	260.4	80.0	178.2	108.0
	Black crappie	**7.4**	**4.3**	4.9	2.6	18.2	6.7	11.4	9.3
	Largemouth bass	**74.7**	**31.5**	132.2	93.2	131.6	62.8	105.0	98.7
	Yellow perch	**7.5**	**4.5**	19.4	10.4	10.5	11.1	13.2	6.0
	Walleye	**6.5**	**5.4**	20.1	2.0	0.0	5.0	2.7	10.0

Pool 7	Species	Historical Mean 1996 - 2008	SD	2008	2007	2006	2005	2004	2003
	Northern pike	**7.3**	**4.2**			11.2	11.8	4.2	
	Bluegill	**173.5**	**221.8**			706.0	76.5	217.5	
	Black crappie	**27.6**	**19.5**			32.8	16.5	36.7	
	Largemouth bass	**42**	**30.7**			103.0	14.7	44.2	
	Yellow perch	**15.1**	**9.3**			13.1	20.0	17.5	
	Walleye	**3.8**	**5.4**			0.0	1.2	0.8	

Pool 9	Species	Historical Mean 1994 - 2008	SD	2008	2007	2006	2005	2004	2003
	Northern pike	**3.6**	**2**	4.7	8.6	1.2	4.0	4.6	3.0
	Bluegill	**138.1**	**90.2**	197.1	199.3	285.9	79.0	62.3	305.0
	Black crappie	**32.1**	**25.5**	10.9	24.6	31.8	26.0	26.2	82.0
	Largemouth bass	**97.9**	**55.2**	180.0	97.1	189.4	80.0	103.1	169.0
	Yellow perch	**3.6**	**3.6**	5.5	8.0	9.8	7.5	8.8	0.0
	Walleye	**7.8**	**7.5**	15.6	6.9	0.0	4.0	13.5	2.0

Table 5: Relative Stock Density for 7", 7.5", 8" BLG
in Pools 5 and 5A from Fall electrofishing 2002 - 2008

	Pool 5			Pool 5A	
	MN	WI		MN	WI
2002	7" - 27%	7" - 24%	**2002**	7" - 31%	7" - 24%
	7.5" - 11%	7.5" - 12%		7.5" - 18%	7.5" - 14%
	8" - 4%	8" - 2%		8" - 8%	8" - 9%
2003	7" - 17%	7" - 24%	**2003**	7" - 30%	7" - 24%
	7.5" - 7%	7.5" - 9%		7.5" - 20%	7.5" - 9%
	8" - 2%	8" - 4%		8" - 12%	8" - 4%
2004	7" - 28%	7" - 21%	**2004**	7" - 24%	7" - 29%
	7.5" - 12%	7.5" - 11%		7.5" - 15%	7.5" - 17%
	8" - 5%	8" - 5%		8" - 3%	8" - 7%
2005	7" - 31%	7" - 20%	**2005**	7" - 22%	7" - 9%
	7.5" - 18%	7.5" - 9%		7.5" - 11%	7.5" - 7%
	8" - 8%	8" - 3%		8" - 5%	8" - 3%
2006	7" - 17.5%	7" - 9.8%	**2006**	7" - 12.2%	7" - 20.8%
	7.5" - 7.9%	7.5" - 5%		7.5" - 6.2%	7.5" - 7.7%
	8" - 2%	8" - 2%		8" - 2%	8" - 3%
2007	7" - 9%	7" - 13%	**2007**	7" - 19%	7" - 8%
	7.5" - 2%	7.5" - 5%		7.5" - 9%	7.5" - 2%
	8" - 0%	8" - 1%		8" - 2%	8" - <1%
2008	7" - 20%	7" - 16%	**2008**	7" - 20%	
	7.5" - 9%	7.5" - 7%		7.5" - 10%	
	8" - 2%	8" - 2%		8" - 2%	
Mean	**8" - 3%**	**8" - 3%**	**Mean**	**8" - 5%**	**8" - 4%**

Figure 1. Lower Pool 3

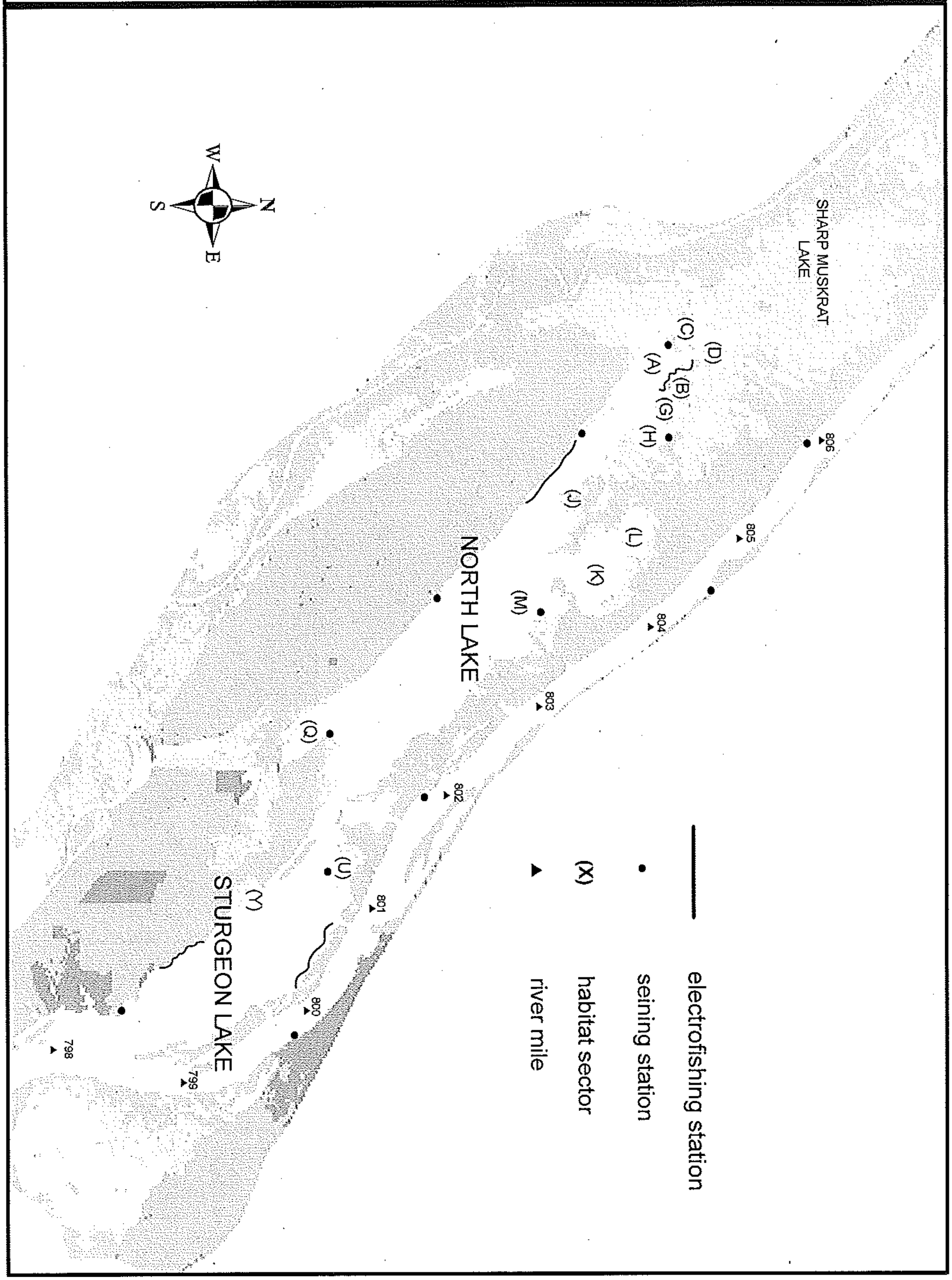

Figure 2. Pool 3 Hydrograph, 2008

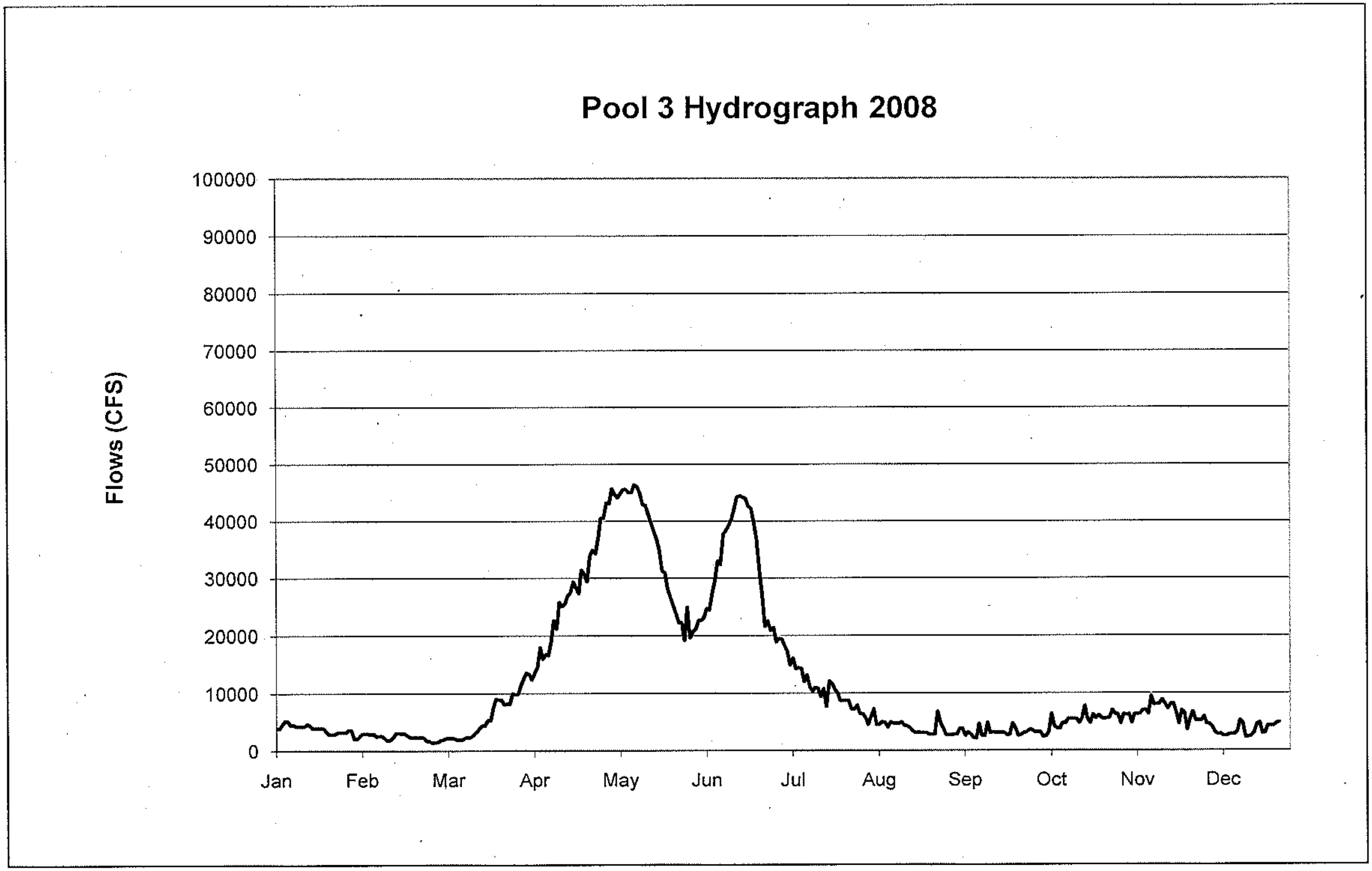

Table 6. Aquatic Habitat Quality Index Summary, Pool 3, 1993 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 3																
North Lake																
Sharp Muskrat L.	16	19	16													
sector A	10	12	13	11	11	7	9	7	9	11	11	11	10	9	11	12
sector B	13	16	15	12	15	10	14	10	14	13	14	13	13	12	13	14
sector C and C1	11	15	15	15	11	8	12	7	8	9	11	8	10	8	11	8
sector D	15	17	15	12	14	12	14		13							
sector E				16			8					14	10	11	12	14
sector G	15		14	14	13	13	14	10	11	12	10	11	10	13	12	13
sector H		15	14	14	13	11	14	10	11	12	13	13	10	12	12	12
sector I		12			7			10	2	11	9	9	9	13	10	3
sector J	15	17	14	15	14	15		10	10	13	13	12	12	11	10	12
sector K and L	7	9	10	8	4	6	7	7	2	7	8	7	8	8	9	11
sector M	13	14	14	11	4	12	14	7	8	13	13	9	6	10	9	13
sector N and O	12		12		11			14				11	12	9		12
sector P								9	9	11	11	11	9	9		10
sector Q	14	13	13	11	11				2	10	11			7		10
Main Lake	12		12													
Mean	**12.8**	**14.5**	**13.6**	**12.6**	**10.7**	**10.4**	**11.8**	**9.2**	**8.4**	**11.1**	**11.3**	**10.8**	**9.9**	**10.2**	**10.9**	**11.1**
SD	**2.5**	**2.7**	**1.5**	**2.4**	**3.7**	**3.0**	**2.9**	**2.1**	**4.2**	**1.9**	**1.8**	**2.1**	**1.9**	**2.0**	**1.4**	**3.0**
Sturgeon Lake																
sector U	10	15	14	13	8		10	10	12	11	14	12		10		7
sector V		8	8	10			10	10	11	8	8	9		8		10
sector W		9	8	10				8	7			6		6		10
sector X		14	12	12												
sector Y		13			9			8	6			12		9		9
sector Y1			13													
sector Z				7				8	2			5				3
Entire Area						8										
Mean	**10.0**	**11.8**	**11.0**	**10.4**	**8.5**		**10.0**	**8.8**	**7.6**	**9.5**	**11.0**	**8.8**		**8.3**		**7.8**
SD		**3.1**	**2.8**	**2.3**	**0.7**		**0.0**	**1.1**	**4.0**	**2.1**	**4.2**	**3.3**		**1.7**		**3.0**
MN Backwater above L&D 3																
Entire area	**8**	**7**	**9**	**9**	**7**											
Brewer Lake																
Sector S	14	14														
Sector T	4	4														
Mean	**9**	**9**														
SD	**7.1**	**7.1**														
Diamond Bluff Bay																
Entire area	**12**															

Table 7. Electrofishing Length Frequency Distribution, Pool 3, 2008

Length (in.)	northern pike	northern pike yoy	black crappie	white crappie	bluegill	large mouth bass	large mouth bass yoy	walleye	yellow perch
2 - 2.9									
3 - 3.9			2		3		3		1
4 - 4.9							5		1
5 - 5.9					5				
6 - 6.9					13	1			
7 - 7.9				1	10				1
8 - 8.9			2	1	3				1
9 - 9.9			2						
10 - 10.9			2						
11 - 11.9			9	2					
12 - 12.9			6	1		1			
13 -13.9						2			
14 - 14.9						2			
15 - 15.9						5			
16 - 16.9						2			
17 - 17.9						3			
18 - 18.9									
19 - 19.9									
20 - 20.9									
21 - 21.9									
22 - 22.9									
23 - 23.9									
24 - 24.9									
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 - 36.9									
37 - 37.9									
38 - 38.9									
39 - 39.9									
40 - 40.9									
Totals	**0**	**0**	**23**	**5**	**34**	**16**	**8**	**0**	**4**
Mean Length			**10.5**	**10.3**	**6.6**	**14.9**	**4.2**		**5.9**

Table 8. Seining CPUE (#/acre) Summary, Pool 3, 2003 - 2008

Species	Historical Mean 1993-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	1.2	1.9	0	0	0	0	0	3
Bowfin	0.6	1.3	0	0	0	0	0	0
Northern pike (yoy)	0.4	1.3	1	0	0	0	0	0
Gizzard shad (yoy)	454.4	382.1	54	489	355	144	192	532
Carp	10.0	10.6	10	4	2	3	0	3
Emerald shiner	854.9	1077.7	12	55	707	142	168	97
Spottail shiner	57.9	60.1	13	19	14	81	5	97
Spotfin shiner	260.6	263.8	57	36	57	411	92	226
River shiner	3.4	13.8	0	0	0	0	0	0
Weed shiner	1.8	3.7	0	0	7	0	0	0
Golden shiner	19.3	32.6	0	0	0	56	0	10
Pallid shiner	1.1	4.3	0	0	0	0	0	0
Sand shiner	0.5	2.0	0	0	0	0	0	0
Mimic shiner	2.1	3.6	0	0	0	0	0	3
Bullhead minnow	193.0	226.2	91	34	16	792	71	52
Pugnose minnow	1.2	2.5	0	9	0	0	0	0
Bluntnose minnow	5.8	8.7	0	0	0	0	0	0
Fathead minnow	0.6	1.4	0	0	0	0	0	0
Silver chub	2.0	6.3	0	0	0	25	3	0
Smallmouth buffalo (yoy)	28.1	35.6	10	0	2	0	0	42
Bigmouth buffalo (yoy)	6.9	14.4	0	0	0	0	0	7
Carpsucker sp. (yoy)	43.1	51.9	6	3	71	6	0	168
Redhorse sp. (yoy)	13.6	16.4	6	22	11	3	0	23
Spotted sucker	0.4	1.0	0	0	0	0	0	0
White sucker	0.1	0.3	1					
Tadpole madtom	1.9	3.4	1	0	0	0	0	0
Channel catfish (yoy)	6.2	9.8	0	6	5	36	0	19
Flathead catfish	0.0	0.0	0	0	0	0	0	0
Black bullhead	0.3	1.0	0	0	0	0	0	0
Mud minnow	0.3	1.0	0	0	0	0	0	0
Brook silverside	36.8	53.9	52	9	21	31	18	10
Trout perch	0.9	2.4	0	0	0	0	0	0
White bass (yoy)	70.4	85.6	1	19	7	33	13	19
Rock bass (yoy)	1.4	2.3	1	0	2	3	0	0
Pumpkinseed sunfish (yoy)	0.2	0.8	0	0	0	3	0	0
Green sunfish (yoy)	4.1	6.6	1	0	0	6	24	3
Orange-spotted sunfish	10.3	14.1	30	30	27	44	3	7
Hybrid sunfish	0.0	0.0	0	0	0	0	0	0
Bluegill (yoy)	269.8	287.6	593	31	61	250	158	61
Largemouth bass (yoy)	12.9	15.9	21	0	0	22	3	16
Smallmouth bass (yoy)	6.8	7.9	4	3	2	19	3	29
Black crappie (yoy)	59.4	77.4	24	8	39	8	13	68
White crappie (yoy)	9.6	19.8	1	0	4	0	3	2
Logperch	13.2	18.3	3	6	9	0	18	13
Johnny darter	38.8	56.7	3	0	2	56	16	10
Slenderhead darter	0.0	0.0	0	0	0	0	0	0
Mud darter	0.3	1.0	0	0	0	0	0	0
River darter	0.0	0.0	0	0	0	0	0	0
Yellow perch (yoy)	5.9	5.2	10	3	5	3	0	19
Walleye (yoy)	5.8	8.9	0	0	0	0	0	10
Sauger (yoy)	0.6	1.5	0	0	0	0	0	0
Freshwater drum	34.3	30.2	6	9	13	5	5	45
Total (all species)	2552	1856	1012	795	1439	2182	808	1594
Total No. of Species	25	3	26	19	23	24	18	28
Total Acres Seined	0.4	0.2	1	0.64	0.56	0.36	0.38	0.31

Figure 3. Upper Pool 5

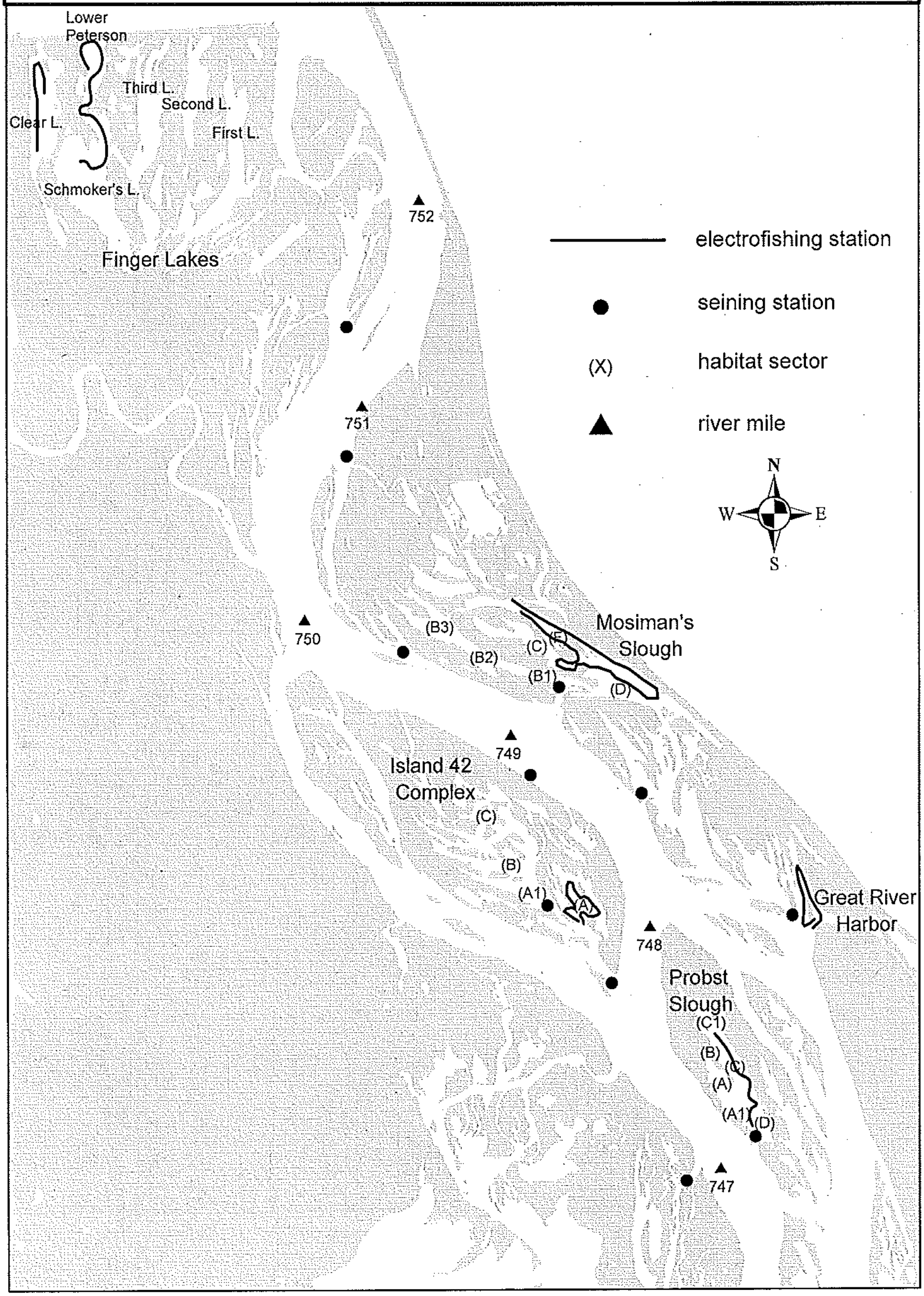

Figure 4. Middle/Lower Pool 5

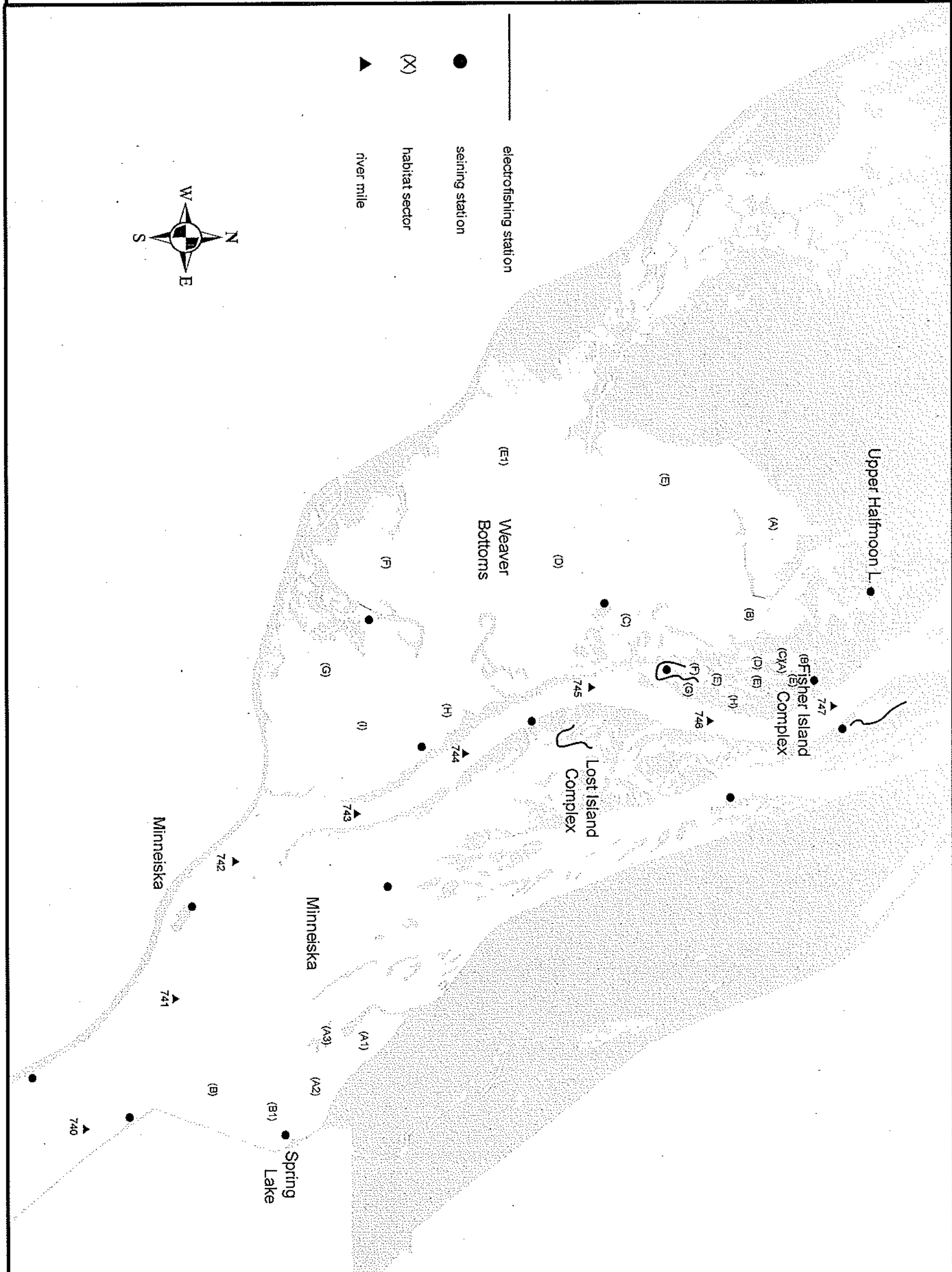

Figure 5. Pool 5 Hydrograph, 2008

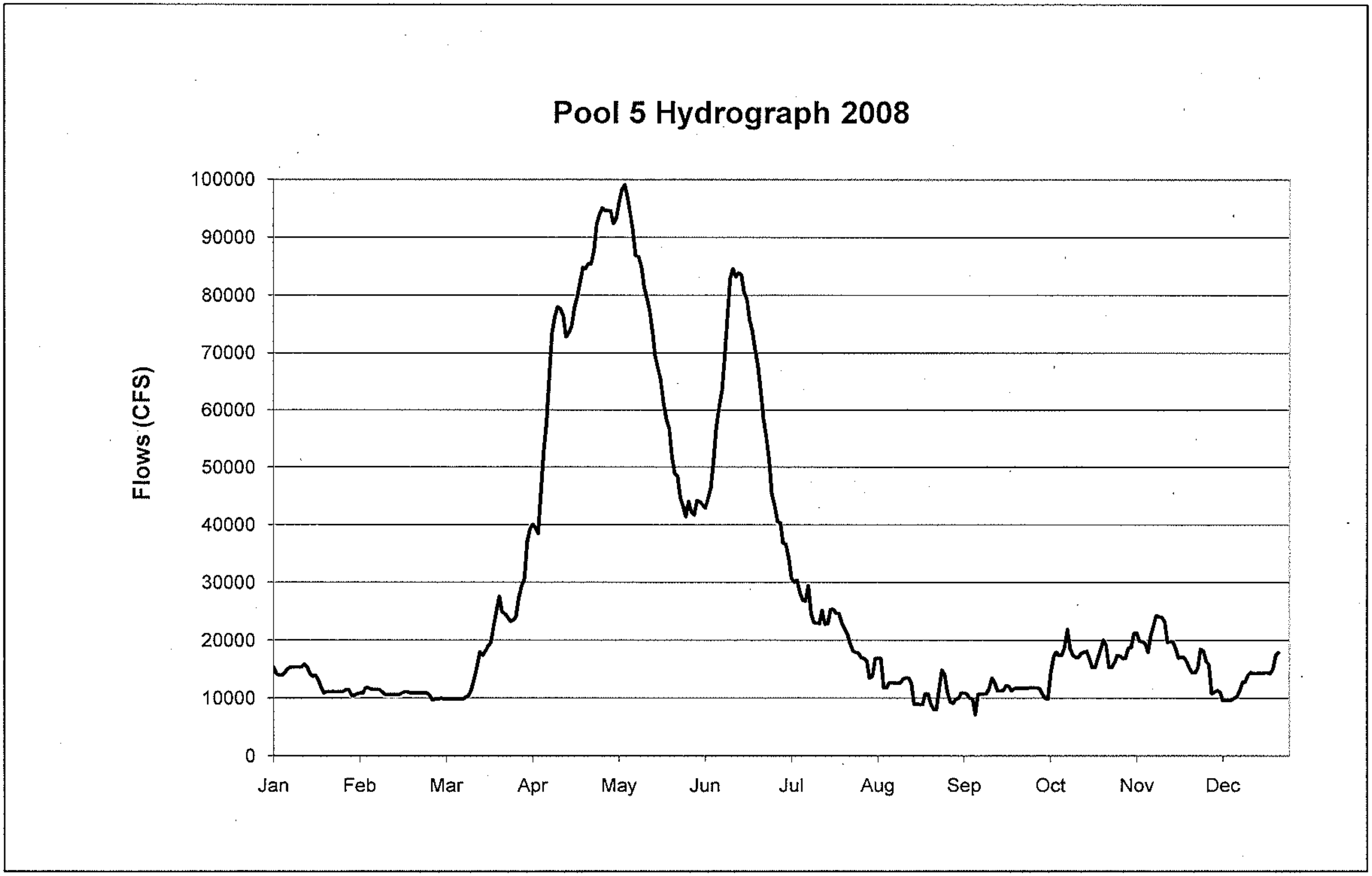

Table 9. Aquatic Habitat Quality Index Summary, Pool 5, 1993 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 5																
Finger Lakes																
Clear Lake	18	15	14	11	9											
Lower Peterson	16	14	12		12											
Schmokers	19	14	15		11											
Third Lake	18	16	19		17											
Second Lake			16													
First Lake	17	19	18		16											
Mean	**17.6**	**15.6**	**15.7**		**13.0**											
SD	**1.1**	**2.1**	**2.6**		**3.0**											
Mosiman's																
sector A and A1										14	13	14	15	14	14	13
sector B1	17	15	14	16	11	12	10	10	11	12	11	9	7	8	6	2
sector B2	14	15	14	14	11	10	10	10	8	6	8	7	5	3	5	2
sector B3	14	13	16	11	11	10	10	10	6	8	8	9	6	8	6	2
sector C	11	15	14	16	15	14	15	10	9	13	13	12	12	9	12	5
sector C1					15	15	15	10	9							5
sector D	20	19	18	16	15	12	12	14	13	17	17	13	14	14	5	9
sector F	16	16	15	16	12	10	11	9	10	9	11	6	10	9	8	8
Mean	**15.3**	**15.5**	**15.2**	**14.8**	**12.9**	**11.9**	**11.9**	**10.4**	**9.4**	**11.3**	**11.5**	**10.0**	**9.8**	**9.3**	**8.0**	**5.8**
SD	**3.1**	**2.0**	**1.6**	**2.0**	**2.0**	**2.0**	**2.3**	**1.6**	**2.2**	**3.8**	**3.2**	**3.1**	**4.0**	**3.8**	**3.6**	**4.0**
Island 42																
sector A	19	19	18	19	18	15	15	15	14	16	15	16	11	13	9	12
sector B	14	13	15	16	15	19	18	15	16	16	17	12	13	12	14	15
sector C	14	15	15	14	15	18	18	15	18	17	17	17	13	14	14	15
sector D	17		15	17	15	18	18	15	17	17	11	13	12	10	9	13
sector E			16	20		18	17	10		18						
Mean	**16.0**	**15.7**	**15.8**	**17.2**	**15.8**	**17.6**	**17.2**	**14.0**	**16.3**	**16.8**	**15.0**	**14.5**	**12.2**	**12.3**	**11.5**	**13.8**
SD	**2.4**	**3.1**	**1.3**	**2.4**	**1.5**	**1.6**	**1.3**	**2.2**	**1.7**	**0.8**	**2.8**	**2.4**	**1.0**	**1.7**	**2.9**	**1.5**
Probst Slough																
sector A and A1	15	13		18					10	12	13	15	12	12	15	14
sector B and B1	18	19		13					9	11	10	13	11	12	12	12
sector C and C1		16		14					11	13	10	9	8	10	6	11
sector C2									8	7	8	13	7	12	8	8
sector D	18	17		20					11	12	11	12	13	14	12	12
Entire Area			**19.0**		**19.0**	**15.0**	**17.0**	**13.0**								
Mean	**17.0**	**17.0**		**16.3**					**9.8**	**11.0**	**10.4**	**12.4**	**10.2**	**12.0**	**10.6**	**11.4**
SD	**1.7**	**2.5**		**3.3**					**1.3**	**2.3**	**1.8**	**2.2**	**2.6**	**1.4**	**3.6**	**2.2**
Kruger Slough																
sector A	13	16	15	11		17			19	15	14	14	9	8	11	14
sector B	13	18	14	17		19			16	15	17	17	11	11	14	15
sector C	19	18	17	17		15			18	15	11	14	10	10	13	14
sector D	19	14	17	17		18			18	13	12	13	13	12	8	10
sector E1			15	15	19	13			17	16	17	14	13	14	14	9
sector E2 and E3	16	16	18	15	20	17			17	17	18	18	14	14	14	13
sector F	20	17	19	20		18						18	16	15	14	12
sector G	18	20	19	19	20	16			18	19	18	16	14	10	14	16
sector H		12	11	13	20	19			17	16	16	16	15	15	14	15
Entire Area							**18.0**	**18.0**								
Mean	**16.9**	**16.4**	**16.1**	**16.0**	**19.8**	**16.9**			**17.5**	**15.8**	**15.3**	**15.6**	**12.8**	**12.1**	**12.9**	**13.1**
SD	**2.9**	**2.5**	**2.6**	**2.8**	**0.5**	**2.0**			**0.9**	**1.8**	**2.7**	**1.9**	**2.3**	**2.5**	**2.1**	**2.4**
Upper Halfmoon L.																
Entire Area			**16.0**	**18.0**												

Table 9 (cont.)

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 5 (cont.)																
Weaver																
sector A	19	16	16	13	16	15	17	15	12	14	13					
sector A1	16	16	16	18												
sector B	18	20	19	18	16	17	14	13	13	14	14					
sector C	21	21	20	20	20	21	21	16	16	15	15					
sector D	17	14	14	10	10	13	14	11	8	10	10					
sector D1	18	13	11	8												
sector E	19	17	11	12	10	16	12	14	13	13	14					
sector E1	18	19	14	10	14	18	17									
sector E2	15	15	15	15												
sector F	18	16	16	17	14	15	14	14	13	11	11					
sector G	18	16	15	15	15	15	16	13	12	14	14					
sector H	20	18	18	13	13	8	21	16	16	17	16					
sector I	13	12	10		5											
Mean	**17.7**	**16.4**	**15.0**	**14.1**	**13.3**	**15.3**	**16.2**	**14.0**	**12.8**	**13.5**	**13.4**				**13**	
SD	**2.1**	**2.6**	**3.1**	**3.7**	**4.1**	**3.6**	**3.2**	**1.7**	**2.5**	**2.2**	**2.0**					
Lost Island Area																
sector A	18	19	18	18												
sector B	19	21	18	18												
sector C	21	18	16	20												
Entire Area					**15**											
Mean	**19.3**	**19.3**	**17.3**	**18.7**												
SD	**1.5**	**1.5**	**1.2**	**1.2**												
Minneiska Flats																
Entire Area	**16**	**14**	**16**	**14**	**13**	**11**		**10**								
Spring Lake																
sector A				16	15	19	17	16	19	18	17	16	18	17	14	17
sector A1	16	19	19	18	19	16	16	13	13	12	11	13	11			
sector A2	19	19	19													
sector A3	20	20	18													
sector B	19	18	16	12	15	14	13	12	12	12	12	12	12	12	11	11
sector B1	19	14	18													
sector C				13	14	12	12	10	11	10	11	11	10	11	10	10
sector D				13	10	8	12	10	9	9	9	6	7	10	9	2
Mean	**18.6**	**18.0**	**18.0**	**14.4**	**14.6**	**13.8**	**14.0**	**12.2**	**12.8**	**12.2**	**12.0**	**11.6**	**11.6**	**12.5**	**11.0**	**10.0**
SD	**1.5**	**2.3**	**1.2**	**2.5**	**3.2**	**4.2**	**2.3**	**2.5**	**3.8**	**3.5**	**3.0**	**3.6**	**4.0**	**3.1**	**2.2**	**6.2**
Lower Impounded Reach																
Minneiska Island	18	20	14													
Latsch SP Area	17	17	15	13	11											
Mean	**17.5**	**18.5**	**14.5**													
SD	**0.7**	**2.1**	**0.7**													

Table 10. Electrofishing Length Frequency Distribution, Pool 5, 2008

Length (in.)	northern pike	northern pike yoy	black crappie	bluegill	large mouth bass	large mouth bass yoy	walleye	yellow perch	yellow perch yoy
2 - 2.9			6	14		4			
3 - 3.9				56		6			1
4 - 4.9				129		9			11
5 - 5.9			4	323	2	3		1	2
6 - 6.9			6	210	1			1	
7 - 7.9		2	3	138	9			3	
8 - 8.9			6	12	8			2	
9 - 9.9		3	3	2	7			3	
10 - 10.9		6	3		10		3	1	
11 - 11.9		2	1		19			1	
12 - 12.9		3			25			1	
13 -13.9					34				
14 - 14.9	1				43		1		
15 - 15.9					21		1		
16 - 16.9	1				10				
17 - 17.9					7		2		
18 - 18.9					5				
19 - 19.9	1								
20 - 20.9	1								
21 - 21.9	1								
22 - 22.9									
23 - 23.9									
24 - 24.9	1						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 - 36.9									
37 - 37.9									
38 - 38.9									
39 - 39.9									
40 - 40.9									
Totals	**6**	**16**	**32**	**884**	**201**	**22**	**8**	**13**	**14**
Mean Length	**19.4**	**10.4**	**6.9**	**5.8**	**13.2**	**4.1**	**15.2**	**8.9**	**4**

Table 11. Bluegill Age-length Frequency and Length at Capture from Fall Electrofishing in MN Waters of Pool 5, 2008

Species	Sample size	Sub-sample	Number of fish from each year-class								
			2008	2007	2006	2005	2004	2003	2002	2001	2000
Bluegill	**540**	**83**	6	38	284	133	42	28	8		1

Length (in.)	# of Fish	Ages								
		0+	1+	2+	3+	4+	5+	6+	7+	8+
< 3.0	**6**	6								
3.0 - 3.9	**27**		24	3						
4.0 - 4.9	**57**		14	38	5					
5.0 - 5.9	**207**			175	32					
6.0 - 6.9	**136**			68	54	14				
7.0 - 7.9	**99**				42	28	24	5		
8.0 - 8.9	**8**						4	3		1
9.0 - 9.9	**0**									

Length at Capture (2008 Fall Electrofishing) from Aged Subsample

Bluegill	0+	1+	2+	3+	4+	5+	6+	7+	8+
Mean length	2.2	3.8	5.5	6.8	7.1	7.9	8.5	7.7	8.7
Maximum	na	4.9	6.7	7.9	7.5	8.7	8.7	na	na
Minimum	na	3.0	3.6	4.9	6.7	7.4	8.2	na	na
N	1	14	29	20	8	8	2	1	1

Table 12. Bluegill Age-length Frequency and Length at Capture from Fall Electrofishing in WI Waters of Pool 5, 2008

Species	Sample size	Sub-sample	Number of fish from each year-class								
			2008	2007	2006	2005	2004	2003	2002	2001	2000
Bluegill	**343**	**88**	7	42	164	81	27	2	1	2	

Length (in.)	# of Fish	Ages 0+	1+	2+	3+	4+	5+	6+	7+	8+
< 3.0	**7**	7								
3.0 - 3.9	**29**		12							
4.0 - 4.9	**65**		23	42						
5.0 - 5.9	**112**		7	77	21	7				
6.0 - -6.9	**77**			43	29	5				
7.0 - 7.9	**46**			2	30	14				
8.0 - 8.9	**5**				1	1	2		1	
9.0 - 9.9	**2**							1	1	

Length at Capture (2008 Fall Electrofishing) from Aged Subsample

Bluegill	0+	1+	2+	3+	4+	5+	6+	7+	8+
Mean length	na	3.7	5.5	6.9	7.4	8.4	9.1	8.8	
Maximum	na	5.2	7	8	8.5	8.7	na	9.3	
Minimum	na	3	4.3	5.4	5.9	8.1	na	8.3	
N	0	18	28	25	10	2	1	2	

Table 13. Seining CPUE (#/acre) Summary, Pool 5, 2003 - 2008

Species	Historical Mean 1993-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	2.8	4.2	3.0	0	0	0	0	0
Shortnose gar	0.2	0.8	0.0	0	0	0	0	0
Bowfin	0.3	1.0	1.0	0	0	0	0	0
Northern pike (yoy)	4.3	4.7	7.0	0	8	3	5	0
Gizzard shad (yoy)	250.8	369.6	9.0	41	656	3	6	114
Carp	2.4	5.2	0.0	0	0	3	13	0
Emerald shiner	483.1	776.5	97.0	182	360	36	29	19
Spottail shiner	106.1	100.2	223.0	120	21	0	50	17
Spotfin shiner	454.2	858.6	57.0	230	110	253	94	50
River shiner	44.4	39.8	19.0	71	35	19	62	137
Weed shiner	81.1	262.3	19.0	3	25	0	23	0
Golden shiner	14.6	24.9	9.0	0	0	0	0	15
Common shiner	0.1	0.3	0.0	0	0	0	0	0
Sand shiner	4.6	9.5	0.0	0	23	0	0	0
Mimic shiner	12.1	27.4	3.0	5	21	0	8	0
Bullhead minnow	385.1	547.3	40.0	73	152	53	98	58
Pugnose minnow	16.4	26.5	0.0	0	0	11	13	2
Bluntnose minnow	4.6	13.8	0.0	0	0	0	0	0
Fathead minnow	0.0	0.0	0.0	0	0	0	0	0
Smallmouth buffalo (yoy)	8.3	24.9	0.0	0	0	0	0	4
Bigmouth buffalo (yoy)	0.9	2.6	0.0	0	0	0	0	4
Quillback	1.1	3.3	4.0	0	0	0	0	0
River carpsucker	0.1	0.5	0.0	0	0	0	0	0
Carpsucker sp. (yoy)	50.3	125.0	1.0	17	185	19	8	25
Silver redhorse	1.1	2.3	1.0	0	0	0	0	0
Redhorse sp. (yoy)	68.4	81.4	5.0	11	19	19	21	84
Spotted sucker	2.0	3.7	7.0	0	0	0	4	0
White sucker	4.0	11.6	0.0	0	0	0	0	0
Tadpole madtom	6.1	5.7	9.0	3	0	11	4	0
Channel catfish (yoy)	0.6	2.3	0.0	0	0	0	0	0
Flathead catfish	0.3	1.0	0.0	0	0	0	0	0
Black bullhead	0.3	0.9	0.0	0	0	0	0	0
Yellow Bullhead	0.1	0.5	0.0	2	0	0	0	0
Mud minnow	0.1	0.5	0.0	0	0	0	0	0
Trout perch	2.9	4.3	0.0	0	0	0	0	0
Brook silverside	198.6	491.0	61.0	33	17	33	92	21
White bass (yoy)	14.5	25.7	0.0	0	0	0	6	2
Rock bass (yoy)	26.1	19.5	30.0	32	21	19	48	8
Pumpkinseed sunfish (yoy)	0.4	0.9	3.0	0	0	0	0	0
Green sunfish (yoy)	16.0	27.7	3.0	3	0	3	4	2
Hybrid sunfish	1.4	3.3	0.0	0	0	0	0	0
Bluegill (yoy)	2642.3	1689.1	1784.0	2071	2740	1442	2712	1429
Largemouth bass (yoy)	269.9	233.7	437.0	268	177	239	185	189
Smallmouth bass (yoy)	8.7	7.0	4.0	14	19	3	6	12
Black crappie (yoy)	61.3	87.5	167.0	3	4	6	44	27
White crappie (yoy)	0.9	1.7	0.0	0	0	0	0	2
Logperch	39.1	48.5	16.0	17	129	0	23	12
Johnny darter	53.1	70.5	0.0	3	0	0	21	4
Western sand darter	0.1	0.5	0.0	0	0	0	0	0
Slenderhead darter	0.1	0.5	0.0	0	0	0	0	0
Mud darter	6.6	8.6	10.0	0	0	9	6	8
River darter	0.4	1.2	0.0	0	0	0	0	0
Rainbow darter	0.3	1.0	0.0	0	0	0	0	0
Yellow perch (yoy)	30.6	45.9	9.0	2	12	42	13	0
Walleye (yoy)	1.3	2.4	0.0	0	0	0	0	0
Sauger (yoy)	1.1	2.0	0.0	0	0	0	0	2
Freshwater drum	5.0	7.1	0.0	2	2	3	6	2
Total (all species)	5391	3441	3038	3206	4736	2229	3604	2249
Total No. of Species	28	5	29	23	21	21	27	26
Total Acres Seined	0.5	0.3	0.70	0.66	0.52	0.36	0.52	0.52

Figure 6. Upper and Middle Pool 5A

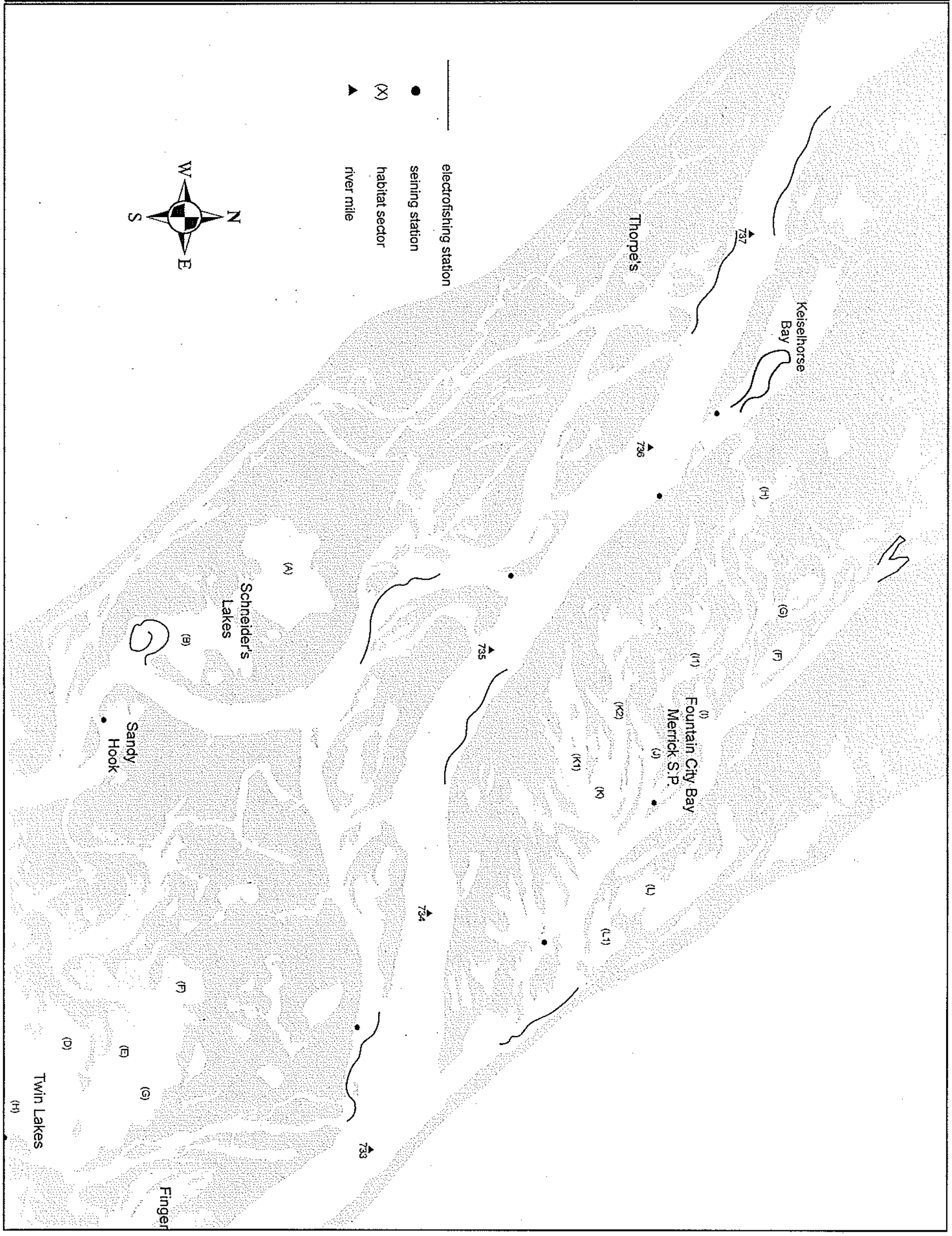

Figure 7. Lower Pool 5A

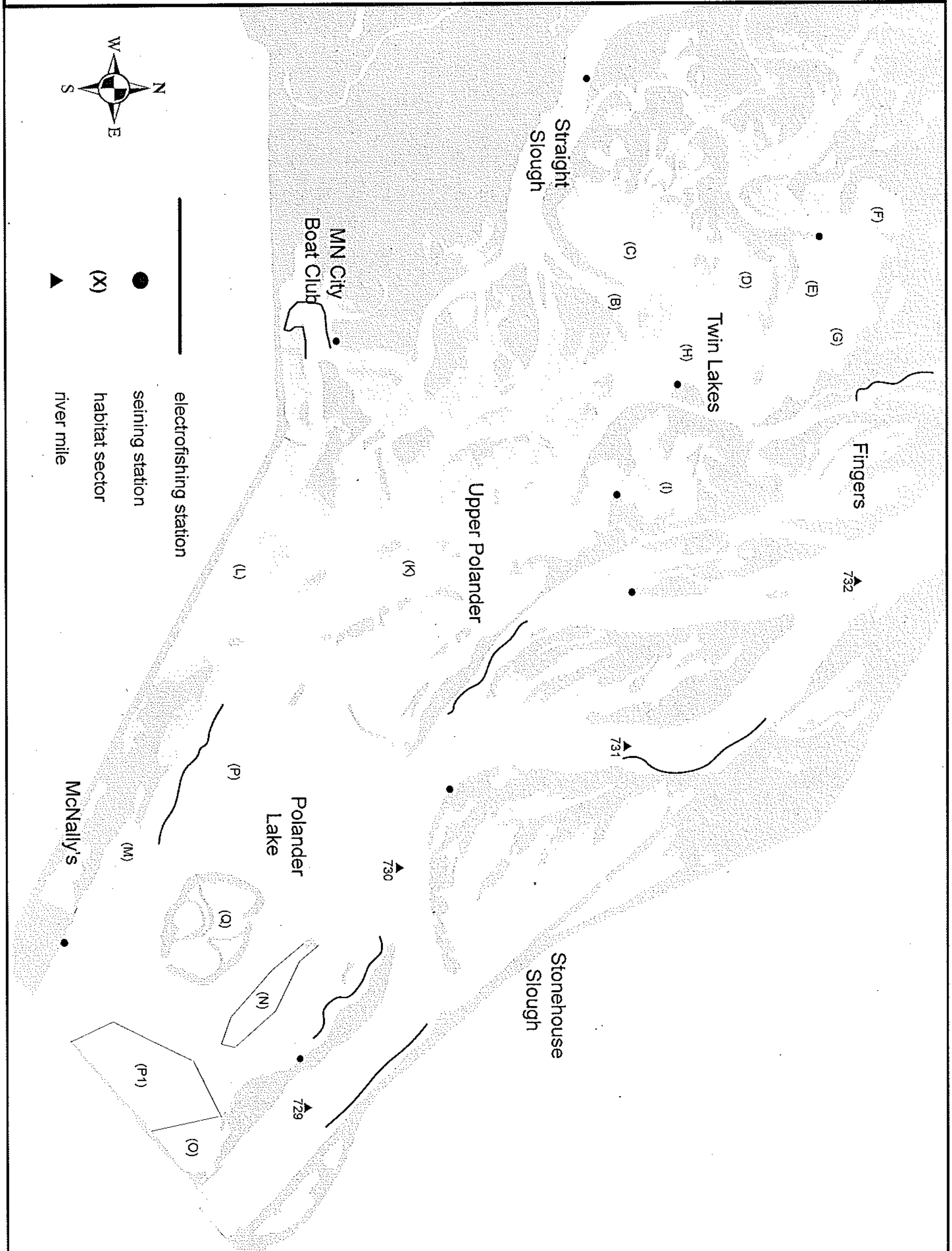

Figure 8. Pool 5A Hydrograph, 2008

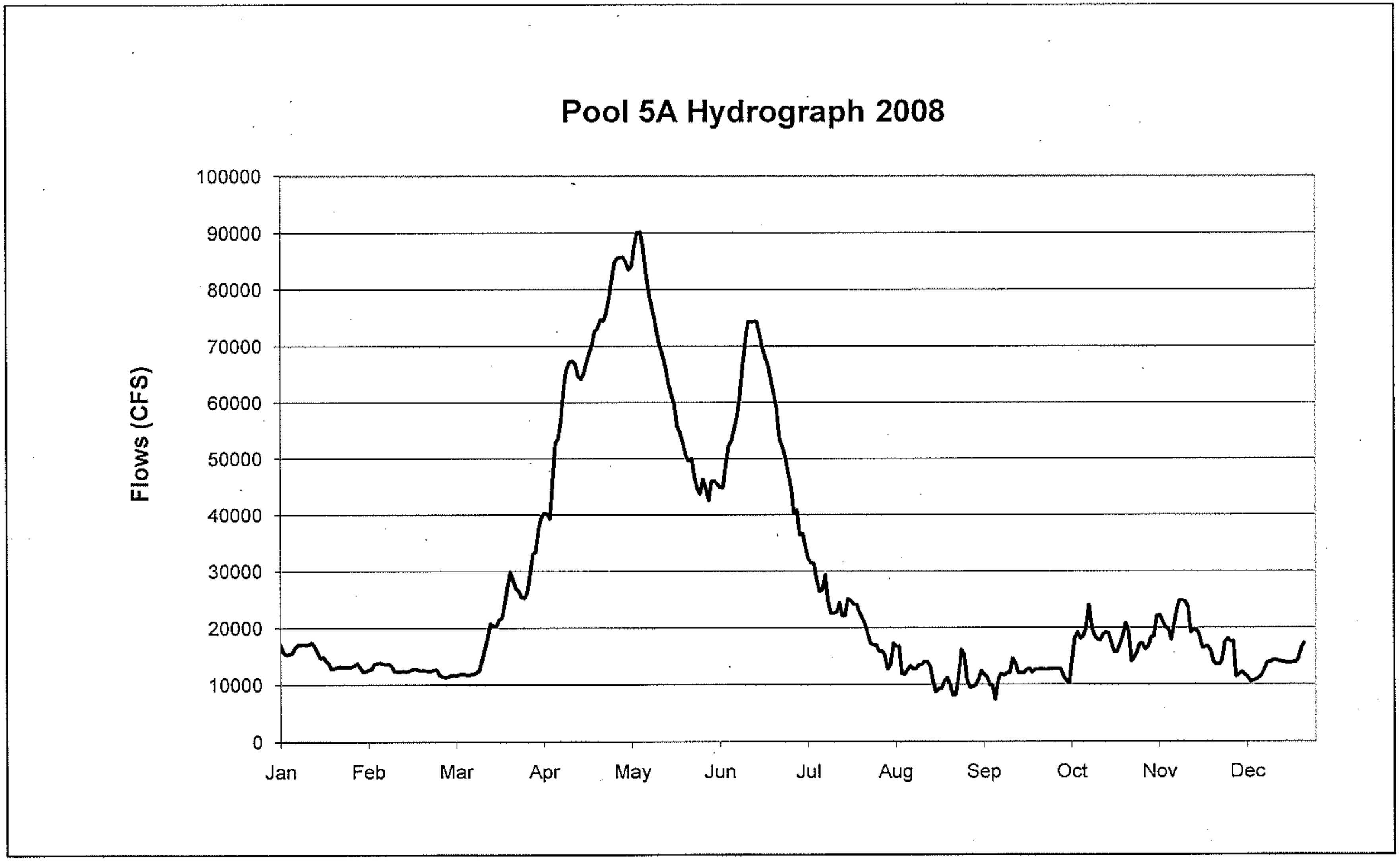

Table 14. Aquatic Habitat Quality Index Summary, Pool 5A, 1993 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 5a																
Keiselhorse Bay																
Entire area	**13**	**13**	**10**	**8**	**4**											
Fountain City Bay																
sector F	13	11	10	11	9	10	12	15	12	14	13	12	9	2		2
sector G	14	17	18	19	17	15	16	15	14	17	17	15	16	15	13	10
sector H	13	16	14	16	18	18	18	13	11	17	16	18	15	13	14	11
sector I	13	14	14	12	14	17	16	17	15	17	15	12	14	14	14	14
sector I1	19	19	17	17	16	15	18		15	17	17	18	15	10		10
sector J	18	15	17	16	16	15	15	13	13	13	14	14	12	11		3
sector J1 and J2						15	15	11	11	15	12	12	14	14		10
sector K	19	19	20	20	19	20	19	19	17	19	17	18	17	16	13	15
sector K1				15	19	14	19	19	16	17	17	17	16	16	16	16
sector K2				17	19	18	19	19	17	16	14	16	16	16		13
sector L				15	17	13	14		16	18	15	15	17	15	16	13
sector L1		11	12	14	17	12	14		16	19	16	17	16	15		11
Mean	**15.6**	**15.3**	**15.3**	**15.6**	**16.5**	**15.2**	**16.3**	**15.7**	**14.4**	**16.6**	**15.3**	**15.3**	**14.8**	**13.1**	**14.3**	**10.7**
SD	**2.9**	**3.2**	**3.3**	**2.7**	**2.9**	**2.7**	**2.3**	**3.0**	**2.2**	**1.8**	**1.7**	**2.4**	**2.3**	**4.0**	**1.4**	**4.3**
Schneider's																
sector A	13	12	13	13	13	14	16	15	16	17	17	17	15	16	14	16
sector B	20	21	21	20	21	20	20	16	19	19	19	19	18	16	16	17
Mean	**16.5**	**16.5**	**17.0**	**16.5**	**17.0**	**17.0**	**18.0**	**15.5**	**17.5**	**18.0**	**18.0**	**18.0**	**16.5**	**16.0**	**15.0**	**16.5**
SD	**4.9**	**6.4**	**5.7**	**5.0**	**5.7**	**4.2**	**2.0**	**0.7**	**2.1**	**1.4**	**1.4**	**1.4**	**2.1**	**0.0**	**1.5**	**0.7**
Sandy Hook																
Entire area	**17**	**18**	**17**	**18**	**15**											
Denzer's Meadow																
Entire area	**12**	**11**	**13**	**14**	**16**											
Twin Lakes																
sector B	18	18	18	15				16	15	16	17	18		12		5
sector C	20	18	18	17	16	16	20	19	19	19	19	16	16	16		15
sector D	17	19	15	15	16	17	17	18	18	16	19	18	15	12		11
sector E	19	20	20	20	16	15	17	17	18	18	18	18	16	18		11
sector F	18	19	18	18	18	18	16	16	17	16	17	17	15	15		12
sector G	19	20	18	18	18	15	16									11
sector H	20	19	18	19	13	18	16	15	14	17	15	15	13	10		10
sector I1 and I2	19	21	17	18	18	19	19	19	19	19	19		17	13		15
Mean	**18.8**	**19.3**	**17.8**	**17.5**	**16.4**	**17.2**	**17.3**	**17.1**	**17.1**	**17.3**	**17.7**	**17.0**	**16.3**	**13.7**		**11.3**
SD	**1.0**	**1.0**	**1.4**	**1.8**	**1.8**	**1.3**	**1.6**	**1.6**	**2.0**	**1.4**	**1.5**	**1.3**	**1.4**	**2.8**		**3.2**
McNally's																
Entire area	**19**	**19**		**19**	**18**											
Polander Lake																
sector A			18			19		17	18	18	18	18	19	18	17	16
sector B				19		19		18	17	20	18	19	16	17	18	17
sector K	20	20		19	15	17	19	15	17	18	19	17	17	14	7	12
lake	19						17									
Island interior	18	18	17	19	17	14	10									
sector L	18	17	18	18	18	19	17	18	18	19	18	18	13	16	12	14
sector M	20	16	19	18	16	18		18	19	19		18	13	16	12	12
sector P, P1,N	18	18	16	17	15	14		16	15	16	15	14	12	11	8	8
sector O	18	19	18		16	14		14	15	15			12	11	10	12
Mean	**18.0**	**18.0**	**17.7**	**18.3**	**16.2**	**16.8**	**15.8**	**16.6**	**17.0**	**17.9**	**17.6**	**17.3**	**14.6**	**14.7**	**12.0**	**13.0**
SD	**0.9**	**1.1**	**1.1**	**0.8**	**1.2**	**2.4**	**3.9**	**1.6**	**1.5**	**1.8**	**1.5**	**1.8**	**2.8**	**2.8**	**4.2**	**3.0**

Table 15. Low-Frequency Electrofishing Length Frequency Distribution, Pool 5A, 2008

Length (in.)	CCF	FHC
2 - 2.9		
3 - 3.9		
4 - 4.9		
5 - 5.9		
6 - 6.9		
7 - 7.9		1
8 - 8.9		
9 - 9.9	2	5
10 - 10.9	4	1
11 - 11.9	4	
12 - 12.9	1	4
13 -13.9		2
14 - 14.9		3
15 - 15.9		1
16 - 16.9		4
17 - 17.9		3
18 - 18.9	2	3
19 - 19.9	1	1
20 - 20.9	1	4
21 - 21.9		3
22 - 22.9		4
23 - 23.9		5
24 - 24.9		4
25 - 25.9		2
26 - 26.9		
27 - 27.9		4
28 - 28.9		1
29 - 29.9		1
30 - 30.9		1
31 - 31.9		
32 - 32.9		
33 - 33.9		
34 - 34.9		
35 - 35.9		
36 - 36.9		
37 - 37.9		2
38 - 38.9		
39 - 39.9		
40 - 40.9		
41 - 41.9		
42 - 42.9		
43 - 43.9		1
44 - 44.9		
45 - 45.9		
Totals	**15**	**60**
Mean Length	**13.3**	**20.2**

Table 16. Electrofishing Length Frequency Distribution, Pool 5A, 2008

Length (in.)	northern pike	black crappie	bluegill	largemouth bass	walleye	yellow bullhead	yellow perch
2 - 2.9		6	8	1			
3 - 3.9			31	2			1
4 - 4.9			70				
5 - 5.9	1		80	1			
6 - 6.9	1		56				
7 - 7.9			62	2			
8 - 8.9			12	3			
9 - 9.9		3		1			
10 - 10.9				2			
11 - 11.9				5			
12 - 12.9				3			
13 -13.9				9			
14 - 14.9				10			
15 - 15.9				13		1	
16 - 16.9				5			
17 - 17.9				4			
18 - 18.9				2			
19 - 19.9				3			
20 - 20.9	1					1	
21 - 21.9	1						
22 - 22.9							
23 - 23.9						1	
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 - 36.9							
37 - 37.9							
38 - 38.9							
39 - 39.9							
40 - 40.9							
Totals	**4**	**9**	**319**	**66**	**7**	**4**	**1**
Mean Length	**13.5**	**4.9**	**5.7**	**14.0**	**19.9**	**20.7**	**3.9**

Table 17. Bluegill Age-length Frequency and Length at Capture from Fall Electrofishing in MN Waters of Pool 5A, 2008

Species	Sample size	Sub-sample	Number of fish from each year-class							
			2008	2007	2006	2005	2004	2003	2002	2001
Bluegill	256	93	7	115	61	48	21	4		

Length (in.)	# of Fish	Ages							
		0+	1+	2+	3+	4+	5+	6+	7+
< 3.0	7	7							
3.0 - 3.9	30		30						
4.0 - 4.9	71		71						
5.0 - 5.9	64		14	46	4				
6.0 - 6.9	35			15	20				
7.0 - 7.9	37				22	15			
8.0 - 8.9	12				2	6	4		
9.0 - 9.9	0								

Length at Capture (2008 Fall Electrofishing) from Aged Subsample								
Bluegill	0+	1+	2+	3+	4+	5+	6+	7+
Mean length	2.0	4.1	5.8	7.1	7.9	8.3		
Maximum	na	5.2	6.7	8.1	8.3	8.7		
Minimum	na	3.0	5.0	5.9	7.0	8.0		
N	na	25	20	25	13	4		

Table 18. Bluegill Age-length Frequency and Length at Capture from Early Ice Angling in WI Waters of Pool 5A, 2008

Species	Sample size	Sub-sample	Number of fish from each year-class							
			2008	2007	2006	2005	2004	2003	2002	2001
Bluegill	60	60	0	0	10	31	16	3		

		Ages							
Length (in.)	# of Fish	0+	1+	2+	3+	4+	5+	6+	7+
< 3.0	0								
3.0 - 3.9	0								
4.0 - 4.9	0								
5.0 - 5.9	13			7	6				
6.0 - 6.9	21			2	14	4	1		
7.0 - 7.9	19			1	9	8	1		
8.0 - 8.9	7				2	4	1		
9.0 - 9.9	0								

Length at Capture (2008 Early Ice Angling) from Aged Sample								
Bluegill	0+	1+	2+	3+	4+	5+	6+	7+
Mean length	na	na	5.9	6.7	7.4	7.4		
Maximum	na	na	7.4	8.9	8.2	8.5		
Minimum	na	na	5.2	5.3	6.0	6.6		
N	0	0	10	30	16	3		

Table 14. Seining CPUE (#/acre) Summary, Pool 5A, 2003 - 2008

Species	Historical Mean 1993-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	3.3	6.5	0	0	0	0	0	0
Bowfin	0.6	1.5	0	3	2	0	0	0
Northern pike (yoy)	18.4	18.9	11	0	12	2	9	13
Gizzard shad (yoy)	612.6	765.8	47	1897	29	92	165	1714
Carp	7.0	24.8	0	3	0	0	0	0
Emerald shiner	430.3	656.4	0	30	437	26	157	16
Spottail shiner	56.3	54.6	81	45	37	0	87	9
Spotfin shiner	534.9	780.0	153	485	298	202	374	122
River shiner	51.3	60.3	3	124	132	23	9	144
Weed shiner	51.8	64.7	25	36	137	28	257	0
Golden shiner	86.3	182.9	6	0	0	0	9	13
Sand shiner	0.8	1.3	0	0	0	0	0	0
Mimic shiner	45.9	83.6	3	245	188	0	161	6
Bullhead minnow	253.9	264.2	100	470	168	147	174	41
Pugnose minnow	32.6	64.0	0	0	0	0	170	3
Bluntnose minnow	3.9	10.4	0	0	0	0	0	0
Fathead minnow	0.0	0.0	0	0	0	0	0	0
Silver chub	0.8	2.3	0	0	0	0	9	0
Smallmouth buffalo (yoy)	23.2	85.9	0	0	0	0	0	0
Bigmouth buffalo (yoy)	0.2	0.8	0	0	0	0	0	0
Highfin carpsucker	0.2	0.8	0	0	0	0	0	0
Carpsucker sp. (yoy)	31.2	98.3	6	0	22	0	0	3
Silver redhorse	0.3	0.8	0	1	0	0	0	0
Shorthead redhorse	0.6	2.5	0	0	0	0	0	0
Redhorse sp. (yoy)	77.6	98.7	1	33	15	0	13	72
Spotted sucker	2.1	5.6	0	0	0	0	22	6
White sucker	5.0	20.0	0	0	0	0	0	0
Tadpole madtom	14.9	26.8	14	12	12	0	0	0
Channel catfish (yoy)	5.1	20.3	0	0	0	0	0	0
Flathead catfish	0.4	1.5	0	6	0	0	0	0
Yellow bullhead	0.2	0.8	0	0	0	0	0	0
Mud minnow	0.4	1.0	0	3	0	0	0	0
Brook silverside	209.9	333.2	8	42	54	13	204	37
Trout perch	8.1	29.4	0	0	0	0	0	0
White bass (yoy)	87.4	281.7	0	21	0	0	0	3
Rock bass (yoy)	56.5	100.5	28	61	54	4	422	16
Pumpkinseed sunfish (yoy)	4.9	13.9	3	0	15	0	0	0
Green sunfish (yoy)	3.6	5.4	0	9	0	0	18	0
Orange-spotted sunfish	2.6	7.4	0	3	0	0	4	0
Hybrid sunfish	0.8	1.9	3	3	0	0	0	0
Bluegill (yoy)	2661.3	1693.1	1097	2358	1720	694	4622	1960
Largemouth bass (yoy)	263.0	155.5	450	288	451	181	270	409
Smallmouth bass (yoy)	7.4	10.3	8	3	5	2	0	16
Black crappie (yoy)	79.0	104.2	54	9	2	0	65	69
White crappie (yoy)	2.5	7.5	0	0	0	0	4	3
Logperch	19.3	19.6	47	9	5	26	22	31
Johnny darter	44.3	62.5	3	0	5	4	22	6
Western sand darter	0.2	0.8	0	0	0	0	0	0
River darter	0.2	0.8	0	0	0	0	0	0
Mud darter	6.9	9.4	8	3	0	4	0	0
Slenderhead darter	0.1	0.3	0	0	0	0	0	0
Yellow perch (yoy)	38.8	62.9	3	0	15	2	9	13
Walleye (yoy)	1.9	3.9	0	3	0	0	0	0
Sauger (yoy)	4.0	6.4	0	3	0	0	0	0
Freshwater drum	12.8	22.8	0	9	0	9	4	0
Total (all species)	5867	3091	2162	6217	3815	1459	7282	4725
Total No. of Species	27	6	24	29	23	17	26	24
Total Acres Seined	0.4	0.3	0.36	0.33	0.41	0.53	0.23	0.32

Figure 9. Upper Pool 6

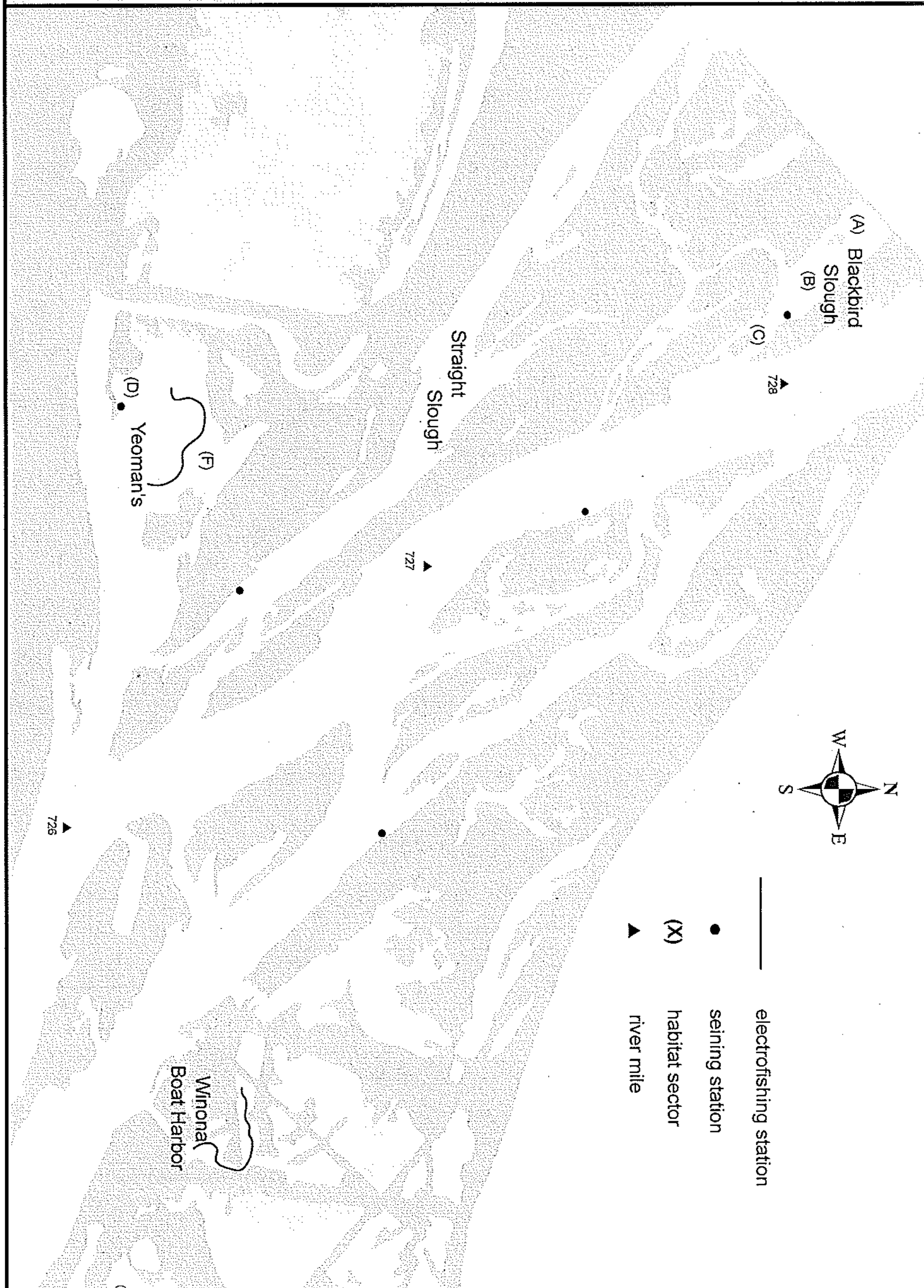

Figure 10. Middle Pool 6

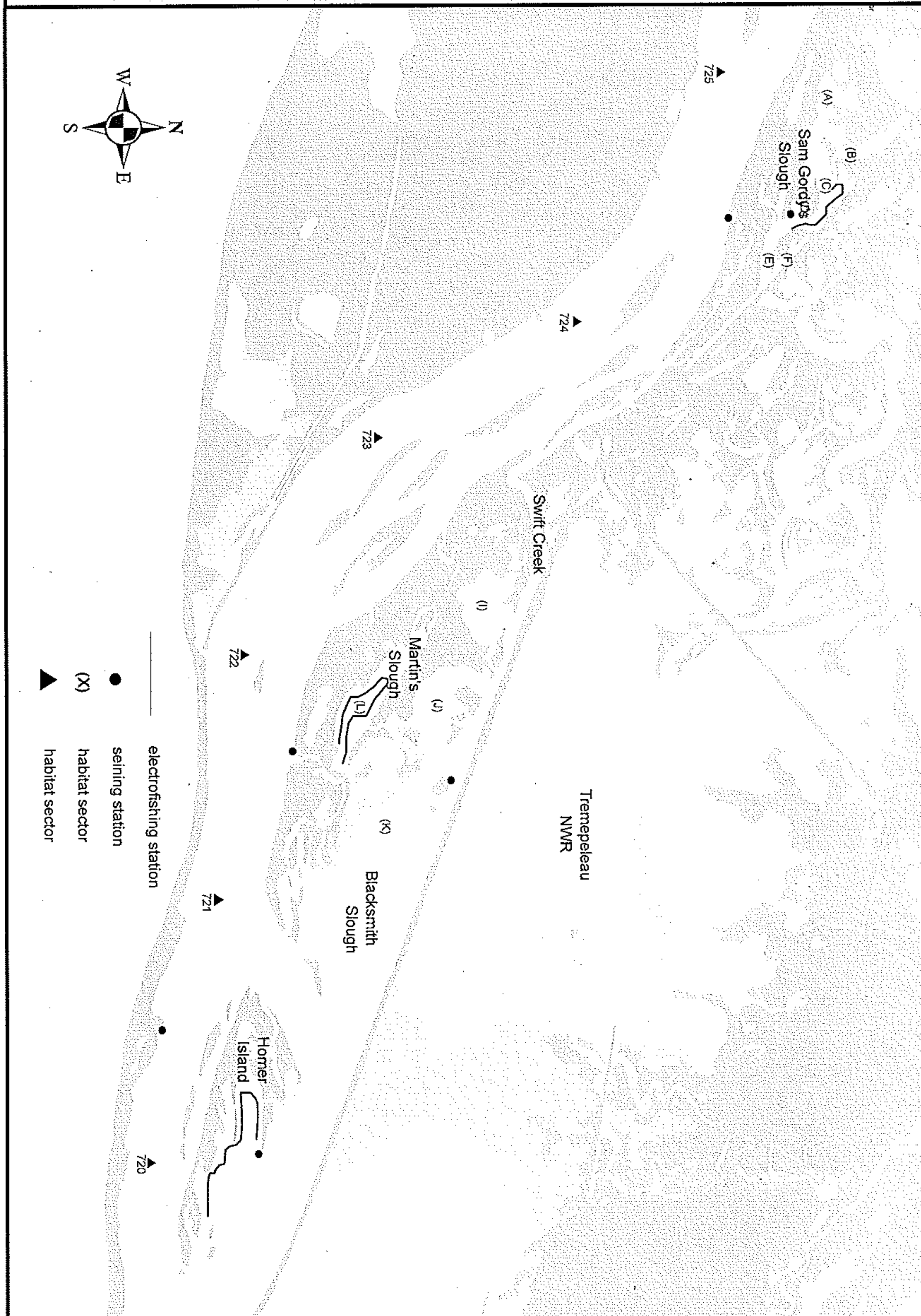

Figure 11. Lower Pool 6

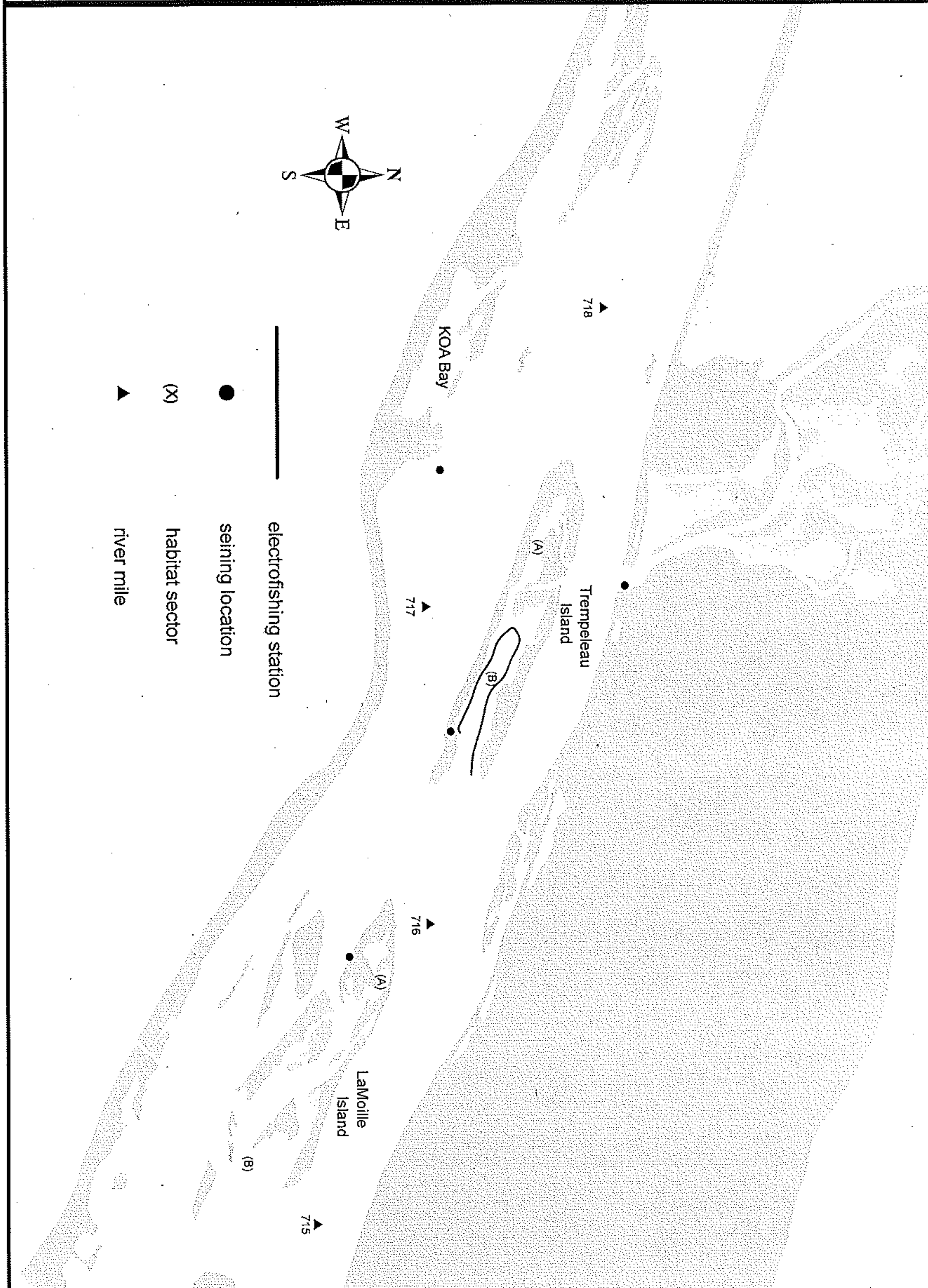

Figure 12. Pool 6 Hydrograph, 2008

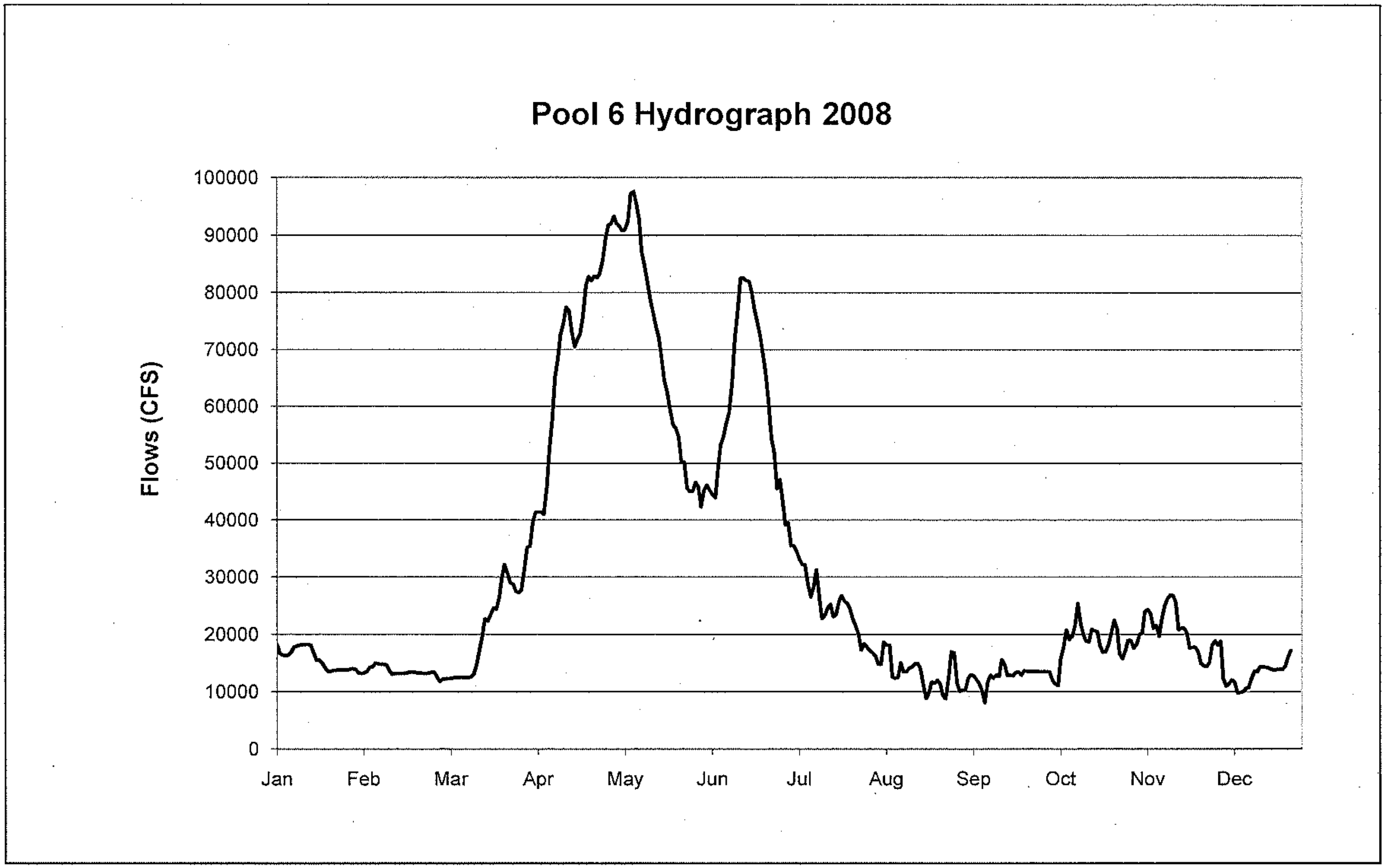

Table 20. Aquatic Habitat Quality Index Summary, Pool 6, 1993 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 6																
Airport/Bartlett Lake																
Entire area					19											
Blackbird Sough																
sector A		16	12	13	9											
sector B		9		10	4											
sector C		12	10	9	2											
Mean	13	12.3	11.0	10.7	5.0											
SD		3.5	1.4	2.1	3.6											
Yeoman's Pond																
sector B					15				15	16		16	14	15	15	10
sector D		18	16	16	13	11			11				14	14	11	11
sector F		21	18	19	18	19			16	16		17	16	16	14	12
Entire area	20							15								
Mean		19.5	17.0	17.5	15.3	15.0			14.0	16.0		16.5	14.7	15.0	13.3	11.0
SD		2.1	1.4	2.1	2.5	5.7			2.6	0.0		0.7	1.2	1.0	2.1	1.0
Winona Boat Harbor																
Entire area	13	16	14	12	11	12		12	10	16	14	14				
Sam Gordy's Slough																
sector A	14	14	15	15	15	14			18	18	17	17	16	18		16
sector B	18	19	19	18	18	19			19	19	17	18	17	18		15
sector C	18	20	20	20	17	15			18	18	18	18	17	18		17
sector D	14	15	14	12	14	17			17	18	16	15	15	17		15
sector E	14	14	14	12	14	11			16	16	16	16	16	16		12
sector F	14	13	14	12	14	11			15	14	13	13	13	13		13
sector G									12	13	12	11	11	12		8
Entire area							18	18							16	
Mean	15.3	15.8	16.0	14.8	15.3	14.5			16.4	16.6	15.6	15.4	15.0	16.0		13.7
SD	2.1	2.9	2.8	3.5	1.8	3.2			2.4	2.3	2.2	2.6	2.2	2.5		3.0
Blacksmith Slough																
sector I	20	20	20	17	15	16	21	17	18	19	17	19	19	13		14
sector J	21	20	20	18	16	17	19	18	15	19	18	16	18	15		15
sector K	20	21	20	17	14	15	16	17	16	18	16	18	17	13		15
sector L	16	20	19	18	16	18	18	14	14	17	16	17	17	16		17
Entire area															14	
Mean	19.3	20.3	20.0	17.5	15.3	16.5	18.5	16.5	15.8	18.3	16.8	17.5	17.8	14.3		15.3
SD	2.2	0.5	0.5	0.6	1.0	1.3	2.1	1.7	1.7	1.0	1.0	1.3	1.0	1.5		1.3
Homer Island																
Entire area	20	20	22	19	19											
KOA Bay																
Entire area	19	16	17	17	17	19	19	19	17	18						
Trempeleau Island																
sector A	16	19	17	15	17	18		18	18	19	19					
sector B	21	21	20	21	18	20		18	19	20	17					
Entire area												18				
Mean	18.5	20	18.5	18.0	17.5	19.0	14.0	18.0	18.5	19.5	18.0					
SD	3.5	1.4	1.5	4.2	0.7	1.4	0.0	0.0	0.7	0.7	0.7					
LaMoille Island																
sector A	17	16	17	16	17	18	20	16	16	18	15					
sector B	20	21	20	19	15	17	19	15	14	15	16					
sector C	17	17														
Entire area												15				
Mean	18	18	18.5	17.5	16.0	17.5	19.5	15.5	15.0	16.5	15.5					
SD	1.7	2.6	2.1	2.1	1.4	0.7	0.7	0.7	1.4	2.1	0.7					

Table 21. Electrofishing Length Frequency Distribution, Pool 6, 2008

Length (in.)	northern pike	black crappie	bluegill	largemouth bass	largemouth bass yoy	yellow perch	yellow perch yoy
2 - 2.9			20		7		1
3 - 3.9			104		30		7
4 - 4.9			91		16		3
5 - 5.9			85		4	5	
6 - 6.9		1	74	7		4	
7 - 7.9		1	68	14		2	
8 - 8.9			8	8		2	
9 - 9.9		1		13		2	
10 - 10.9		2		11		1	
11 - 11.9		2		10		1	
12 - 12.9				23			
13 -13.9				18			
14 - 14.9				12			
15 - 15.9				8			
16 - 16.9				4			
17 - 17.9				3			
18 - 18.9				2			
19 - 19.9							
20 - 20.9	1			1			
21 - 21.9							
22 - 22.9							
23 - 23.9	1						
24 - 24.9							
25 - 25.9							
26 - 26.9							
27 - 27.9							
28 - 28.9	1						
29 - 29.9	1						
30 - 30.9							
31 - 31.9							
32 - 32.9							
33 - 33.9							
34 - 34.9							
35 - 35.9							
36 - 36.9							
37 - 37.9							
38 - 38.9							
39 - 39.9							
40 - 40.9							
Totals	**4**	**7**	**450**	**134**	**57**	**17**	**11**
Mean Length	**25.6**	**9.5**	**5.2**	**11.8**	**3.7**	**7.6**	**3.8**

Table 22. Seining CPUE (#/acre) Summary, Pool 6, 2003 - 2008

Species	Historical Mean 1993-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	1.5	2.1	0	0	2	0	0	7
Shortnose gar	0.3	1.3	0	0	0	0	0	0
Bowfin	0.6	1.8	0	0	0	0	0	0
Northern pike (yoy)	6.4	6.3	9	0	2	5	0	3
Gizzard shad (yoy)	242.4	317.7	0	339	2	78	1248	170
Carp	2.3	5.0	0	0	0	0	0	0
Emerald shiner	457.1	546.5	0	145	208	57	90	38
Spottail shiner	101.8	262.1	0	42	2	3	118	10
Spotfin shiner	716.8	748.2	36	842	142	972	1455	476
River shiner	125.3	141.6	0	187	200	34	330	117
Weed shiner	32.6	61.4	2	3	169	20	203	0
Golden shiner	27.5	70.1	0	0	0	0	23	0
Sand shiner	0.6	1.3	2	0	0	0	0	3
Mimic shiner	63.8	159.8	0	590	8	0	98	300
Bullhead minnow	458.4	582.0	2	290	35	111	288	431
Pugnose minnow	32.1	104.2	0	0	0	0	10	0
Bluntnose minnow	11.5	36.1	0	0	0	0	0	0
Fathead minnow	0.8	2.6	0	0	0	0	10	3
Smallmouth buffalo (yoy)	1.8	5.1	0	0	0	0	0	0
Bigmouth buffalo (yoy)	0.0	0.0	0	0	0	0	0	0
Quillback	0.7	2.8	0	0	0	0	0	0
Carpsucker sp. (yoy)	19.1	29.6	0	26	48	3	38	76
Shorthead redhorse	0.4	1.2	0	3	0	0	0	0
Redhorse sp. (yoy)	32.6	41.2	2	0	2	0	13	24
Spotted sucker	3.2	7.5	4	0	0	3	30	0
White sucker	0.6	1.8	0	0	0	0	2	0
Tadpole madtom	4.3	4.1	7	6	6	3	3	0
Channel catfish (yoy)	0.0	0.0	0	0	0	0	0	0
Black bullhead	0.4	1.2	0	0	0	0	0	0
Flathead catfish	0.3	1.0	0	0	0	0	0	0
Mud minnow	0.1	0.5	2	0	0	0	0	0
Brook silverside	177.9	208.5	5	74	69	185	195	107
White bass (yoy)	5.3	10.5	0	23	0	0	23	0
Rock bass (yoy)	15.8	15.0	11	13	6	6	50	17
Pumpkinseed sunfish (yoy)	1.2	2.3	0	0	0	0	0	3
Green sunfish (yoy)	3.1	6.0	2	0	0	0	0	3
Warmouth	4.2	15.7	0	0	0	0	0	0
Hybrid sunfish	0.0	0.0	0	0	0	0	0	0
Bluegill (yoy)	1939.8	1426.5	362	619	971	955	2785	2286
Largemouth bass (yoy)	214.7	174.9	131	94	96	138	158	245
Smallmouth bass (yoy)	8.4	6.9	2	3	8	0	8	21
Black crappie (yoy)	48.1	78.8	2	0	2	3	188	0
White crappie (yoy)	0.9	2.4	0	0	0	0	0	0
Logperch	31.5	29.9	7	13	17	9	40	45
Johnny darter	36.4	38.6	9	0	10	11	25	17
Western sand darter	1.3	3.4	0	0	0	0	0	0
Mud darter	6.5	15.7	2	0	2	0	0	0
River darter	0.0	0.0	0	0	0	0	0	0
Yellow perch (yoy)	74.0	155.2	16	0	6	0	15	41
Walleye (yoy)	0.9	1.6	0	3	0	0	0	0
Sauger (yoy)	0.5	1.2	0	3	0	0	0	0
Freshwater drum	2.8	5.3	0	3	0	0	0	3
Total (all species)	4918	2656	615	3321	2013	2596	7446	4446
Total No. of Species	24	4	20	21	23	18	26	24
Total Acres Seined	0.4	0.2	0.55	0.31	0.48	0.65	0.40	0.29

Figure 13. Upper Pool 7

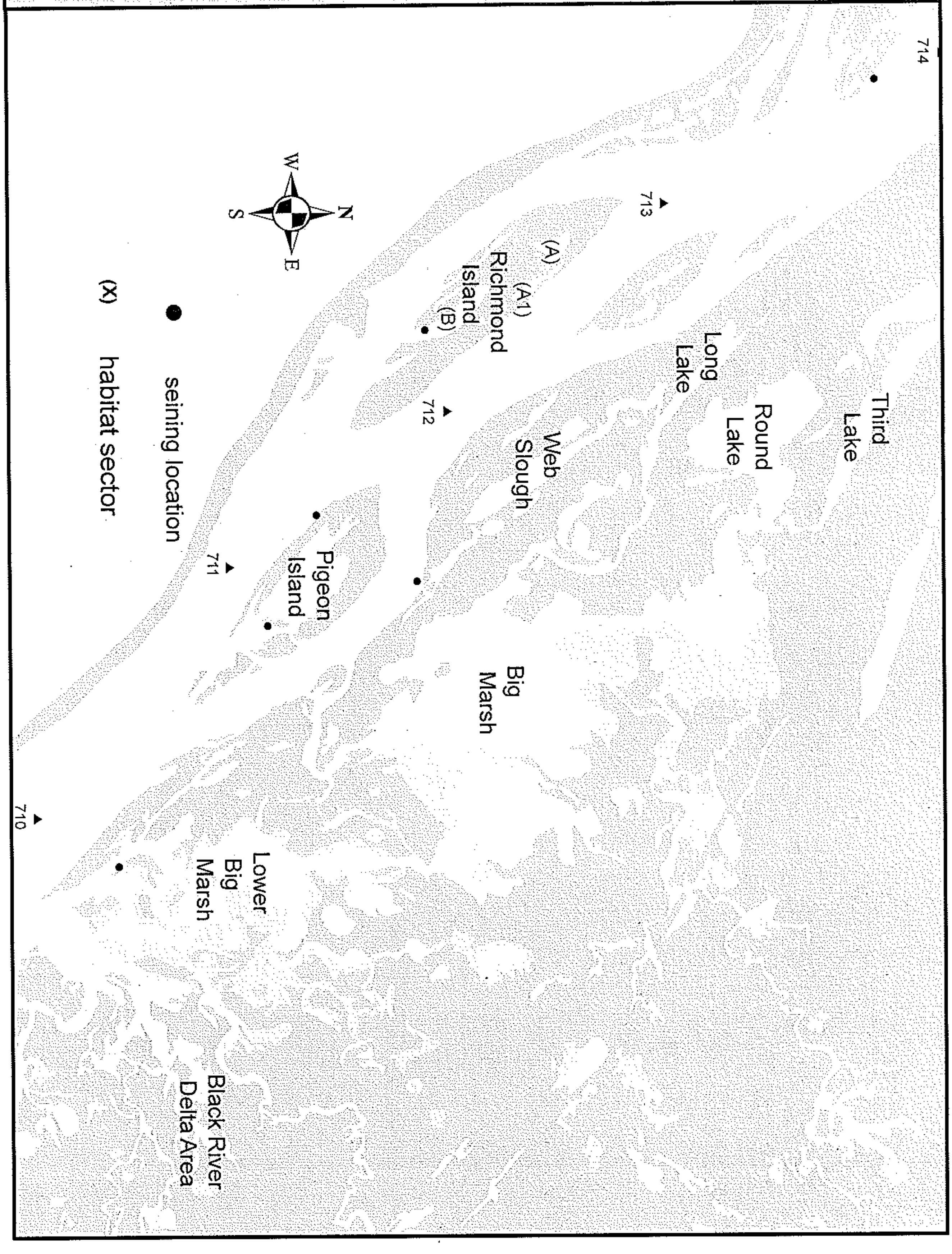

Figure 14. Lower Pool 7

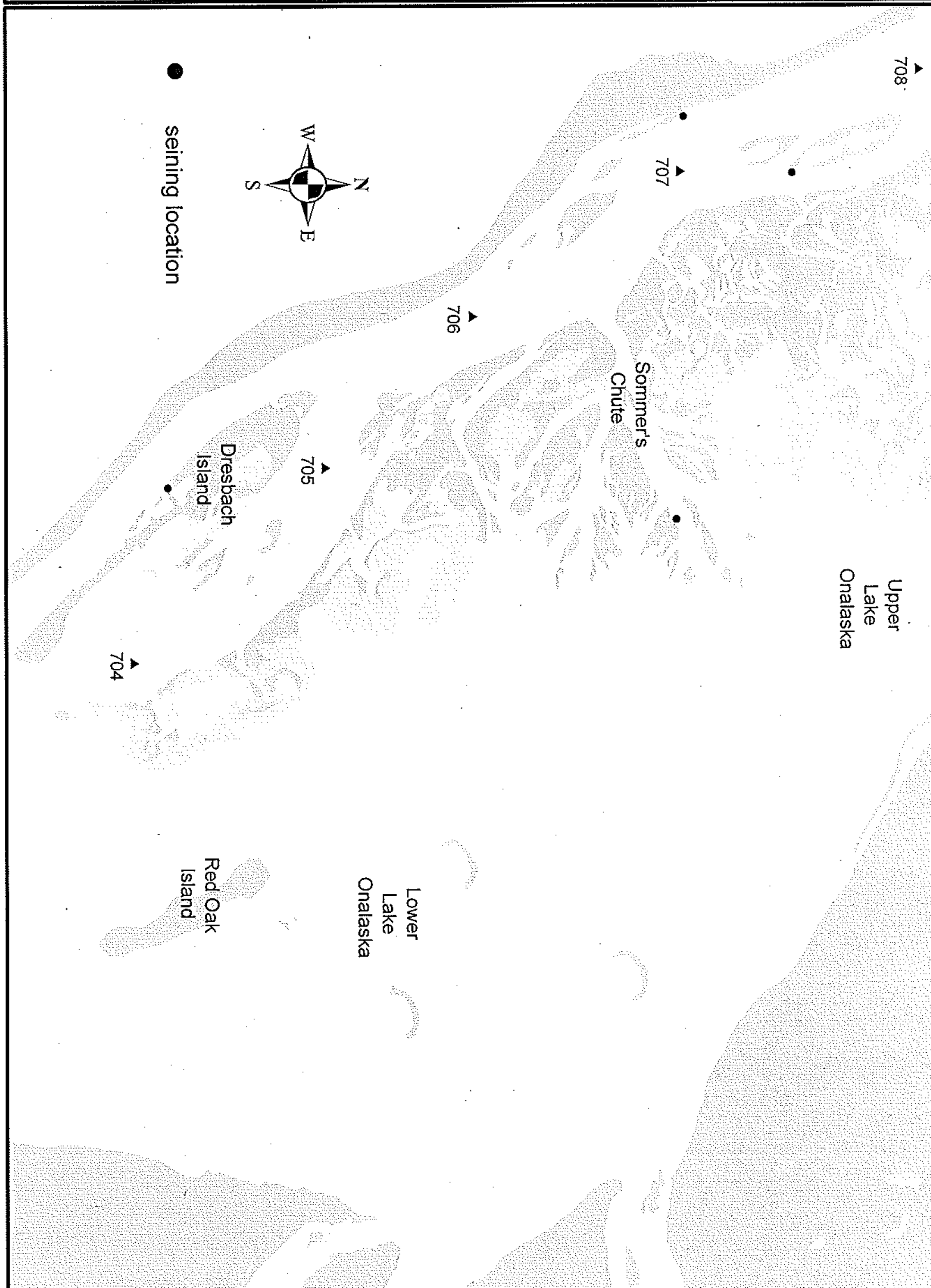

Figure 15. Pool 7 Hydrograph, 2008

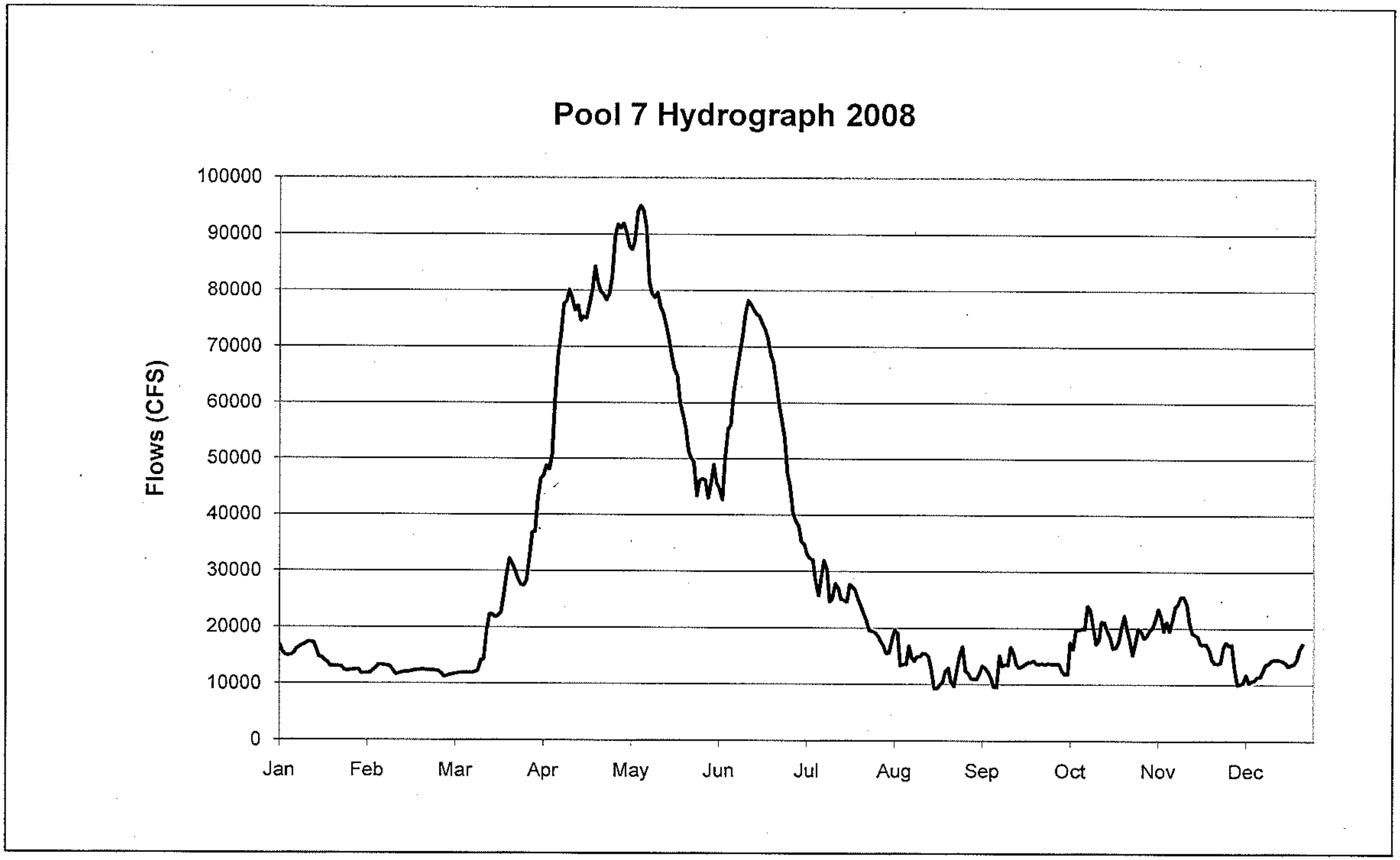

Table 23. Aquatic Habitat Quality Index Summary, Pool 7, 1997 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 7																
Richmond Island																
sector A	15	15	11	14	7	8			7	10	9	8				
sector B	17	12	14	13	9	9			9	9	11	7				
sector C	14		14	12	11	8			8							
Mean	**15.3**	**13.5**	**13.0**	**13.0**	**9.0**	**8.3**			**8.0**	**9.5**	**10.0**	**7.5**				
SD	**1.5**	**2.1**	**1.7**	**1.0**	**2.0**	**0.6**			**1.0**	**0.7**	**1.4**	**0.7**				
Pigeon Island																
Entire area	**21**	**20**	**21**	**22**	**21**	**19**										
Web Slough																
sector A	14	16				16	14		16	16	16					
sector B	13	14				15	13		16	18	16					
sector C						19	17		18	14	12					
Entire area												**17**				
Mean	**13.5**	**15**				**16.7**	**14.7**		**16.7**	**16.0**	**14.7**					
SD	**0.7**	**1.4**				**2.1**	**2.1**		**1.2**	**2.0**	**2.3**					
Third Lake																
Entire area	**17**	**16**	**17**		**17**	**19**	**15**		**18**	**18**	**15**	**17**				
Round Lake																
Entire area	**18**	**19**	**20**		**18**	**16**	**17**									
Big Marsh																
Entire area	**20**	**20**	**18**	**15**	**21**	**19**	**21**		**20**	**20**	**19**	**19**				
Lower Big Marsh																
Entire area	**18**		**19**	**19**		**19**	**19**									
Dresbach Island (SE side)																
sector A	18		19													
sector B	19		21													
Entire area				**20**	**19**											
Mean	**18.5**		**20.0**													
SD	**0.7**		**1.4**													
L. Onalaska																
Upper	21		20													
Lower	19		19													
Entire area				**20**	**21**	**20**	**19**		**17**	**18**	**18**	**19**				
Mean	**20**		**19.5**													
SD	**1.4**		**0.7**													

Table 24. Seining CPUE (#/acre) Summary, Pool 7, 2003-2008

Species	Historical Mean 1996-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	3.2	5.7	0		0		0	14
Bowfin	0.0	0.0	0		0		0	0
Northern pike (yoy)	14.0	12.1	17		7		8	5
Gizzard shad (yoy)	142.7	225.4	0		119		754	86
Carp	5.2	5.5	0		4		12	10
Emerald shiner	355.5	598.1	9		381		4	10
Spottail shiner	101.7	106.0	178		48		21	10
Spotfin shiner	630.5	784.1	0		144		488	148
River shiner	123.2	174.5	0		167		21	576
Weed shiner	174.0	152.1	52		378		96	10
Golden shiner	36.1	57.1	0		7		0	0
Sand shiner	10.0	23.1	0		0		4	0
Mimic shiner	16.5	30.3	0		0		21	0
Bullhead minnow	220.2	257.9	48		44		104	5
Pugnose minnow	33.6	100.2	0		0		0	0
Brassy minnow	1.0	3.3	0		0		0	0
Fathead minnow	0.5	1.5	0		0		0	0
Smallmouth buffalo (yoy)	0.5	1.5	0		0		0	5
Bigmouth buffalo (yoy)	0.0	0.0	0		0		0	0
Carpsucker sp. (yoy)	61.5	127.9	0		207		0	43
Redhorse sp. (yoy)	39.5	44.7	0		4		17	5
Spotted sucker	4.6	5.0	9		4		0	10
Tadpole madtom	11.0	13.0	22		4		4	14
Channel catfish (yoy)	0.0	0.0	0		0		0	0
Flathead catfish	0.0	0.0	0		0		0	0
Pirate perch	3.8	10.6	35		7		0	0
Mud minnow	0.0	0.0	0		0		0	0
Brook silverside	292.5	352.0	17		163		8	67
White bass (yoy)	46.4	128.4	0		19		0	5
Rock bass (yoy)	55.8	46.9	17		15		96	10
Pumpkinseed sunfish (yoy)	2.2	4.9	4		0		4	0
Green sunfish (yoy)	4.3	7.0	0		0		0	0
Orange-spotted sunfish	4.3	8.1	0		0		0	20
Hybrid sunfish	0.0	0.0	0		0		0	0
Bluegill (yoy)	1869.6	1116.8	696		2170		1133	1957
Largemouth bass (yoy)	277.0	78.1	370		333		325	386
Smallmouth bass (yoy)	9.8	9.6	4		4		13	10
Black crappie (yoy)	63.4	56.9	0		4		108	105
White crappie (yoy)	2.6	5.6	0		0		4	0
Logperch	10.8	15.7	17		4		0	10
Johnny darter	43.7	39.9	4		7		54	19
Western sand darter	2.0	6.6	22		0		0	0
Banded darter	0.6	2.1	0		0		0	0
Mud darter	9.5	10.6	26		0		17	5
River darter	0.6	2.1	0		0		0	0
Yellow perch (yoy)	36.7	51.3	9		0		25	5
Walleye (yoy)	1.8	4.1	0		0		0	0
Sauger (yoy)	0.0	0.0	0		0		0	0
Freshwater drum	4.7	7.0	0		0		17	14
Total (all species)	4727	2026	1556		4244		3358	3564
Total No. of Species	24	3	19		24		25	28
Total Acres Seined	0.2	0.0	0.23		0.27		0.24	0.21

Figure 16. Upper Pool 9

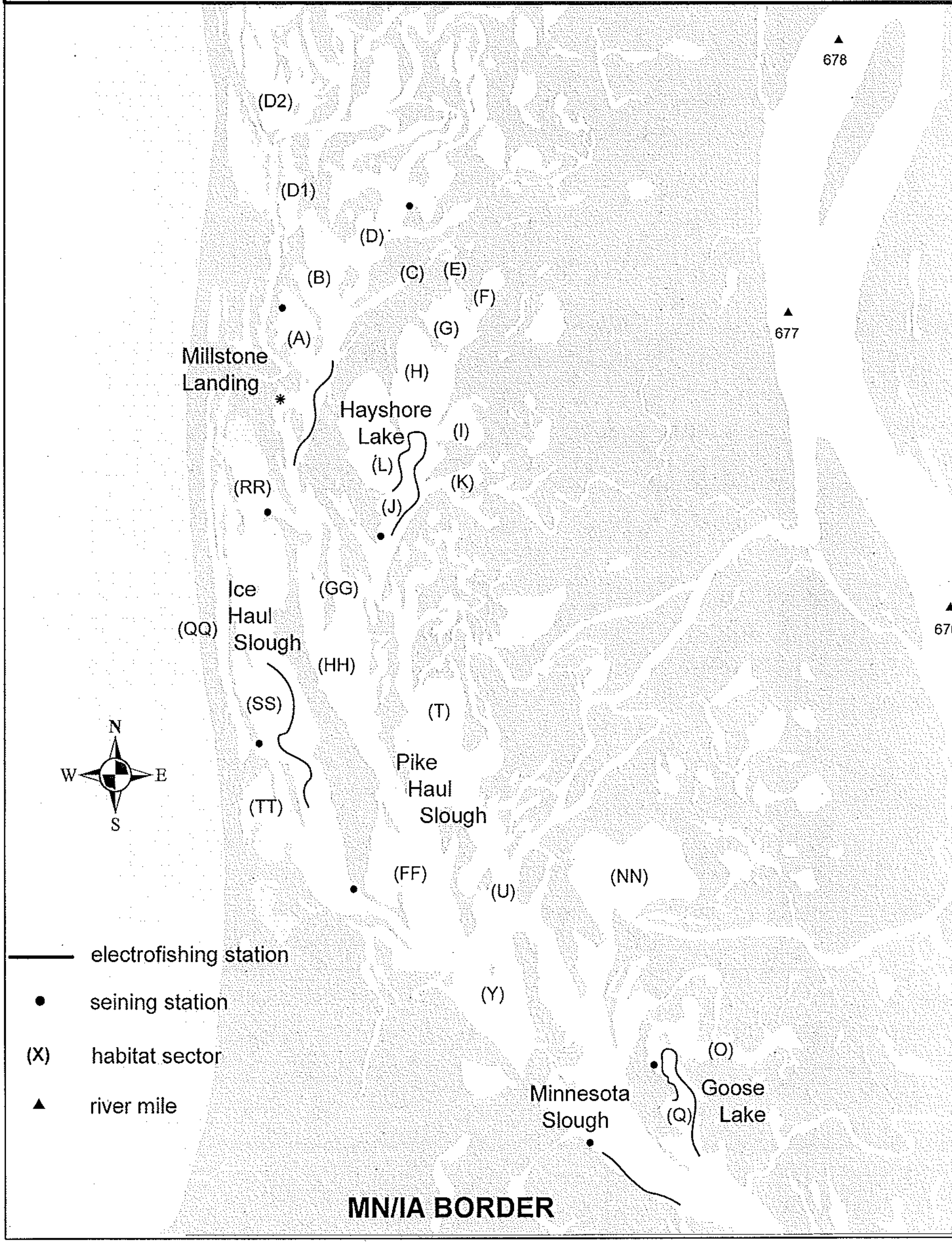

Figure 17. Upper Pool 9 Hydrograph, 2008

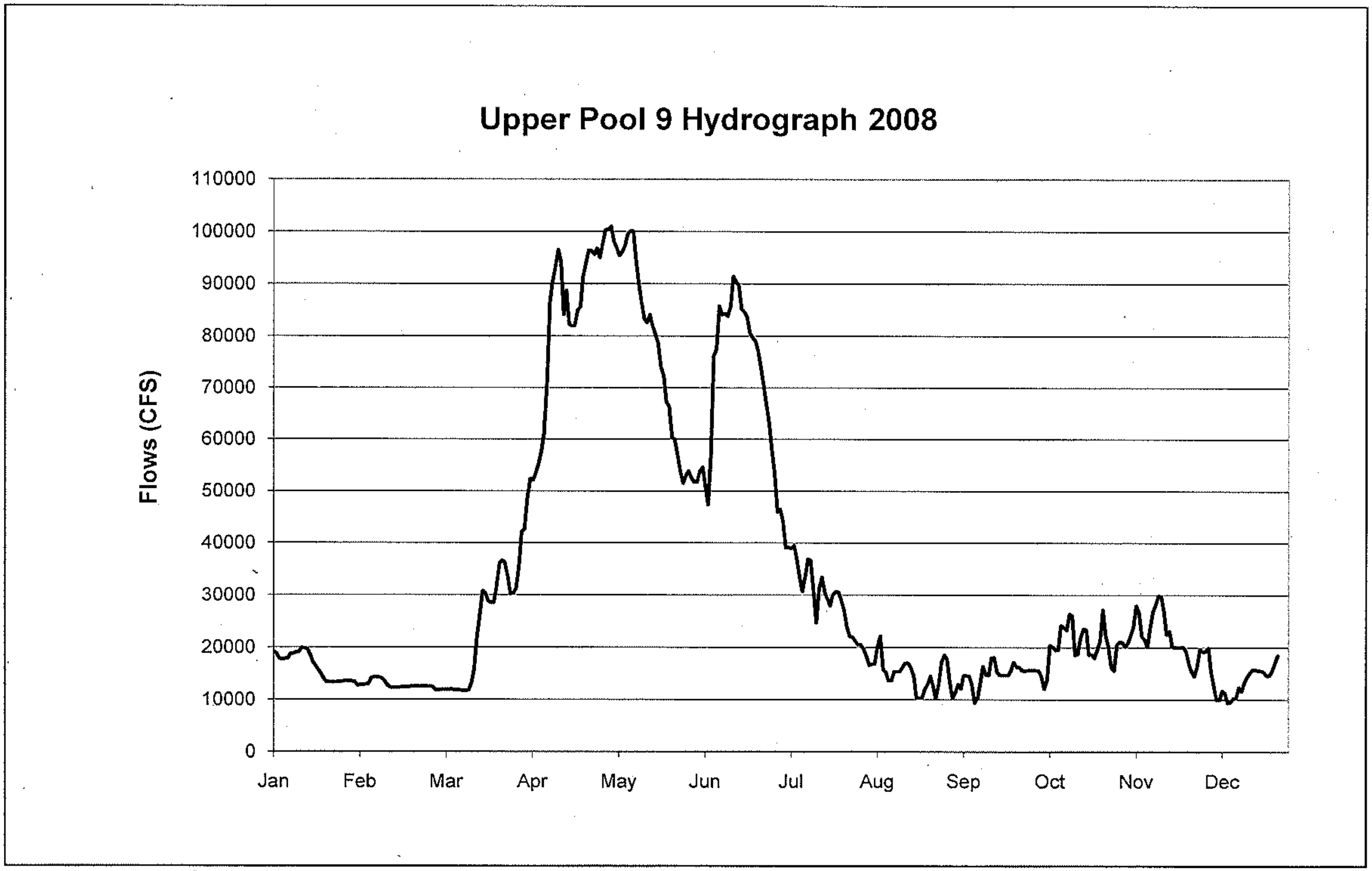

Table 25. Aquatic Habitat Quality Index Summary, Pool 9, 1994 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Pool 9																
Millstone Landing Area																
sector A	16	17	15	11	12	6	13		9	7	9	11	7		6	
sector B	17	16	16	15	12	9	13		10	8	9	12	7		7	
sector C		12		15	18	14			12	14	14	13	10		10	
sector D		16	18	17	13	12	13		9	8	8	13	7		7	
sector D1	12	14		15	15	11	12		14	14	15					
sector D2	11	12	13	16	13											
Entire area														6		
Mean	14.0	14.5	15.5	14.8	13.8	10.4	12.8		10.8	10.2	11.0	12.3	7.8		7.5	
SD	2.9	2.2	2.1	2.0	2.3	3.1	0.5		2.2	3.5	3.2	1.0	1.5		1.7	
Hayshore Lake																
sector E	16		14	11	18	14			13	13	14				13	
sector F	13	13	14	16	13	15			15	15	16	12	10		9	
sector G	13	15	14	16	13	15			14	13	13	12	10		10	
sector H and J	14	11	11	12	13	15			16	12	11	9	8		10	
sector I	14	13	11	13	13	12			13	12	13	9	8		9	
sector K and L	15	14	17	14	11	9			11	8	12	9	10		10	
sector M		10		10	11	9			3	9	7	7	8		4	
Entire area							16							8		
Mean	14.2	12.7	13.5	13.1	13.1	12.7			12.1	11.7	12.3	9.7	9.0		9.3	
SD	1.2	1.5	2.3	2.3	2.3	2.8			4.3	2.4	2.8	2.0	1.1		2.7	
Pike Haul Slough																
sector N									9	9	6				3	
sector GG	14	11		15	13											
sector HH	10	12	12	12	9											
sector T	12	14	12	16	11	11	13		9	9	6				4	
sector U	10	11	12	11		11	13		6	5	10				3	
sector Y	8	10		8	7	11			4	4	10				4	
sector (2f,g,h,l)										13	15				4	
sector FF	15	13	14	10	7	11	13									
sector NN	15	17	17	16	9	6	11		9	8	10				5	
Entire area														7		
Mean	12.0	12.6	13.4	12.6	9.3	10.0	12.5		7.4	8.0	9.5				3.8	
SD	2.9	2.5	2.2	3.2	2.3	2.2	1.0		2.3	3.2	3.3				0.8	
Goose Lake																
sector O	12	13	12	12												
sector P	13	13	17	16												
sector Q	11	11	10	11												
Mean	12.0	13.0	13.0	13.0												
SD	1.0	1.2	3.6	2.6												
Ice Haul Slough																
sector RR	13	9	13	10	11	7	12		7	8					8	
sector SS	16	12	11	10	9	9	12		7	9	10				8	
sector TT	13	14	4	11	14	14	12		13	9	10		10		8	
sector QQ	13	14	15	8	8	4	7		7	11	12	11	8	6		
Mean	13.8	12.3	10.8	9.8	10.5	8.5	10.8		8.5	9.3	10.7	11.0	9.0	6.0	8.0	
SD	1.5	2.4	4.8	1.3	2.6	4.2	2.5		3.0	1.3	1.2	0.0	1.4	0.0	0.0	

Table 26. Electrofishing Length Frequency Distribution, Pool 9, 2008

Length (in.)	northern pike	black crappie	white crappie	bluegill	large mouth bass	large mouth bass yoy	walleye	white bass	yellow perch
2 - 2.9		2		9		2			
3 - 3.9				24		8		1	3
4 - 4.9				18		2		3	
5 - 5.9				67				2	1
6 - 6.9		4		83	1		1	2	
7 - 7.9	2			48	5				
8 - 8.9		5		4	4				
9 - 9.9					13				2
10 - 10.9		2	1		13				
11 - 11.9		1			20		3		1
12 - 12.9			3		27		3		
13 -13.9					64		3	3	
14 - 14.9					34				
15 - 15.9					18				
16 - 16.9					15		1		
17 - 17.9					4		1		
18 - 18.9					1		2		
19 - 19.9									
20 - 20.9							4		
21 - 21.9							1		
22 - 22.9									
23 - 23.9	2								
24 - 24.9							1		
25 - 25.9									
26 - 26.9									
27 - 27.9	1								
28 - 28.9									
29 - 29.9									
30 - 30.9	1								
31 - 31.9									
32 - 32.9									
33 - 33.9									
34 - 34.9									
35 - 35.9									
36 - 36.9									
37 - 37.9									
38 - 38.9									
39 - 39.9									
40 - 40.9									
Totals	**6**	**14**	**4**	**253**	**219**	**12**	**20**	**11**	**7**
Mean Length	**20.1**	**8.5**	**12.1**	**5.9**	**13.2**	**3.5**	**16.0**	**7.5**	**6.7**

Table 27. Seining CPUE (#/acre) Summary, Pool 9, 2003 - 2008

Species	Historical Mean 1994-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	0.6	1.5	0	0	0	0	0	0
Bowfin	1.6	3.0	0	0	0	5	0	0
Northern pike (yoy)	21.1	29.9	29	0	0	20	15	31
Gizzard shad (yoy)	399.2	333.9	196	886	183	40	150	369
Mooneye	0.1	0.3	0	0	0	0	0	0
Carp	6.7	20.3	0	0	0	0	0	0
Emerald shiner	319.7	470.4	4	1729	39	30	100	62
Spottail shiner	223.7	413.3	242	29	13	0	655	1592
Spotfin shiner	228.5	531.4	4	21	139	10	130	0
River shiner	86.7	197.1	0	171	9	10	5	8
Weed shiner	44.6	72.8	267	0	109	85	20	0
Golden shiner	80.5	80.9	175	21	22	25	15	162
Sand shiner	0.3	1.3	0	0	0	0	0	0
Mimic shiner	15.3	24.9	0	7	0	0	35	0
Bullhead minnow	379.9	586.6	421	129	287	90	600	715
Pugnose minnow	10.3	16.2	0	0	0	0	35	0
Bluntnose minnow	0.0	0.0	0	0	0	0	0	0
Fathead minnow	0.0	0.0	0	0	0	0	0	0
Smallmouth buffalo (yoy)	17.7	45.6	0	0	0	0	0	0
Bigmouth buffalo (yoy)	12.0	45.4	0	0	0	0	0	0
Carpsucker sp. (yoy)	4.1	13.9	0	7	0	0	0	0
Silver redhorse	0.5	1.4	0	0	0	0	0	0
Redhorse sp. (yoy)	34.4	45.3	0	0	0	0	20	46
Spotted sucker	2.3	6.5	0	0	4	5	0	0
White sucker	0.1	0.3	0	0	0	0	0	0
Tadpole madtom	8.1	11.6	13	0	0	5	0	15
Channel catfish (yoy)	1.2	2.8	0	0	0	0	0	0
Flathead catfish	0.0	0.0	0	0	0	0	0	0
Yellow bullhead	1.0	2.8	0	0	0	0	0	0
Brown bullhead	0.3	1.3	0	0	0	0	0	0
Pirate perch	0.3	1.3	0	0	0	0	0	0
Brook silverside	61.1	85.0	17	14	178	125	55	39
White bass (yoy)	71.4	102.7	0	150	4	0	20	123
Warmouth	6.9	21.7	0	0	4	5	0	0
Rock bass (yoy)	3.6	7.9	4	0	4	0	5	0
Pumpkinseed sunfish (yoy)	4.7	12.9	0	0	0	0	0	0
Green sunfish (yoy)	0.0	0.0	0	0	0	0	0	0
Orange-spotted sunfish	18.3	20.8	4	7	39	0	25	16
Hybrid sunfish	1.5	3.2	0	0	0	10	0	8
Bluegill (yoy)	2142.9	2219.7	1104	1357	1900	2710	1235	1446
Largemouth bass (yoy)	292.7	171.7	400	171	109	160	325	454
Smallmouth bass (yoy)	0.1	0.3	0	0	0	0	0	0
Black crappie (yoy)	167.6	242.2	29	50	9	50	340	54
White crappie (yoy)	6.3	9.8	0	0	0	0	0	0
Logperch	41.4	29.5	29	0	13	35	35	62
Johnny darter	53.5	63.5	29	0	35	15	15	39
Western sand darter	0.0	0.0	0	0	0	0	0	0
Banded darter	0.0	0.0	0	0	0	0	0	0
Mud darter	10.4	22.2	88	0	4	0	0	8
River darter	0.2	0.8	0	0	0	0	0	0
Yellow perch (yoy)	69.4	155.1	92	7	22	60	35	46
Walleye (yoy)	6.4	6.8	4	0	0	0	15	9
Sauger (yoy)	10.9	10.2	13	0	0	10	5	39
Freshwater drum	56.5	56.5	4	7	4	30	100	77
Total (all species)	**4926**	**2512**	**3168**	**4763**	**3130**	**3535**	**3990**	**5420**
Total No. of Species	**25**	**4**	**22**	**17**	**22**	**22**	**25**	**22**
Total Acres Seined	**0.2**	**0.1**	**0.24**	**0.14**	**0.23**	**0.20**	**0.20**	**0.13**

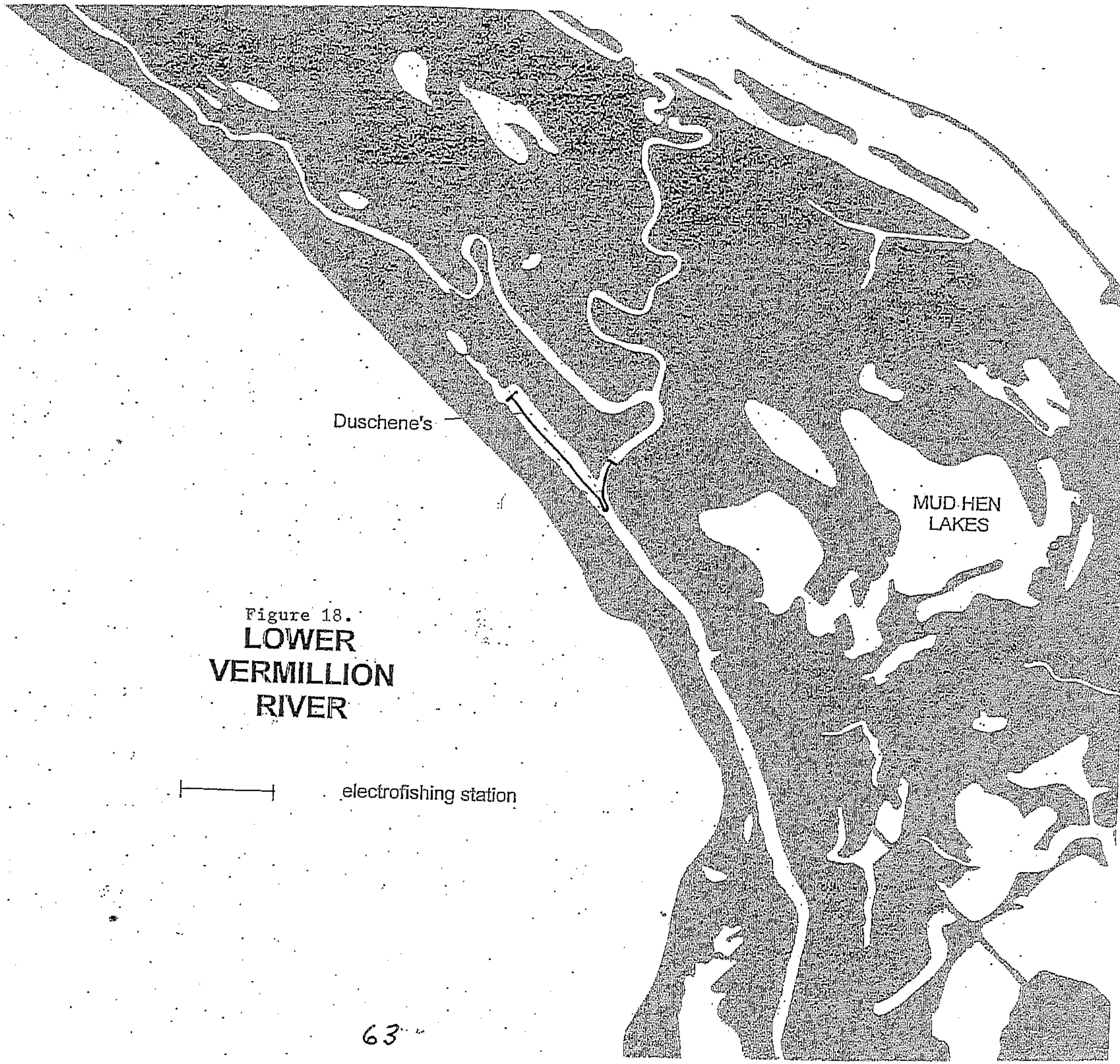

Figure 18.
LOWER VERMILLION RIVER

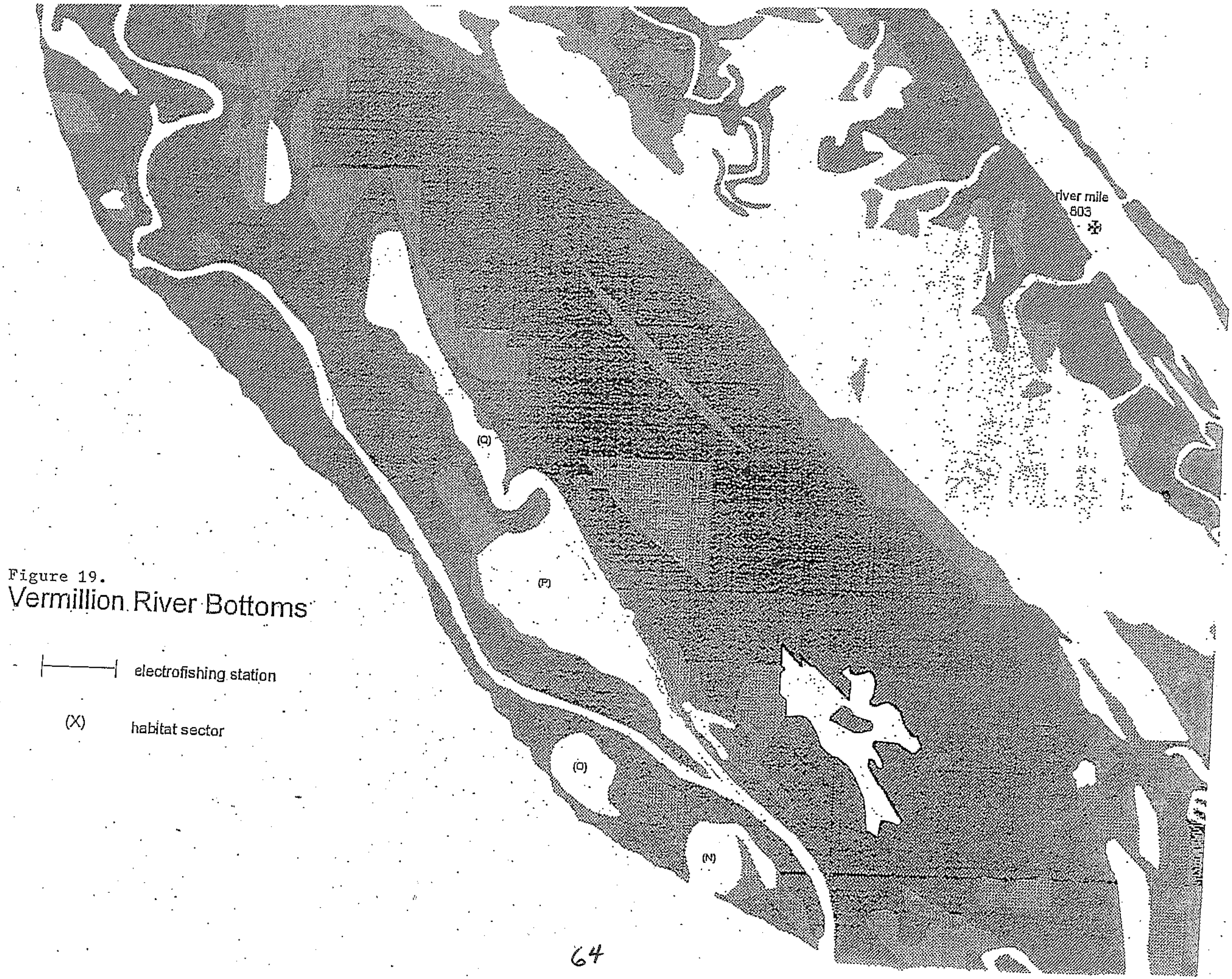
(Q)
(P)
(O)
(N)
river mile
603
Figure 19.
Vermillion River Bottoms
electrofishing station
(X)
habitat sector

Figure 20.
LOWER VERMILLION RIVER

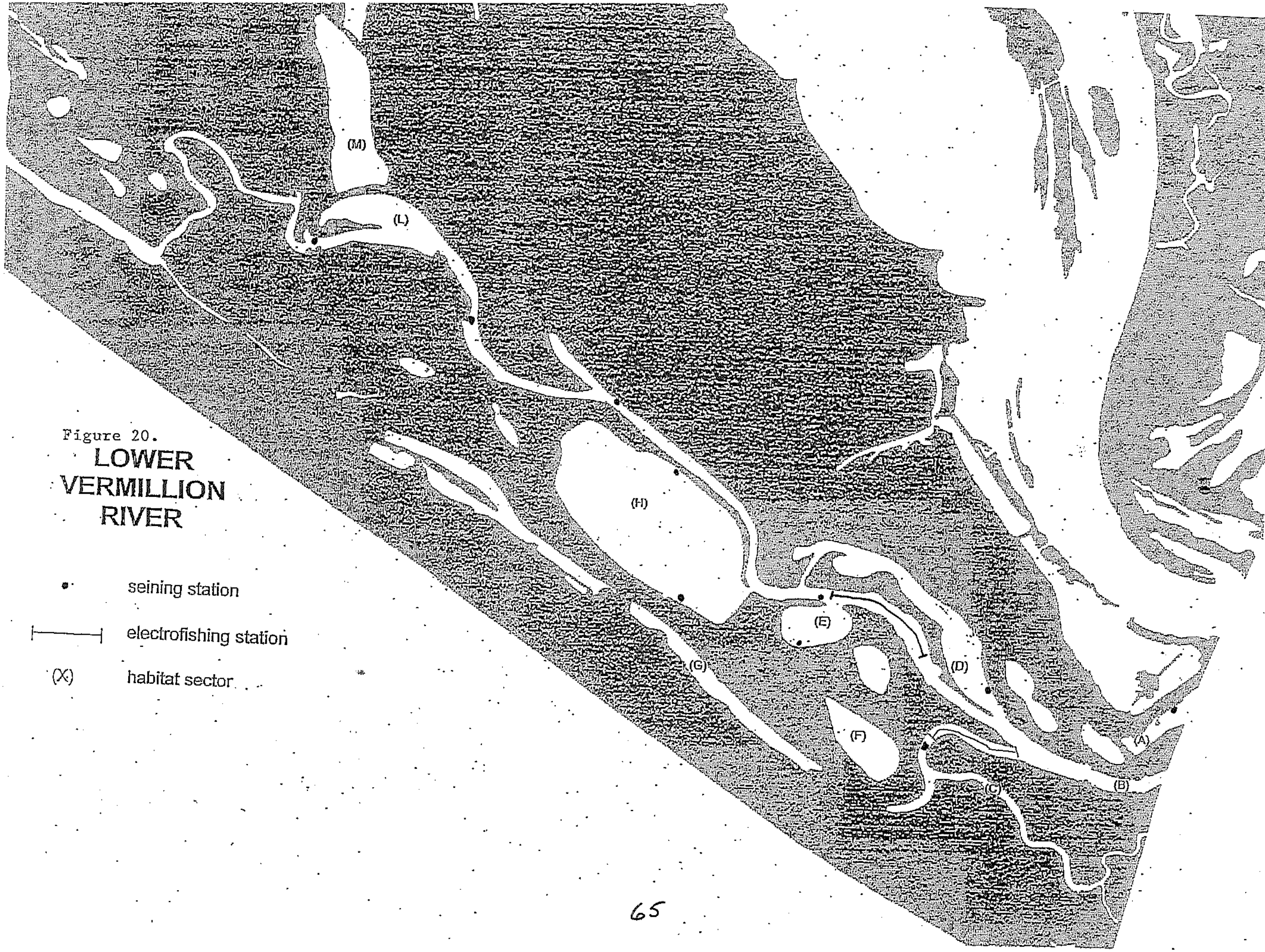

Table 28. Aquatic Habitat Quality Index Summary, LVR, 1995 - 2008

MISSISSIPPI RIVER	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Vermillion River Bottoms																
Pickerel Lake (A)	4	4	4	3	6				2	2	2	3	2	5		
Buffalo Slough (B)				11	11											
Catfish Slough C	7	4	4	3	3											
Birch Lake (D)	5	6	5	7	7				4	4	4	4	4	3		
Wildcat Lake (E)	5	5	5	6	5				7	9	3	3	7	6		
Jones Lake (F)			4		9				14	17			14	11		
Bluff Slough (G)													16	16		
Goose Lake (H)	5	5		5	3				2	2	2	3	3	3		
Indian Slough (I)		5			6											
Larson Lake (L)	3	9	4										2	2		
Nelson Lake (M)	16	16			14							12	13	9		
Rattling Springs (N)					12	16		14	15	16	15		11	11		
Clear Lake (P)		5	4	7	6	9		4		5	4	5	4	3		
Upper Clear L. (Q)		7	6	9	7	9		4		5	4	5	4	2		
Mud Hen Lakes				7	5	9		6	6					7		
Duschene's				4				8						2		
Entire Area							**11**									
Mean	**6.0**	**7.0**	**4.5**	**6.2**	**7.2**	**10.8**		**7.2**	**7.1**	**7.5**	**4.9**	**5.0**	**7.3**	**6.2**		
SD	**4.4**	**3.6**	**0.8**	**2.6**	**3.4**	**3.5**		**4.1**	**5.4**	**6.0**	**4.6**	**3.2**	**5.2**	**4.4**		

Table 29. Electrofishing Length Frequency Distribution, LVR, 2008

Length (in.)	northern pike	northern pike yoy	black crappie	white crappie	bluegill	large mouth bass	large mouth bass yoy	walleye	yellow perch
2 - 2.9			1		3				
3 - 3.9			2		7				
4 - 4.9			1		20		4		
5 - 5.9					68		6		
6 - 6.9			4		45				
7 - 7.9			5		8	1			
8 - 8.9		1	10		1	3			1
9 - 9.9		2	10			1			
10 - 10.9		2	9	2		1			1
11 - 11.9			7	14		2			
12 - 12.9			4	4		11		5	
13 -13.9						13		2	
14 - 14.9						4		2	
15 - 15.9						1		2	
16 - 16.9									
17 - 17.9									
18 - 18.9	1								
19 - 19.9									
20 - 20.9	1								
21 - 21.9									
22 - 22.9									
23 - 23.9	1								
24 - 24.9								1	
25 - 25.9								1	
26 - 26.9									
27 - 27.9								2	
28 - 28.9	1							1	
29 - 29.9									
30 - 30.9	1							2	
31 - 31.9									
32 - 32.9									
33 - 33.9									
34 - 34.9									
35 - 35.9									
36 - 36.9									
37 - 37.9									
38 - 38.9									
39 - 39.9									
40 - 40.9									
Totals	**6**	**5**	**53**	**20**	**152**	**37**	**10**	**18**	**2**
Mean Length	**23.7**	**9.9**	**9.1**	**11.5**	**5.6**	**13.4**	**5.1**	**19.1**	**9.3**

Table 30. Seining CPUE (#/acre) Summary, LVR, 2003 - 2008

Species	Historical Mean 1995-2008	SD	2008	2007	2006	2005	2004	2003
Longnose gar	0	0	0	0	0	0	0	0
Bowfin	2	4	0	0	0	0	0	0
Northern pike (yoy)	13	16	57	4	12	0	0	0
Gizzard shad (yoy)	2575	4610	204	333	1096	84	190	9910
Carp	38	76	0	22	0	10	10	20
Emerald shiner	3308	5190	21	833	1848	144	230	70
Spottail shiner	18	41	0	19	8	4	0	0
Spotfin shiner	36	46	0	41	32	0	0	0
River shiner	3	10	0	0	0	0	0	0
Weed shiner	1	2	0	0	0	0	0	0
Golden shiner	6	13	0	0	0	0	0	20
Sand shiner	0	0	0	0	0	0	0	0
Mimic shiner	5	10	0	11	20	0	0	0
Bullhead minnow	198	263	14	352	304	108	50	120
Pugnose minnow	8	16	0	0	0	0	.0	0
Fathead minnow	0	0	0	0	0	0	0	0
Smallmouth buffalo (yoy)	23	77	0	15	0	0	0	280
Bigmouth buffalo (yoy)	10	22	0	7	0	0	0	50
Silver chub	0	0	0	0	0	0	0	0
Quillback	0	0	0	0	0	0	0	0
Carpsucker sp. (yoy)	2	5	0	0	4	0	0	0
Redhorse sp. (yoy)	0	1	0	0	4	0	0	0
Tadpole madtom	7	18	4	0	4	0	0	0
Yellow bullhead	1	2	0	0	0	0	0	0
Black bullhead	0	1	0	0	0	0	0	0
Channel catfish (yoy)	3	7	0	0	0	0	0	10
Mud minnow	0	0	0	0	0	0	0	0
Brook silverside	5	12	43	7	4	12	0	0
White bass (yoy)	25	41	0	0	12	4	0	10
Rock bass (yoy)	1	3	0	0	0	0	0	0
Pumpkinseed sunfish (yoy)	4	11	0	0	0	0	0	40
Green sunfish (yoy)	3	3	7	0	4	0	0	10
Orange-spotted sunfish	3	6	0	0	0	0	10	0
Hybrid sunfish	1	2	0	0	0	0	0	0
Bluegill (yoy)	1278	849	821	615	516	496	510	1430
Largemouth bass (yoy)	113	139	129	19	48	152	40	520
Smallmouth bass (yoy)	0	0	0	0	0	0	0	0
Black crappie (yoy)	241	313	50	170	104	28	40	330
White crappie (yoy)	33	43	0	11	0	0	10	10
Logperch	8	10	4	0	24	4	0	30
Johnny darter	40	36	43	11	52	0	100	60
Slenderhead darter	1	3	0	0	0	0	10	0
River darter	0	0	0	0	0	0	0	0
Iowa darter	0	0	0	0	0	0	0	0
Yellow perch (yoy)	12	13	11	4	44	0	0	30
Walleye (yoy)	3	7	0	0	0	4	0	0
Sauger (yoy)	0	1	0	0	0	0	0	0
Freshwater drum (yoy)	35	75	0	7	4	0	0	170
Total (all species)	8058	6504	1408	2474	4144	1050	1200	13100
Total No. of Species	18	5	13	18	20	12	11	19
Total Acres Seined	0.23	0.16	0.28	0.27	0.25	0.25	0.10	0.10

Table 31. Trammel Netting Length Frequency Distribution, Pool 3, 2008

Length (in.)	SNS	LKS	BLS*
12 - 12.9			
13 -13.9			
14 - 14.9			
15 - 15.9			
16 - 16.9			
17 - 17.9			
18 - 18.9			2
19 - 19.9			
20 - 20.9			
21 - 21.9	1		2
22 - 22.9	1		
23 - 23.9	1		
24 - 24.9	7	1	5
25 - 25.9	10		2
26 - 26.9	11		
27 - 27.9	9		3
28 - 28.9	5		
29 - 29.9	5		
30 - 30.9			2
31 - 31.9			
32 - 32.9		1	
33 - 33.9			
34 - 34.9			
35 - 35.9			
36 - 36.9			
37 - 37.9			
38 - 38.9			
39 - 39.9			
40 - 40.9			
41 - 41.9			
42 - 42.9			
43 - 43.9			
44 - 44.9			
45 - 45.9			
46 - 46.9			
47 - 47.9			
48 - 48.9			
49 - 49.9			
50 - 50.9			
51 - 51.9			
52 - 52.9			
53 - 53.9			
54 - 54.9			
55 - 55.9			
56 - 56.9			
57 - 57.9			
58 - 58.9			
59 - 59.9			
Totals	**50**	**2**	**16**
Min. Length	**21.6**	**24.4**	**18.5**
Max. Length	**29.5**	**32.7**	**30.3**
Mean Length	**26.4**	**28.5**	**24.9**

*** BLS = Blue sucker**

Table 32. Sturgeon Length Frequency Distribution, Pool 4, 2008

	Trammel netting		Angling	
Length (in.)	SNS	LKS	SNS	LKS
12 - 12.9				
13 -13.9				
14 - 14.9				
15 - 15.9				
16 - 16.9				
17 - 17.9	1			
18 - 18.9		1		
19 - 19.9	3			
20 - 20.9	3			1
21 - 21.9	3	2		2
22 - 22.9	5	1		2
23 - 23.9	4	1		4
24 - 24.9	30	3		7
25 - 25.9	52	1	2	7
26 - 26.9	58	2		4
27 - 27.9	61	1	1	3
28 - 28.9	57	2	1	4
29 - 29.9	29	2		3
30 - 30.9	16			
31 - 31.9	6			
32 - 32.9	1			2
33 - 33.9				
34 - 34.9				1
35 - 35.9				
36 - 36.9		1		
37 - 37.9				
38 - 38.9				
39 - 39.9				
40 - 40.9				
41 - 41.9				
42 - 42.9				
43 - 43.9				
44 - 44.9				
45 - 45.9				
46 - 46.9				
47 - 47.9				
48 - 48.9				
49 - 49.9				
50 - 50.9				
51 - 51.9				
52 - 52.9				
53 - 53.9				
54 - 54.9				
55 - 55.9				
56 - 56.9				
57 - 57.9				
58 - 58.9				
59 - 59.9				
Totals	**329**	**17**	**4**	**40**
Min. Length	**17.9**	**18.6**	**25.8**	**20.6**
Max. Length	**32.3**	**36.5**	**28.9**	**34.1**
Mean Length	**27**	**25.8**	**26.9**	**26**

Table 33. Lake Sturgeon Age Class Frequency Distribution, Pools 3 and 4, 2008

Pool 3

Number of Fish			Number of fish in Year Class ('yy) and Age Class															
			08	07	06	05	04	03	02	01	00	99	98	97	96	95	94	< 93
Aged	Keyed*	Unaged	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
3	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0

Pool 4

Number of Fish			Number of fish in Year Class ('yy) and Age Class															
			08	07	06	05	04	03	02	01	00	99	98	97	96	95	94	< 93
Aged	**Keyed***	**Unaged**	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
50	5	2	0	0	0	3	17	27	4	3	0	0	1	0	0	0	0	0

* - Number of fish keyed: Fish assigned an age with an age-length key

Major River Report

2008

Prepared by:

Dan Dieter

Approved by:

4-1-09

Area Fisheries Supervisor

Regional Fisheries Supervisor