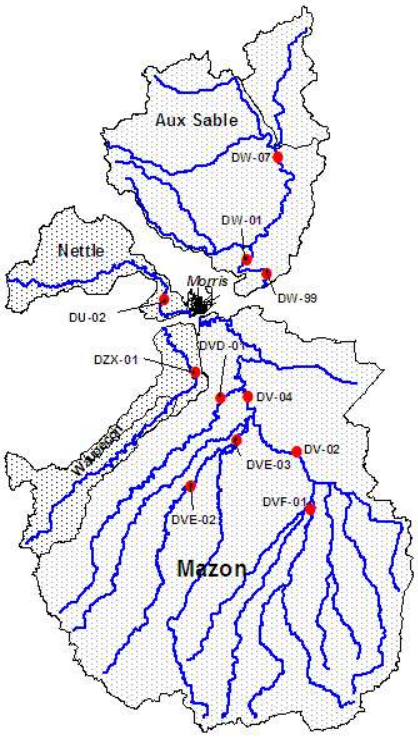
ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Region 2
Watershed Program
5931 Fox River Drive
Plano, Illinois 60548

Status of fish communities and stream quality in the Upper Illinois River Basin: Mazon River, Aux Sable Creek Nettle Creek and Waupecon Creek July 2004



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Summary

During July 2004, eleven locations in the Upper Illinois River Basin were sampled as part of a statewide monitoring program to measure the health of Illinois streams. The survey included six locations in the Mazon River Basin, three on Aux Sable Creek, and one station on Nettle and Waupecon Creeks. All sites on the Mazon River were previously sampled by IDNR in 1993 and 1999. Aux Sable Creek station DW-01 was also sampled in 1999. DW-07 and seven other sites in the Aux Sable Creek Basin were sampled in 1998 as a part of an IDNR sub-watershed survey. Nettle and Waupecon Creeks have not been sampled previously. Fish were collected using boat electrofishing, seine, backpack electrofishing, and electric seine; similar to methods used in previous surveys.

For all Upper Illinois River Basin stations combined, 8,459 fish were collected, representing 59 species from 11 families. A total of seven species collected in the survey are considered Species in Special Need of Conservation by Illinois DNR. Two of these species are listed by the Illinois Endangered Species Protection Board, including the State Endangered greater redhorse, found at one location on Aux Sable Creek, and the State Threatened river redhorse, recorded for the first time at one location on Mazon River. Overall, the catostomid (sucker) family was well represented, with 14 of the 16 species known to occur in Northeastern Illinois present, including all six species in the *Moxostoma* (redhorse) genus. Seven darter species were also collected throughout the basin. Species composition was generally similar among the sub-basins, except for Waupecon Creek, which had fewer species, and held one cool-water species, Southern redbelly dace (not found elsewhere in the survey. The Upper Illinois Basin streams support a diverse assemblage of fishes, including many species from the sucker and darter families which are known to be intolerant of habitat degradation and poor water quality. Factors contributing to species diversity within the basin were; stream size, channel gradient, substrate composition, and proximity to the species-rich Illinois River.

Three of six stations in the Mazon River Basin had IBI scores of 54-56, out of a possible 60 points, while the remaining station ranged from 41 to 49. Stream ratings were generally similar to results for previous surveys, with the exception of Johnny Run where IBI decreased from 53 to 41 over the sampling period, possibly due to siltation and excessive nutrification. The lower two stations on Aux Sable Creek also had higher IBI scores (53, 59), while the upper station at Rt. 52 scored only 36. Although species diversity was lower at the Waupecon Creek site, it scored an IBI of 47 out of 60. The Netttle Creek site had an IBI of 57 indicating good habitat and water quality. Generally, stations located lower in the watershed, which were higher gradient and closer to the Illinois River, had higher IBI scores.

Acknowledgments

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Introduction

Tributaries to the Upper Illinois River were surveyed in 2004 by the Illinois Environmental Protection Agency (IEPA) and the Illinois Department of Natural Resources (DNR) as part of a statewide monitoring program to measure the health of Illinois streams using fish community, macroinvertebrate, habitat, water and sediment quality sampling. Watersheds included in this study were the Mazon River, Aux Sable Creek, Nettle Creek, and Waupecon Creek. Data from basin surveys is also used in watershed and fisheries management applications.

This report summarizes results of the fish surveys including species composition, distribution, and determination of stream quality based of fish community structure. Results are compared to previous basin surveys in 1993 and 1999 as well as other historic fish collections.

Watershed Characteristics

The Mazon River watershed drains an area of 548 square miles, located primarily in Grundy and northeastern Livingston Counties (Figure 1). Major tributaries include Johnny Run, East Fork and West Fork Mazon River. The mainstem of the river is 33 miles long with a mean slope of 3.2 feet/mile, flowing North/North West to its confluence with the Illinois River, near Morris. Landuse is primarily agriculture. Surface mining is prevalent in the Northeastern section of the basin, resulting in major hydrologic modifications including 3 miles of mainstem channelization. A section of the mainstem near the mouth of the river has also been relocated. Throughout the entire basin, over 70 miles of tributary streams have been channelized (ISIS 1999), primarily smaller streams. No dams were observed during the survey and no records of dams exist in the Illinois Stream Information System (ISIS 1999). A United States Geological Survey (USGS) stream gage is located on the mainstem near Coal City.

Aux Sable Creek originates in Kendall County (Figure 1). The total watershed encompasses 186 square miles; 152 in Kendall County and 34 in Grundy County (ISIS 2004). The stream is divided into three major branches, including the West Aux Sable, Middle Aux Sable, East Aux Sable. Also draining from the west is a larger tributary Valley/Collins Run, which empties directly into the Aux Sable Creek mainstem south of Interstate 80. Aux Sable Creek and eight tributaries have a combined total of 97 miles of stream channel (IEPA, 1994-95). Currently, there are no USGS flow

gages on Aux Sable Creek. Based on our observations and input from local landowners, much of the system goes to very low flow during summer months, with many long pooled areas. The watershed landscape is principally agricultural with a low percentage of residential housing. Most of the watershed is row crops, although cattle farming was observed on the Middle Aux Sable and Collins Run (Valley Run) and a hog farm is located on East Aux Sable. A quarry operation is located along the headwaters of Valley Run. Water withdrawal for irrigation has been observed in some areas. The headwaters of most Aux Sable Creek tributaries have been channelized, while most of the main stem is a natural, meandering stream. Headwater areas typically have a substrate comprised of sand, gravel, and some cobble. The lower reaches of East Aux Sable, Middle Aux Sable, West Aux Sable, and the confluence of these branches exhibit streambed and bank scour, often with silt, sand, and/or gravel deposition. However, the majority of the mainstem streambed is bedrock. Average gradient for Aux Sable Creek is moderate falling 4.2 feet/mile. The only high gradient area (10 feet/mile) is located between the I&M Canal and the Illinois River, where the stream descends over relict river banks that the Illinois River occupied during the last glacial period. A main channel dam was identified between Wildy Road and Holt Road .

Nettle and Waupecon Creeks are relatively small streams, primarily in agricultural land use. The mainstem of Nettle Creek runs primarily West to East for a distance of 23.7 miles, entering the Illinois River near Morris (Figure 1). The East Fork Nettle Creek is the largest tributary, meeting with the mainstem at Gephard Woods State Park near the mouth. The watershed area includes 46.6 square miles, all within Grundy County. Stream slope of the Nettle Creek mainstem averages 10.6 feet/mile. Waupecon Creek runs primarily north for 29.6 miles, draining 57.2 square miles. The stream empties into a gravel pit lake just before entering the Illinois River at Sugar Island, downstream of Morris. The mainstem of Waupecon Creek has an average slope of 8.1 feet/mile.

Methods

A total of eleven locations were sampled in July 2004, six in the Mazon River Basin, three on Aux Sable Creek, and one station each on Nettle and Waupecon Creeks (Table 1, Figure 1). Sampling sites on the Mazon River were sampled in previous survey in 1993 and 1999 (Pescitelli and Rung 2001). Aux Sable Creek station DW-01 was also sampled in 1999. DW-07 and six other sites in the Aux Sable Creek Basin were sampled in 1998 as a part of an IDNR watershed survey (Rung

and Pescitelli 1998). Nettle and Waupecon Creeks had not been sampled previously by IDNR.

Fish were collected using boat electrofishing, seine, backpack electrofishing, and electric seine, similar to methods used in previous surveys. Locations with water depth greater than 0.6 meters (2 ft.) were sampled using a boat equipped with a 3500 watt, 3 phase generator (AC). Where habitat and water depths were permitting, supplemental collections were made at boat sites using a 9 meter (30 ft.) minnow seine with 6 mm (0.25 in.) mesh. Wadable sites, less than 0.6 meters. in depth were sampled using a 9 meter (30 ft.) electric seine, powered by a single-phase, 1600 watt generator (Bayley et al. 1989). Station length was roughly 20 times the average stream width, or sufficient distance to include all available habitat types. Upstream and downstream limits of the station were blocked by nets to prevent fish escape and/or entry into the station during sampling. Larger fish specimens were weighed, measured, and returned to the stream. Smaller individuals were preserved and identified in the laboratory. Voucher specimens for each species at each location were retained and sent to the Illinois Natural History in Urbana, and the Field Museum of Natural History in Chicago for verification and permanent record. Fish data from each station were summarized and used to calculate the Index of Biotic Integrity (IBI). The IBI is a widely-used stream quality measurement which takes into account the number and types of species present, their tolerance to degradation, as well as food, habitat, and reproductive characteristics (Smogor 2004). IBI scores range from 0-60, with higher scores indicating better quality conditions, as determined by comparison to reference sites for similar sized streams within the same region of the State. Data for all gear types were combined to calculate the IBI for an individual location.

United States Geological Survey (USGS) stream discharge data was only available for the Mazon River (Figure 2). Discharge levels during the 2004 Mazon River survey was similar to 1999 survey (Pescitelli and Rung 2001). Both collections were made during the low flow period with discharge ranging from 2-6 cubic feet per second. Although no data was available for other basins surveyed in 2004, observations made during the survey indicate flows were near base levels.

Table 1. Upper Illinois Basin sampling stations, and collection information. All stations located Grundy County except DW-01 in Kendall County.

IDNR ID	IEPA CODE	SAMPLING DATE	STREAM NAME	LOCATION	LEGAL LOC. T	R	SEC	GEAR	STREAM WIDTH
11496	DVD-01	28-Jul-2004	Johnny Run	Spring Road	32N	7E	2SE	ES	30
11493	DVE-02	27-Jul-2004	W. Fk. Mazon River	Gardner Rd US	31N	7E	4SW	ES	30
11494	DVE-03	27-Jul-2004	W. Fk. Mazon River	Braceville Road	32N	7E	24SW	BE,SH	50
11495	DVF-01	27-Jul-2004	E. Fk. Mazon River	Gardner Road	31N	8E	23SW	ES	32
11497	DV-02	27-Jul-2004	Mazon River	I-55 Bridge	32N	8E	34NE	BE,SH	50
11498	DV-04	28-Jul-2004	Mazon River	Spring Road	32N	8E	7NW	BE,	125
11491	DW-07	29-Jul-2004	Aux Sable Creek	Rt 52 bridge	34N	8E	29	BE, SH	60
11490	DW-01	28-Jul-2004	Aux Sable Creek	Rt. 6 bridge	34N	8E	17SW	BE,SH	60
11492	DW-99	28-Jul-2004	Aux Sable Creek	Cemetery Rd, I&M Canal	34N	8E	29E	ES	64.5
11488	DU-02	26-Jul-2004	Nettle Creek	Rt. 6, Morris Cnty Club	33N	7E	4SW	ES	30
11489	DZX-01	26-Jul-2004	Waupecon Creek	Dwight Road bridge	34N	8E	29NW	ES	20

ES = electric seine; BE = boat electrofishing; SH = seine haul

Results and Discussion

For all Upper Illinois Basin stations combined, 8,459 fish were collected, representing 59 species from 11 families (Table 2). A total of seven species collected in the survey are considered "Species in Special Need of Conservation" by the Illinois Comprehensive Wildlife Plan (2005). Two of these species are listed by the Illinois Endangered Species Protection Board (2004): the State Endangered greater redhorse (*Moxostoma valenciennesi*), found at one location on Aux Sable Creek, and the State Threatened river redhorse (*Moxostoma carinatum*), recorded for the first time at one location on the Mazon River. In addition to these listed species, 14 others had very limited distributions, occurring at only one site (Table 2). Some of these species rely on connection to large-river habitats available in the Illinois River (e.g. river carpsucker, *Carpiodes carpio*; buffalos, *Ictiobus* spp., bullhead minnow, *Pimephales vigilax;* flathead catfish, *Pylodictus olivaris*). Other species with limited distribution, like the southern redbelly dace (*Phoxinus erythrogaster*) have specific habitat requirements (cool water temperatures), while rainbow darter (*Etheostoma caeruleum*) is very intolerant to habitat degradation. Both of these were present only in Waupecon Creek. Nettle and

Waupecon Creek were the only locations where fantail and orangethroat darters *(E. flabellare, E. Spectabile*) were found. These streams also had much higher abundance of several minnow species (Table 2). The catostomid family was well represented in the Upper Illinois River Basin with 14 of the 16 species known to occur in Northeastern Illinois found in the 2004 survey, including all six species in the *Moxostoma* (redhorse) genus. Seven species of darter were also collected throughout the basin. A total of 59% of all species collected were relatively widespread, occurring at 5 or more location across the Basin (Table 2).

Overall, the Upper Illinois Basin streams support a diverse assemblage of fishes, including many species from the sucker and darter families which are known to be intolerant of habitat degradation and poor water quality. In addition to the wide variety of stream sizes, stream gradients and substrate composition, direct connection to the Illinois River was an important factor determining species diversity and abundance in the basin. Detailed description of results for each sub-basin, and comparison to previous collections (if available) are given below.

Mazon River

A total of 3,329 fish, representing 43 species, were collected in Mazon River survey in 2004, similar to the totals found in 1993 and 1999 (Table 3). Twenty-five of the species collected were relatively common, occurring at 4 or more locations within the watershed. Striped shiner (*Luxilus chrysocephalus)*, redfin shiner *(Lythrurus umbratilus*), and bluntnose minnow (*Pimephales notatus*) dominated the collection numerically. These species, along with the white sucker (*Catostomus commersoni*), green sunfish (*Lepomis cyanellus*), central stoneroller (*Campostoma anomalum*), hornyhead chub (*Nocomis biguttatus*), and johnny darter (*Etheostoma nigrum*), were generally more abundant at the tributary locations (Table 4). Spotfin shiner (*Cyprinella spiloptera*), sand shiner (*Notropis ludibundus*) and bluegill (*Lepomis macrochirus*) were more abundant at the larger mainstem stations. Golden redhorse (*Moxostoma erythrurum*) and longear sunfish (*Lepomis megalotis*) were also among the more numerous species, but were relatively evenly distributed among tributary and mainstem stations. A total of 5 species were found at only one location in the Mazon River Basin including the endangered river redhorse which was captured in a deep pool at DV-04 (Table 4). The minnow family had the highest number of species (15) followed by the suckers with

10 species, a relatively high number compared to other smaller stream basins in the region (Fisheries Analysis System 2004).

Species composition in 2004 was generally similar to previous collections with a few notable exceptions. Red shiner (*Cyprinella lutrensis*), the most abundant fish in 1999 with over 900 individuals, had relatively limited distributions in both 1993 and 2004 (Table 3). Another anomaly in 1999 was the presence of 476 emerald shiners, which were not found in either of the other surveys. All DNR surveys combined yielded a total of 51 species, compared to 58 historic species records from the Illinois Natural History Survey (2004). The Natural History Survey records included the bigeye shiner (*Notripis boops*), an Illinois endangered species (Illinois Endangered Species Protection Board 2004). This species was last collected in the Mazon River Basin in 1966 and has not since been found in any IDNR surveys, indicating it may be extirpated or have very limited distribution. As previously noted, the State Threatened species river redhorse was collected in 2004 and is the only known record for the Mazon River Basin (Smith 1979).

The 2004 fish community survey indicates that the Mazon River is a relatively high quality stream system. Three of the six stations, DV-02, DV-04, DVE-03, (Table 5, Figure 1) had IBI scores ranging from 54 to 56 out of a possible 60 points. The other three locations ranged from 41 to 49 (Table 5). Stream quality, based on the IBI appears to have been relatively stable at most stations, showing little change since 1993. One exception was DVD-01 located on Johnny Run (Table 5), which showed a decrease in IBI score from 53 in 1993, to 41 in 2004. A change of greater than 10 IBI points is considered to be significant and outside the range of natural variation (Smogor 2004). Although habitat data is not available for 1993, comparison of 1999 and 2004 observations indicated a increase in coverage of silt substrate from 0 to 25 % (Table 6) , which could have a negative impact on stream quality. Abundant algal growth was found in both 1999 and 2004, indicating nutrient enrichment.

The Mazon River Basin supported a high diversity species, including many suckers (10 species) and darters (5 species), which are typically considered to be intolerant of siltation and other degraded conditions. At most locations, gravel and cobble were the dominant substrate types (Table 6) with riffles and pools present at all stations, along with other habitat features including undercut banks, woody debris, and boulders. These features contributed to diverse habitat conditions and high

stream quality ratings. The emergent plant water willow (*Justica americana*), was also abundant at many stations, providing cover and a source of food organisms. The absence of dams on the mainstem and major tributaries allows direct connection to the Illinois River, an important recruitment source, helping to maintain diverse fish communities in the Mazon River.

Table 5. Index of Biotic Integrity (IBI) for Mazon River Basin Surveys 1993 - 2004. The IBI ranges from 0 to 60, with higher scores indicating higher quality stream conditions.

Stream	Station Code	1993	1999	2004
		IBI	IBI	IBI
Mazon River	DV-02	51	56	56
Mazon River	DV-04	49	46	54
Johnny Run	DVD-01	53	49	41
W. Fork. Mazon River	DVE-02	49	47	44
W. Fork Mazon River	DVE-03	49	53	55
E. Fork Mazon River	DVF-01	51	47	49

Smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), and rock bass *(Ambloplites rupestris*) were the most numerous sportfish, occurring at most locations (Table 4) in the Mazon River Basin. Smallmouth bass provide the best angling opportunities with the highest number of larger individuals, including a total of 14 fish larger than 250 mm (10 in.) (Figure 3 and 4). Tributary streams had a larger percentage of smallmouth bass young-of-of the-year (Y-O-Y), but also yielded two adults in the 425 to 500 mm (17 - 19 in.) range (Figure 3). All rock bass were 250 mm (10 in.) or less, and few Y-O-Y were collected (Figure 3). Largemouth bass were less abundant than rock bass but a few larger individuals were collected (>300 mm, 12 in.), and Y-O-Y were present at several locations (Figure 3). Channel catfish (*Ictalurus punctatus*) were relatively rare, with only 12 fish captured in the entire basin, typical of previous collections (Table 3).

Aux Sable Creek

Three sampling stations on Aux Sable Creek yielded 47 species and a total of 1,716 individuals (Table 7). The State Threatened greater redhorse, one of Illinois' rarest fish species

(Smith 1979) was collected at DW-01. This species was one of twelve sucker species collected in Aux Sable Creek. Largescale stoneroller, a relatively rare minnow species (Smith 1979) was abundant at DW-99, one of 35 species collected at this site. The next station upstream, DW-01 also had high diversity with 34 species present. The number of species decreased to 23 at the farthest upstream sampling station DW-07. Reduced diversity at this location was due in part to low gradient conditions and the resultant lost of several riffle species. This station is also 17 miles from the of the Illinois River, upstream of large dam which may block movement of the large river migrants present in the lower creek. Species diversity and abundance at each station in 2004 was generally similar a previous surveys conducted in 1998 (Rung and Pescitelli 1998).

Table 9. Index of Biotic Integrity (IBI) for Aux Sable Creek Basin Surveys 1993 - 2004. The IBI ranges from 0 to 60, with higher scores indicating higher quality stream conditions.

Station Code	Location	1998	1999	2004
		IBI	IBI	IBI
DW-99	I and M Canal	NA	46	53
DW-01	Route 6	52	49	59
DW-07	Route 52	42	NA	36

Stream quality ratings were very high at downstream stations DW-99 and DW-01 in 2004. DW-01 scored one point below the maximum score of 60 while DW-99 had a score of 53 (Table 9). Diverse habitat conditions and proximity to the Illinois River contributed to high ratings at these sites. Two previous collections were made at DW-01 in 1998, and 1999 resulting in IBI scores of 52 and 49, respectively. Since no major changes in habitat or water quality have been noted, this may represent natural variation associated with change in water levels or other conditions effecting distribution of large river migrants. Station DW-07 had a much lower IBI compared to the downstream locations, scoring only 36 (Table 9), similar to the results from the 1998 survey. Stream gradient is much lower at DW-07, compared to DW-01 and DW-09. Lower gradient location can be more vulnerable to siltation during low flow periods. Only one species considered to be intolerant (Smogor 2004) was found at DW-07, compared to downstream stations which yielded up to 8 intolerants (Table 7). As previously indicated, DW-07 is farther from the Illinois River and the

presence of a dam near Holt Road may inhibit upstream movement from the lower reaches and the Illinois River.

In November of 2002, several segments of Aux Sable Creek experienced a fish kill caused by a combination of low flow, and early ice formation. Decomposition of leaf litter and other organic material caused depletion of oxygen beneath the ice cover. At Route 52, all aquatic life including macroinvertebrates were affected. The presence of the dam could inhibit fish recolonization from the downstream sources following a total kill as observed in 2002. Several species including great redhorse (State-Threatened), smallmouth bass, black redhorse (*Moxostoma duquesnei*), and northern pike (*Esox lucius*) were present in 1998, but not in 2002. However, the migratory sucker shorthead redhorse were present in 2002, indicating the dam may be passable at higher spring flows.

Bluegill, smallmouth bass, and largemouth bass were the most numerous sport species present in Aux Sable Creek (Table 7). A total of 198 bluegill were collected, a large portion (128) of which were from DW-07, where the low gradient conditions were more well suited for this pool/lake species. Most individuals were less than 125 mm (5 inches) in length , with Y-O-Y less than one inch composing nearly 50 % of the population (Figure 4). Largemouth bass, another pool/lake species, was also abundant at DW-07. The largemouth bass population consisted of a range of year classes, including numerous Y-O-Y and a few individuals in the catchable size range between 250 and 350 mm (10-14 inches) (Figure 4). Smallmouth bass were only found at the downstream, higher gradient locations, with DW-99, which yielded 42 out of the 51 collected in the survey. A range of size class were present with fish up to 425 mm (17 inches). However, most fish were between 125 and 300 mm (5-12 inches), with very few Y-O-Y present, indicated poor spawning success in 2004 (Figure 4).

Nettle and Waupecon Creeks

Nettle and Waupecon Creeks are similar in size and like other streams in the basin, flow directly into the Illinois River. Despite the similarity in size and geography, fish communities in these creeks were very different. While Nettle Creek had 35 species, with a composition similar to the larger streams in the basin, Waupecon Creek held only 19 species (Table 8), with a different composition. Many species found in Nettle Creek and most other basin sites were absent from

Waupecon Creek including longnose gar (*Lepisoteus osseus*), northern pike, quilback, black redhorse, northern hogsucker (*Hypentilium nigracans*), and channel catfish. These species generally rely on a direct connection to a larger river system. Waupecon Creek flows into a strip mine lake near the confluence with the Illinois River which may effect movement of fish and isolate it from the Illinois River. Other barriers to movement associated with the mining activity may also be present.

Another group of fishes missing from the Waupecon Creek collections were sunfishes and other pool species. In fact, the only sunfishes found in the survey were Y-O-Y smallmouth bass and rock bass (*Ambloplites rupestris*), species associated with riffle and flowing water habitats. Blackstipe topminnow (*Fundulus notatus*), another pool species was also absent. The lack of these types of species suggest pool habitats were not available within the sampling reach, and perhaps not prevelant in the adjacent segments. Measurements taken at the sampling site found a mean thalweg depth of less than 300 mm (12 inches).

Another interesting aspect of the Waupecon Creek fish community is the presence of southern redbelly dace. As noted previously, this cool water species were not found at any of the other Upper Illinois River Basin sites, and suggest the presence of ground water flow into the stream.

Nettle Creek had a very high IBI with 57 out of 60 possible points. Despite the lower number of species, the sampling site on Waupecon Creek had an IBI score of 47 out of 60, with 4 intolerant species present. This suggests that current water quality conditions may not be responsible for the reduced species richness and that absence of deep pools and lack of connection to the Illinois River were more important factors. The stream segment in the area of the sampling stations was incised, showing evidence of past channelization. Riffles and very shallow pools were present indicating the re-development of natural channel characteristics.

The lack of pools in Waupecon Creek also limited sportfish populations. In contrast, Nettle Creek had relatively abundant smallmouth bass population including Y-O-Y and fish up to 360 mm (14 in., Figure 5). No Y-O-Y rock bass, or individuals greater than 250 mm (10 in.) were present in Nettle Creek (Figure 5).

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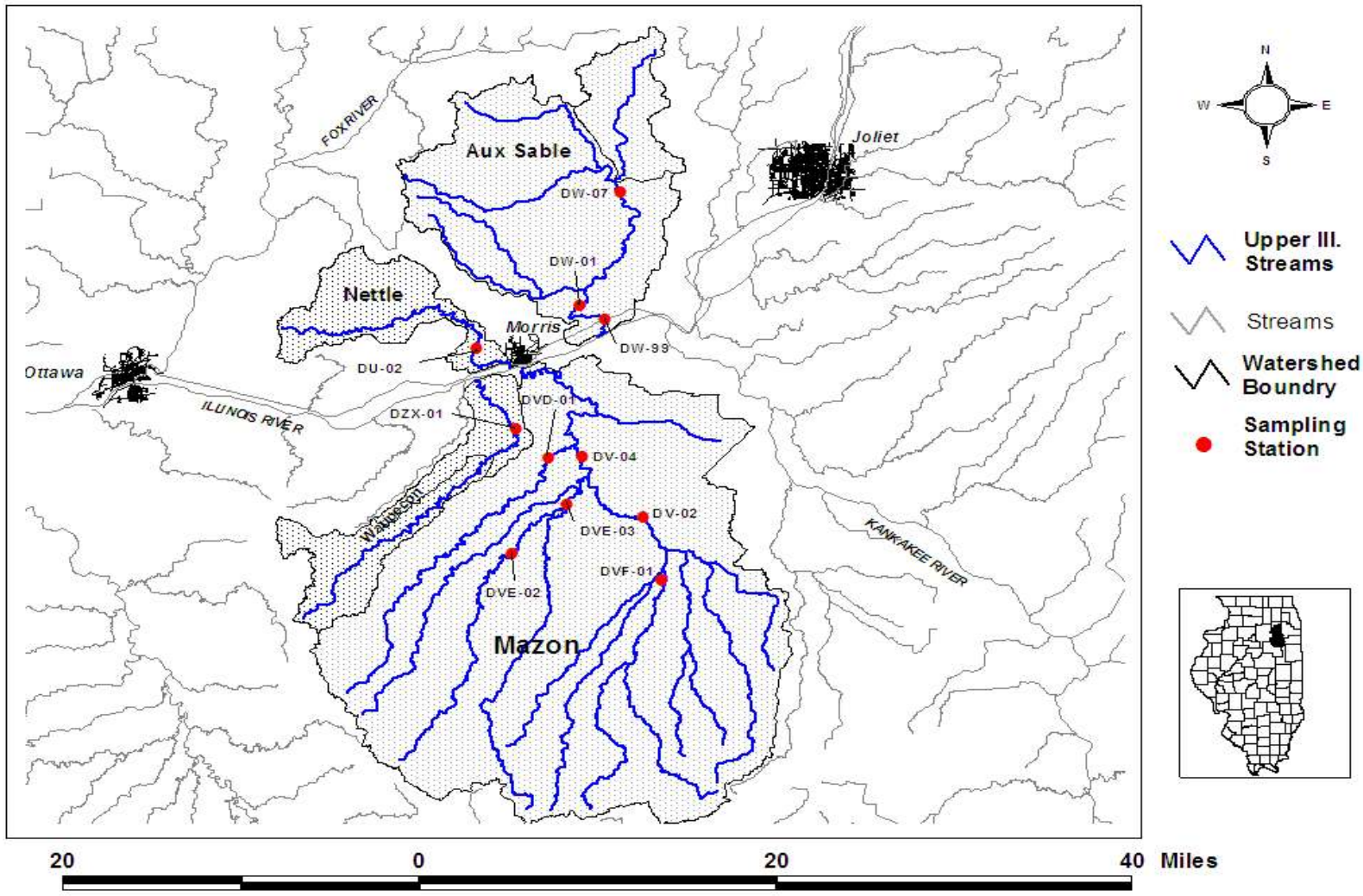


Figure 1. Upper Illinois River Basin Watersheds showing sampling stations for the 2004 fish community survey.

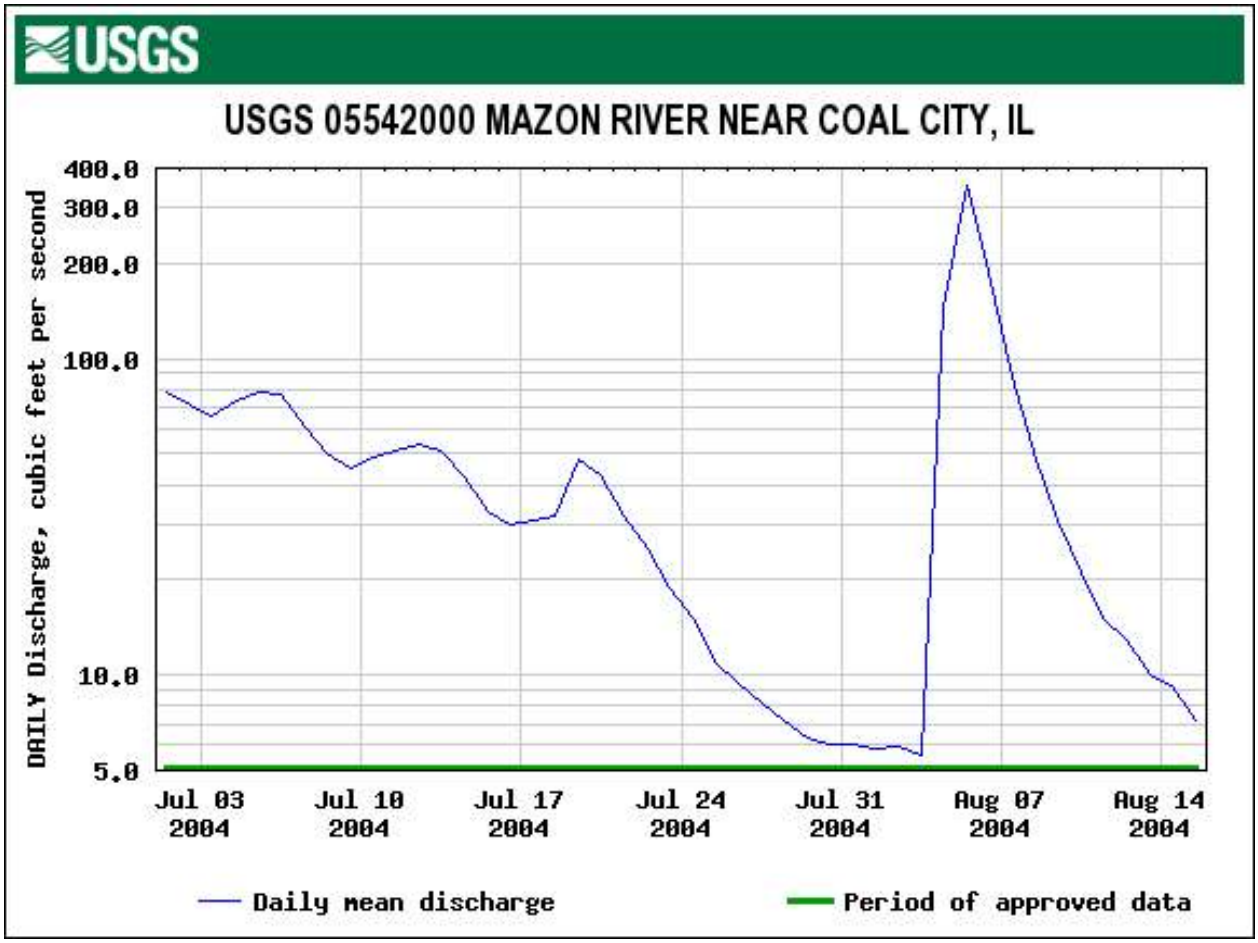
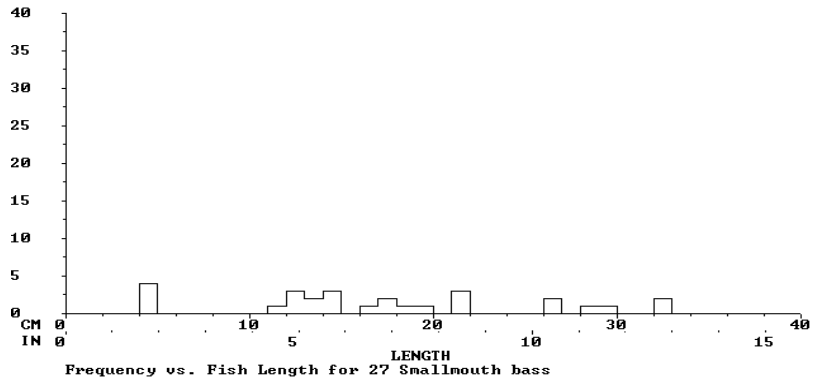
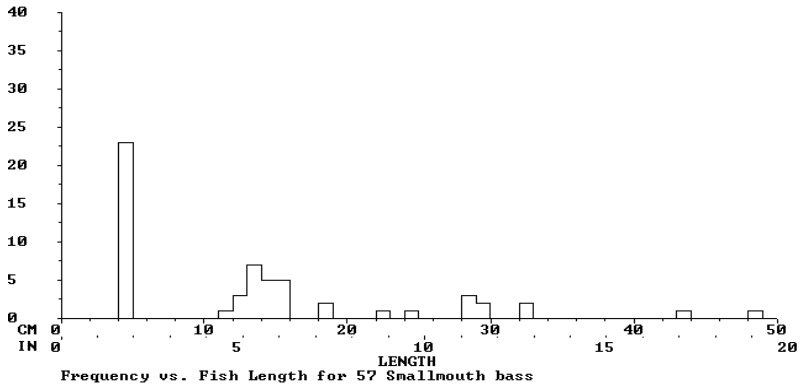


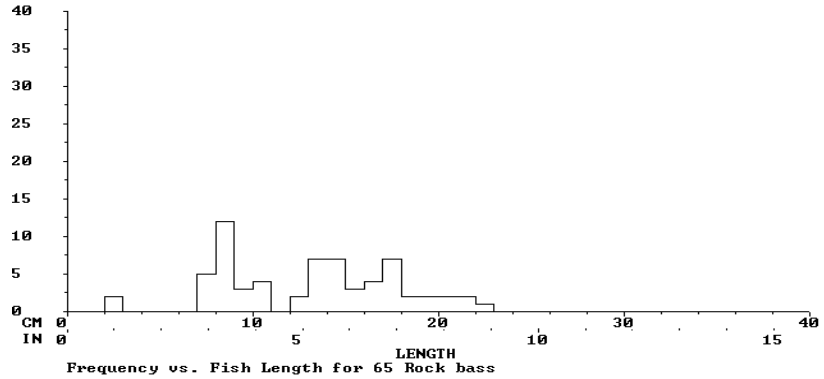
Figure 2. Daily discharge data for the Mazon River during the 2004 fish community survey conducted July 26-29.



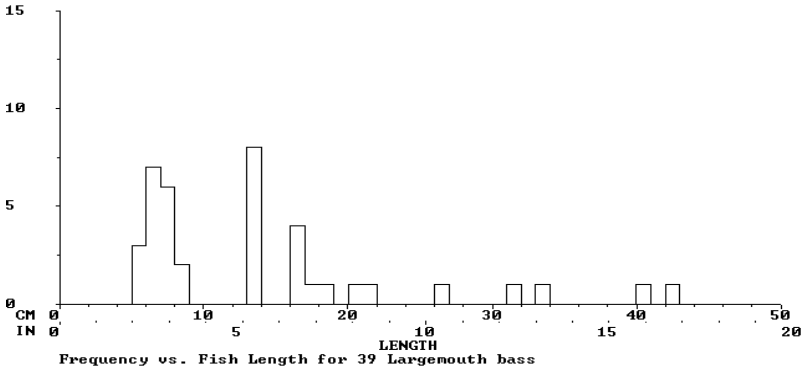
Samlllmouth bass - mainstem



Smallmouth bass - tributaries

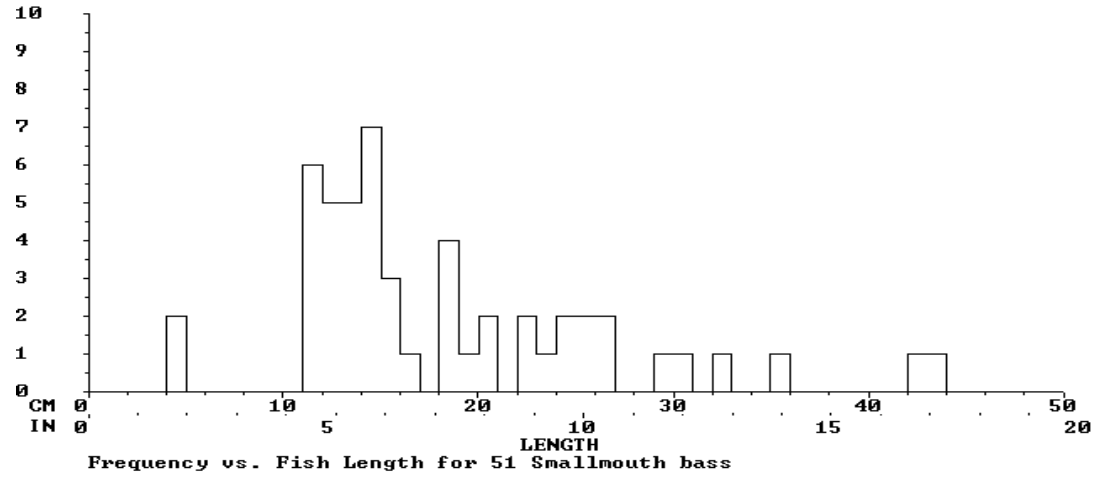


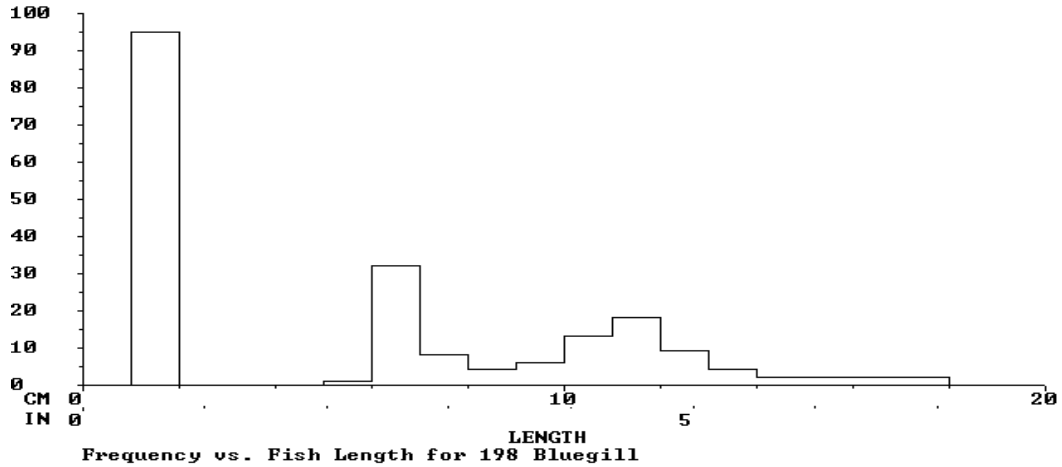
Rock bass - all stations combined



Largemouth bass - all stations combined

Figure 3. Length frequency distributions from selected sportfish species for the Mazon River 2004 survey.





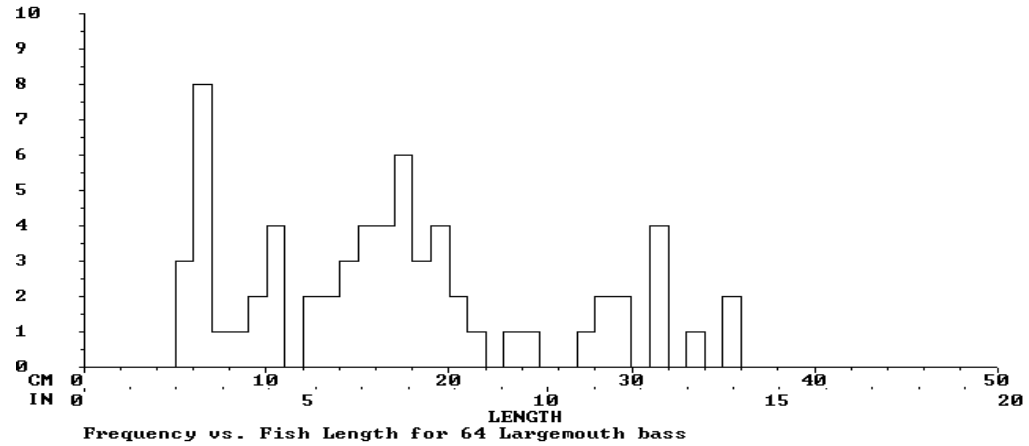
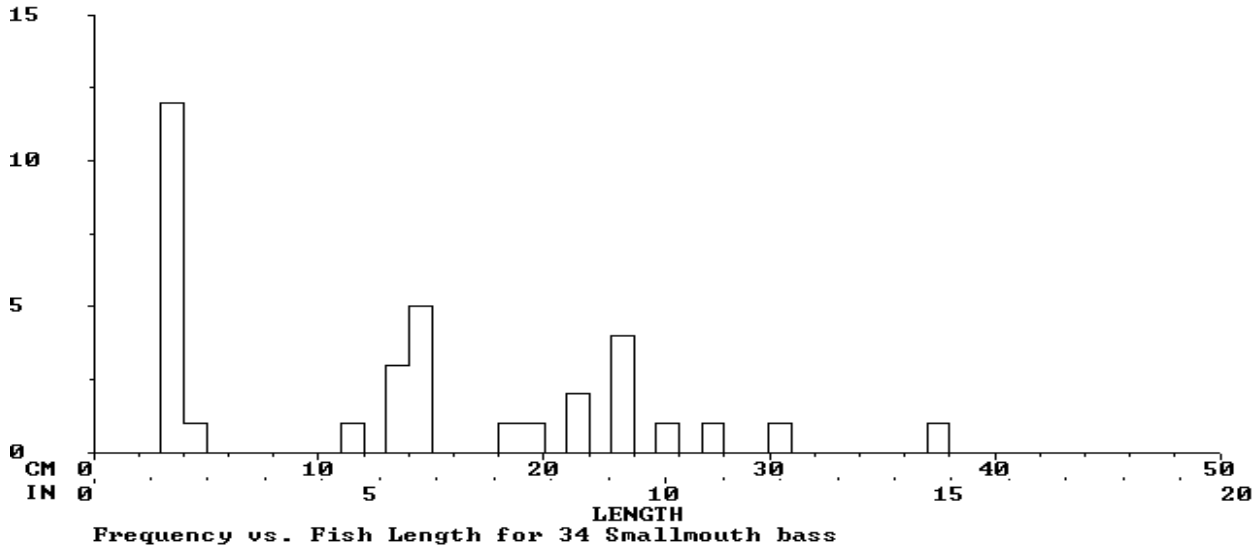


Figure 4. Length-frequency distributions for selected species, 2004 Aux Sable Creek survey.



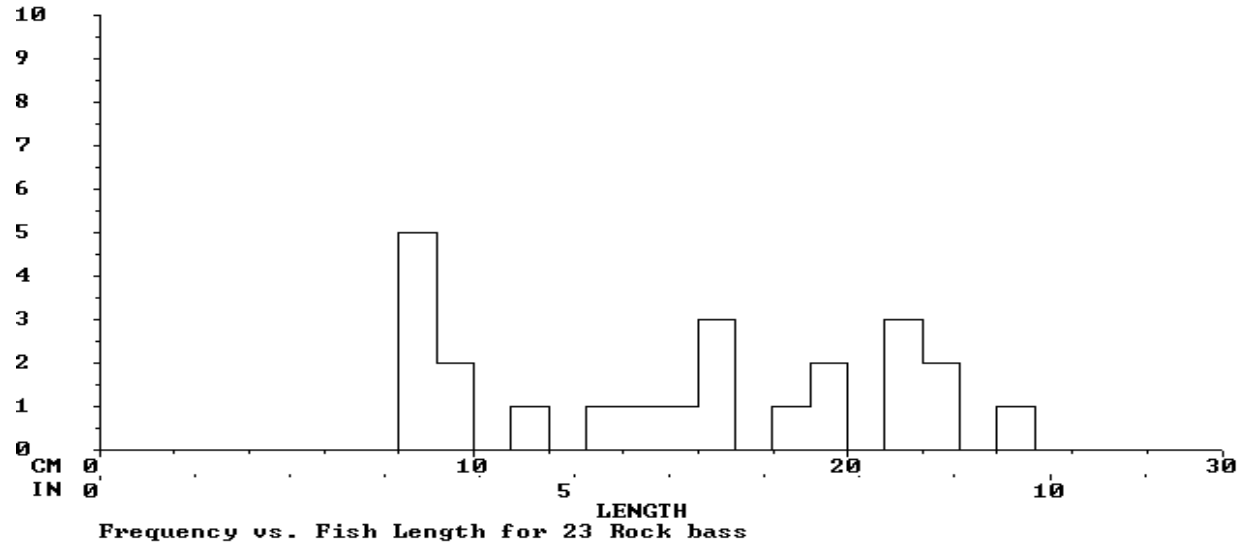


Figure 5. Length-frequency distributions for smallmouth bass and rock bass from the 2004 Nettle Creek fish survey.

Table 2. Total number of individuals and total species numbers collected at each station for the 2004 Upper Illinois Basin Survey (*Illinios DNR Species in Greatest Need of Conservation)

Common name	Scientific name	No. Sites present	Total No Fish	DV-02 Mazon River	DV-04 Mazon River	DVD-01 Johnny Run	DVE-02 West Fork Mazon River	DVE-03 West Fork Mazon River	DVF-01 East Fork Mazon River	DW-01 Aux Sable Creek	DW-07 Aux Sable Creek	DW-99 Aux Sable Creek	DZX-01 Waupecon Creek	DU-02 Nettle Creek
Longnose gar	Lepisosteus osseus	4	7	0	0	1	3	0	2	0	0	0	0	1
Gizzard shad	Dorosoma cepedianum	5	104	17	12	0	0	22	0	30	0	23	0	0
Grass pickerel	Esox americanus	5	22	7	0	0	2	0	5	1	0	0	0	7
Northern pike*	Esox lucius	1	1	0	0	0	0	0	0	0	0	0	0	1
Carp	Cyprinus carpio	8	42	7	7	0	2	2	0	10	10	3	0	1
Southern redbelly dace*	Phoxinus erythrogaster	1	52	0	0	0	0	0	0	0	0	0	52	0
Creek chub	Semotilus atromaculatus	6	279	0	0	5	15	5	7	0	0	0	244	3
Hornyhead chub	Nocomis biguttatus	11	265	10	7	5	69	21	18	8	6	24	54	43
Central stoneroller	Campostoma anomalum	10	785	1	1	9	43	14	34	17	10	0	436	220
Largescale stoneroller*	Campostoma oligolepis	1	102	0	0	0	0	0	0	0	0	102	0	0
Striped shiner	Luxilus chrysocephalus	11	1235	16	15	90	143	13	106	20	30	38	579	185
Redfin shiner	Lythrurus umbratilus	10	437	0	7	67	268	8	13	28	27	1	1	17
Spotfin shiner	Cyprinella spiloptera	8	315	42	108	17	0	0	1	63	1	74	0	9
Red shiner	Cyprinella lutrensis	7	54	0	0	0	25	4	1	1	13	1	0	9
Red shiner x Spotfin shiner hybrid	Cyprinella lutrensis x C. spiloptera	1	2	0	0	0	0	0	0	2	0	0	0	0
Bluntnose minnow	Pimephales notatus	11	653	12	24	106	113	5	96	20	67	15	83	112
Bullhead minnow	Pimephales vigilax	1	4	4	0	0	0	0	0	0	0	0	0	0
Emerald shiner	Notropis atherinoides	2	47	0	0	0	0	0	0	3	0	44	0	0
Bigmouth shiner	Notropis dorsalis	2	7	0	5	0	0	0	0	0	0	0	2	0
Sand shiner	Notropis ludibundus	8	124	49	19	0	6	13	3	22	0	11	1	0
Mimic shiner	Notropis volucellus	3	20	0	15	0	0	0	0	4	0	1	0	0
Smallmouth buffalo	Ictiobus bubalus	1	4	0	0	0	0	0	0	0	0	4	0	0
Black buffalo	Ictiobus niger	1	7	0	0	0	0	0	0	7	0	0	0	0
Quillback	Carpiodes cyprinus	8	53	12	9	0	3	7	0	1	19	1	0	1
River carpsucker	Carpiodes carpio	1	2	0	0	0	0	2	0	0	0	0	0	0
Highfin carpsucker	Carpiodes velifer	2	3	0	2	0	0	0	0	1	0	0	0	0
White sucker	Catostomus commersoni	10	464	1	0	26	58	59	1	1	92	1	212	13
Creek chubsucker	Erimyzon oblongus	1	2	0	0	0	0	0	0	0	2	0	0	0
Northern hog sucker	Hypentelium nigricans	6	35	2	0	0	0	1	6	6	0	11	0	9
Greater redhorse*	Moxostoma valenciennesi	1	3	0	0	0	0	0	0	3	0	0	0	0
River redhorse*	Moxostoma carinatum	1	2	0	2	0	0	0	0	0	0	0	0	0
Shorthead redhorse	Moxostoma macrolepidotum	7	41	6	1	0	4	17	4	0	3	6	0	0
Black redhorse*	Moxostoma duquesnei	6	106	8	4	0	0	5	0	30	0	29	0	30
Golden redhorse	Moxostoma erythrurum	11	487	59	84	15	36	85	19	82	46	11	6	44
Silver redhorse	Moxostoma anisurum	3	9	2	6	0	0	0	0	1	0	0	0	0
Channel catfish	Ictalurus punctatus	6	18	2	2	0	2	6	0	0	0	4	0	2
Yellow bullhead	Ameiurus natalis	7	30	0	0	6	3	0	7	0	4	2	2	6
Black bullhead	Ameiurus melas	1	1	0	0	0	0	0	0	0	1	0	0	0
Flathead catfish	Pylodictis olivaris	1	1	0	0	0	0	0	0	0	0	1	0	0
Stonecat	Noturus flavus	5	11	2	0	1	0	0	2	0	0	1	0	5
Freckled madtom	Noturus nocturnus	1	1	0	0	0	0	0	0	0	0	1	0	0
Slender madtom*	Noturus exilis	1	6	0	0	0	0	0	0	0	0	0	0	6
Blackstripe topminnow	Fundulus notatus	8	50	1	0	16	5	0	6	2	7	1	0	12
Brook silverside	Labidesthes sicculus	4	20	1	3	1	0	0	0	0	15	0	0	0
Black crappie	Pomoxis nigromaculatus	1	1	0	0	0	0	0	0	0	1	0	0	0
Rock bass	Ambloplites rupestris	10	115	9	7	22	3	9	15	12	0	9	6	23
Largemouth bass	Micropterus salmoides	10	117	7	7	3	13	2	7	5	55	4	0	14
Smallmouth bass*	Micropterus dolomieu	9	176	6	21	28	0	17	12	9	0	42	7	34
Green sunfish	Lepomis cyanellus	10	284	7	1	87	34	1	6	4	25	108	0	11
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	3	8	0	0	0	1	0	0	0	4	3	0	0
Bluegill	Lepomis macrochirus	10	275	24	20	2	8	2	3	10	153	35	0	18
Longear sunfish	Lepomis megalotis	9	326	26	13	159	53	15	26	25	0	7	0	2
Orangespotted sunfish	Lepomis humilis	9	116	11	12	17	28	2	6	4	30	0	0	6
Blackside darter	Percina maculata	4	10	0	0	2	4	0	0	0	0	0	2	2
Slenderhead darter	Percina phoxocephala	7	15	2	2	1	6	1	0	1	0	2	0	0
Johnny darter	Etheostoma nigrum	9	188	3	0	33	35	2	37	2	13	0	47	16
Banded darter	Etheostoma zonale	7	134	9	25	12	0	0	7	1	0	1	0	79
Rainbow darter	Etheostoma caeruleum	1	75	0	0	0	0	0	0	0	0	0	75	0
Orangethroat darter	Etheostoma spectabile	2	558	0	0	0	0	0	0	0	0	0	435	123
Fantail darter	Etheostoma flabellare	3	102	0	0	0	0	0	0	0	0	2	43	57
Freshwater drum	Aplodinotus grunniens	6	46	6	9	0	0	2	0	11	0	12	0	6
	Total fish		**8459**	**371**	**450**	**731**	**985**	**342**	**450**	**447**	**634**	**635**	**2287**	**1127**
	Total species		**59**	**32**	**30**	**25**	**27**	**28**	**27**	**34**	**23**	**35**	**19**	

Table 3. Summary of fish collection for Mazon Basin Surveys 1993 -2004 - all stations combined.

FAMILY	COMMON NAME	SCIENTIFIC NAME	2004	1999	1993
Lepisosteidae	Longnose gar	*Lepisosteus osseus*	6	4	0
Clupeidae	Gizzard shad	*Dorosoma cepedianum*	51	117	12
Esocidae	Grass pickerel	*Esox americanus*	14	0	3
Cyprinidae	Carp	*Cyprinus carpio*	18	34	25
	Creek chub	*Semotilus atromaculatus*	32	10	48
	Hornyhead chub	*Nocomis biguttatus*	130	9	77
	Central stoneroller	*Campostoma anomalum*	102	35	230
	Suckermouth minnow	*Phenacobius mirabilis*	0	4	1
	Striped shiner	*Luxilus chrysocephalus*	383	97	343
	Redfin shiner	*Lythrurus umbratilis*	363	15	54
	Spotfin shiner	*Cyprinella spiloptera*	168	0	52
	Red shiner	*Cyprinella lutrensis*	30	934	61
	Fathead minnow	*Pimephales promelas*	0	15	0
	Bluntnose minnow	*Pimephales notatus*	356	692	285
	Bullhead minnow	*Pimephales vigilax*	4	0	0
	Emerald shiner	*Notropis atherinoides*	0	476	0
	Bigmouth shiner	*Notropis dorsalis*	5	0	2
	Sand shiner	*Notropis ludibundus*	90	88	95
	Mimic shiner	*Notripis volucellus*	15	0	0
Catostomidae	Smallmouth buffalo	*Ictiobus bubalus*	0	6	1
	Quillback	*Carpiodes cyprinus*	31	55	37
	Highfin carpsucker	*Carpoides velifer*	2	1	2
	River carpsucker	*Carpiodes carpio*	2	3	0
	White sucker	*Catostomus commersoni*	145	18	152
	Northern hogsucker	*Hypentilium nigricans*	9	48	36
	River redhorse	*Moxostoma carinatum*	2	0	0
	Shorthead redhorse	*Moxostoma macrolepidotum*	32	74	35
	Black redhorse	*Moxostoma duquesni*	17	56	15
	Golden redhorse	*Moxostoma erythrurum*	298	249	160
	Silver redhorse	*Moxostoma anisurum*	8	10	9
Ictaluridae	Channel catfish	*Ictalurus punctatus*	12	7	5
	Yellow bullhead	*Ameiurus natalis*	16	10	19
	Flathead catfish	*Pylodictus olivaris*	0	1	2
	Stonecat	*Noturus flavus*	5	3	10
Cyprinodontidae	Blackstripe topminnow	*Fundulus notatus*	28	48	6
Atherinidae	Brook silverside	*Labidesthes sicculus*	5	14	7
Centrarchidae	White crappie	*Pomoxis annularis*	0	1	0
	Rock bass	*Ambloplites rupestris*	65	41	58
	Largemouth bass	*Micropterus salmoides*	39	76	14
	Smallmouth bass	*Micropterus dolomieu*	84	120	38
	Green sunfish	*Lepomis cyanellus*	136	111	164
	Bluegill x Green hybrid	*L. machrochirus x L. cyanellus*	1	2	1
	Bluegill	*Lepomis macrochirus*	59	68	14
	Longear sunfish	*Lepomis megalotis*	292	160	37
	Orangespotted sunfish	*Lepomis humilis*	76	86	15
Percidae	Blackside darter	*Percina maculata*	6	67	32
	Slenderhead darter	*Percina phoxocephala*	12	11	14
	Logperch	*Percina caprodes*	0	1	18
	Johnny darter	*Etheostoma nigrum*	110	19	44
	Banded darter	*Etheostoma zonale*	53	19	111
Scaenidae	Freshwater drum	*Aplodinotus grunniens*	17	30	21
		total no.	3329	3962	2365
		no. species	43	44	42

Table 4. Total number of individuals of each species collected and Index of Biological Integrity scores (IBI) for each station in the 2004 Mazon River sub-Basin Survey.

Common name	Scientific name	Total	DV-02 Mazon River	DV-04 Mazon River	DVD-01 Johnny Run	DVE-02 W Fork Mazon River	DVE-03 W Fork Mazon River	DVF-01 E Fork Mazon River
Striped shiner	Luxilus chrysocephalus	383	16	15	90	143	13	106
Redfin shiner	Lythrurus umbratilus	363	0	7	67	268	8	13
Bluntnose minnow	Pimephales notatus	356	12	24	106	113	5	96
Golden redhorse	Moxostoma erythrurum	298	59	84	15	36	85	19
Longear sunfish	Lepomis megalotis	292	26	13	159	53	15	26
Spotfin shiner	Cyprinella spiloptera	168	42	108	17	0	0	1
White sucker	Catostomus commersoni	145	1	0	26	58	59	1
Green sunfish	Lepomis cyanellus	136	7	1	87	34	1	6
Hornyhead chub	Nocomis biguttatus	130	10	7	5	69	21	18
Johnny darter	Etheostoma nigrum	110	3	0	33	35	2	37
Central stoneroller	Campostoma anomalum	102	1	1	9	43	14	34
Sand shiner	Notropis ludibundus	90	49	19	0	6	13	3
Smallmouth bass	Micropterus dolomieu	84	6	21	28	0	17	12
Orangespotted sunfish	Lepomis humilis	76	11	12	17	28	2	6
Rock bass	Ambloplites rupestris	65	9	7	22	3	9	15
Bluegill	Lepomis macrochirus	59	24	20	2	8	2	3
Banded darter	Etheostoma zonale	53	9	25	12	0	0	7
Gizzard shad	Dorosoma cepedianum	51	17	12	0	0	22	0
Largemouth bass	Micropterus salmoides	39	7	7	3	13	2	7
Creek chub	Semotilus atromaculatus	32	0	0	5	15	5	7
Shorthead redhorse	Moxostoma macrolepidotum	32	6	1	0	4	17	4
Quillback	Carpiodes cyprinus	31	12	9	0	3	7	0
Red shiner	Cyprinella lutrensis	30	0	0	0	25	4	1
Blackstripe topminnow	Fundulus notatus	28	1	0	16	5	0	6
Carp	Cyprinus carpio	18	7	7	0	2	2	0
Black redhorse	Moxostoma duquesnei	17	8	4	0	0	5	0
Freshwater drum	Aplodinotus grunniens	17	6	9	0	0	2	0
Yellow bullhead	Ameiurus natalis	16	0	0	6	3	0	7
Mimic shiner	Notropis volucellus	15	0	15	0	0	0	0
Grass pickerel	Esox americanus	14	7	0	0	2	0	5
Channel catfish	Ictalurus punctatus	12	2	2	0	2	6	0
Slenderhead darter	Percina phoxocephala	12	2	2	1	6	1	0
Northern hog sucker	Hypentelium nigricans	9	2	0	0	0	1	6
Silver redhorse	Moxostoma anisurum	8	2	6	0	0	0	0
Longnose gar	Lepisosteus osseus	6	0	0	1	3	0	2
Blackside darter	Percina maculata	6	0	0	2	4	0	0
Stonecat	Noturus flavus	5	2	0	1	0	0	2
Brook silverside	Labidesthes sicculus	5	1	3	1	0	0	0
Bigmouth shiner	Notropis dorsalis	5	0	5	0	0	0	0
Bullhead minnow	Pimephales vigilax	4	4	0	0	0	0	0
River carpsucker	Carpiodes carpio	2	0	0	0	0	2	0
Highfin carpsucker	Carpiodes velifer	2	0	2	0	0	0	0
River redhorse	Moxostoma carinatum	2	0	2	0	0	0	0
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	1	0	0	0	1	0	0
Total fish		**3329**	**371**	**450**	**731**	**985**	**342**	**450**
Total species		**43**	**32**	**30**	**25**	**27**	**28**	**27**

Table 4. Cont.

IBI Metrics	Mazon River DV-02	Mazon River DV-04	Johnny Run DVD-01	W Fork Mazon River DVE-02	W Fork Mazon River DVE-03	E Fork Mazon River DVF-01
Native fish species	. 31 (6)	. 29 (6)	. 25 (5)	. 26 (6)	. 27 (6)	. 27 (6)
Native minnow species	. 7 (5)	. 9 (6)	. 7 (4)	. 8 (5)	. 8 (5)	. 9 (5)
Native sucker species	. 7 (6)	. 7 (6)	. 2 (2)	. 4 (4)	. 7 (6)	. 4 (4)
Native sunfish species	. 7 (6)	. 7 (5)	. 7 (6)	. 6 (6)	. 7 (6)	. 7 (6)
Benthic invertivore species	. 9 (6)	. 8 (5)	. 6 (4)	. 5 (4)	. 6 (4)	. 6 (4)
Intolerant species	. 6 (6)	. 6 (6)	. 4 (4)	. 2 (2)	. 5 (5)	. 4 (4)
Prop. specialist benthic invertivores	. 0.25 (6)	. 0.28 (4)	. 0.09 (3)	. 0.09 (3)	. 0.32 (6)	. 0.16 (5)
Prop. geneneralist feeders	. 0.52 (5)	. 0.55 (5)	. 0.56 (5)	. 0.69 (3)	. 0.44 (6)	. 0.54 (5)
Prop. mineral-substrate spawners	. 0.33 (4)	. 0.35 (5)	. 0.33 (3)	. 0.58 (6)	. 0.56 (6)	. 0.50 (5)
Prop. tolerant species	. 0.13 (6)	. 0.10 (6)	. 0.20 (5)	. 0.27 (5)	. 0.22 (5)	. 0.22 (5)
IBI Score	56	54	41	44	55	49

Table 6 Estimated % composition of substrate for Mazon River Basin sampling locations in 199 and 2004.

Stream Name	EPA Code	% Silt-Mud		%Sand		% Gravel		% Cobble		% Boulder	
		2004	1999	2004	1999	2004	1999	2004	1999	2004	1999
Johnny Run	DVD-01	25	0	5	0	10	45	40	40	20	15
West Fork Mazon River	DVE-02	10	15	5	30	60	30	25	15	0	0
West Fork Mazon River	DVE-03	10	13	10	20	40	50	40	15	0	2
East Fork Mazon River	DVF-01	5	10	30	20	30	40	30	25	>1	5
Mazon River	DV-02	30	20	15	30	30	30	20	20	5	>1
Mazon River	DV-04	10	0	40	0	20	60	20	30	10	10

Table 7. Total number of individuals for each species collected at each Aux Sable Creek sampling station, 2004.

Common name	Scientific name	Total	DW-99 I&M CANAL	DW-01 RT. 6	DW-07 RT. 52
Gizzard shad	Dorosoma cepedianum	53	23	30	0
Grass pickerel	Esox americanus	1	0	1	0
Carp	Cyprinus carpio	23	3	10	10
Hornyhead chub	Nocomis biguttatus	38	24	8	6
Central stoneroller	Campostoma anomalum	27	0	17	10
Largescale stoneroller	Campostoma oligolepis	102	102	0	0
Striped shiner	Luxilus chrysocephalus	88	38	20	30
Redfin shiner	Lythrurus umbratilus	56	1	28	27
Spotfin shiner	Cyprinella spiloptera	138	74	63	1
Red shiner	Cyprinella lutrensis	15	1	1	13
Red shiner x Spotfin shiner hybrid	Cyprinella lutrensis x C. spiloptera	2	0	2	0
Bluntnose minnow	Pimephales notatus	102	15	20	67
Emerald shiner	Notropis atherinoides	47	44	3	0
Sand shiner	Notropis ludibundus	33	11	22	0
Mimic shiner	Notropis volucellus	5	1	4	0
Smallmouth buffalo	Ictiobus bubalus	4	4	0	0
Black buffalo	Ictiobus niger	7	0	7	0
Quillback	Carpiodes cyprinus	21	1	1	19
Highfin carpsucker	Carpiodes velifer	1	0	1	0
White sucker	Catostomus commersoni	94	1	1	92
Creek chubsucker	Erimyzon oblongus	2	0	0	2
Northern hog sucker	Hypentelium nigricans	17	11	6	0
Greater redhorse	Moxostoma valenciennesi	3	0	3	0
Shorthead redhorse	Moxostoma macrolepidotum	9	6	0	3
Black redhorse	Moxostoma duquesnei	59	29	30	0
Golden redhorse	Moxostoma erythrurum	139	11	82	46
Silver redhorse	Moxostoma anisurum	1	0	1	0
Channel catfish	Ictalurus punctatus	4	4	0	0
Yellow bullhead	Ameiurus natalis	6	2	0	4
Black bullhead	Ameiurus melas	1	0	0	1
Flathead catfish	Pylodictis olivaris	1	1	0	0
Stonecat	Noturus flavus	1	1	0	0
Freckled madtom	Noturus nocturnus	1	1	0	0
Blackstripe topminnow	Fundulus notatus	10	1	2	7
Brook silverside	Labidesthes sicculus	15	0	0	15
Black crappie	Pomoxis nigromaculatus	1	0	0	1
Rock bass	Ambloplites rupestris	21	9	12	0
Largemouth bass	Micropterus salmoides	64	4	5	55
Smallmouth bass	Micropterus dolomieu	51	42	9	0
Green sunfish	Lepomis cyanellus	137	108	4	25
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	7	3	0	4
Bluegill	Lepomis macrochirus	198	35	10	153
Longear sunfish	Lepomis megalotis	32	7	25	0
Orangespotted sunfish	Lepomis humilis	34	0	4	30
Slenderhead darter	Percina phoxocephala	3	2	1	0
Johnny darter	Etheostoma nigrum	15	0	2	13
Banded darter	Etheostoma zonale	2	1	1	0
Fantail darter	Etheostoma flabellare	2	2	0	0
Freshwater drum	Aplodinotus grunniens	23	12	11	0
Total fish		1716	**635**	**447**	**634**
Total species		**47**	**35**	**34**	**23**

IBI Metrics	DW-99	DW-01	DW-07
Native fish species	. 34 (6)	. 33 (6)	. 22 (5)
Native minnow species	. 10 (6)	. 10 (6)	. 7 (6)
Native sucker species	. 7 (6)	. 9 (6)	. 5 (5)
Native sunfish species	. 6 (5)	. 7 (6)	. 5 (4)
Benthic invertivore species	. 10 (6)	. 9 (6)	. 3 (2)
Intolerant species	. 6 (6)	. 8 (6)	. 1 (1)
Prop. specialist benthic invertivores	. 0.10 (2)	. 0.28 (6)	. 0.10 (2)
Prop. geneneralist feeders	. 0.51 (5)	. 0.50 (5)	. 0.70 (3)
Prop. mineral-substrate spawners	. 0.43 (5)	. 0.49 (6)	. 0.20 (3)
Prop. tolerant species	. 0.18 (6)	. 0.15 (6)	. 0.27 (5)
IBI Score	**53**	**59**	**36**

Table 8.. Total number of individuals for each species collected in Nettle and Waupecon Creeks, 2004.

			DU-02	DZX-01
Common name	**Scientific name**	**Total**	**Nettle Creek**	**Waupecon Creek**
Longnose gar	Lepisosteus osseus	1	1	0
Grass pickerel	Esox americanus	7	7	0
Northern pike	Esox lucius	1	1	0
Carp	Cyprinus carpio	1	1	0
Southern redbelly dace	Phoxinus erythrogaster	52	0	52
Creek chub	Semotilus atromaculatus	247	3	244
Hornyhead chub	Nocomis biguttatus	97	43	54
Central stoneroller	Campostoma anomalum	656	220	436
Striped shiner	Luxilus chrysocephalus	764	185	579
Redfin shiner	Lythrurus umbratilus	18	17	1
Spotfin shiner	Cyprinella spiloptera	9	9	0
Red shiner	Cyprinella lutrensis	9	9	0
Bluntnose minnow	Pimephales notatus	195	112	83
Bigmouth shiner	Notropis dorsalis	2	0	2
Sand shiner	Notropis ludibundus	1	0	1
Quillback	Carpiodes cyprinus	1	1	0
White sucker	Catostomus commersoni	225	13	212
Northern hog sucker	Hypentelium nigricans	9	9	0
Black redhorse	Moxostoma duquesnei	30	30	0
Golden redhorse	Moxostoma erythrurum	50	44	6
Channel catfish	Ictalurus punctatus	2	2	0
Yellow bullhead	Ameiurus natalis	8	6	2
Stonecat	Noturus flavus	5	5	0
Slender madtom	Noturus exilis	6	6	0
Blackstripe topminnow	Fundulus notatus	12	12	0
Rock bass	Ambloplites rupestris	29	23	6
Largemouth bass	Micropterus salmoides	14	14	0
Smallmouth bass	Micropterus dolomieu	41	34	7
Green sunfish	Lepomis cyanellus	11	11	0
Bluegill	Lepomis macrochirus	18	18	0
Longear sunfish	Lepomis megalotis	2	2	0
Orangespotted sunfish	Lepomis humilis	6	6	0
Blackside darter	Percina maculata	4	2	2
Johnny darter	Etheostoma nigrum	63	16	47
Banded darter	Etheostoma zonale	79	79	0
Rainbow darter	Etheostoma caeruleum	75	0	75
Orangethroat darter	Etheostoma spectabile	558	123	435
Fantail darter	Etheostoma flabellare	100	57	43
Freshwater drum	Aplodinotus grunniens	6	6	0
Total fish		**3414**	**1127**	**2287**
Total species		**39**	**35**	**19**

IBI Metrics	**DU-02**	**DZX-01**
Native fish species	34	19
Native minnow species	8	9
Native sucker species	5	2
Native sunfish species	7	2
Benthic invertivore species	10	7
Intolerant species	6	4
Prop. specialist benthic invertivores	0.32	0.27
Prop. geneneralist feeders	0.34	0.51
Prop. mineral-substrate spawners	0.65	0.72
Prop. tolerant species	0.21	0.21
IBI	**57**	**47**