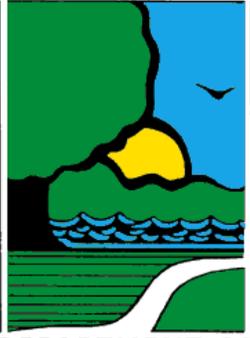
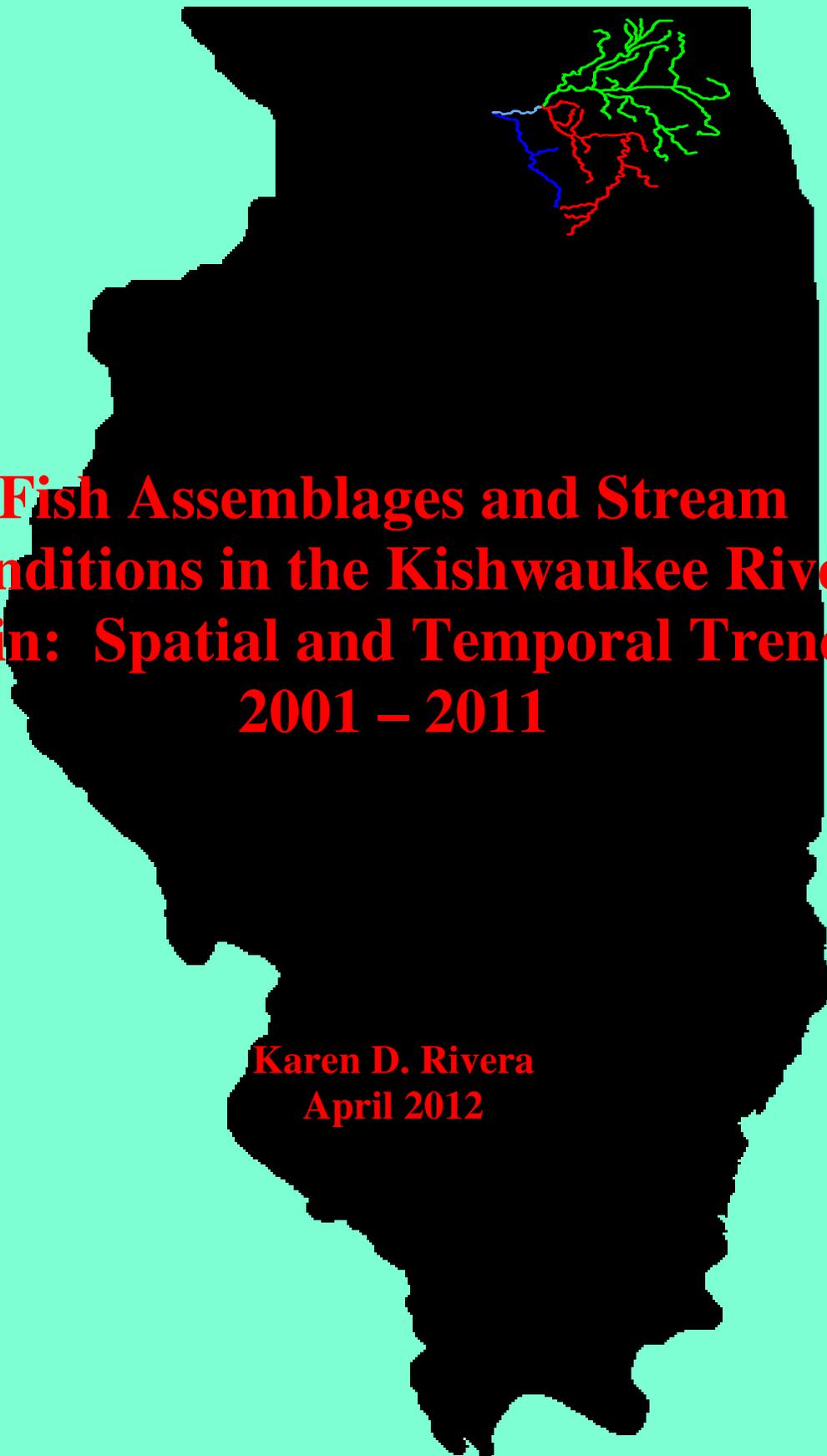


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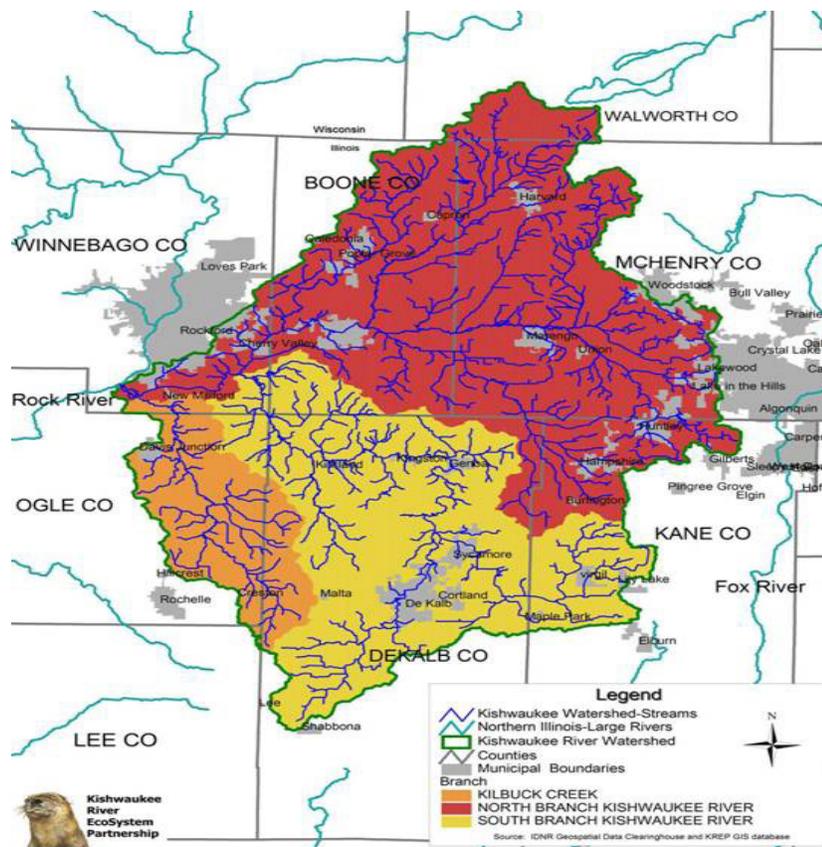


**Fish Assemblages and Stream  
Conditions in the Kishwaukee River  
Basin: Spatial and Temporal Trends,  
2001 – 2011**

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## Introduction

The Kishwaukee River Basin covers an area of approximately 1,218 square miles spanning seven counties in northern Illinois, including parts of Boone, McHenry, Kane, DeKalb, Ogle, and small parts of Lee and Winnebago counties. The mainstem of the river empties into the Rock River about 3 miles south of Rockford, Illinois. It is formed by two branches which unite just south and west of Cherry Valley, IL. The North Branch arises in east-central McHenry County and flows to the west to near Rockford, where it turns south before uniting with the South Branch. The South Branch has its origin on a moraine just north of Shabbona. It flows northeasterly to the village of Genoa, where it turns to the northwest before uniting with the North Branch. The two branches thus united, then flow only a short distance before emptying into the Rock River. One large tributary, Kilbuck Creek, empties into the united main stem of the Kishwaukee River within a few miles of where the Kishwaukee River empties into the Rock River (Figure 1 below). The major land use in the area is for cropland, which accounts for 87.4 % of the land in the area, with woodland comprising only 4% of the area, wetlands at 2.4%, lakes and streams accounting for 0.9%, and urban developed areas accounting for 5.3% of the area. The urban land use increases to 30% in the portion of the basin near Rockford, as well as near some of the smaller tributaries which could potentially result in degradation of the watershed as development proceeds.



**Figure 1: Map showing the two major branches of the Kishwaukee River, Kilbuck Creek, and their relationship to the Rock River (figure courtesy of the Kishwaukee River Partnership).**

## Methods

In the summer of 2011 an intensive survey was conducted of the Kishwaukee Basin and its main tributaries. A total of 18 stations were sampled including 4 samples collected from the North Branch, 3 samples from the South Branch, 1 sample from the main stem near the mouth of the Kishwaukee River, and 10 samples collected from 9 different tributaries. The non-wadeable sites were sampled using a small electro-fishing boat equipped with a 230V generator. This method was supplemented with minnow seine hauls where feasible, using a 20' X 6', 1/4" mesh straight seine and/or a 30' X 6', 1/4" mesh bag seine. At wadeable sites an electric seine was pulled through the stream with three to four netters following the device and collecting stunned fish. Block nets were placed at both the upper and lower reaches of each wadeable station to prevent fish escape from within the station. Most of the larger fish were enumerated in the field with total length recorded to the nearest mm, and weights measured to the nearest gram. Smaller fish, primarily minnows, were preserved for later identification. These fish were then similarly enumerated.

A number of other biological, chemical, and physical measurements or observations were made by IDNR or IEPA personnel at each sampling location. These included water depth, water width, temperature, water stage, pH, dissolved oxygen, alkalinity, conductivity, channel modifications, bank stability, substrate type, percent shading, instream cover, weather, riparian cover, and adjacent land use. The data collected during this survey was also compared to previous data collected in 2001 and 2006.

## Results

### Kishwaukee River North Branch Main Stem

**North Branch Kishwaukee River - PQ-13:** This station represented the uppermost end of the main stem of the Kishwaukee River and was located approximately 5 miles east of Marengo along Pleasant Valley Road in McHenry County. In this area the stream was channelized, and was approximately 26' wide with an average depth of 2.3'. One long 300' run was sampled with an electric seine for a total sample time of 28 minutes. The water was high and somewhat turbid resulting in a poor sample. Bottom sediments consisted of 40% sand, 25% silt-mud, and 35% gravel. Instream cover was provided by undercut banks, submerged roots, logs, debris brush jams, and abundant aquatic and submerged terrestrial vegetation. Coontail, *elodea*, Dwarf Sparganium, Sagittaria, and overhanging reed canary grass were the predominant vegetation types which covered approximately 10% of the area.

Only 21 total fish were collected at this station. The few fishes collected included carp, white suckers, bluegill, green sunfish, northern pike, common shiners, largemouth bass, and blackstripe topminnows. Due to the poor sampling conditions and the few fish obtained, an IBI for this station was not calculated. In 2006 the IBI for this station was 34, which was up a little from the 2001 survey which reported a score of only 24. Widespread development of the area, coupled with sewage treatment effluent and storm water runoff are heavily impacting this upstream end of the Kishwaukee River.

**North Branch Kishwaukee River- PQ-07:** This station was located just downstream of the Route 23 bridge on the north edge of Marengo, and approximately 5 miles downstream from PQ-13 (see above). The small electrofishing boat was used to sample an area approximately 600' long X 50' wide for a total sample time of 39 minutes. One long run, several shallow areas, and a log jam were sampled. Bottom sediments consisted of 50% sand, 10% gravel, and 40% silt/mud. Instream habitat consisted of undercut banks, submerged roots, logs and debris/brush jams. Average depth in this area was approximately 1'. This station was located immediately downstream of the Marengo sewage treatment plant. The area showed signs of erosion, with steep banks and exposed tree roots in some areas. The riparian corridor was covered in tall grasses and weeds. The stream appeared to be widening, with some evidence of floodplain formation and sandbar development. An excellent sample was obtained which included silver, shorthead, and golden redhorse, northern pike, northern hogsuckers, carp, grass pickerel, and largemouth bass. Smaller fishes included common, spotfin and sand shiners, blackside and johnny darters, and a large number of American brook lamprey among others. The IBI was 44, which is up significantly from the 2006 value of 30. In 2001 the IBI was 43, similar to the result obtained this past summer.

**North Branch Kishwaukee River - PQ-14:** Station PQ-14 was located in Belvidere just upstream of the Route 20 Bridge crossing. The small electrofishing boat was used to sample an area approximately 1/4 mile long for a total sample time of 30 minutes. The stream in this area was somewhat impounded due to the dam just downstream. Bottom sediments consisted of a mix of sand, gravel, and mud. The channel averaged approximately 100' wide. One large pool with a few log jams and some riprap was sampled. Instream cover was provided by undercut banks, logs, riprap, and a few debris/brush jams. The area was popular for fishing and boating with park land bordering the south bank and housing development and city bordering the north.

An excellent sample of smallmouth bass was collected from this area, with several large individuals over 2 pounds. Other large fishes collected included silver and golden redhorse, quillback, bigmouth buffalo, carp, and rock bass. Smaller fishes included green sunfish, bluegill, grass pickerel, and one species of minnow. The IBI for this station was 37, down slightly from the 41 calculated in 2006, and significantly lower than the score of 57 found in 2001. Several darter species and northern pike were collected in 2001, along with 8 different minnow species instead of only 1. The deeper water sampled in 2011 most likely made sampling these smaller species more difficult, and may have contributed to the lower IBI rating seen in this survey. However, this area is upstream of the Belvidere dam so the sediments that settle out behind the dam may be impacting the habitat as the IBI seems to be going down consistently.

**North Branch Kishwaukee River- PQ-09:** Station PQ-09 was located downstream of the Belvidere Dam and about 2-3 miles west of Belvidere at the end of Distillery Road, in the Boone County Conservation District Canoe Launch area. A small electrofishing boat was used to sample an area about 600' long upstream of the canoe launch, for a total sample time of 27 minutes. Sample efficiency was intermediate due to high, swift water. The water was turbid with fast flow, and bottom sediments of 20% sand, 30% gravel, 35% cobble, and 20% boulders. Several large stream barbs had been installed in this area to protect an eroding bank, and these were what accounted for the large number of boulders. Instream cover was provided by the

boulders, undercut banks, submerged roots, logs, and debris/brush jams.

With the newly protected bank, the stream in this area appeared stable. The riparian corridor was forested. Large fishes collected included smallmouth bass, channel catfish, northern hogsuckers, silver, golden, black, and shorthead redhorse, highfin carpsuckers, quillback, freshwater drum, river carpsuckers, and carp. Smaller fishes included bluegill, green sunfish, banded darters, American brook lampreys, and 4 species of native minnows. The IBI for this area was calculated at 60 using the large river metrics. In 2006 this area scored a 57 using the large river metrics, but only 49 using the wadeable stream metrics. Both scores are similar to the 2011 IBI rating of "A". The area contains excellent species diversity and should be considered a high quality area. An IBI rating within 10 points of the previous rating is not considered significantly different.

**North Branch Kishwaukee River- PQ-12:** This station was located south of Rockford at the junction of Blackhawk and Mulford Roads, in the Kishwaukee Forest Preserve just downstream of the confluence of the North Branch and the South Branch of the Kishwaukee. The small electrofishing boat was used to sample an area almost 1/4 mile long for a total sample time of 30 minutes. Sampling efficiency was good. Bottom sediments were firm with 30% sand, 30% gravel, 30% cobble, and 10% silt/mud. Some erosion was occurring along the banks with several trees down or leaning and many exposed roots. Instream cover was provided by boulders, undercut banks, submerged roots, submerged logs, and debris/brush jams. One long run and one riffle were sampled. The riparian corridor was forested. Average width of the stream in this area was 150', with an average depth of 4'. Larger fish collected included rock bass, smallmouth bass, freshwater drum, walleye, northern pike, channel catfish, carp, and seven species of native suckers. Smaller fishes included 5 species of minnows, banded darters, blackside darters, rainbow darters, bluegill, and white crappie. The IBI for this station was 50, similar to the score of 52 in 2006, and the score of 50 in 2001, all A ratings indicating a unique natural resource. This stretch of stream is a popular fishing and canoeing area, so protecting the good water quality and fish diversity of this area should be of paramount importance.

**Kishwaukee River North Branch Tributaries:** Six tributaries were sampled on the North Branch of the Kishwaukee River. One sample was taken from each of the following streams: the South Fork of the North Branch of the Kishwaukee River, the North Fork of the North Branch of the Kishwaukee River, Piscasaw Creek, Rush Creek, Coon Creek, and Beaver Creek. The results are presented below.

**South Fork of the North Branch of the Kishwaukee River - PQI-10:** This station was sampled in McHenry County along Seaman Road. The electric seine was used to sample an area 500' long X 28' wide for a total sample time of 35 minutes. The average depth at this station was 2.36', over a bottom of 25% silt/mud, 40% sand, and 35% gravel. Instream habitat consisted of undercut banks, submerged roots, and submerged logs. The stream in this area had been channelized and appeared to be widening. The water level was high and the flow was very fast making sampling very difficult. Only 5 total fish were collected, one each of the following: Golden redhorse, white sucker, grass pickerel, green sunfish, and blackstripe topminnow. Because of the poor quality of the sample, an IBI was not calculated. In 2006 this area scored an IBI of 34. This was the 2<sup>nd</sup> attempt at sampling this area this summer, but due to heavy rains and continued flooding only this poor sample could be obtained.

**North Fork of the North Branch of the Kishwaukee River - PQJ-01:** The North Fork was sampled in McHenry County near the McCann Berry Farm along Kishwaukee Valley Road. The electric seine was used to sample an area 450' long X 21.9' wide for a total sample time of 43 minutes. The mean depth in this area was 1.7' over a bottom of 10% silt-mud, 55% sand, and 35% gravel. Instream habitat was provided by undercut banks, submerged roots, brush-debris jams, and submerged logs. Four pools, four riffles, and one run were sampled.

An excellent diversity of fishes were collected from this station including 9 species of native minnows, white suckers, northern hogsuckers, shorthead redhorse, golden redhorse, crappie, largemouth bass, green sunfish, stonecat, and 6 species of darters, including the endangered Iowa Darter. The IBI for this station has always been high with a 47 calculated in 1997, a 54 in 2001, a 50 in 2006, and a 55 in this 2011 survey. This area also appears to have important habitat for the Iowa Darter, and because it consistently scores as an A rated stream segment, protecting this stretch should be a top priority.

**Rush Creek - PQH-01:** Rush Creek was sampled in McHenry County along River Road using the electric seine for a total distance of 700' and a total sample time of 70 minutes. The stream in this area was small with an average width of 22.9' and a mean depth of 1.52'. The extended station length and sample time reflected a hunt for lampreys, and this hunt was successful! One pool, 2 riffles, and one run were sampled. Bottom sediments consisted of 25% silt-mud, 50% sand, 20% gravel, and 5% cobble. Instream cover consisted of undercut banks, debris/brush jams, rock ledges, and a small amount of aquatic vegetation. Large fish collected included only a few white suckers and northern hogsuckers. Smaller fishes included 9 species of native minnows, mudminnows, 6 species of darters, green sunfish, and 1 lamprey ammocete which was an American Brook Lamprey. The IBI for this station was 50, very similar to the 2006 value of 53, and comparable to other years which have all scored in the 50's indicating a consistently "A" rated stream.

**Piscasaw Creek - PQE-06:** This station was located in Beck's Woods, off of Route 173 a few miles west of Harvard, IL. An electric seine was used to sample an area 550' long X 33' wide for a total sample time of 38 minutes. The mean depth at this station was 2.35' over a bottom of 50% sand, 35% gravel, and 15% cobble. Instream cover was provided by undercut banks, submerged roots, logs, debris-brush jams, and abundant aquatic vegetation consisting of leafy pondweed, filamentous algae, and *rannunculus*. Large fishes collected included white suckers, northern hogsuckers, and shorthead redhorse. Smaller fishes included 8 species of native minnows, brook stickleback, and 4 species of darters. The IBI for this station was 45, down from the 2006 value of 51, or the 52 calculated in the 2001 survey. However this drop was not considered statistically significant since it was within 10 points of the previous value. The overall diversity however was lower, with no game fish collected compared to the 2006 survey which found rock bass, smallmouth bass, and bluegill as well as two more species of suckers. The increased depth and swiftness of the water due to all the heavy rain probably accounted for the change in diversity as some species may have been missed due to sampling difficulties.

**Coon Creek - PQF-09:** Coon Creek was sampled at the junction of Grange and Burma Roads in McHenry County. The electric seine was used to sample an area 618' long X 35' wide for a total

sample time of 68 minutes. Four pools, 2 riffles, and 2 runs were sampled. The stream in this area appeared to be widening with a bottom of 20% silt-mud, 40% sand, and 40% gravel. Instream cover was provided by undercut banks, submerged roots, brush-debris jams, and submerged terrestrial vegetation.

Large fishes collected included 5 species of native suckers, largemouth bass, smallmouth bass, rock bass, bluegill, carp, and green sunfish. Smaller fishes included blackstripe topminnows, 4 species of darters, 9 species of minnows, stonecats, and a single lamprey ammocete, most probably an American Brook Lamprey. The IBI for this station was 54, a significant improvement over the 32 score of 2006. This station was not sampled prior to 2006 so earlier comparison data is not available.

**Beaver Creek - PQD-10:** This station was located northwest of Belvidere upstream of the Squaw Prairie Road Bridge. The electric seine was used to sample an area 430' X 30' for a total sample time of 31 minutes. One long run was sampled. Bottom sediments consisted of 60% sand, 20% gravel, and 20% cobble. Instream habitat was provided by boulders, undercut banks, submerged roots, logs, debris/brush jams, and a small amount of aquatic vegetation. The stream in this area appeared stable.

Beaver Creek has historically been an "A" rated stream through most of its length. However the diversity of this site was considerably lower than for the previous samples which were collected further downstream along Route 20 west of Belvidere. The previous location was not sampled due to a loss of access. Large fish collected from this area included only 5 species of suckers, and green sunfish. Smaller fishes included 10 species of native minnows, stonecats, and two species of darters. The IBI for this station was calculated at 40, a significant decrease from the 54 calculated in 2006 at the downstream station. Earlier samples collected from the Route 20 station scored 53 in 2001 and 54 in 1997.

## **Kishwaukee River South Branch Main Stem**

**South Branch Kishwaukee River - PQC-13:** The main stem of the South Branch of the Kishwaukee River was sampled in 3 locations. This station was located south of DeKalb along Gurler Road, and represented the upstream end of the South Branch of the Kishwaukee River. An electric seine was used to sample an area 600' long by 35' wide for a total sample time of 22 minutes. Average depth was 1.5'. The stream in this area was channelized, with bottom sediments of 20% silt-mud, 70% sand, and 10% gravel. A small amount of aquatic vegetation was present, represented by Illinois Pondweed, but only covered scattered patches. Mowed lawns bordered both sides of the stream, with row crop fields in the surrounding area.

Large fish collected included golden and silver redhorse, carp, northern pike, white suckers, rock bass, bigmouth buffalo, and black bullheads. Smaller fish included 7 species of minnows, blackside darters, banded darters, and johnny darters among others. The IBI score for this station was 48, a statistically significant improvement from the scores of 2006 and 2001 (both 32). The stream in this area also appeared to be stabilizing, with firmer bottom sediments than those seen in the past, and slightly better habitat.

**South Branch Kishwaukee River - PQC-02:** Station PQC-02 was located just east of

Sycamore along Route 64 at the public fishing area. The small electrofishing boat was used to sample an area approximately 1/8 mile long X 50' wide for a total sample time of 17 minutes. Sampling efficiency was intermediate. The stream in this area was incised, with an almost uniform "U" shaped channel and an average depth of approximately 3'. The bottom was soft and sandy, with 30% silt-mud 60% sand, and 10% gravel. Two pools and one riffle were sampled. Instream cover was provided by undercut banks, submerged roots, a few debris-brush jams, and submerged logs. Large fishes collected included seven species of native suckers, northern pike, freshwater drum, a few smallmouth bass, channel catfish, and carp. Smaller fishes included rock bass, bluegill, green sunfish, Johnny darters, and two species of minnows. The IBI for this station was 46, very similar to the result obtain in 2006 which was 45, but lower than the 54 reported in 2001. However this change is not statistically significant.

**South Branch Kishwaukee River - PQC-11:** This station was located about 7 miles south of Cherry Valley along McNeal Road. The electrofishing boat was used to sample an area about 930' long X 81' wide for a total sample time of 15 minutes. Sampling efficiency was good. One riffle and two runs were sampled. The bottom sediments consisted of 10% silt/mud, 30% sand, 30% gravel, and 30% cobble. Instream cover was provided by boulders, undercut banks, submerged logs, debris-brush jams, and submerged roots. The stream in this area appeared stable, with a firm, clean bottom, and slightly turbid water. On the edge of the sampled area a field tile was draining very cold water into a road side ditch, which created a pool and small stream that then flowed into the river. Fish were noticed in this small pool and a few were collected in the dip net. These turned out to be brook stickleback. The brook sticklebacks were found in this same area in 2006, and at that time they represented a new species for this area of the river.

Larger fishes collected from this station included golden, silver, and shorthead redhorse, smallmouth bass, channel catfish, freshwater drum, largemouth bass, northern hogsuckers, white suckers, highfin carpsuckers, flathead catfish and carp among others. Smaller fishes included 10 species of minnows, rock bass, white bass, grass pickerel, banded darters, slenderhead darters, and the brook stickleback. Among the minnow species collected were 4 gravel chubs, a state threatened species. The IBI score for this station was 50, an A rating. Historically this section of the river has always scored an IBI over 50 (A rating), but the 2006 sample found an IBI of only 44. The very high conductivity noted when sampling in 2006 may indicate that the South Branch of the Kishwaukee River is beginning to be impacted from the increasing loads of treated sewage from the cities of DeKalb and Sycamore. In 2001 this area scored an IBI rating of 57.

**Kishwaukee River South Branch Tributaries:** Two tributaries were sampled on the South Branch of the Kishwaukee River, Kilbuck Creek (two stations sampled), and the East Fork of the South Branch of the Kishwaukee River. In addition, one sample was taken from a small tributary of the East Fork, this being Union Ditch in Kane County. The results of these surveys are presented below.

**Kilbuck Creek - PQB-03:** This station was located southwest of New Milford in Kilbuck Creek Forest Preserve along Baxter Road. The electrofishing boat was used to sample an area both downstream and upstream of the bridge for about 900' for a total sample time of 29 minutes. Bottom sediments consisted of 10% silt-mud, 30% sand, 30% gravel, and 30% cobble. The silt

was confined mostly to the sides of the channel, which were mucky and difficult to wade through, although a fine layer of sediment covered all of the heavier sediments in the main channel to a depth of approximately ½". Two riffles and two runs were sampled. The stream in this area appeared to be widening, with instream cover provided by boulders, submerged logs, and submerged terrestrial vegetation. The mean width of the station was 60' with a mean depth of 1.5'.

Large fishes collected included smallmouth bass, northern pike, channel catfish, walleye, freshwater drum, rock bass, carp, and 7 species of native suckers among others. Smaller fishes included bluegill, green sunfish, pumpkinseed sunfish, banded darters, American brook lampreys, and 5 species of minnows. The IBI for this station was calculated at 51, up significantly from the 41 calculated in 2006, but similar to the IBI of 56 found in 2001. It is most likely that an inadequate sample was collected in 2006 accounting for the significant difference.

**Kilbuck Creek - PQB-06:** This station was located just downstream of the Mowers Road Bridge about a mile northeast of the Route 64 X Interstate 39 junction, south of Lindenwood. A stretch of stream 603' long was sampled using an electric seine for a total sample time of 32 minutes. The stream in this area was approximately 25' wide, with an average depth of 2'. One long run was sampled. Sampling efficiency was fair, and some fish were lost while sampling through a 4' deep pool. Bottom sediments consisted of 10% silt/mud, 70% sand, and 20% gravel. Instream cover was provided by undercut banks, submerged roots, a few debris/brush jams, overhanging terrestrial vegetation, and a small amount of curlyleaf pondweed. Riffle development was minimal, and the bottom was mostly shifting sand. The riparian vegetation consisted of tall grasses and weeds, and the stream banks were eroding, with many banks undercut or standing vertical.

Large fishes collected included carp, and 4 species of native suckers. Smaller fishes included grass pickerel, green sunfish, pumpkinseed sunfish, 10 species of native minnows, and three species of darters. The exotic invasive Rusty Crayfish, *Orconectes rusticus*, was also present. The IBI for this station was calculated at 45. This area was not sampled in 2001 or 2006.

**East Fork of the South Branch of the Kishwaukee River - PQCL-03:** This small stream was sampled along Airport Road in a city park owned by the city of Sycamore next to the Sycamore Golf Course. The small electrofishing boat was used to sample an area 1350' long X 50' wide for a total sample time of 21 minutes. Sampling efficiency was good but some turbidity interfered with the collection. Bottom sediments consisted of 50% sand, 40% gravel, and 10% cobble. One riffle and one pool were sampled. The stream in this area appeared to be incising, with many exposed tree roots and steep vertical banks. Instream cover was provided by boulders, undercut banks, submerged roots, brush-debris jams, submerged logs, and submerged terrestrial vegetation. Despite the failing banks, diversity at this site was good. Larger fish collected included shorthead redhorse, golden redhorse, silver redhorse, northern hogsuckers, freshwater drum, white suckers, northern pike, and carp. The golden redhorse overall were in poor body condition, and some had a few sores on their skin. The smaller fishes collected included bluegill, green sunfish, 8 species of minnows, slenderhead darters, black sided darters, and one small largemouth bass. The IBI for this station was calculated at 52, similar to the IBI of 54 calculated

in 2006 and the 53 calculated in 2001. It is surprising that this small impacted tributary consistently rates in the A category. The poor body condition found on the redhorse may indicate problems for the future.

**Union Ditch – PQCLA-01:** This station was located at the bridge on County Line Road between DeKalb and Kane Counties, 1.6 miles north of Maple Park. A stretch of stream 430' long was sampled using an electric seine for a total sample time of 42 minutes. One long run was sampled. Bottom sediments consisted of 60% sand, and 40% gravel. Instream habitat was provided by submerged logs and undercut banks. The stream in this area appeared to be widening, with a mean width of 33.25', and a mean depth of 1.82'. Large fish collected included northern pike, freshwater drum, black bullhead, channel catfish, quillback, golden redhorse, and carp. Smaller fishes included bluegill, green sunfish, 11 species of minnows, white suckers, johnny darters, and a few young largemouth bass. The IBI for this station was calculated at 37. This station has not been sampled in the past.

## **Conclusions**

### **Index of Biotic Integrity**

The Kishwaukee River Basin appears to be in good condition overall, with most stations scoring IBI's in the 40's to 50's (B or A ratings respectively). Most of the stations also showed similar results to past surveys indicating overall stable conditions in the watershed. A few stations found lower IBI's and lower diversity, with some evidence of water quality degradation. The most notable of these was the mainstem station on the North Branch of the Kishwaukee River (PQ-14) which dropped from a high of 57 in 2001, to 41 in 2006, and down to 37 in 2011. The sediment that continues to accumulate behind the Belvidere dam may be contributing to the general decline of the habitat in this area. Two other stations showed significant improvements over past surveys. These included PQC-13, the main stem of the south branch of the Kishwaukee River south of DeKalb which improved from a C rating to a high B, and PQF-09, Coon Creek at the junction of Grange and Burma Roads in McHenry County which improved from a C rating to an A!

Two other stations were not given an IBI rating due to poor sampling conditions and an inability to collect an adequate sample. These were PQ-13, the station on the upstream end of the North Branch of the Kishwaukee River, and PQI-10, on the South Fork of the North Branch of the Kishwaukee, only a few miles from the previously mentioned station. Both of these stations were located in McHenry County. High water and heavy rains in this area made sampling these two sites almost impossible. Two attempts were made to collect samples from these areas, and the meager collections were made on the second attempt. Table 1 lists the IBI rating for each station and for each of the years where data is available. Table 2 lists the station locations for each of the samples collected, and tables 3, 4, and 5 contain a list of all of the fishes collected during this survey sorted by the stations where they were collected.

## **Sportfish**

The most commonly collected sport fish on the Kishwaukee Basin was the bluegill, which was collected at 11 of the stations, for a total of 88 collected (Table 6). Channel catfish was the second most commonly collected sport fish, having been found at 7 of the stations for a total of 47 collected, followed closely by smallmouth bass which were found at 8 stations for a total of 41 collected. The channel catfish was most abundant below the Belvidere Dam at stations PQ-09 and PQ-12, the first located west of Belvidere at the end of Distillery Road, and the second located south of Rockford, at Kishwaukee Forest Preserve. Channel catfish have never been found upstream of the Belvidere dam in any of the surveys conducted by the IL Dept. of Natural Resources, despite the fact that they have been stocked upstream in the past. Smallmouth bass were most abundant at stations PQ-12 (Kishwaukee Forest Preserve south of Rockford) and at PQ-14, located upstream of the Belvidere Dam near the Route 20 Bridge. The bass in these areas were of good size and in excellent condition. Northern pike were collected at 8 stations, most commonly at the stations downstream of the Belvidere dam, but two stations in the uppermost end of the North Branch of the Kishwaukee River held northern pike.

## **Rare and Endangered Species**

Two species of threatened and/or endangered fish were collected during this survey. The first was the Iowa darter, which was collected in the North Fork of the North Branch of the Kishwaukee River in McHenry County. In the past, Iowa Darters have been collected at other sites on the North Branch, but never in large numbers. During this survey only 3 individuals were found. The other threatened and/or endangered species was the Gravel chub, which was only collected at one site on the South Branch of the Kishwaukee River near the McNeal Road Bridge. At this site only 4 individuals were found. Gravel chubs are commonly collected in the Rock River south of Rockford so finding them in this area, located only 10 miles or so from the Rock River is not surprising.

Several species of rare or unusual fish were also collected during this survey. American Brook lampreys were collected at several locations on the North Branch of the Kishwaukee River and in several of the tributaries of the North Branch, although a single individual was also collected in Kilbuck Creek south of Rockford. The American Brook lamprey is not considered endangered but is relatively uncommon except in specific habitats.

Another rather uncommon species is the Central Mudminnow which was found at only 2 sites on the North Branch tributaries. These small fish prefer bottom sediments of soft mud in clean, well vegetated wetland type habitats. The sites where this species was found were Rush Creek and the North Fork of the North Branch of the Kishwaukee River. Rush Creek was also the only site where least darters were found. These tiny darters also prefer clean, well vegetated wetland type habitats, and Rush Creek also held the most diversity of darters with 6 different species found at this location. The station with the greatest overall fish diversity was PQC-11, located on the South Branch of the Kishwaukee River near McNeal Road Bridge. At this station 32 different species of fish were collected including brook stickleback, another rare find, and the gravel chubs which were mentioned above.

Stream Name	Station	2001	2006	2011	Rating
North Branch Kishwaukee River	PQ-07	43	30	44	B
North Branch Kishwaukee River	PQ-09	----	57	60	A
North Branch Kishwaukee River	PQ-12	50	52	50	A
North Branch Kishwaukee River	PQ-14	57	41	37	C
Kilbuck Creek	PQB-03	41	56	51	A
Kilbuck Creek	PQB-06	----	----	45	B
South Branch Kishwaukee River	PQC-02	54	45	46	B
South Branch Kishwaukee River	PQC-11	57	44	50	A
South Branch Kishwaukee River	PQC-13	32	32	48	B
East Branch of South Fork Kishwaukee	PQCL-03	53	54	52	A
Beaver Creek	PQD-10	53	54	40	B
North Branch Kishwaukee River	PQ-13	24	34	----	Not rated.
Union Ditch	PQCLA-01	----	----	37	C
Piscasaw Creek	PQE-06	52	51	45	B
Coon Creek	PQF-09	----	32	54	A
Rush Creek	PQH-01	55	53	50	A
South Fork of North Branch Kishwaukee	PQI-10	----	34	----	Not rated.
North Fork of North Branch Kishwaukee	PQJ-01	54	50	55	A

Table 1: Index of Biotic Integrity ratings for stations sampled on the Kishwaukee River Basin in 2001, 2006, and 2011. (50-60 = A rating, 40-49 = B rating, 30-39 = C rating).

Station	Location	County	Township	Range	Section
PQ-07	Route 23 Br. DS treatment plant, N edge	McHenry	44N	5E	25NW
PQ-09	Distillery Road 2 mil. W of Belvidere	Boone	44N	3E	29SW
PQ-12	Blackhawk Road Br., 3 mi. SE Rockford	Winnebago	43N	2E	21NE
PQ-13	Pleasant Valley Road Br., 2.5 mi. NE Union	McHenry	44N	6E	35NW
PQ-14	Business Rt. 20 Br., E side of Belvidere	Boone	44N	3E	26SE
PQB-03	Baxter Road Br., 2 mi. WSW Morristown	Winnebago	43N	1E	27SE
PQB-06	Mowers Road Br., 2.5 mi. SSE Lindenwood	Ogle	41N	2E	16SE
PQC-02	Rt. 64 turnout, 1 mi. W Sycamore	DeKalb	41N	4E	25SE
PQC-11	McNeal Rd. Br., 2 mi. N Fairdale	DeKalb	42N	3E	7NW
PQC-13	Gurler Road Br., 1.5 mi SW DeKalb	DeKalb	39N	4E	4NW
PQCL-03	Airport Road, Sycamore Golf Course	DeKalb	40N	5E	4NE
PQD-10	Squaw Prairie Road Bridge, NW Belvidere	Boone	44N	3E	20NW
PQE-06	Beck's Woods SW edge of Chemung (Pagles Rd.)	McHenry	45N	5E	5NE
PQH-01	River Rd. Br., 4 mi. W Marengo	McHenry	44N	5E	20NW
PQI-10	Seaman Road Br., 2 mi. SE Union	McHenry	43N	6E	12NW
PQJ-01	Kishwaukee Valley Rd., 5 mi. W Woodstock	McHenry	44N	6E	5SE
PQF-09	Grange Road, 4 mi. SW Marengo	McHenry	43N	5E	18NE
PQCLA-01	County Line Road Bridge	Kane/DeKalb	40N	5E	24NE

Table 2: Station locations for the samples collected from the Kishwaukee River Basin in 2011.

Station code		PQ-07	PQ-09	PQ-12	PQ-14	PQ-13
Total Species		20	21	24	11	9
Total fish		187	268	139	81	21
Electrode minutes		39	27	30	30	28
American brook lamprey	Lampetra appendix	20	1			
Grass pickerel	Esox americanus	15			2	
Northern pike	Esox lucius	4		1		1
Carp	Cyprinus carpio	17	6	7	15	1
Golden shiner	Notemigonus crysoleucas	1				
Hornyhead chub	Nocomis biguttatus			1		
Common shiner	Luxilus cornutus	4				1
Spotfin shiner	Cyprinella spiloptera	2	35	7	6	
Fathead minnow	Pimephales promelas					1
Bluntnose minnow	Pimephales notatus	10	1	12		
Rosyface shiner	Notropis rubellus		2	1		
Bigmouth shiner	Notropis dorsalis		36			
Sand shiner	Notropis ludibundus	1	106	2		
Bigmouth buffalo	Ictiobus cyprinellus				1	
Quillback	Carpiodes cyprinus		2	10	2	
River carpsucker	Carpiodes carpio		3	13		
Highfin carpsucker	Carpiodes velifer		4	4		
White sucker	Catostomus commersoni	5	2			1
Northern hog sucker	Hypentelium nigricans	1	10	5		
Shorthead redhorse	Moxostoma macrolepidotum	5	11	4		
Black redhorse	Moxostoma duquesnei		1			
Golden redhorse	Moxostoma erythrurum	12	7	15	20	
Silver redhorse	Moxostoma anisurum	1	4	10	6	
Channel catfish	Ictalurus punctatus		18	15		
Blackstripe topminnow	Fundulus notatus					1
White crappie	Pomoxis annularis			1		
Rock bass	Ambloplites rupestris			7	3	
Largemouth bass	Micropterus salmoides	7				7
Smallmouth bass	Micropterus dolomieu		4	12	10	
Green sunfish	Lepomis cyanellus	45	5		12	6
Bluegill	Lepomis macrochirus	20		3	4	2
Pumpkinseed	Lepomis gibbosus	6				
Walleye	Stizostedion vitreum			1		
Blackside darter	Percina maculata	1		1		
Johnny darter	Etheostoma nigrum	10				
Banded darter	Etheostoma zonale		5	4		
Rainbow darter	Etheostoma caeruleum			2		
Freshwater drum	Aplodinotus grunniens		5	1		

Table 3: Fishes collected from the North Branch of the Kishwaukee River Stations in 2011.

Station code	PQB-03	PQB-06	PQC-02	PQC-11	PQC-13	PQCL-03	PQCLA-01
Species	26	21	19	32	24	25	25
Total fish	111	430	106	626	171	269	509
Electrode minutes	29	32	17	15	22	30	42
American brook lamprey	1						
Grass pickerel	2	1		2		1	
Northern pike	4		3		6	2	2
Muskellunge					1		
Carp	2	4	4	2	2	8	4
Golden shiner							1
Creek chub				2	1	1	3
Hornyhead chub		17		2	1	6	
Central stoneroller		8					4
Suckermouth minnow				1			
Blacknose dace	3	10					
Gravel chub				4			
Striped shiner							10
Common shiner		175		5	21	44	21
Redfin shiner		1				1	
Spotfin shiner	4	2		35	1	7	4
Fathead minnow							11
Bluntnose minnow	10	31	1	28	49	31	54
Rosyface shiner	2	4	2	4	4	10	6
Bigmouth shiner		16		7	6		137
Sand shiner	10	113		434	40	21	150
Bigmouth buffalo					1		
Black buffalo							1
Quillback	2		5				7
River carpsucker	4		3	1		1	
Highfin carpsucker	5		3	1			
White sucker		15	10	1	4	12	70
Northern hog sucker	1			12		4	
Shorthead redhorse	4	2	1	2		7	
Golden redhorse	18	13	41	33	5	42	1
Silver redhorse	9	2	3	2	2	2	
Channel catfish	8		1	2		1	2
Black bullhead					1		
Flathead catfish				1			
Stonecat				2	1		
Brook stickleback				3			
White bass	4			2			
Black crappie					1		
Rock bass	1		4	1	3	5	1
Largemouth bass			1	1		1	3
Smallmouth bass	3		3	7			1

Green sunfish	2	9	6	7	4	31	5
Bluegill	3		8	13	6	23	2
Pumpkinseed	2	1					
Walleye	1						
Blackside darter					1	3	
Slenderhead darter		1		2		1	
Johnny darter		2	1		7		8
Banded darter	2	3		4	3		
Freshwater drum	4		6	3		4	1

Table 4: Fishes collected from the South Branch of the Kishwaukee River and from Kilbuck Creek in 2011.

Station code		PQD-10	PQE-06	PQF-09	PQH-01	PQI-10	PQJ-01
Species		19	16	27	20	5	25
Total fish		307	243	373	411	5	364
Electrode minutes		31	38	68	70	35	43
American brook lamprey	Lampetra appendix			1	1		3
Central mudminnow	Umbra limi				1		2
Grass pickerel	Esox americanus					1	
Carp	Cyprinus carpio			1			
Golden shiner	Notemigonus crysoleucas				1		
Southern redbelly dace	Phoxinus erythrogaster		1				
Creek chub	Semotilus atromaculatus	3	20	1	66		105
Hornyhead chub	Nocomis biguttatus	6		5	13		7
Central stoneroller	Campostoma anomalum	7	73	20	149		22
Blacknose dace	Rhinichthys atratulus	1	7	1	5		5
Common shiner	Luxilus cornutus	7	2	13	19		38
Spotfin shiner	Cyprinella spiloptera	58		11			
Fathead minnow	Pimephales promelas		5		1		1
Bluntnose minnow	Pimephales notatus	70		38	5		8
Rosyface shiner	Notropis rubellus	5					
Bigmouth shiner	Notropis dorsalis	5	19	7	5		32
Sand shiner	Notropis ludibundus	77	6	164			22
Quillback	Carpiodes cyprinus	5					
White sucker	Catostomus commersoni	40	14	1	53	1	41
Northern hog sucker	Hypentelium nigricans	1	3	7	9		17
Shorthead redhorse	Moxostoma macrolepidotum		2	3			1
Golden redhorse	Moxostoma erythrurum	3		17		1	2
Silver redhorse	Moxostoma anisurum	1		2			
Stonecat	Noturus flavus	1		1			3
Blackstripe topminnow	Fundulus notatus			4		1	
Brook stickleback	Culaea inconstans		2				
White crappie	Pomoxis annularis						1
Rock bass	Ambloplites rupestris			3			
Largemouth bass	Micropterus salmoides			3			5
Smallmouth bass	Micropterus dolomieu			1			

Green sunfish	Lepomis cyanellus	1		36	4	1	7
Bluegill x Green sunfish	Lepomis macrochirus x L. cyanellus			1			
Bluegill	Lepomis macrochirus			4			
Blackside darter	Percina maculata			1	2		2
Johnny darter	Etheostoma nigrum	13	15	1	38		22
Banded darter	Etheostoma zonale	3	32	7	6		4
Rainbow darter	Etheostoma caeruleum		33	19	13		6
Fantail darter	Etheostoma flabellare		9		17		5
Least darter	Etheostoma microperca				3		
Iowa darter	Etheostoma exile						3

Table 5: Fishes collected from the tributaries of the North Branch of the Kishwaukee River in 2011.

	Bluegill	Channel catfish	Smallmouth bass	Rock bass	Largemouth bass	Northern pike	Pumpkinseed	White bass	White crappie	Walleye	Flathead catfish	Black crappie	Muskellunge
PQ-07	20				7	4	6						
PQ-09		18	4										
PQ-12	3	15	12	7		1			1	1			
PQ-14	4		10	3									
PQB-03	3	8	3	1		4	2	4		1			
PQB-06							1						
PQC-02	8	1	3	4	1	3							
PQC-11	13	2	7	1	1			2			1		
PQC-13	6			3		6						1	1
PQCL-03	23	1		5	1	2							
PQD-10													
PQ-13	2				7	1							
PQCLA-01	2	2	1	1	3	2							
PQE-06													
PQF-09	4		1	3	3								
PQH-01													
PQI-10													
PQJ-01					5				1				
Totals	88	47	41	28	28	23	9	6	2	2	1	1	1

Table 6: Sport fish collected from the Kishwaukee Basin in 2011.

