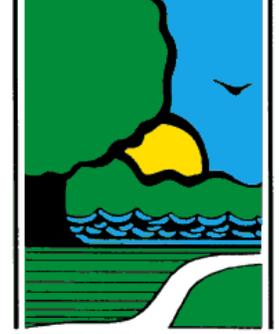
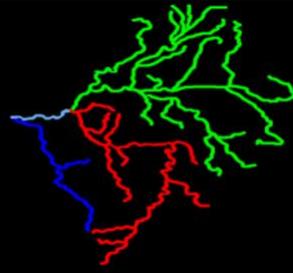


ILLINOIS



DEPARTMENT OF
NATURAL
RESOURCES



Fish Assemblages and Stream Conditions in the Kishwaukee River Basin: Spatial and Temporal Trends, 2001 – 2021

**Rob Hilsabeck
February 2022**

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.

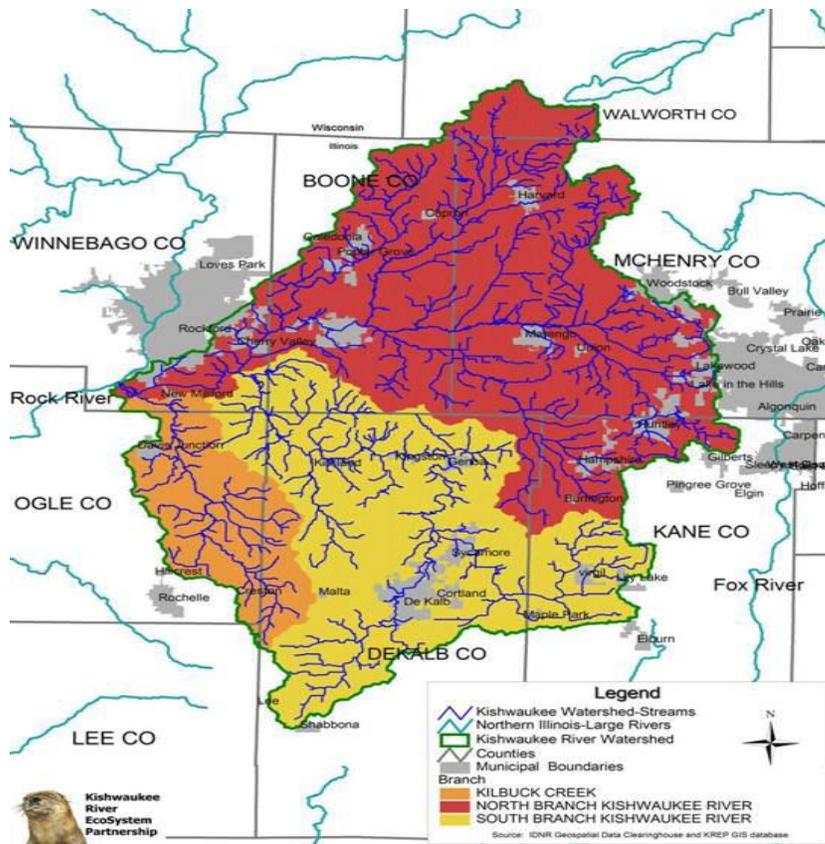


Figure 1: Map showing the two major branches of the Kishwaukee River, Kilbuck Creek, and their relationship to the Rock River (figure courtesy of the Kishwaukee River Partnership).

Methods

In the summer of 2021, an intensive survey was conducted of the Kishwaukee Basin and its main tributaries. A total of 15 stations were sampled including 5 samples collected from the North Branch, 4 samples from the South Branch, and 6 samples collected from 5 different tributaries (Table 1 below). All the sites were sampled using a small electro-fishing boat equipped with a 5.0 GPP, Smith Root DC generator. 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. Selected stations and fish groups had fish flesh samples taken for contaminate analysis by the IEPA lab in Springfield.

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, 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 the surveys from 2001 to 2016.

IEPA Code	Stream	Location	County	Latitude	Longitude
PQ-13	Kishwaukee River	Union	McHenry	42.24784	-88.50644
PQ-07	Kishwaukee River	Marengo	McHenry	42.26549	-88.60839
PQ-11	Kishwaukee River	County Line Road	Boone/McHenry	42.25627	-88.70661
PQ-09	Kishwaukee River	Distillery Road	Boone	42.25377	-88.93001
PQ-12	Kishwaukee River	Blackhawk Road	Winnebago	42.19447	-88.99951
PQI-10	South Branch-East	Union	McHenry	42.21943	-88.49159
PQE-12	Piscasaw Creek	Stimes Conservation Area	Boone	42.37321	-88.72522
PQD-05	Beaver Creek	Poplar Grove	Boone	42.35541	-88.80408
PQD-06	Beaver Creek	Hunter Road	Boone	42.42948	-88.76559
PQC-01	S Br Kishwaukee River	Genoa	DeKalb	42.09777	-88.70514
PQC-02	S Br Kishwaukee River	Sycamore	DeKalb	41.99674	-88.7221
PQC-11	S Br Kishwaukee River	Fairdale	DeKalb	42.13772	-88.93327
PQC-99	S Br Kishwaukee River	Lions Park DeKalb	DeKalb	41.92186	-88.76615
PQCL-03	E Br S Br Kishwaukee River	Sycamore Golf Course	DeKalb	41.96626	-88.65803
PQB-03	Killbuck Creek	Kilbuck Bluffs	Winnebago	42.16528	-89.09945

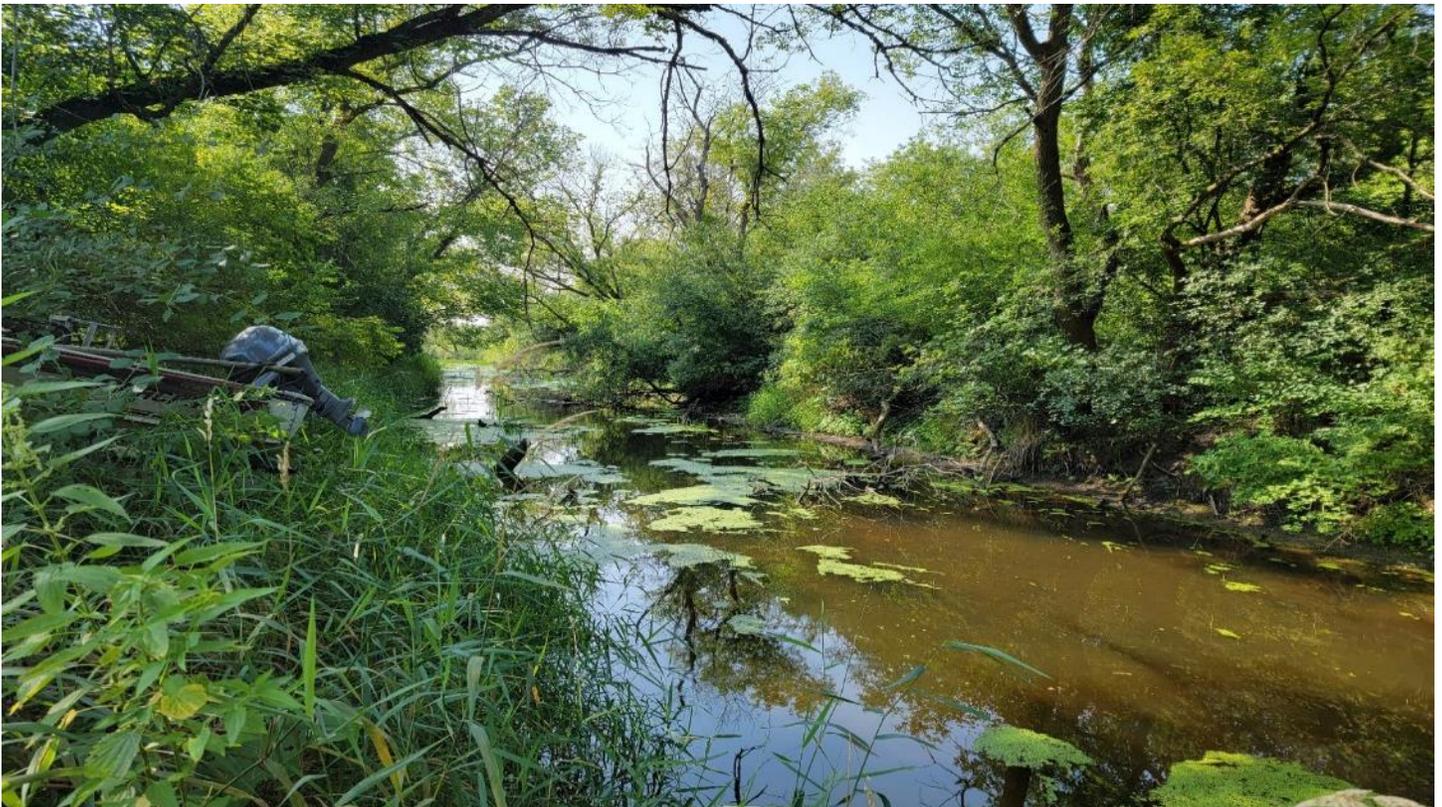
Table 1: Station locations for the samples collected from the Kishwaukee River Basin in 2021.

Kishwaukee River North Branch Main Stem

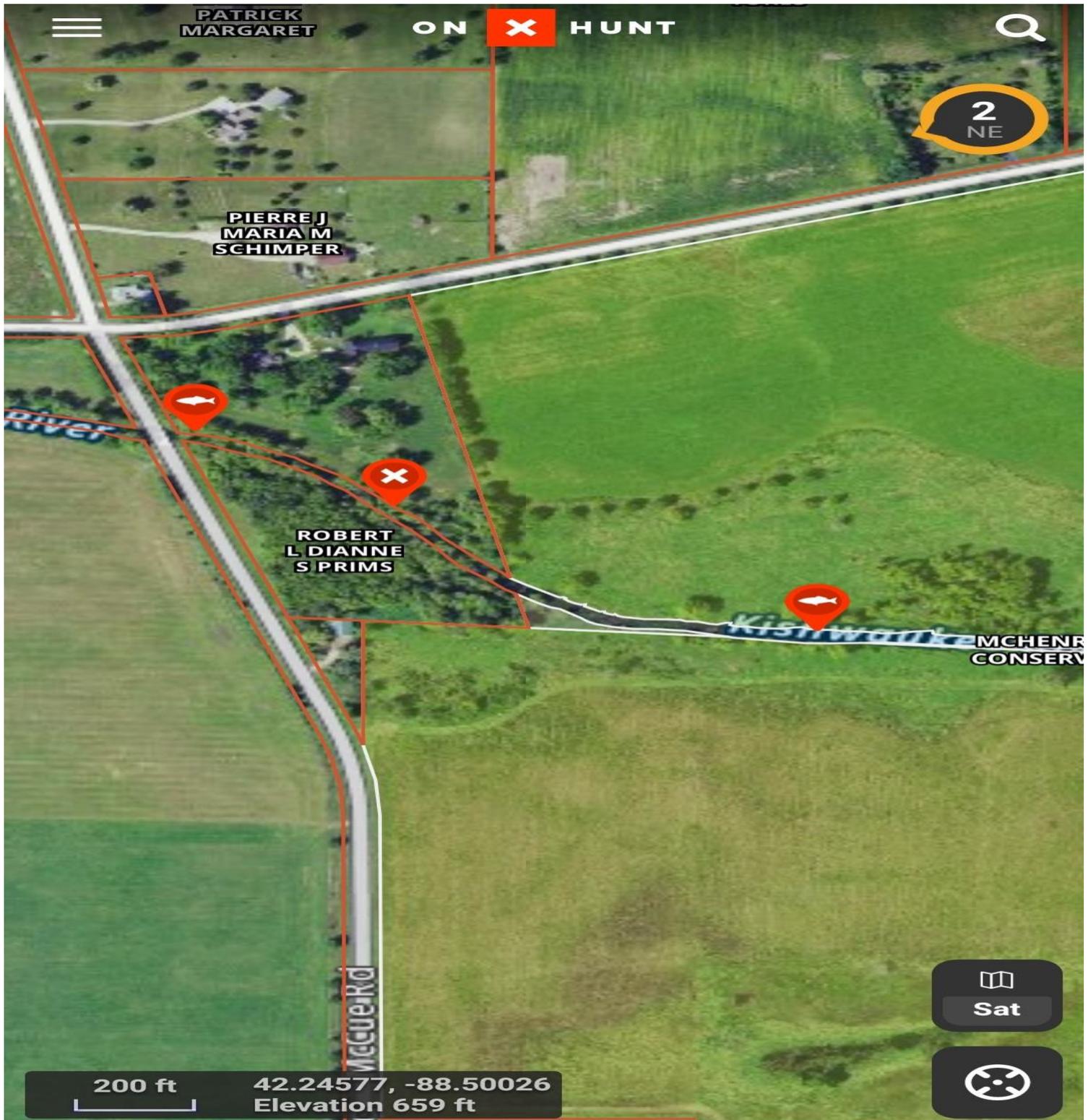
From the data collected, the North Branch of the Kishwaukee River appears to be in good shape overall, with consistent IBI ratings in the upper B to A range at 4 of the surveyed stations. A total of 46 different fish species were collected from these 5 stations including the state threatened American Brook Lamprey at 2 of the stations.

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 25' wide with an average depth of 1'. A 1242' run was sampled time of 24 minutes. The water was pooled with low flow. The water clarity was excellent. Bottom sediments consisted of 20% sand, 20% detritus, 20% vegetation, 5% submerged logs/woody habitat and 30% silt-mud. Instream cover was provided by undercut banks, submerged roots, logs, debris brush jams, and abundant aquatic and submerged terrestrial vegetation. Coontail, elodea, sagittaria, duckweed, watermeal, emergent rush and overhanging reed canary grass were the predominant vegetation types which covered approximately 20% of the area.

Only 83 total fish were collected at this station. 10 native fish species composed the fish collection. The collection was dominated by an impressive collection of large northern pike for such a small stream. White suckers, young largemouth bass and yellow bullheads, green sunfish, smallmouth bass, golden shiners, shorthead redhorse, blackside darter, and blackstripe topminnows. The IBI for this station was calculated at 28. In 2016 the value was 35. 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. The IBI was not calculated in 2011 due to a very poor sample obtained in that year. Urban development of the area, coupled with sewage treatment effluent and storm water runoff are most likely the sources of the impacts to this area. The habitat in this section of the stream was also lentic with the appearance of a marsh. Low oxygen events may occur in this section of the stream during periods of low flow and high water temperatures with the very heavy vegetation coverage.



PQ-13 Upstream view 7/20/2021



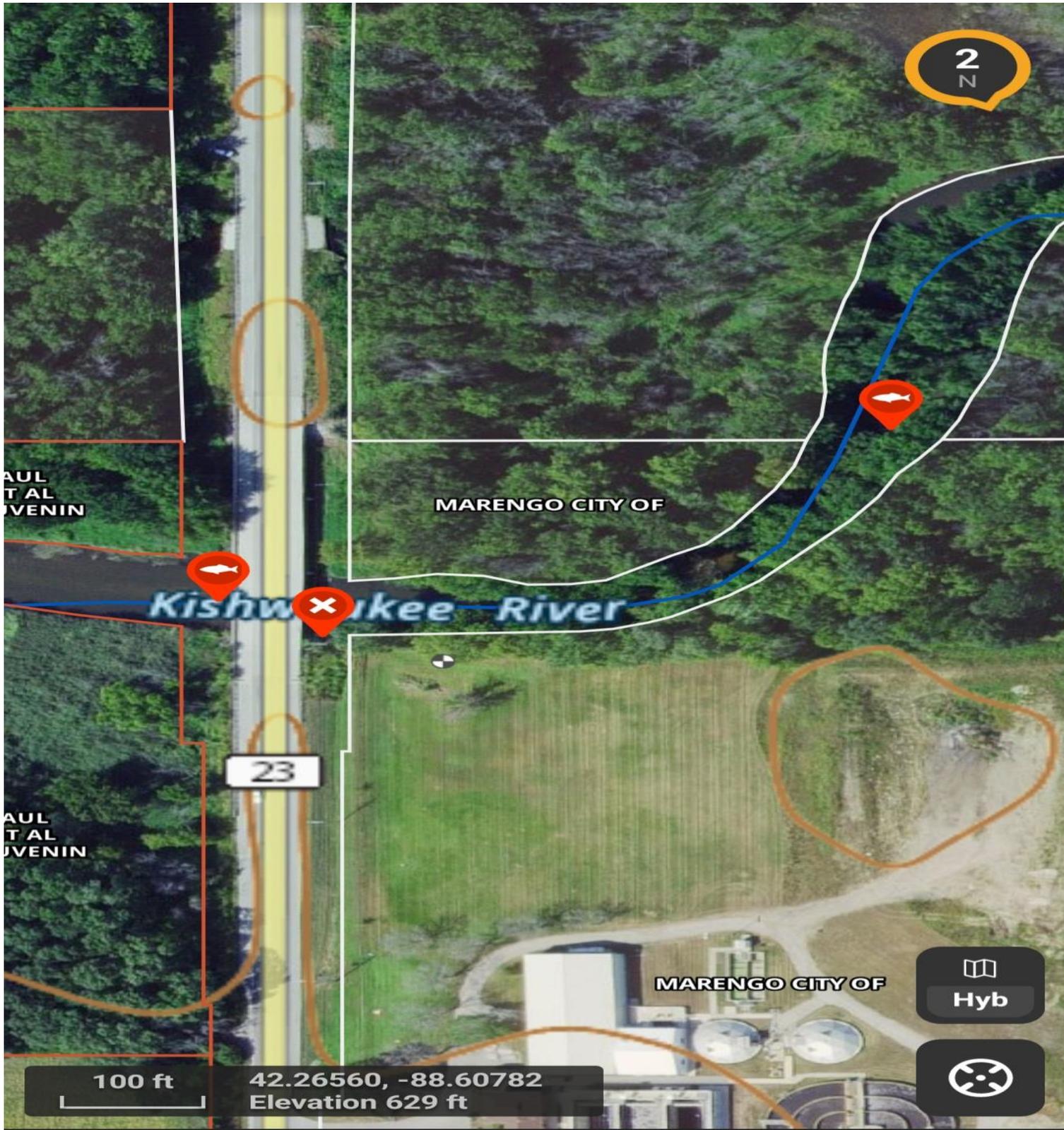
PQ-13 IDNR Sampling Station 7/20/2021

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 DC electrofishing boat was used to sample an area approximately 540' long X 65' wide for a total sample time of 23 minutes. One long run, several shallow areas, and large log jams were sampled. Bottom sediments consisted of 25% sand, 10% gravel, 10% cobble, 5% boulder, 10% detritus, 10% submerged logs and 20% silt/mud. Instream habitat consisted of undercut banks, submerged roots, logs and debris/brush jams. Average depth in this area was approximately 1.5'. This station was located immediately downstream and upstream of the Marengo sewage treatment plant.

An excellent sample of 25 native and 1 non-native fish species were obtained. which included silver, shorthead, and golden redbreast, northern pike, northern hogsuckers, carp, grass pickerel, rock bass, smallmouth bass and largemouth bass. Smaller fishes included common, and spotfin shiners, bluntnose minnows, stonecat, banded darters, rainbow darters and johnny darters. Also collected were 2 American Brook lamprey ammocoetes. The IBI was a 50 in 2021. This is slightly up from the 45 in 2016, and the 44 calculated in 2011, and up significantly from the 2006 value of 30. In 2001 the IBI was 43, which is similar to the recent results. Despite the close proximity of the treatment plant, the stream in this area continues to harbor a good diversity of species including the state threatened lamprey. 2 size groups of common carp flesh samples were taken at this station for IEPA analysis.



PQ-07 Upstream view 7/21/2021



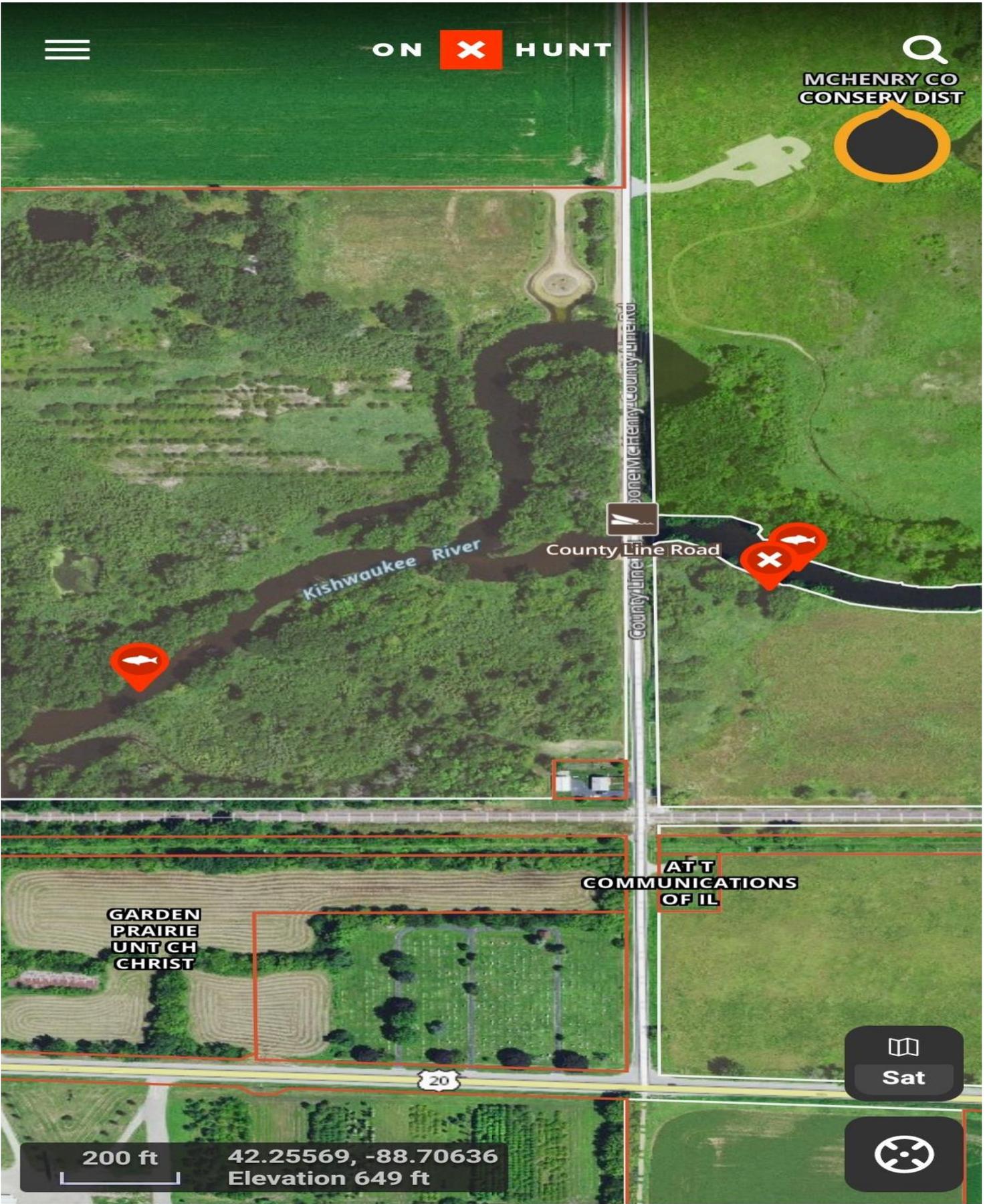
PQ-07 IDNR Sampling Station 7/21/2021

North Branch Kishwaukee River – PQ-11: This station was located at County Line Road to the east of Belvidere off of Route 20. McHenry County and Boone County Conservation Districts owned the riparian corridor both upstream and downstream of the site. The DC electrofishing boat was used to sample an area about 1320' long by 50' wide upstream and downstream of the County Line Road Bridge. The total sample time was 25 minutes. A nice riparian zone was present, but the stream bottom composition was dominated by a sand bedload. The sampled section's bottom composition was 80% sand, 10% gravel, 5% silt/mud and 5% boulder from the bridge stabilization. Brush jams, submerged logs, undercut banks and tree roots were the main structured habitat. Coontail was present in the pooled sections. One pool, 2 riffles and 3 runs were sampled.

A total of 26 native fish species and 1 non-native fish species were sampled. Large fish collected included 7 native suckers, northern pike, largemouth bass, smallmouth bass, and common carp. Smaller fish included bluegill, black crappie, rock bass, green sunfish, yellow bullhead, stonecat, 5 species of minnows, 3 species of darters, and the state threatened American brook lamprey. The IBI score was a 48 for 2021.



PQ-11 Downstream view 7/21/2021



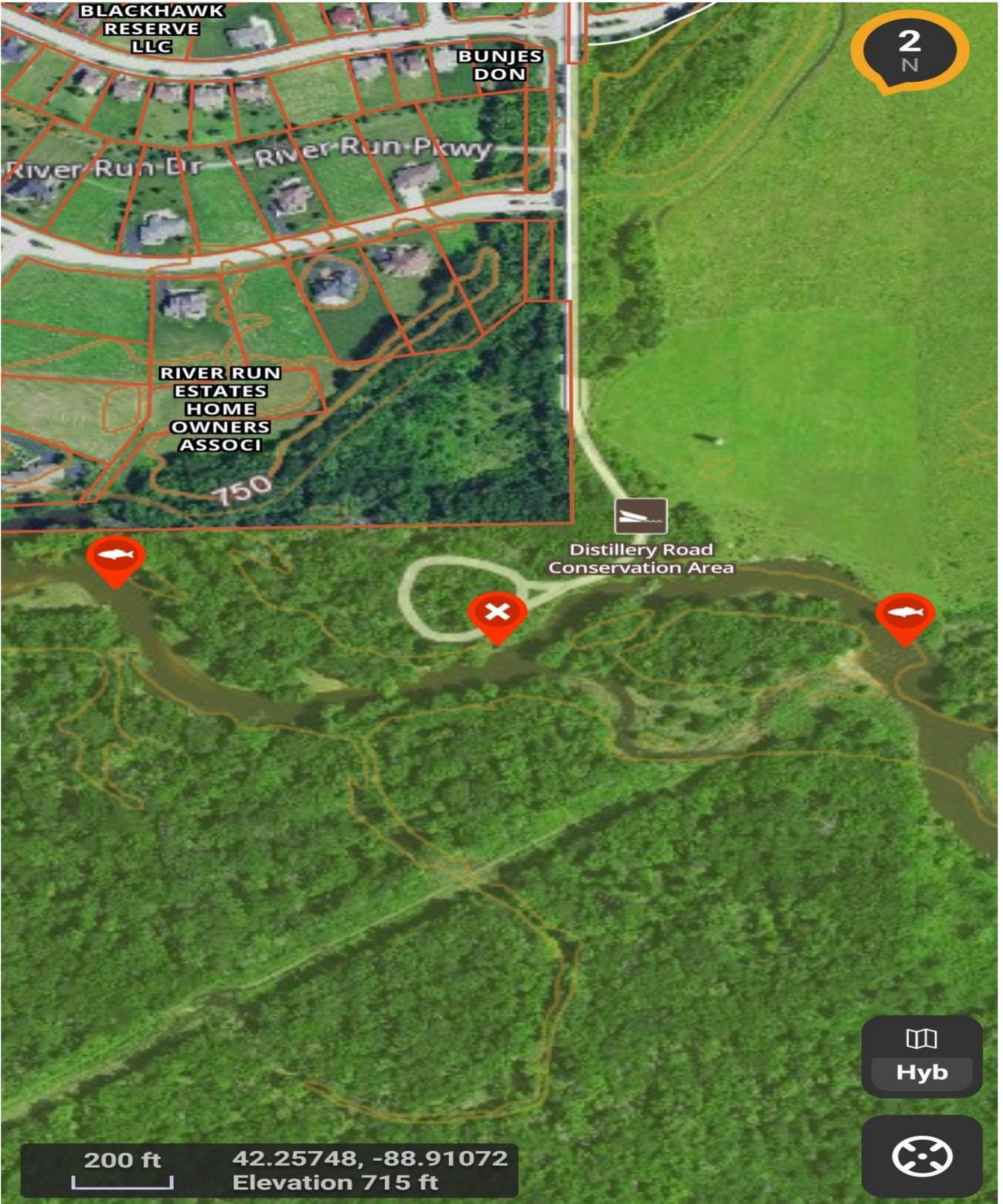
PQ-11 IDNR Sampling Station 7/21/2021

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. The DC electrofishing boat was used to sample an area about 1761' long both downstream and upstream of the canoe launch, for a total sample time of 35 minutes. The water was clear with fast flow, and bottom sediments of 30% sand, 20% gravel, 10% cobble, 20% boulder, 10% submerged logs and 10% silt/mud. Instream cover was provided by boulders (rip/rap), undercut banks, submerged roots, logs, and debris/brush jams. The stream in this area appeared stable, due in part to a past installation of stream barbs along an eroding bank upstream of the canoe launch. The riparian corridor was forested.

A total of 23 native and 1 non-native fish species were collected. Large fish collected included smallmouth bass, channel catfish, freshwater drum, rock bass, walleye, green sunfish, common carp, and 9 different species of suckers. Smaller fish include stonecat, Johnny darter, and 4 species of native minnows. The IBI for this area was calculated at 50 in 2021. Slightly below the 57 in 2016, and the scores of 60 in 2011, and 57 in 2006. The area contains excellent species diversity and should be considered a high quality area. Fish flesh samples were taken from 2 size groups of smallmouth bass, 2 size groups of channel catfish and 1 size group of common carp from this station for IEPA analysis.



PQ-09 Upstream view 7/14/2021



PQ-09 IDNR Sampling Station 7/14/2021

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 DC electrofishing boat was used to sample an area .67 miles long for a total sample time of 33 minutes. Sampling efficiency was good. Bottom sediments were firm with 20% sand, 20% gravel, 20% cobble, 20% boulders and 20% silt/mud. Instream cover was provided by boulders, undercut banks, submerged roots, submerged logs, and debris/brush jams. One long pool and one run were sampled with a nice riffle at the upper and lower end of the station. The riparian corridor was forested. Average width of the stream in this area was 150', with an average depth of 2.5'.

A total of 20 native fish species and 1 non-native fish species was collected. Larger fish collected included rock bass, smallmouth bass, white bass, freshwater drum, channel and flathead catfish, common carp, and 8 species of native suckers. Smaller fishes included 4 minnow species, bluegill, and green sunfish. The IBI for this station was a 43 in 2021. This was lower than the 47 in 2016. And this is down more significantly from the values calculated in prior years (2011- 50, 2006-52, 2001-50) which were all "A" ratings. The channel catfish and smallmouth bass populations at this station were both composed of a high percentage of quality size fish. 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. Fish flesh samples were taken on 3 size groups of common carp, 3 size groups of channel catfish, 1 size group of freshwater drum and 1 size group of smallmouth bass. These samples will be analyzed by the IEPA for levels of contaminants.



PQ-12 Upstream view, Blake Bushman and smallmouth bass 7/15/2021



PQ-12 IDNR Sampling Station 7/15/2021

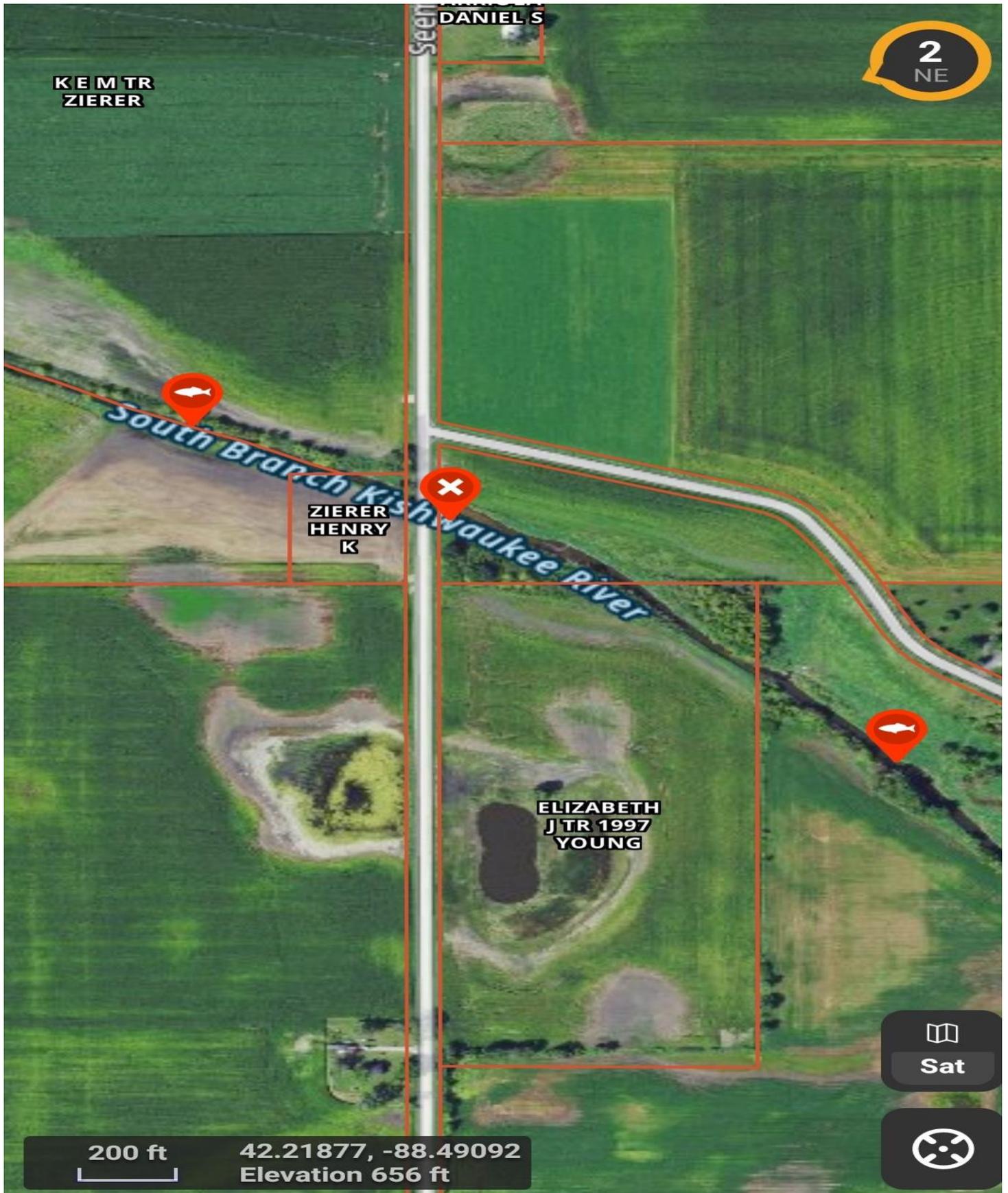
Kishwaukee River North Branch Tributaries: Three tributaries were sampled on the North Branch of the Kishwaukee River. One sample was taken from each of the following streams; the South Fork of the North Branch of the Kishwaukee River, Piscasaw Creek, and two sites on Beaver Creek were sampled. The results 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 DC electrofishing boat was used to sample an area 1719' long X 35' wide for a total sample time of 28 minutes. The average depth at this station was 1.5' over a bottom of 20% silt/mud, 20% gravel, 5% detritus, 10% vegetation, 5% submerged logs and 40% sand. Instream habitat consisted of undercut banks, submerged roots, and submerged logs. The submerged aquatic vegetation was composed of coontail and elodea. The stream in this area was channelized between agricultural fields with a thin riparian zone. A series of beaver dams were present at the lower end of this station.

A total of 25 native fish species were collected from this station including a large number of central mudminnows. Also collected were bluegill, pumpkinseed sunfish, green sunfish, black and yellow bullhead, tadpole madtom, northern pike, largemouth bass, rock bass, grass pickerel, 4 species of native suckers, 7 species of minnows, and 3 species of darters. The IBI for this station was calculated at 47 in 2021 and was a slight improvement of the 45 in 2016. These values were much better than the past score of 34 in 2006. This area was not scored in 2011 due to high water which made sampling very difficult in that year, and resulted in the collection of very few fish.



PQI-10 Upstream view 7/20/2021



PQI-10 IDNR Sampling Station 7/20/2021

Piscasaw Creek – PQE-12: The Piscasaw Creek sampling station was located near the Stimes Conservation Area, located along Mill Road, southeast of Capron, IL. A 639’ stretch of stream was sampled using the DC electrofishing boat for a total sample time of 25 minutes. The sampling site contained 2 riffles, 2 runs and 1 large pool. The mean depth at this station was 2’ and the mean width was 50’. Bottom sediments consisted of 25% silt/mud, 25% sand, 15% gravel, 10% cobble, 5% boulder, 5% claypan, 5% detritus, 5% vegetation and 5% submerged logs. Instream cover was provided by undercut banks, boulders, submerged roots, logs, and debris/brush jams. A small amount of coontail, elodea and pondweed provided the submerged rooted aquatic plant community.

A total of 24 native fish species and 1 non-native fish species were collected at this site. The larger fish collected included smallmouth bass, rock bass, bluegill, green sunfish, common carp and 6 native sucker species. Smaller fish included stonecats, central mudminnows, 9 species of minnows, stonecats, and 3 species of darters. The IBI was calculated at 56 in 2021. This was a good increase over the 48 in 2016, and to the IBI values recorded in the past at other stations on Piscasaw Creek. Fish flesh samples were taken from 1 size group of common carp at this site for IEPA analysis.



PQE-12 Upstream view with Boone County Conservation Summer Staff 7/19/2021



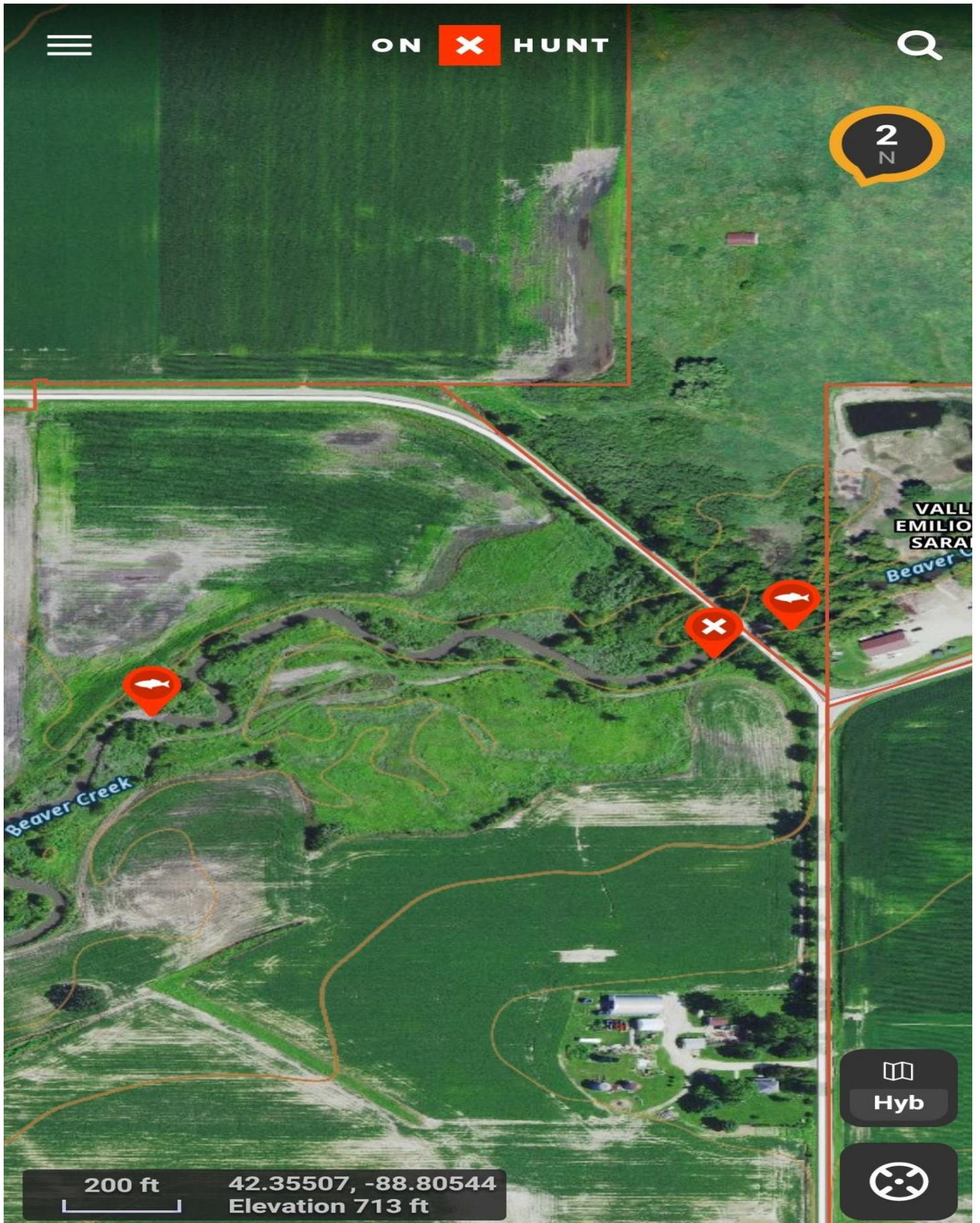
PQE-12 IDNR Sampling Station 7/19/2021

Beaver Creek - PQD-05: This station was located north of Belvidere along Edson Road just downstream of the bridge. The DC electrofishing boat was used to sample an area 1410' X 30' for a total sample time of 27 minutes. Six pools, 6 runs and 3 riffles were sampled. Bottom sediments consisted of 20% silt/mud, 20% sand, 20% gravel, 20% claypan and 20% vegetation. Instream habitat was provided by undercut banks, submerged roots, logs, debris/brush jams, and a dense band of submerged aquatic plants. The aquatic plants were composed of elodea, milfoil, pondweeds and duckweed.

A total 29 native fish species and 2 non-native fish species were collected at this station. Large species collected from this area included black bullhead, green sunfish, bluegill, rock bass, smallmouth bass, largemouth bass, brown trout (non-native), common carp (non-native), and channel catfish. Smaller fishes included 5 species of native suckers, 6 species of minnows, stonecats, and 5 species of darters. The IBI for this station was calculated at 53 in 2021. This was an increase from the 47 in 2016, and well above the 40 calculated in 2011 from a station located at the Squaw Prairie Road Bridge, downstream of Edson Road. The 2021 value of 53 was similar to the 54 calculated in 2006 at the Routh 20 station and the 53 in 2001 and 54 in 1997.



PQD-05, Brown Trout collected on 7/16/2021



PQD-05 IDNR Sampling Station 7/16/2021

Beaver Creek – PQD-06: Beaver Creek was also sampled further upstream along Hunter Road. The DC electrofishing boat was used to sample a station that was 510' long X 10' wide for a total sample time of 10 minutes. Bottom sediments consisted of 50% silt/mud, 25% sand and 25% claypan. The stream in this section was a channelized ditch that had a more natural riparian zone upstream of the bridge. Instream habitat was provided by undercut banks, submerged roots, and overhanging terrestrial grasses and forbs. One riffle of large rip rap was present under and upstream of the road bridge. The rest of the station was pooled with little flow.

A total of 11 native species were collected. The collection was dominated by white suckers and creek chubs. Also present were common shiner, central stonerollers, bluntnose minnow, blacknose dace, southern redbelly dace, bigmouth shiner, Johnny darter, green sunfish and largemouth bass. The IBI was calculated at 30 in 2021 and a 36 in 2016, which indicates an impaired stream.



PQD-06 Downstream view 7/15/2021

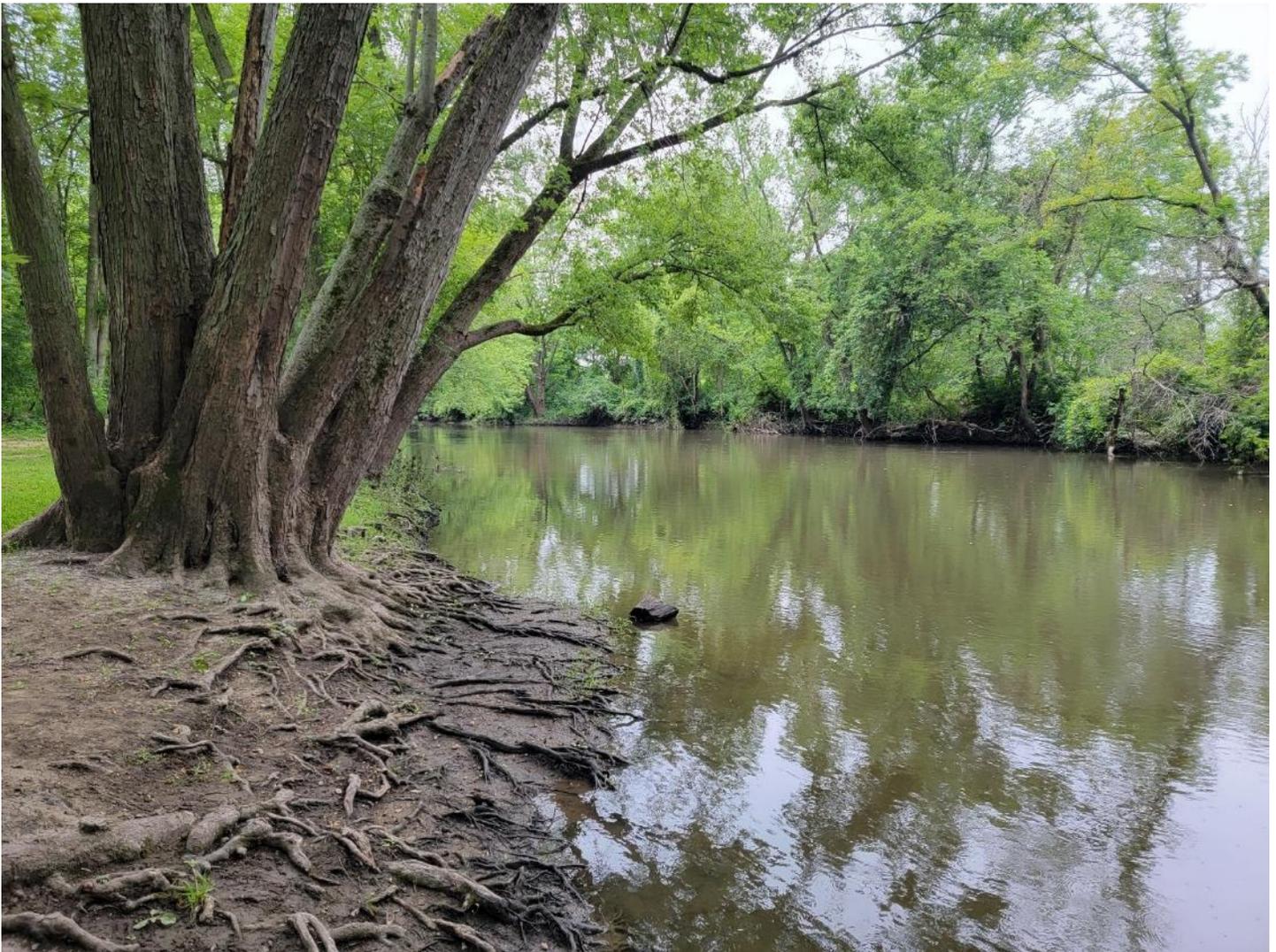


PQD-06 IDNR Sampling Station 7/15/2021

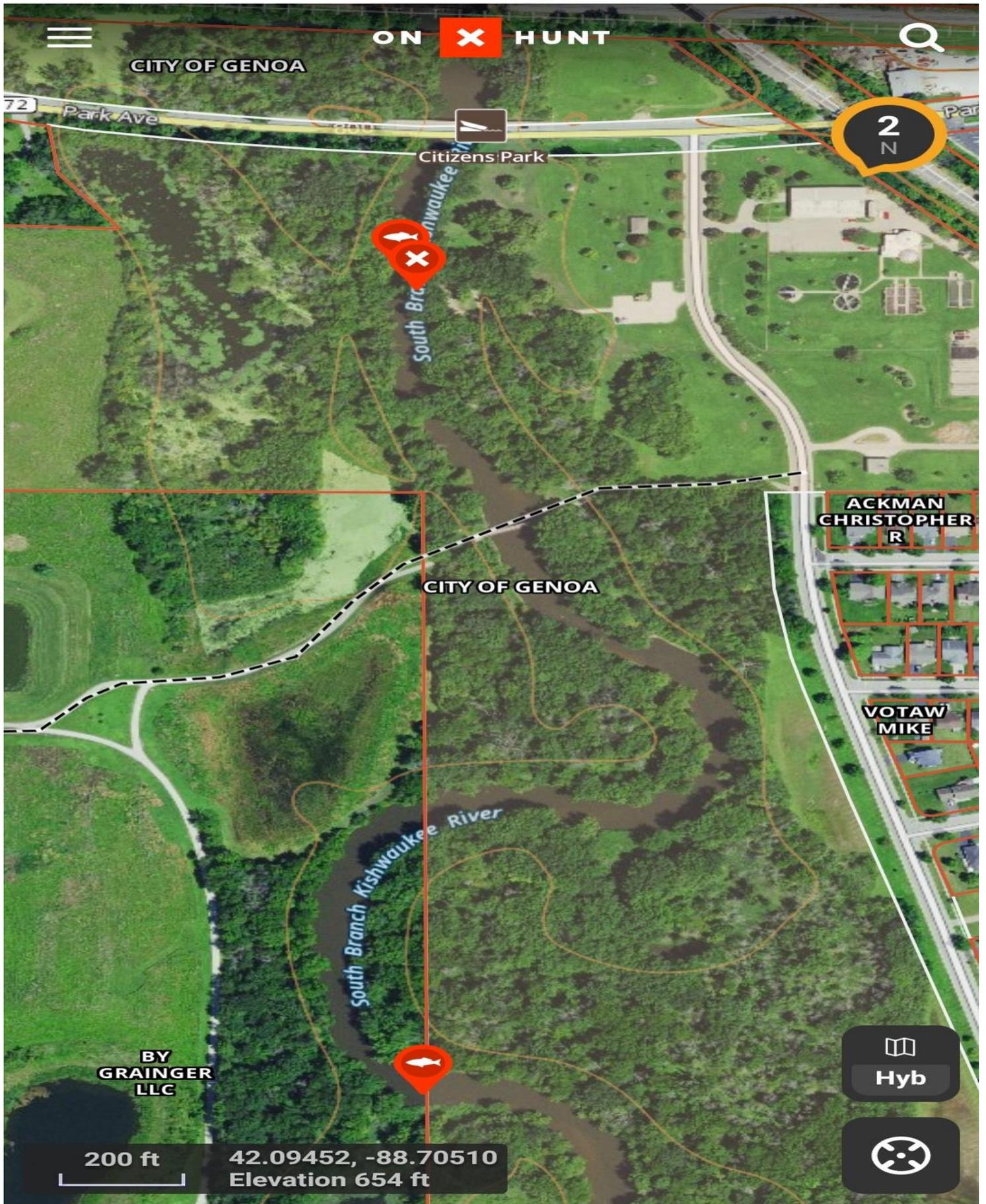
Kishwaukee River South Branch Main Stem

South Branch Kishwaukee River - PQC-01: The main stem of the South Branch of the Kishwaukee River was sampled in 4 locations. This station was located in Genoa at David Carroll Memorial Park off Rt. 72, on the west edge of town. The DC electrofishing boat was used to sample an area 2760' long by 40' wide for a total sample time of 25 minutes. Average depth was 2.0'. The stream in this area had with bottom sediments of 25% sand, 25% gravel, 25% cobble, 10% silt/mud and 15% woody habitat. Instream cover was provided by numerous log jams, undercut banks, a few boulders, woody debris, and submerged roots. Good diversity in the riparian zone including 2 stream bank stabilization sites that were lined with rip rap. Three riffles were present with fast flow and cobble bases. Water stargrass and sagittaria were present in shallow areas.

A total of 22 native species and 1 non-native species were collected. Large fish collected include 9 species of native suckers, common carp, rock bass, bluegill, green sunfish, gizzard shad, channel catfish, smallmouth bass, and freshwater drum. Smaller fish included 6 species of minnows which included the state threatened gravel chub. The IBI score for this station was a 53 in 2021. This is an increase from the score of 47 in 2016. These IBI scores compare favorably to the previous station (PQC-13) located upstream a few miles. This upstream station scored a 48 in 2011, and a 32 in both 2006 and 2001.



PQC-01 Upstream view 7/12/2021



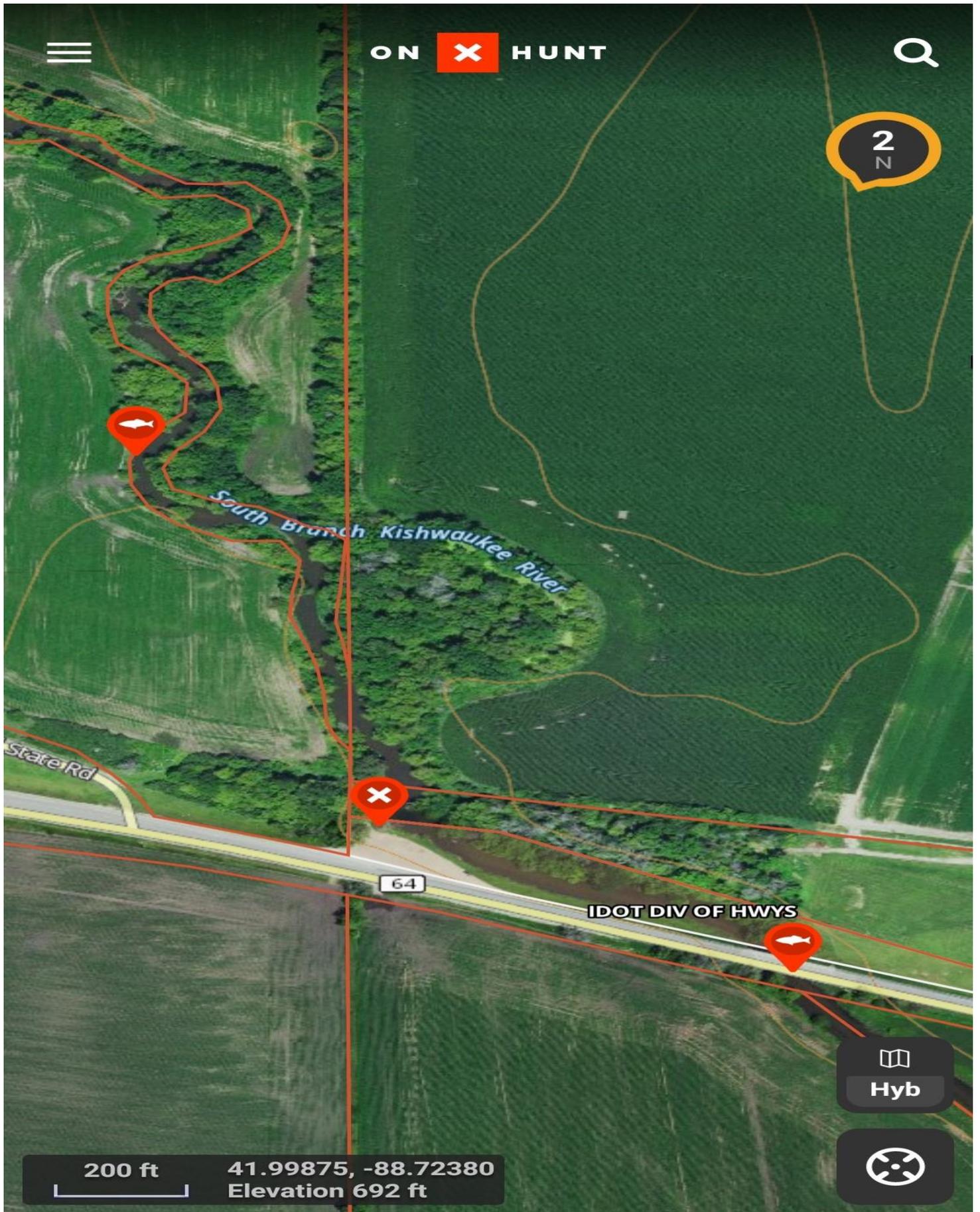
PQC-01 IDNR Sampling Station 7/12/2021

South Branch Kishwaukee River - PQC-02: Station PQC-02 was located just east of Sycamore along Route 64 at the public fishing area. The DC electrofishing boat was used to sample an area approximately 1815' long X 35' wide for a total sample time of 40 minutes. The stream in this sampled area was composed of 1 pool, 3 riffles and 4 runs. The bottom composition was 25% sand, 25% gravel, 25% cobble, 10% claypan, 5% submerged vegetation and 10% woody habitat. Instream cover was provided by undercut banks, submerged roots, a few debris-brush jams, a few boulders, and submerged logs. The submerged aquatic plants included milfoil, water stargrass, pondweed and duckweed.

A total 25 native fish species and 1 non-native fish species were collected. Large fishes collected included 7 species of native suckers, northern pike, freshwater drum, smallmouth bass, channel catfish, gizzard shad and common carp. Smaller fishes included rock bass, bluegill, green sunfish, yellow bullheads, banded darter, stonecat and 7 species of minnows including the state threatened gravel chub. The IBI for this station was a 57 in 2021. In 2016 it was a 49, very similar to the value obtained in 2011 and 2006 (46 and 45), but lower than the 54 reported in 2001. Fish flesh samples were taken on 1 size group of smallmouth bass, 1 size group of channel catfish and 2 size groups of common carp for IEPA analysis.



PQC-02 Upstream view 7/12/2021



PQC-02 IDNR Sampling Station 7/12/2021

South Branch Kishwaukee River - PQC-11: This station was located about 7 miles south of Cherry Valley along McNeal Road just downstream of the McNeal Road Bridge. The DC electrofishing boat was used to sample an area about 1029' long X 120' wide for a total sample time of 25 minutes. One riffle, one pool, and two runs were sampled. The bottom sediments consisted of 40% sand, 20% gravel, 20% claypan, and 20% silt/mud. Instream cover was provided by boulders, undercut banks, submerged logs, debris-brush jams, and submerged roots. The eastern shoreline contained a series of rock barbs which created pools with rock substrate.

A total of 23 native fish species and 1 non-native fish species were collected at this site. Larger fishes collected from this station included 8 species of native suckers, smallmouth bass, channel catfish, freshwater drum, gizzard shad, northern pike and common carp. Smaller fishes included 4 species of minnows, rock bass, bluegill, green sunfish, black crappie, blackside darters, and Johnny darters. The IBI score for this station was down a little to a 48 in 2021. In 2016 it was a 54, similar to the 2011 value of 50, which represents 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. In 2001 this area scored an IBI rating of 57. Fish flesh samples were taken on 1 size group of freshwater drum, 1 size group of channel catfish, 1 size group of common carp bass and 2 size groups of smallmouth bass for IEPA analysis.



PQC-11 Upstream view 7/14/2021



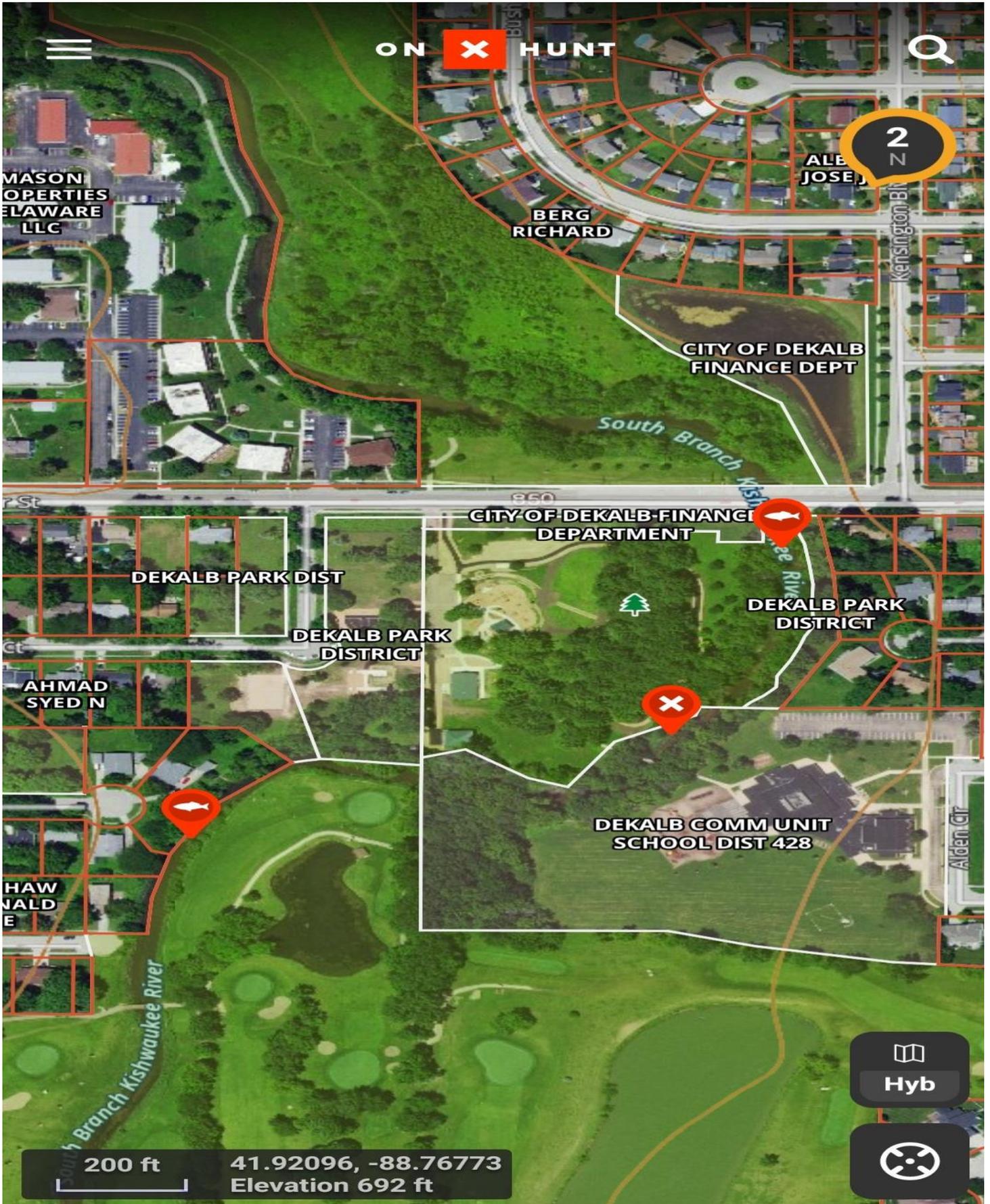
PQC-11 IDNR Sampling station 7/14/2021

South Branch Kishwaukee River – PCQ-99: This station was located in the city of DeKalb at Lions Park on Taylor Street. The DC electrofishing boat was used to sample a stretch 1350' long X 35' wide for a total sample time of 17 minutes. Two pools, 4 riffles, and 3 runs were sampled. Bottoms sediments in this area consisted of 15% silt/mud, 30% sand, 15% gravel, 15% cobble, 10% submerged logs, and 5% vegetation. Instream cover was provided by boulders, undercut banks, submerged roots, logs and debris/brush jams. The submerged aquatic vegetation was composed of milfoil and elodea. The stream bank had been stabilized with rock, rip rap and bricks. A large number of crayfish were observed at this site.

A total of 24 native fish species, 1 hybrid and 1 non-native fish species were collected. Larger fish collected at this station included 4 native suckers, northern pike, common carp, channel catfish, bigmouth buffalo and smallmouth bass. Smaller fish included 8 species of minnows, rock bass, bluegill, green sunfish, bluegill x green sunfish hybrid, stonecat, yellow bullhead, and 2 species of darters. The IBI for this station was a 52 in 2021. This is a substantial increase over the IBI of 39 in 2016. A longer stretch of stream and more habitat diversity included in 2021 may explain some of the increase of the IBI value.



PCQ-99 Upstream view 7/13/2021



PQC-99 IDNR Sampling Station 7/13/2021

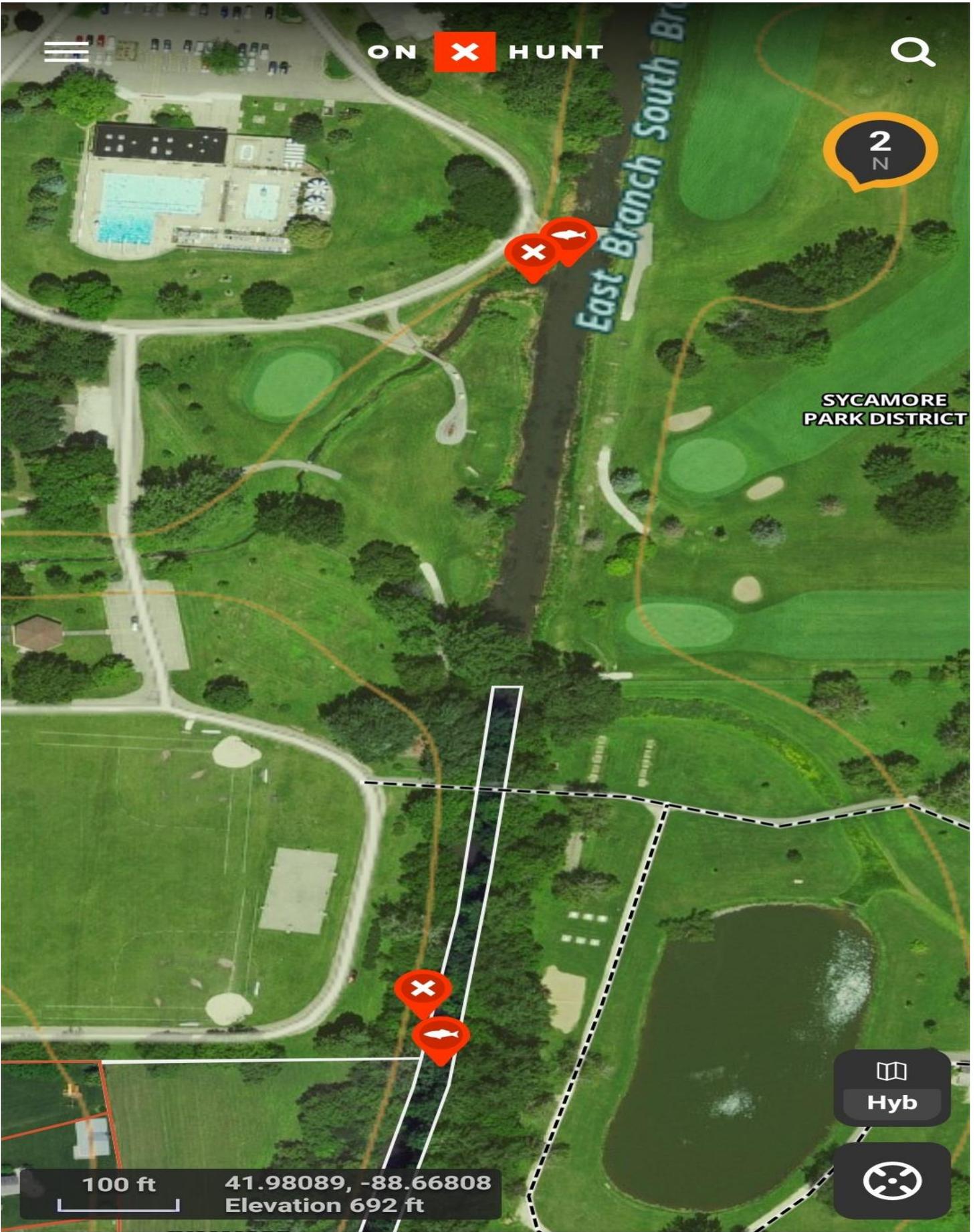
Kishwaukee River South Branch Tributary and Kilbuck Creek: One tributary was sampled on the South Branch of the Kishwaukee River, and Kilbuck Creek, which joins the Kishwaukee River near the Kishwaukee River/Rock River junction, was sampled. The results of these surveys are presented below.

East Fork of the South Branch of the Kishwaukee River - PQCL-03: This stream was sampled upstream of Airport Road in a city park owned by the city of Sycamore next to the Sycamore Golf Course. The DC electrofishing boat was used to sample an area 1068' long X 25' wide for a total sample time of 18 minutes. Bottom sediments consisted of 15% silt/mud, 65% sand, 15% gravel, and 5% aquatic vegetation. Two runs, 2 riffles and 1 pool were sampled. The stream in this area was channelized with steep vertical banks on both sides. Upper half of this station had a full riparian zone of trees. Instream cover was provided by limited undercut banks, submerged roots, brush-debris jams, submerged logs, and fringe of aquatic vegetation. This vegetation was composed of elodea, milfoil and pondweed.

A total of 25 native species of fish, 1 hybrid and 1 non-native species were collected. The larger fish included 5 species of native suckers, channel catfish, smallmouth bass, largemouth bass, bigmouth buffalo, northern pike, and freshwater drum. The smaller fishes collected included bluegill, green sunfish, bluegill x green sunfish hybrid, rock bass, black crappie, 7 species of minnows, and 2 species of darters. The IBI for this station was calculated at a 54 in 2021. In 2016 it was a 54, very close to all of the previous values with all scored in the "A" range. It is surprising that this small, channelized tributary consistently rates in the A category.



PQCL-03 Upstream view 7/13/2021



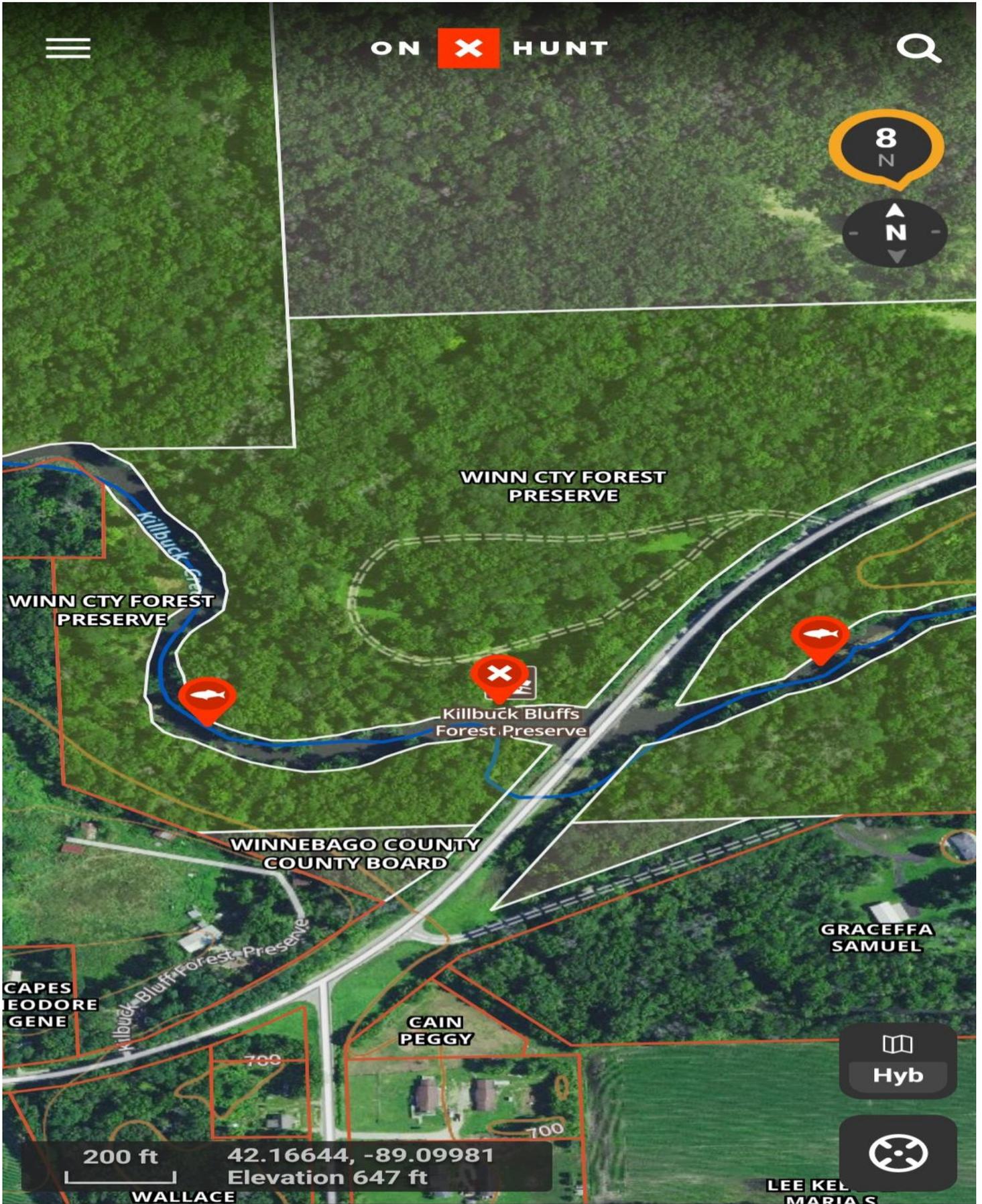
PQCL-03 IDNR Sampling Station 7/13/2021

Kilbuck Creek - PQB-03: This station was located southwest of New Milford in Kilbuck Bluffs Forest Preserve along Baxter Road. The DC electrofishing boat was used to sample an area both downstream and upstream of the bridge for a station about 795' long x 60' wide, for a total sample time of 33 minutes. Bottom sediments consisted of 15% silt-mud, 25% sand, 25% gravel, 25% cobble, 10% boulder, 5% submerged logs and 5% aquatic vegetation. One pool, 2 riffles, and 2 runs were sampled. The instream cover was provided by boulders, submerged logs, undercut banks, debris/brush jams, and submerged aquatic vegetation. This vegetation composition was elodea, pondweeds and coontail.

A total of 34 native fish species were collected at this station! Larger fish collected included smallmouth bass, walleye, northern pike, channel catfish, largemouth bass, and 8 species of native suckers. Smaller fish included bluegill, green sunfish, orange spotted sunfish, rock bass, yellow perch, stonecat, grass pickerel, 9 species of minnows, 3 species of darters, and the state threatened American Brook Lamprey. The IBI for this station was calculated at 57 in 2021. In 2016 it was a 50, very similar to the 2011 value of 51, and 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. Fish flesh samples were taken from 1 size group of channel catfish, 1 size group of freshwater drum, and 1 size group of smallmouth bass for IEPA analysis.



PQB-03 Upstream view 7/19/2021



PQB-03 IDNR Sampling Station 7/19/2021

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. PQC-99, The South Branch of the Kishwaukee River in Dekalb saw a definite improvement from a C rating to an A rating in 2021. While the upper end of Beaver Creek (PQD-06) and the upper end of the North Branch of the Kishwaukee (PQ-13) both continued with their historic low IBI levels in the C to D range. Both of these sites have negative influences of channel modification from agriculture and/or urbanization.

Table 2 lists the IBI rating for each station and for each of the years where data is available. Tables 3, 4, and 5 contain a list of all of the fishes collected during this survey and sorted by the stations where they were collected. Below is an explanation of the IBI ratings system.

IBI Scores	Integrity Class	Attributes
51-60	Unique Aquatic Resource (A)	Comparable to the best situations without human disturbances, all regionally expected species for the habitat and stream size, including the most tolerant forms, are present with a full array of age classes, balanced trophic structure.
41-50	Highly Valued Aquatic Resource (B)	Species richness somewhat below expectations, especially due to the loss of the most intolerant forms, some species are present with less than optimal abundance of size distributions; trophic structure shows some signs of stress.
31-40	Moderate Aquatic Resource (C)	Signs of additional deterioration include loss of intolerant forms, fewer species, and highly skewed trophic structure, older age classes of top predators may be rare.
21-30	Limited Aquatic Resource (D)	Dominated by omnivores, tolerant forms, and habitat generalists, few top carnivores, growth rates and condition factors commonly depressed; hybrids and diseased fish are often present.
< 21	Restricted Aquatic Resource (E)	Few fish present, mostly introduced or tolerant forms; hybrids common; disease, parasites, fin damage and other anomalies regular.

Sportfish

The most common collected sport fish on the Kishwaukee Basin Survey in 2021 was the smallmouth bass, which was collected at 13 of the stations, for a total of 198 collected (Tables 6 and 7). The size structure of the smallmouth bass from the 5 North Branch of the Kishwaukee River stations was also good with 38% over 14 inches in length, and 15% over 17 inches in length. The size structure of the smallmouth bass from the 4 South Branch of the Kishwaukee River stations was also good with 33% over 14 inches in length, and 12% over 17 inches in length.

Bluegill was the second most common collected sport fish, found at 12 stations, for a total of 137 collected.

Channel Catfish were also common with a total collection of 80 fish from 9 of the stations. The size structure of

the channel catfish from the 5 North Branch of the Kishwaukee River stations was good with 90% over 24 inches in length, and 2% over 28 inches in length. The size structure of the channel catfish from the 4 South Branch of the Kishwaukee River stations was lower with only 18% over 24 inches in length, and 0% over 28 inches in length.

And the larger sportfish included the collection of a total of 40 northern pike from 10 stations. The size structure of the northern pike from the 5 North Branch of the Kishwaukee River stations was good with 17% over 28 inches in length. The size structure of the northern pike from the 4 South Branch of the Kishwaukee River stations was also good with 20% over 28 inches in length.

Other notable sportfish populations included the collection of 48 Rock Bass from 13 stations and 36 Largemouth Bass from 8 of the stations.

Rare and Endangered Species

Two species of threatened and/or endangered fish were collected during this survey. The first was the gravel chub (*Erimystax x-punctatus*), which were collected in the South Branch of the Kishwaukee River at both stations PQC-01 and PQC-02 in DeKalb County. This is much further upstream than previous collections. Historically the gravel chub has been found at PQC-11 on the South Branch of the Kishwaukee River near the McNeal Road Bridge. 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 was not surprising.

The second state threatened species collected with this survey was the American Brook lamprey (*Lethenteron appendix*). A total of 9 American Brook lamprey ammocoetes were collected at 3 stations. PQ-07 and PQ-11 on the North Branch of the Kishwaukee River had 7 individual fish and PQB-03 on Kilbuck Creek had 2 individuals. Adult American Brook lamprey were also collected at several sites on the Rock River in the fall of 2020.

Overall, the Kishwaukee Basin appears to be in good shape judging from the good fish diversity and stable IBI ratings. Only a few areas were scored low with increasing impacts, most likely due to increasing development in these upstream areas.

Stream Name	Station	2001	2006	2011	2016	2021	IBI
							Rating
North Branch Kishwaukee River	PQ-07	43	30	44	45	50	A
North Branch Kishwaukee River	PQ-09	****	57	60	57	50	A
North Branch Kishwaukee River	PQ-11	****	****	****	****	49	B
North Branch Kishwaukee River	PQ-12	50	52	50	47	43	B
North Branch Kishwaukee River	PQ-14	57	41	37	****	****	C
Kilbuck Creek	PQB-03	41	56	51	50	57	A
Kilbuck Creek	PQB-06/07	****	****	45	55	****	A
South Branch Kishwaukee River	PQC-01	****	****	****	47	53	A
South Branch Kishwaukee River	PQC-13	32	32	48	****	****	B
South Branch Kishwaukee River	PQC-02	54	45	46	49	57	A
South Branch Kishwaukee River	PQC-11	57	44	50	54	48	B
South Branch Kishwaukee River	PQC-99	****	****	****	39	52	A
East Branch of South Fork Kishwaukee	PQCL-03	53	54	52	54	54	A
Beaver Creek	PQD-10/05	53	54	40	47	53	A
Beaver Creek	PQD-06	****	****	****	36	30	C
North Branch Kishwaukee River	PQ-13	24	34	****	35	28	D
Piscasaw Creek	PQE-06/04	52	51	45	52	****	A
Piscasaw Creek	PQE-12	****	****	****	48	56	A
Rush Creek	PQH-01	55	53	50	58	****	A
South Fork of North Branch Kishwaukee	PQI-10	****	34	****	45	47	B
North Fork of North Branch Kishwaukee	PQJ-01	54	50	55	48	****	B

Table 2: Index of Biotic Integrity ratings for stations sampled on the Kishwaukee River Basin in 2001, 2006, 2011, 2016 and 2021. (50-60 = A rating, 40-49 = B rating, 30-39 = C rating, 20-29 = D rating).

County	McHenry	Boone	Boone	Winnebago	McHenry
Station	PQ-07	PQ-09	PQ-11	PQ-12	PQ-13
Date	2021-07-21	2021-07-14	2021-07-21	2021-07-15	2021-07-20
Minutes	23	35	25	33	24
No. seine hauls	0	0	0	0	0
Common name					
American Brook Lamprey	2	0	5	0	0
Gizzard Shad	0	0	0	7	0
Brown Trout	0	0	0	0	0
Central Mudminnow	0	0	0	0	0
Grass Pickerel	1	0	0	0	0
Northern Pike	11	1	2	0	12
Common Carp	10	3	1	12	0
Golden Shiner	0	0	0	0	1
Southern Redbelly Dace	0	0	0	0	0
Creek Chub	0	0	0	0	0
Hornyhead Chub	0	0	1	0	0
Central Stoneroller	0	0	1	0	0
Largescale Stoneroller	0	0	0	0	0
Blacknose Dace	0	0	0	0	0
Gravel Chub	0	0	0	0	0
Common Shiner	2	0	0	0	0
Redfin Shiner	0	0	0	0	0
Spotfin Shiner	32	44	37	41	0
Bluntnose Minnow	8	1	11	2	0
Emerald Shiner	0	0	0	7	0
Rosyface Shiner	0	9	0	0	0
Bigmouth Shiner	0	0	1	0	0
Sand Shiner	4	4	292	13	0
Spottail Shiner	0	23	0	0	0
Bigmouth Buffalo	0	0	0	0	0
Quillback	9	4	3	6	0
River Carpsucker	0	3	0	4	0
Highfin Carpsucker	0	5	0	0	0
White Sucker	3	7	13	7	9
Northern Hog Sucker	3	11	3	0	0
Shorthead Redhorse	6	25	6	3	1
Black Redhorse	0	2	4	20	0
Golden Redhorse	13	62	31	44	0
Silver Redhorse	1	8	4	5	0
Channel Catfish	0	12	0	29	0
Yellow Bullhead	4	0	3	0	51
Black Bullhead	1	0	0	0	0
Flathead Catfish	0	0	0	2	0

Stonecat	1	1	1	0	0
Tadpole Madtom	0	0	0	0	0
Blackstripe Topminnow	0	0	0	0	4
White Bass	0	0	0	2	0
Black Crappie	0	0	2	0	0
Rock Bass	2	2	2	6	0
Largemouth Bass	3	0	16	0	1
Smallmouth Bass	1	34	7	43	1
Green Sunfish	5	3	20	6	2
Bluegill x Green Sunfish	0	0	0	0	0
Bluegill	7	0	18	15	0
Pumpkinseed	1	0	0	0	0
Orangespotted Sunfish	0	0	0	0	0
Walleye	0	2	0	0	0
Yellow Perch	0	0	0	0	0
Blackside Darter	0	0	0	0	1
Logperch	0	0	2	0	0
Johnny Darter	1	1	1	0	0
Banded Darter	1	0	1	0	0
Rainbow Darter	2	0	0	0	0
Fantail Darter	0	0	0	0	0
Freshwater Drum	0	3	0	9	0
Total no. individuals	134	270	488	283	83
No. native species	25	23	26	20	10
No. non-native species	1	1	1	1	0
No. hybrid species	0	0	0	0	0

Table 3: Fishes collected from the Kishwaukee River (PQ) in the Kishwaukee River Basin Survey in 2021.

County	Boone	Boone	Boone	McHenry
Stream name	Beaver Creek (PQD)	Beaver Creek (PQD)	Piscasaw Creek (PQE)	South Branch-East (PQI)
Station	PQD-05: Poplar Grove	PQD-06	PQE-12: Stimes Conservation Area	PQI-10: Union
Date	2021-07-16	2021-07-15	2021-07-19	2021-07-20
Minutes	27	10	25	28
No. seine hauls	0	0	0	0
Common name				
American Brook Lamprey	0	0	0	0
Gizzard Shad	0	0	0	0
Brown Trout	3	0	0	0
Central Mudminnow	0	0	2	50
Grass Pickerel	0	0	0	1
Northern Pike	0	0	0	7
Common Carp	3	0	3	0
Golden Shiner	0	0	0	3
Southern Redbelly Dace	0	1	0	0
Creek Chub	21	64	20	1
Hornyhead Chub	1	0	3	0
Central Stoneroller	16	46	52	0
Largescale Stoneroller	7	0	136	0
Blacknose Dace	14	4	0	0
Gravel Chub	0	0	0	0
Common Shiner	21	1	61	12
Redfin Shiner	0	0	0	0
Spotfin Shiner	19	0	4	9
Bluntnose Minnow	81	34	7	14
Emerald Shiner	0	0	0	0
Rosyface Shiner	20	0	0	0
Bigmouth Shiner	29	3	7	0
Sand Shiner	46	0	59	10
Spottail Shiner	0	0	0	0
Bigmouth Buffalo	0	0	0	0
Quillback	8	0	12	0
River Carpsucker	1	0	0	0
Highfin Carpsucker	0	0	0	0
White Sucker	292	157	30	59
Northern Hog Sucker	0	0	41	3
Shorthead Redhorse	6	0	7	12
Black Redhorse	0	0	0	0

Golden Redhorse	11	0	7	11
Silver Redhorse	0	0	18	0
Channel Catfish	2	0	0	0
Yellow Bullhead	0	0	0	6
Black Bullhead	2	0	0	3
Flathead Catfish	0	0	0	0
Stonecat	1	0	12	0
Tadpole Madtom	0	0	0	2
Blackstripe Topminnow	0	0	0	6
White Bass	0	0	0	0
Black Crappie	0	0	0	0
Rock Bass	1	0	4	3
Largemouth Bass	1	1	0	7
Smallmouth Bass	1	0	9	0
Green Sunfish	2	7	1	15
Bluegill x Green Sunfish	0	0	0	1
Bluegill	1	0	3	21
Pumpkinseed	0	0	0	2
Orangespotted Sunfish	0	0	0	0
Walleye	0	0	0	0
Yellow Perch	0	0	0	0
Blackside Darter	8	0	1	3
Logperch	0	0	0	0
Johnny Darter	35	11	0	10
Banded Darter	15	0	3	10
Rainbow Darter	2	0	4	0
Fantail Darter	3	0	0	0
Freshwater Drum	0	0	0	0
Total no. individuals	673	329	506	281
No. native species	29	11	24	25
No. non-native species	2	0	1	0
No. hybrid species	0	0	0	1

Table 4: Fishes collected from the Kishwaukee River North Branch Tributaries of the Kishwaukee Basin Survey in 2021.

County	Winnebago	DeKalb	DeKalb	DeKalb	DeKalb	DeKalb
Stream name	Killbuck Creek (PQB)	S Br Kishwaukee River (PQC)	E Br S Br Kishwaukee River (PQCL)			
Station	PQB-03: Kilbuck Bluffs	PQC-01: Genoa	PQC-02: Sycamore	PQC-11: Fairdale	PQC-99: Lions Park DeKalb	PQCL-03: Sycamore Golf Course
Date	2021-07-19	2021-07-12	2021-07-12	2021-07-14	2021-07-13	2021-07-13
Minutes	33	25	40	25	17	18
No. seine hauls	0	0	0	0	0	0
Common name						
American Brook Lamprey	2	0	0	0	0	0
Gizzard Shad	0	1	5	3	0	0
Brown Trout	0	0	0	0	0	0
Central Mudminnow	0	0	0	0	0	0
Grass Pickerel	2	0	0	0	0	0
Northern Pike	1	0	2	1	2	1
Common Carp	0	2	13	3	5	1
Golden Shiner	0	0	0	0	0	0
Southern Redbelly Dace	0	0	0	0	0	0
Creek Chub	1	0	0	3	9	2
Hornyhead Chub	0	0	0	0	0	0
Central Stoneroller	3	0	0	0	2	5
Largescale Stoneroller	0	0	4	0	0	0
Blacknose Dace	0	0	0	0	0	0
Gravel Chub	0	1	2	0	0	0
Common Shiner	7	0	6	0	7	0
Redfin Shiner	0	0	0	0	1	0
Spotfin Shiner	26	204	53	19	20	23
Bluntnose Minnow	21	21	5	7	21	14
Emerald Shiner	0	0	0	0	0	0

Rosyface Shiner	21	13	12	0	6	9
Bigmouth Shiner	1	0	0	0	2	0
Sand Shiner	61	7	4	100	43	47
Spottail Shiner	0	0	0	0	0	0
Bigmouth Buffalo	0	0	0	0	7	1
Quillback	0	19	2	5	2	0
River Carpsucker	2	3	0	0	0	0
Highfin Carpsucker	1	8	3	3	0	0
White Sucker	4	16	31	2	36	13
Northern Hog Sucker	5	14	9	14	6	11
Shorthead Redhorse	9	13	7	3	0	2
Black Redhorse	12	6	0	22	0	0
Golden Redhorse	30	63	42	37	26	42
Silver Redhorse	5	7	12	3	0	2
Channel Catfish	5	2	8	8	4	10
Yellow Bullhead	0	0	3	0	2	1
Black Bullhead	0	0	0	0	0	0
Flathead Catfish	0	0	0	0	0	0
Stonecat	2	0	1	0	3	0
Tadpole Madtom	0	0	0	0	0	0
Blackstripe Topminnow	2	3	0	0	0	1
White Bass	0	0	0	0	0	0
Black Crappie	0	0	0	1	0	1
Rock Bass	4	2	3	3	3	13
Largemouth Bass	4	0	0	0	0	3
Smallmouth Bass	26	21	9	42	3	1
Green Sunfish	11	2	1	1	5	1
Bluegill x Green Sunfish	0	0	0	0	3	1
Bluegill	6	13	9	2	12	30
Pumpkinseed	0	0	0	0	0	0
Orangespotted Sunfish	1	0	0	0	0	0

Walleye	1	0	0	0	0	0
Yellow Perch	1	0	0	0	0	0
Blackside Darter	2	0	0	1	9	4
Logperch	0	0	0	0	0	0
Johnny Darter	0	0	0	1	0	1
Banded Darter	1	0	3	0	2	0
Rainbow Darter	3	0	0	0	0	0
Fantail Darter	0	0	0	0	0	0
Freshwater Drum	6	1	1	3	0	1
Total no. individuals	289	442	250	287	241	241
No. native species	34	22	25	23	24	25
No. non-native species	0	1	1	1	1	1
No. hybrid species	0	0	0	0	1	1

Table 5: Fishes collected from the Kishwaukee River South Branch Main Stem, Tributaries and Kilbuck Creek from the Kishwaukee Basin Survey in 2021.

County		McHenry	Boone	Boone	Winnebago	McHenry	Winnebago
Station		PQ-07	PQ-09	PQ-11	PQ-12	PQ-13	PQB-03
Common name	Total						
Brown Trout	3	0	0	0	0	0	0
Grass Pickerel	4	1	0	0	0	0	2
Northern Pike	40	11	1	2	0	12	1
Channel Catfish	80	0	12	0	29	0	5
Yellow Bullhead	70	4	0	3	0	51	0
Black Bullhead	6	1	0	0	0	0	0
Flathead Catfish	2	0	0	0	2	0	0
White Bass	2	0	0	0	2	0	0
Black Crappie	4	0	0	2	0	0	0
Rock Bass	48	2	2	2	6	0	4
Largemouth Bass	36	3	0	16	0	1	4
Smallmouth Bass	198	1	34	7	43	1	26
Green Sunfish	82	5	3	20	6	2	11
Bluegill x Green Sunfish	5	0	0	0	0	0	0
Bluegill	137	7	0	18	15	0	6
Pumpkinseed	3	1	0	0	0	0	0
Walleye	3	0	2	0	0	0	1
Yellow Perch	1	0	0	0	0	0	1

Table 6: Sport fish collected from the Kishwaukee Basin during the summer of 2021.

County		DeKalb	DeKalb	DeKalb	DeKalb	DeKalb	Boone	Boone	Boone	McHenry
Station		PQC-01	PQC-02	PQC-11	PQC-99	PQCL-03	PQD-05	PQD-06	PQE-12	PQI-10
Common name	Total									
Brown Trout	3	0	0	0	0	0	3	0	0	0
Grass Pickerel	4	0	0	0	0	0	0	0	0	1
Northern Pike	40	0	2	1	2	1	0	0	0	7
Channel Catfish	80	2	8	8	4	10	2	0	0	0
Yellow Bullhead	70	0	3	0	2	1	0	0	0	6
Black Bullhead	6	0	0	0	0	0	2	0	0	3
Flathead Catfish	2	0	0	0	0	0	0	0	0	0
White Bass	2	0	0	0	0	0	0	0	0	0
Black Crappie	4	0	0	1	0	1	0	0	0	0
Rock Bass	48	2	3	3	3	13	1	0	4	3
Largemouth Bass	36	0	0	0	0	3	1	1	0	7
Smallmouth Bass	198	21	9	42	3	1	1	0	9	0
Green Sunfish	82	2	1	1	5	1	2	7	1	15
Bluegill x Green Sunfish	5	0	0	0	3	1	0	0	0	1
Bluegill	137	13	9	2	12	30	1	0	3	21
Pumpkinseed	3	0	0	0	0	0	0	0	0	2
Walleye	3	0	0	0	0	0	0	0	0	0
Yellow Perch	1	0	0	0	0	0	0	0	0	0

Table 7: Sport fish collected from the Kishwaukee Basin during the summer of 2021.

