Forest Preserves of Cook County
Department of Resource Management

Spring Creek - Stream Assessment

1 October 2021

Forest Preserves of Cook County
Department of Resource Management - Fisheries Section

Forest Preserves of Cook County
Department of Resource Management - Wildlife Section

Forest Preserves of Cook County
Department of Resource Management - Ecology Section

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

Spring Creek

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INTRODUCTION:

Spring Creek is located predominantly in the northwest Cook and southeastern McHenry Counties. The creek drains a watershed of approximately 27 square miles in part of the Valparaiso Moraine system and flows through an area of rolling hills and valleys. Flowing south to north, Spring Creek is approximately 13.4-miles long from its headwaters to its confluence with the Fox River. Spring Creek originates is the residential subdivision of "Woods of South Barrington" and flows west for approximately 1.5-miles before entering Spring Creek Valley Headwaters Forest Preserve. From here the creek flow north for seven miles before leaving Cook County. The remaining 5-miles flows through mostly residential area before joining the Fox River. Ten tributaries, totaling an additional 14-miles of stream channel feeds Spring Creek.

Most of the 8.5-miles of Spring Creek that flows through Cook County is on land managed by the Forest Preserves of Cook County. This area is collectively known as the Spring Creek Valley Forest Preserves and consists of 3,910 acres. The 560 acres between Lake-Cook Road on the north and Donlea Road on the south is the Spring Lake Nature Preserve. This area consists of a mixture of woodlands, prairie, marsh, fen, and old field communities. The creek flows through two small glacial lakes known as Spring Lake and Mud Lake. The site was dedicated the States 11th Illinois Nature Preserve in January of 1965

The 950 acres of the Spring Creek Valley Forest Preserve south of Donlea Road and north of Algonquin Road was historically old croplands, drained wetland hayfields and grazing land. This area is undergoing restoration efforts by the Forest Preserves of Cook County and volunteers.

The southernmost section of the Spring Creek Valley Forest Preserve stretches from Penny Road south to Higgins Road and is known as the Spring Creek Valley Headwaters and consists of 1,330-acres. At the north end, Spring Creek flows through Penny Road Pond. This seven-acre pond is managed by the Forest Preserves of Cook County for fishing.

GENERAL:

An assessment of Spring Creek was carried out on 1 October 2021 by the Forest Preserves of Cook County's Department of Resource Management. This assessment was conducted on the stretch of Spring Creek at the southern end of the Nature Preserve just north of Donlea Road and continued south of the road for 107 meters, see Figure 1. This site was chosen for ease of access to the creek and the presence of riffles and pools. North of Donlea Road, the creek bed was made up of fine gravel with some larger cobble that created some small riffles. The creek bed south of Donlea Road was made up of more silt and muck. This area was also highly vegetated with Illinois Pondweed (*Potamogeton illinoensis)*, Curly-leaf Pondweed (*Potamogeton crispus*), and Leafy Pondweed (*Potamogeton foliosus*).

Water samples were collected from one riffle and one pool, and the fish population was sampled for thirty minutes utilizing a backpack electro-fishing unit. A vegetation analyses was carried out by a FPCC's Department of Resource Management ecologist. General stream information and sampling conditions are represented below in Table 1.

FIGURE 1: MAP OF SURVEY LOCATION AT SPRING LAKE NATURE PRESERVE

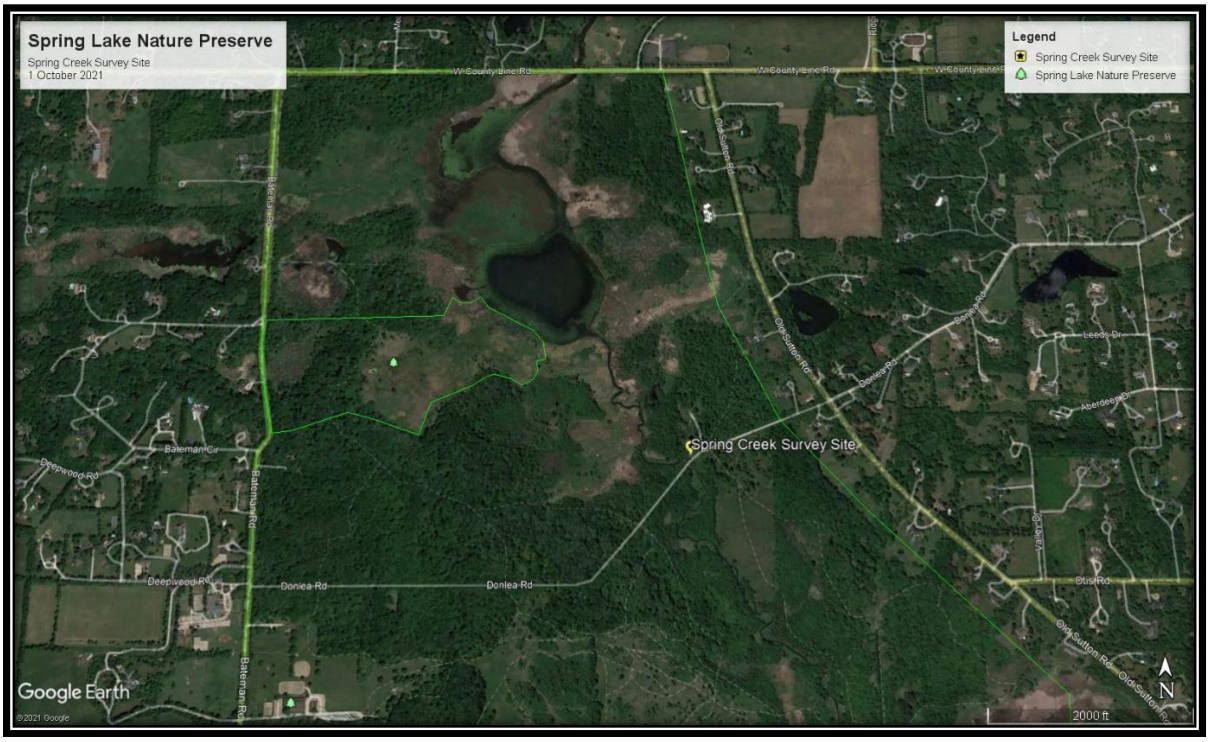
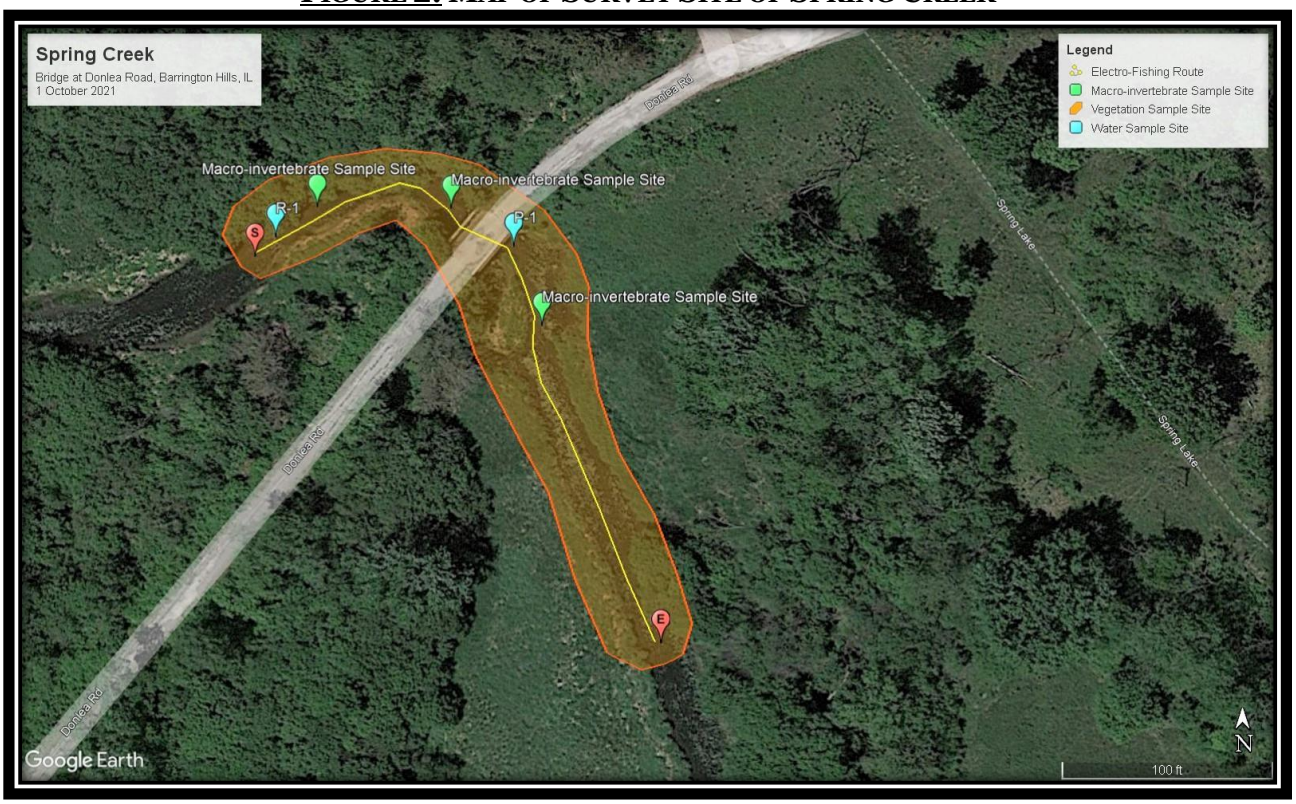


TABLE 1: GENERAL STREAM INFORMATION AND SAMPLING CONDITIONS

STREAM INFO						
STREAM: SPRING CREEK			**DATE:** 1 OCTOBER 2021		**TIME:** 09:30 – 11:25	
STREAM LOCATION: SOUTH EDGE OF SPRING LAKE NATURE PRESERVE AT THE DONLEA ROAD BRIDGE, BARRINGTON HILLS, ILLINOIS						
GPS COORDINATES:	START: 42° 8′ 33.126″ N x 88° 12′ 28.3248″ W END: 42° 8′ 31.3044″ N x 88° 12′ 25.4124″ W				**STATION #:** 1	
WEATHER (CHOOSE ONE): ~~**SUNNY**~~ PARTLY SUNNY CLOUDY RAIN				**WINDS:** ~~**CALM**~~ LIGHT MODERATE STRONG		
WEATHER OVER PAST 48 HOURS: PARTLY SUNNY AND MILD, HIGHS IN UPPER 70'S TO LOW 80'S WITH NIGHTTIME TEMPS. IN THE LOW TO MID 60'S						
PRECIPITATION OVER PAST 48 HOURS:		0.00 MM			**AVERAGE AIR TEMP:**	22.4°C
AVERAGE CONDUCTIVITY:	1102.0 µS	**AVERAGE FLOW RATE:**	0.01 M/S		**AVERAGE WATER TEMP:**	16.7°C
ELECTRO-FISHING TIME:	30 MINUTES	**DISTANCE:**	107.0 M		**AVERAGE WIDTH:**	4.31 M
MINNOW TRAP HOURS: Ø		**NUMBER OF TRAPS:** Ø				

Figure 2 shows a map of the assessment area that was sampled on 1 October 2021. It includes the location of the start and end points of the electro-fishing run (yellow line), covering a total of 107.0 meters. Water sample collection sites are indicated by the blue marker points. Green marker points indicate macro-invertebrate sampling locations and the light orange highlighted area represents the vegetation monitoring route.

FIGURE 2: MAP OF SURVEY SITE OF SPRING CREEK



WATER QUALITY:

Water samples were collected at two locations along the creek. One riffle and one pool were identified to be sampled. The sample site's GPS coordinates were recorded. Water temperature, dissolved oxygen, conductivity levels and flow rates were measured at both sites. Water samples were collected and analyzed at McGinnis Field Station for total alkalinity (Total Alk.), chlorides (Cl), color, turbidity, nitrates (NO_3), phosphates (PO_4), ammonia nitrogen (NH_4), and pH and are represented in Table 2.

Dissolved oxygen (D.O.) readings of Spring Creek were surprisingly high considering the low flow rate. This may be due to the large amount of vegetation in this section of the creek. Aquatic plants like terrestrial plants produce oxygen through the process of photosynthesis. Total alkalinity levels were on the higher end but were comparable with the other streams sampled in the northern part of the county. Chloride levels at 264 mg/L were the highest levels we have seen in any stream surveyed this year. In fact, they were the highest we have seen in any of the stream surveys that we have conducted since 2016. The average chloride level in 2021, was 169.8 mg/L and the overall average from 2016 through 2021 is 120.1 mg/L. Why these levels are so high is unclear but possible sources of these chlorides may be road salts and septic fields. South of the sample site are large residences that are on wells and septic tanks. Salts from water-softeners flowing into the septic field and then percolating into groundwater and the creek may help explain these elevated chloride levels. Further monitoring of chloride levels is strongly recommended.

The color and turbidity levels at this site were fairly low and are consistent with those found in the other stream that were surveyed in 2021. These low levels are likely due to the lack of silt from stream bank erosion within the sampling area.

TABLE 2: WATER CHEMISTRY ANALYSES

GPS Coordinates: 42° 8′ 33.17″ N x 88° 12′ 28.03″ W

	H_2O Temp	D.O. mg/l	Total Alk	Cl mg/L	Color APC	Turbidity FTU	NO_3 mg/L	PO_4 mg/L	NH_4 mg/L	pH
Riffle #1	16.3	8.0	272	264	85	25	0.4	0.28	0.79	7.65
	Sample #: R-1		Conductivity:			1089.0 µS	Flow Rate:			0.02 m/s

GPS Coordinates: 42° 8′ 33.17″ N x 88° 12′ 26.47″ W

	H_2O Temp	D.O. mg/l	Total Alk	Cl mg/L	Color APC	Turbidity FTU	NO_3 mg/L	PO_4 mg/L	NH_4 mg/L	pH
Pool #1	17.1	6.3	273	264	115	35	1.3	0.26	0.50	7.58
	Sample #: P-1		Conductivity:			1115.0 µS	Flow Rate:			0.00 m/s

Nitrate and phosphates levels were slightly lower but were within the range found in most of the other streams surveyed this year. Considering the possibility of influence from septic fields and runoff, you would expect these readings to be on the higher end similar to the chloride levels. Ammonia nitrogen levels were slightly elevated and can be contributed to the time of year. The levels tend rise in the fall when vegetation starts to die back and fall into the creek. The decomposition of this vegetation will help increase the ammonia nitrogen levels in the water.

The average conductivity level at this survey location was 1102.0µS. This level is most likely due to the high chloride levels in the water of this stream. Since there is very little historical data of conductivity for this stream in which to compare these levels, additional reading will be needed in order to get a better understanding of the conductivity levels of this stream.

The average flow rate was 0.01 meters per second (m/s) or 0.03 feet per second (f/s). The flow rate at the riffle was only 0.02 m/s (0.07 f/s). This low flow rate is due to the lack of precipitation prior to this survey and the semi drought conditions in the region.

FISHERIES:

The fish population of Spring Creek was sampled on 1 October 2021 using a backpack electro-fishing unit as indicated in Table 3. The electro-fishing unit was used for 30-minutes and covered approximately 107.0 meters. The electro-fishing run began north (down-stream) of the Donlea Road Bridge (42° 8′ 33.126″ N x -88° 12′ 28.3248″ W) and continued upstream of the bridge (42° 8′ 31.3044″ N x -88° 12′ 25.4124″ W).

TABLE 3: ELECTRO-FISHING

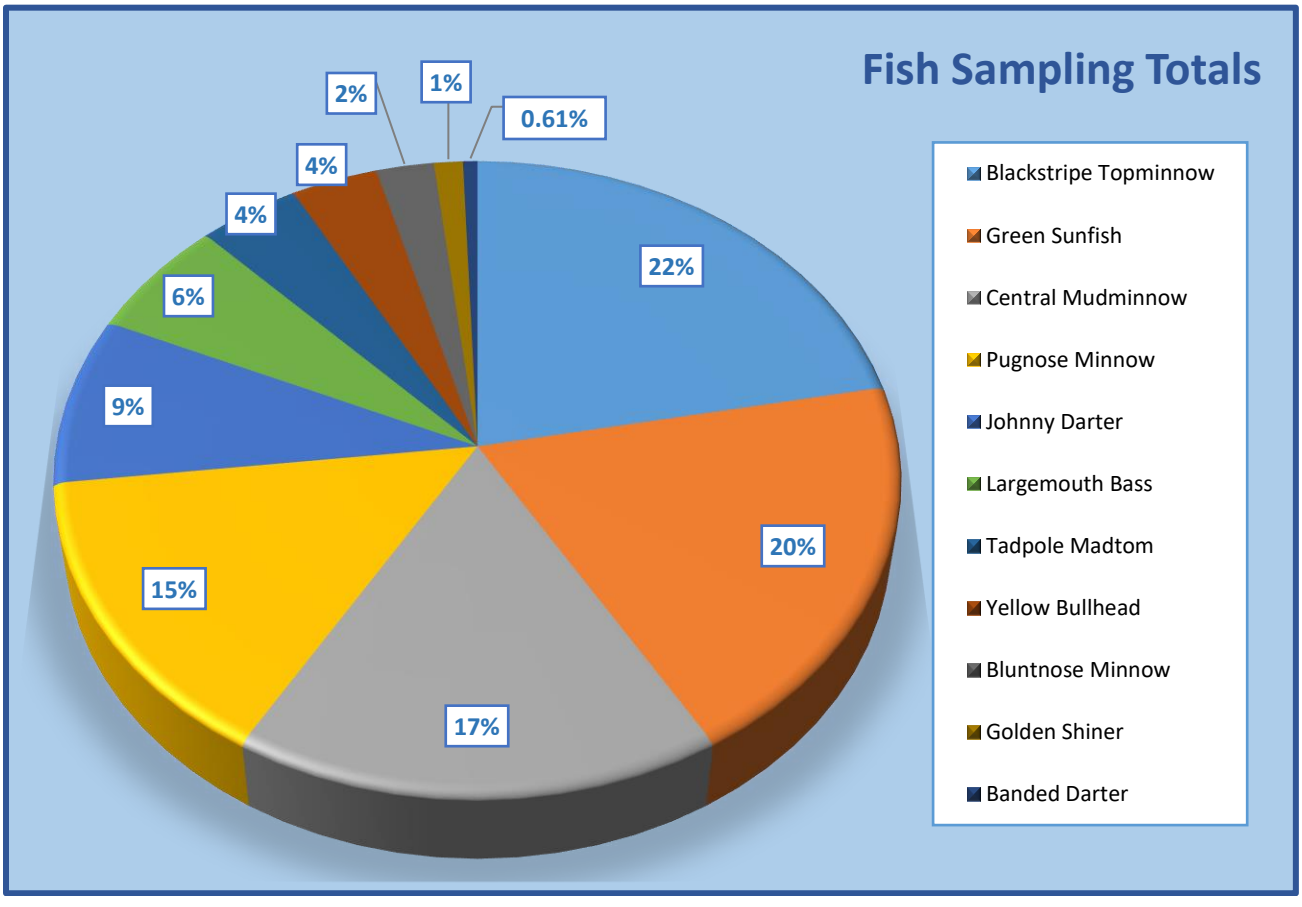
STREAM INFO				
	STREAM: SPRING CREEK	**DATE:** 10/1/2021	**START TIME:** 09:59	**END TIME:** 10:34
	STREAM LOCATION: SPRING LAKE NATURE PRESERVE AT THE DONLEA ROAD BRIDGE, BARRINGTON HILLS, ILLINOIS			
	GPS COORDINATES:	START: 42° 8′ 33.126″ N X 88° 12′ 28.3248″ W END: 42° 8′ 31.3044″ N X 88° 12′ 25.4124″ W		**STATION #:** 1
	AVERAGE CONDUCTIVITY: 1102.0µS	**AVERAGE FLOW RATE:** 0.01 M/S	**AVERAGE WATER TEMP:** 16.7°C	**AVERAGE AIR TEMP:** 22.4°C
	ELECTRO-FISHING TIME: 30 MINUTES	**DISTANCE:** 107.0 M	**AVERAGE WIDTH:** 4.31 M	
	MINNOW TRAP HOURS: Ø	**NUMBER OF TRAPS:** Ø		

All fish observed were collected for identification and to ascertain a count. When possible, a maximum of twelve individuals of each species were measured in order to obtain the minimum, maximum, and average lengths of the species. Once identified, measured, and counted, all fish were returned to the creek. The breakdown of the total fish population collected is represented in Table 4 and Figure 3

TABLE 4: FISH SAMPLING TOTALS

Stream: Spring Creek						**Date:** 1 October 2021	
Sampling Location: Spring Lake Nature Preserve at the Donlea Road bridge, Barrington Hills, Illinois							
Species	Common Name	Total #	% of Population	Min. Length	Max. Length	Avg. Length	# of fish Measured
Fundulus notatus	Blackstripe Topminnow	36	21.95%	43mm	67mm	53mm	12
Lepomis cyanellus	Green Sunfish	32	19.51%	43mm	122mm	75mm	12
Umbra limi	Central Mudminnow	28	17.07%	66mm	94mm	80mm	12
Opsopoeodus emiliae	Pugnose Minnow	24	14.63%	56mm	84mm	77mm	12
Etheostoma nigrum	Johnny Darter	14	8.54%	44mm	72mm	59mm	12
Micropterus salmoides	Largemouth Bass	10	6.10%	70mm	99mm	87mm	10
Noturus gyrinus	Tadpole Madtom	7	4.27%	46mm	82mm	65mm	7
Ameiurus natalis	Yellow Bullhead	6	3.66%	76mm	151mm	126mm	6
Pimephales notatus	Bluntnose Minnow	4	2.44%	54mm	72mm	62mm	4
Notemigonus crysoleucas	Golden Shiner	2	1.22%	61mm	77mm	69mm	2
Etheostoma zonale	Banded Darter	1	0.61%	47mm	47mm	47mm	1
Total		**164**	**100.00%**				**90**

FIGURE 3: FISH SAMPLING TOTALS



Blackstripe Topminnow (*Fundulus notatus*) was the most abundant species collected from Spring Creek, with 36 individuals collected making up 21.95% of the population sampled. This topminnow is a species of killifish that prefers the quiet waters along the edges of streams and small quiet bays of lakes and ponds. It is quite tolerant of ecologically degraded habitat and can survive low dissolved oxygen levels. As its name suggests, this species with its bold black stripe down its side, is well adapted to feeding at the surface of a waterbody.

Green Sunfish (*Lepomis cyanellus*) was the second most abundant species sampled, with 32 individuals collected. This sunfish made up 19.51% of the total population sampled. This was the only sunfish species collected from Spring Creek. This species feeds heavily on the eggs and young of other species and could pose a threat to some of the more vulnerable species of this creek.

The third most abundant species collected was the Central Mudminnow (*Umbra limi*) with 28 individual fish collected representing 17.07% of the total population sampled. Mudminnows are small hardy primitive fish and are represented in Illinois by a single species. This species is found in bogs, well vegetated streams, and ponds with mud bottoms where the water temperature does not get excessive in the summer. They are tolerant of water with high acidity and low oxygen levels and can gulp air or even use air bubbles under the ice to breath.

With 24 individual fish collected and making up 14.63% of the population sampled, the Pugnose Minnow (*Opsopoeodus emiliae*) was the fourth most abundant species collected. This species can be identified by the crosshatched pattern on its back and the upper half of its sides. The dorsal fin with the front and back dusky and a clear stripe in between is diagnostic. It can be found in well vegetated streams that are clear or turbid where it feeds mostly on insects.

Johnny Darter (*Etheostoma nigrum*) was the next most abundant species with 14 individuals collected making up 8.54% of total population sampled. Being more tolerant of different water conditions, the Johnny Darter is the most abundant *Etheostoma* species found in Illinois and was one of only two darter species found in Spring Creek. Further surveys both here and elsewhere on Spring Creek are needed in order to get a better understanding of the population of this darter.

Largemouth Bass (*Micropterus salmoides*) made up 6.10% of the population sampled with 10 individual fish collected. This large predatory species is most likely more abundant downstream in Spring and Mud Lakes but will be found throughout this watershed. While highly sought after by anglers, this population is not large enough to support a viable fishery.

Surprisingly, the next most abundant species collected was the Tadpole Madtom (*Noturus gyrinus*) with 7 individuals collected making up 4.27% of the population sampled. Madtoms are small cousins to the bullheads and catfish and like their cousins they have spines in their pectoral and dorsal fin. As added protection, madtoms have cells in the skin around these spines that contain venom. The pain from getting “stung” by a madtom is said to be like the sting of a bee.

The Tadpole Madtom’s larger cousin, the Yellow Bullhead (*Ameiurus natalis*) was the next most abundant species with 6 individual fish collected making up 3.66% of the population sampled. Of the three species of bullheads found in Illinois, the Yellow Bullhead is the least likely to overpopulate an ecosystem therefore does not pose a problem in Spring Creek.

The common Bluntnose Minnow (*Pimephales notatus*) made up 2.44% of the population with 4 individuals collected. While this minnow occurs in almost any type of habitat, it prefers hard bottomed stream and small rivers. This species is considered the most abundant and widespread fish in Illinois and can be found throughout most of the state.

The two Golden Shiners (*Notemigonus crysoleucas*) collected made up 1.22% of the total population sampled. This common large minnow prefers lakes and pools of quiet streams. This species is also sold as bait in Illinois. These fish may have made their way downstream from Penny Road Pond where they were dumped into the lake by a local angler. Additional surveys of Mud or Spring Lakes should also be considered to determine if there is a native population of this shiner in these lakes.

Only one Banded Darter (*Etheostoma zonale*) was collected in our sampling. This darter species is restricted to fast riffles with bottoms of gravel or small rock. A species of northern Illinois, its population has been reduced due to the degradation of suitable habitat. Additional sampling of Spring Creek is needed to determine the extent and status of this population.

The overall fish population of Spring Creek appears to be doing well. There were no non-native species collected which was very encouraging. It would have been nice to see larger numbers of the two darter species that were collected, and additional survey should be carried out in order to help evaluate these species. To date, Spring Creek is the only stream that the Department of Resource Management has sample where Pugnose Minnows have been seen. Protection of the shoreline from erosion and determining where the high chloride levels are originating from should be a top priority in order to protect this fishery.

MACRO-INVERTEBRATES:

Macro-invertebrate samples were taken from Spring Creek on 1 October 2021. Three 30-foot sample runs were conducted. One riffle and two pools were sampled using one 500 µm D-frame sampling net. The substrate was disturbed by using a kicking method about an arm's length away from the D-framed net. Any macro-invertebrates dislodged from the substrate were collected in the net downstream. Sampling time took roughly 25 minutes. When sampling the riffles, rocks were flipped over and examined, any organism found was removed and placed in a holding bucket. Any downed tree or leaf litter in the sampling area was also scraped/sampled for macro-invertebrates. Samples were taken back to McGinnis Field Station for analysis. Once back in the lab, the three samples were run through sieves at 4.75mm and then 500µm, leaving behind only organisms. These organisms were identified using an identification key down to the lowest taxon-typically family. A total of 183 specimens were collected representing 10 different orders, and 20 families.

One of the indexes that was used is the Family Biotic Index (FBI). The FBI estimates the overall tolerance (Organic/Inorganic pollution) of the community in a sampled area, weighted by the relative abundance of each taxonomic group. Once identified they are counted and given their Tolerance Value (TV). The TV is an organism's sensitivity to organic pollution, with Ø being most sensitive and 10 being most tolerant. The number given after using the FBI equation correlates to the degree of the organic pollution, shown at the bottom of the table.

The Shannon Diversity Index (SDI) is used to calculate the aquatic biodiversity. The minimum range for SDI being Ø and the max being 5. In most studies ranges between 1.5-3.5 are seen. The SDI range increases as both richness and evenness of the community increase, meaning more diversity in that sampled community.

In a healthy body of water, some of the orders that you would expect to find are ***E**phemeroptera* (Mayflies), ***P**lecoptera* (Stoneflies), and ***T**richoptera* (Caddisflies). These orders make up your EPT Index. The EPT index displays taxa richness within the insect groups which are considered to be sensitive to pollution, and therefore should increase with increasing water quality. The min/max range being Ø-100%, with samples over 50% being preferable. Data collected was analyzed using the EPT index.

TABLE 5: MACRO-INVERTEBRATES

Forest Preserves of Cook County- Department of Resource Management- Fisheries

Aquatic Invertebrate Survey Data Sheet

Stream: Spring Creek | Staff: Michael Feldmann | Date: 10-1-2021

Habitat Sample Area: logs, leaf litter, rocks, under stream bank

Order	Family	Common Name	Count	TV	FFG	SDI
DECAPODA	*Cambaridae*	Crayfish	3	6	CG	-0.067
AMPHIPODA	*Gammaridae*	Scud	17	4	CG	-0.221
ISOPODA		Aquatic Sow Bug	2	8	CG	-0.049
Bivalvia "Class"		Fresh Water Mussel	1	7	CF	-0.028
EPHEMEROPTERA	*Baetidae*	Small Minnow Mayfly	8	4	CG,SC	-0.137
EPHEMEROPTERA	*Hetageniidae*	Flathead Mayfly	19	4	SC	-0.235
EPHEMEROPTERA	*Caenidae*	Small Square-gilled Mayfly	2	7	CG,SC	-0.049
ODONATA	*Coenagrionidae*	Narrow-winged Damselfly	24	9	PR	-0.266
ODONATA	*Aeshnidae*	Darner Dragonfly	9	3	PR	-0.148
ODONATA	*Libellulidae*	Common Skimmer	1	7	PR	-0.028
HEMIPTERA	*Belostomatidae*	Giant Water Bug	9	10	PR	-0.148
HEMIPTERA	*Nepidae*	Water Scorpion	2	8	PR	-0.049
TRICHOPTERA	*Helicopsychidae*	Snail Case-maker Caddisfly	46	3	SC	-0.347
COLEOPTERA	*Dytiscidae*	Predaceous Diving Beetle	3	5	PR	-0.067
COLEOPTERA	*Hydrophilidae*	Water Scavenger Beetle	7	5	CG	-0.125
COLEOPTERA	*Elmidae*	Riffle Beetle	3	5	SC	-0.067
COLEOPTERA	*Scirtidae*	Marsh Beetle	20	7	SC,CG,SH	-0.242
TRICHOPTERA	*Leptoceridae*	Long-horned Caddisfly	1	4	CG,SH	-0.028
Hydracarina "Class"		Water Mit	4	4	PR	-0.084
COLEOPTERA	*Haliplidae*	Crawling Water Bug	2	7	SH	-0.049

Specimen Total:	183	
Product (Species # X TV):	964	
EPT Richness (# families):	5	
EPT Index: (# EPT/ # Total):	42%	
Family Biotic Index:	5.27	Fair Water Quality
Shannon Diversity Index:	2.44	
Species Richness:	20	
Evenness:	0.81	

Functional Feeding Group (FFG):

Collector/Gatherers- CG
Collector/Filterers- CF
Filterers-F
Parasite-PA
Piercer-PI
Predators- PR
Scrapers- SC
Shredders- SH

Comments:
Devil (*Cambarus Diogenes*) and Calico Crayfish (*Orconectes Immunis*) were seen.

FBI	Water	Degree of Organic Pollution
0.00-3.75	Excellent	Organic pollution Unlikely
3.76-4.25	Very Good	Possible slight organic pollution
4.26-5.00	Good	Some organic pollution probable
5.01-5.75	Fair	Fairly substantial pollution likely
5.76-6.50	Fairly Poor	Substantial pollution likely
6.51-7.25	Poor	Very substantial pollution likely
7.26-10.00	Very Poor	Severe organic pollution likely

Breaking down the data shown in Table 5, Spring Creek has an FBI of 5.27 which indicates that it has "Fair Water Quality" indicating that some organic pollution is likely. It is hard to tell what would be contributing to this since this creek is well buffered from urban development. The two potential sources of pollution could come from Algonquin Road to the south and the extensive trail usage of equestrians. Spring Lake Preserve has a lot of trails running through it that get used heavily by horses. Maybe land erosion from trail usage and horse droppings/urine are loading the creek with organic nutrients. Further tests before, during, and after peak trail usage would be needed to see if this has any validly.

Overall Spring Creek had a diverse mixture of different orders and Tolerance Values. This is shown in Shannon Diversity Index (SDI). With a rating of 2.44, this shows it is in the middle of the SDI scale.

The EPT Index for Spring Creek was 42%. An EPT of 42% is an average number. An average EPT could indicate that there are some swings in water quality since most families found in EPT are sensitive to pollution. It would be preferable to see this number above 50%. Only three families were found in Order ***E**phemeroptera* (Mayflies), zero for ***P**lecoptera* (Stoneflies), and two in ***T**richoptera* (Caddisflies).

Ephemeroptera: These are the Mayflies, and they can be found in a variety of habitat. Family *Heptageniidae* (Flathead Mayflies) made up most of this order. They are mainly found clinging to rocks, logs, and leaves. They prefer fast flowing steams mainly and are found in riffles.

Baetidae (Small Minnow Mayfly) were also found along with *Caenidae* (Small Square-gilled Mayfly). They are found in streams of moderate current or areas of slack water. They are very common in the Upper Midwest and tend to tolerate lower water quality.

Heptageniidae

Baetidae

Canenidae

Plecoptera: These are the Stoneflies, they are found in streams with cobble, woody debris, and leaf packs. They are normally found in streams with low organic pollution and high levels of dissolved oxygen. None were found in Spring Creek.

Trichoptera: These are the Caddisflies, they are known for building their own protective cases out of sand, pebbles, sticks, and leaves. Family *Helicopsychidae* (Snail Case-maker Caddisfly) was seen in great numbers comprising over half of all EPT collected. They get their name from the shape of their case, which resembles that of a snail. The peculiar case of this family of caddisflies is more difficult to crush, which protects the larva as it grazes on exposed substrates. It is good to see high numbers of them in this sample. Only one *Leptoceridae* (Long-horned Caddisfly) was seen while sampling.

Helicopsychidae

Leptoceridae

Two *Cambaridae* (Crayfish) species were seen while sampling. The majority found were *Ocrconectes immunis* (Calico Crayfish) along with a few *Cambarus iogenes* (Devil Crayfish).

Ocrconectes immunis

It would be interesting to see what is in the creek during the late spring to early summer. Further testing will have to be done in the future.

VEGETATION SURVEY:

This survey was done in the stretch of Spring Creek that extends both north and south of the bridge at Donlea Road in Barrington, Illinois. Although Reed Canary Grass (*Phalaris arundinacea*) is a serious issue at this site, a small amount of quality stream vegetation persists.

Sheet erosion has caused a recent increase in siltation in this area and can be attributed to an increase in invasive brush such as European Buckthorn (*Rhamnus cathartica*). The density of this brush cover has reduced the cover of ground layer vegetation surrounding the stream. The lack of ground cover under the heavy canopy allows rainwater to uniformly remove soil in thin layers evenly over the entire area. This siltation could have a detrimental effect on the habitat of fish and macro-invertebrate in Spring Creek. Brush removal is warranted in this area in order to allow the restoration of native ground layer vegetation.

SITE: Spring Creek at Spring Lake Nature Preserve
LOCALE: Barrington, Cook County, Illinois
BY: Monica Mueller
DATE: 1 October 2021 - ½ hour
NOTES: Meander inventory of vegetation present within a 30-foot buffer around Spring Creek, both north and south of the bridge at Donlea Road.

CONSERVATISM-BASED METRICS			ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	2.61		SPECIES RICHNESS (ALL)	40
MEAN C (ALL SPECIES)	1.83		SPECIES RICHNESS (NATIVE)	28
MEAN C (NATIVE TREES)	0.00		% NON-NATIVE	0.30
MEAN C (NATIVE SHRUBS)	0.50		WET INDICATOR (ALL)	-0.43
MEAN C (NATIVE HERBACEOUS)	2.88		WET INDICATOR (NATIVE)	-0.96
FQAI (NATIVE SPECIES)	13.80		% HYDROPHYTE (MIDWEST)	0.68
FQAI (ALL SPECIES)	11.54		% NATIVE PERENNIAL	0.48
ADJUSTED FQAI	21.81		% NATIVE ANNUAL	0.20
% C VALUE 0	0.45		% ANNUAL	0.20
% C VALUE 1-3	0.33		% PERENNIAL	0.75
% C VALUE 4-6	0.20			
% C VALUE 7-10	0.03			

SPECIES	SPECIES (SYNONYM)	COMMON NAME	C	WET NESS	PHYSIOGNOMY			REL ABU
Acer negundo	Acer negundo var. violaceum	Ash-Leaf Maple	0	FAC	Tree	Perennial	Native	1
Arctium minus	ARCTIUM MINUS	Lesser Burrdock	0	FACU	Forb	Biennial	Adventive	1
Asclepias incarnata	Asclepias incarnata	Swamp Milkweed	3	OBL	Forb	Perennial	Native	1
Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	Forb	Annual	Native	2
Bidens connata	Bidens comosa; Bidens connata	Three-Lobe Beggarticks	3	OBL	Forb	Annual	Native	2
Calamagrostis	Calamagrostis canadensis	Bluejoint	6	OBL	Grass	Perennial	Native	2
Carex muskingumensis	Carex muskingumensis	Muskingum Sedge	9	OBL	Sedge	Perennial	Native	2
Carex stricta	Carex stricta	Uptight Sedge	5	OBL	Sedge	Perennial	Native	3

Celastrus orbiculatus	CELASTRUS ORBICULATUS	Asian Bittersweet	0	UPL	Vine	Perennial	Adventive	2
Ceratophyllum demersum	Ceratophyllum demersum	Coontail	2	OBL	Forb	Perennial	Native	3
Cirsium discolor	Cirsium discolor	Field Thistle	3	FACU	Forb	Biennial	Native	3
Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	Shrub	Perennial	Native	2
Cyperus esculentus	Cyperus esculentus	Chufa	0	FACW	Sedge	Perennial	Native	2
Echinochloa muricata	Echinochloa muricata	Rough Barnyard Grass	4	OBL	Grass	Annual	Native	3
Concan	Conyza canadensis	Canadian Horseweed	0	FACU	Forb	Annual		2
Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	Forb	Perennial	Native	2
Glechoma hederacea	GLECHOMA HEDERACEA	Groundivy	0	FACU	Forb	Perennial	Adventive	3
Hemerocallis fulva	HEMEROCALLIS FULVA	Orange Day-Lily	0	UPL	Forb	Perennial	Adventive	2
Leerisa oryzoides	Leersia oryzoides	Rice Cut Grass	3	OBL	Grass	Perennial	Native	3
Persicaria lapathifolia	Polygonum lapathifolium; POLYGONUM SCABRUM; PERSICARIA SCABRA	Dock-Leaf Smartweed	0	FACW	Forb	Annual	Native	3
Persicaria punctata	Polygonum punctatum	Dotted Smartweed	4	OBL	Forb	Annual	Native	3
Persicaria virginiana	Antenoron virginianum	Jumpseed	4	FAC	Forb	Perennial	Native	1
Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	Grass	Perennial	Adventive	5
Plantago lanceolata	PLANTAGO LANCEOLATA	English Plantain	0	FACU	Forb	Perennial	Adventive	1
Potamogeton nodosus	Potamogeton nodosus	Long-Leaf Pondweed	3	OBL	Forb	Perennial	Native	3
Duchesnea indica	DUCHESNEA INDICA	Indian-Strawberry	0	FACU	Forb	Perennial	Adventive	2
Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	Shrub	Perennial	Adventive	2
Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	Shrub	Perennial	Adventive	2
Rubus occidentalis	Rubus occidentalis	Black Raspberry	0	UPL	Shrub	Perennial	Native	2
Sagittaria latifolia	Sagittaria latifolia	Duck-Potato	3	OBL	Forb	Perennial	Native	2
Saponaria officinalis	SAPONARIA OFFICINALIS	Bouncing-Bett	0	FACU	Forb	Perennial	Adventive	2
Scutellaria lateriflora	Scutellaria lateriflora	Mad Dog Skullcap	4	OBL	Forb	Perennial	Native	2
Senecio hieraciifolius	Erechtites hieracifolia	American Burnweed	0	FAC	Forb	Annual	Native	2
Solidago canadensis	Solidago canadensis	Canadian Goldenrod	1	FACU	Forb	Perennial	Native	3
Spirodela polyrhiza	Spirodela polyrhiza	Great Duckweed	4	OBL	Forb	Annual	Native	3
Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	Forb	Perennial	Native	2
Taraxacum officinale	TARAXACUM OFFICINALE	Common Dandelion	0	FACU	Forb	Perennial	Adventive	1
Urtica dioica ssp. Gracilis	Urtica procera; Urtica gracilis	Tall Nettle	1	FACW	Forb	Perennial	Native	2
Verbena urticifolis	Verbena urticifolia var. leiocarpa	White Vervain	2	FAC	Forb	Perennial	Native	2
Viburnum opulus	VIBURNUM OPULUS	Highbush-Cranberry	0	FAC	Shrub	Perennial	Adventive	1

"C" column refers to Coefficient of Conservatism (C-value)

"Wetness" refers to National Wetland Category (for definition of abbreviations see table below)

"REL ABU" column refers to relative abundance scale: 1=0-5% (rare), 2=5-25% (occasional), 3=25-50% (common), 4=50-75% (very common), 5=75-100% (abundant).

National Wetland Category	
OBL	obligate wetland
FACW	facultative wetland
FAC	facultative
FACU	facultative upland
UPL	obligate upland

CONCLUSION AND RECOMMENDATIONS:

"Spring Creek is known as one of the highest quality streams in the area" (*Spring Creek Watershed Based Plan – 2012*), yet its diversity of fish species was only average when compared to the other streams surveyed throughout the Forest Preserves. And while, some of these species are found in only a few streams within the Forest Preserves and one, the Pugnose Minnow has only been observed in Spring Creek, you would expect higher biodiversity from such a high-quality stream. The lack of species diversity may be due to the time of the year when this survey was done, sampling methods, or the survey location. The high Chloride levels and sedimentation from sheet erosion may also play a factor in the low species numbers. The lack of non-indigenous invasive species in Spring Creek is a very encouraging sign and continued monitoring is paramount to keeping invasive species out. Additionally, surveys elsewhere on Spring Creek are needed in order to get a better understanding of the overall fishery of this stream.

After analyzing the macro-invertebrate samples collected it was determined that Spring Creek had a Family Biotic Index (FBI) of 5.27 which indicates that it has "Fair Water Quality" and indicates that some organic pollution is likely. Being surrounded by 3,910 acres of forest preserves including the 560-acre Spring Lake Nature Preserve it is hard to tell what would be contributing to this since this creek is well buffered from urban development. Spring Lake Preserve has 45-miles of unpaved trails running through it. These trails get used heavily by horseback riders. The land erosion from trail usage and horse droppings/urine maybe loading the creek with organic nutrients. Determining where this organic pollution is coming from and taking measures to decrease it should help improve water quality and the biodiversity of the macro-invertebrates. Sampling the macro-invertebrates of Spring Creek during the late spring to early summer would also be interesting and helpful in determining macro-invertebrate biodiversity and water quality. Further surveys should be done in the near future.

The restoration of the vegetation along the stretch of Spring Creek that extends south of the bridge at Donlea Road should be explored. Reed Canary Grass in this area is a serious issue and its removal, and the restoration of the shoreline is needed. This work would allow, with a little help, the small amount of quality stream vegetation that persists here, to spread and stabilize the streambanks. Likewise, removing the European Buckthorn and reestablishing a native ground layer of vegetation in this area would help reduce the siltation caused by sheet erosion. Stopping the flow of sediment into Spring Creek would in turn help improve the natural riffles and pools that native fish and macro-invertebrates need to thrive.

Additional surveys of Spring Creek in this area and elsewhere is recommended in order to maintain and improve this high-quality stream.

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