

# Spring Creek Assessments

June 6-7, 2022

## Overview:

Jeff Weiss, coordinator of the Flint Creek/Spring Creek Watersheds Partnership applied for a FPDCC research permit to conduct a class and a series of stream assessments at Spring Creek Forest Preserve near the Donlea Road Bridge.

When the class was cancelled, it was decided to conduct the assessments as a Partnership activity on June 6. Due to forecasted thunderstorms on the scheduled date, the event was moved to June 7. Two of us visited the site on June 6 and conducted some assessments in what turned out to be a light rain.

Few of the confirmed participants were able to attend on the rain date. Three of us – Mark Lynch from Xylem, Mark Krivchenia, Steward at Deer Grove FP and Jeff Weiss met and conducted the following assessments:

- Stream flow – measurements with acoustic Doppler and impeller flow meters
- Unified Stream Assessment worksheets
- Field parameters for water quality – DO, air and water temp, EC, pH
- Grab samples that were taken to the Lake County Health Department lab for testing
- Biological – mussel shells, aquatic, streambank and buffer vegetation

Discussion of our assessment protocols and findings are on the following slides.

Mark Krivchenia and Jeff Weiss are scheduled to teach the class and hope to get permits to do a more thorough and well-documented set of assessments with our class on June 5, 2023. We appreciate FPDCC support and would welcome direct FPDCC participation.

Photos taken during a scouting visit on March 12, 2022 confirmed access to and suitability of the channelized reach at the Donlea Bridge site and a meandering reach upstream. A recent burn through the reed canarygrass monoculture revealed the presence of mussel shells on the streambanks.



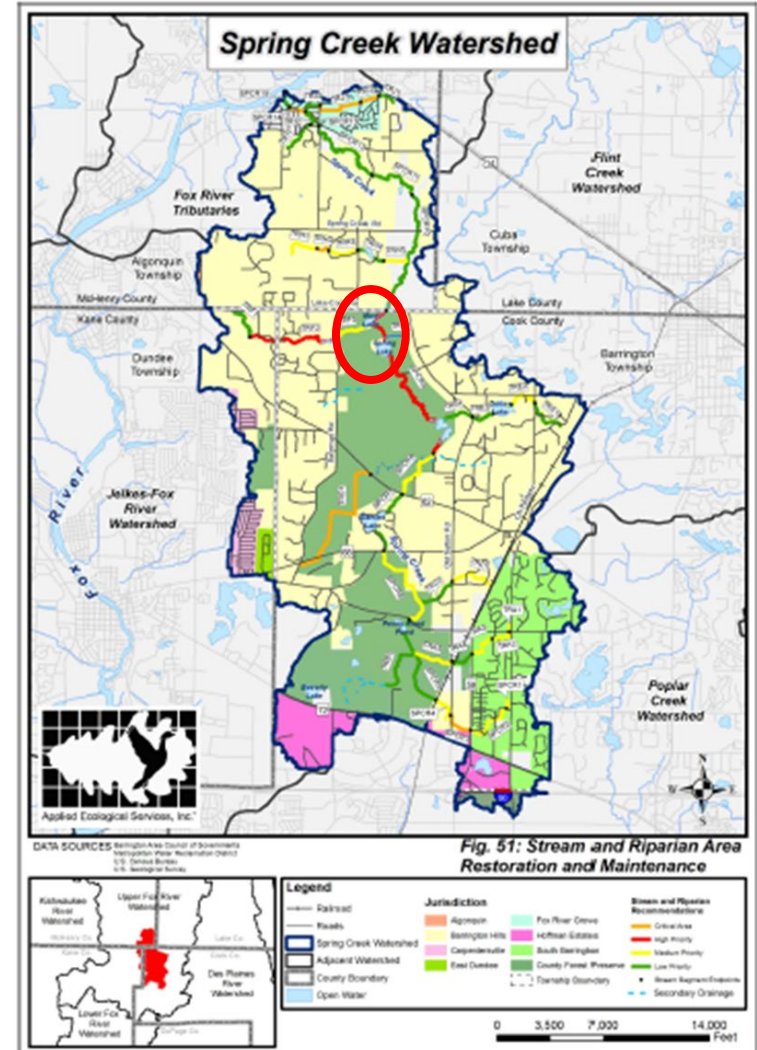
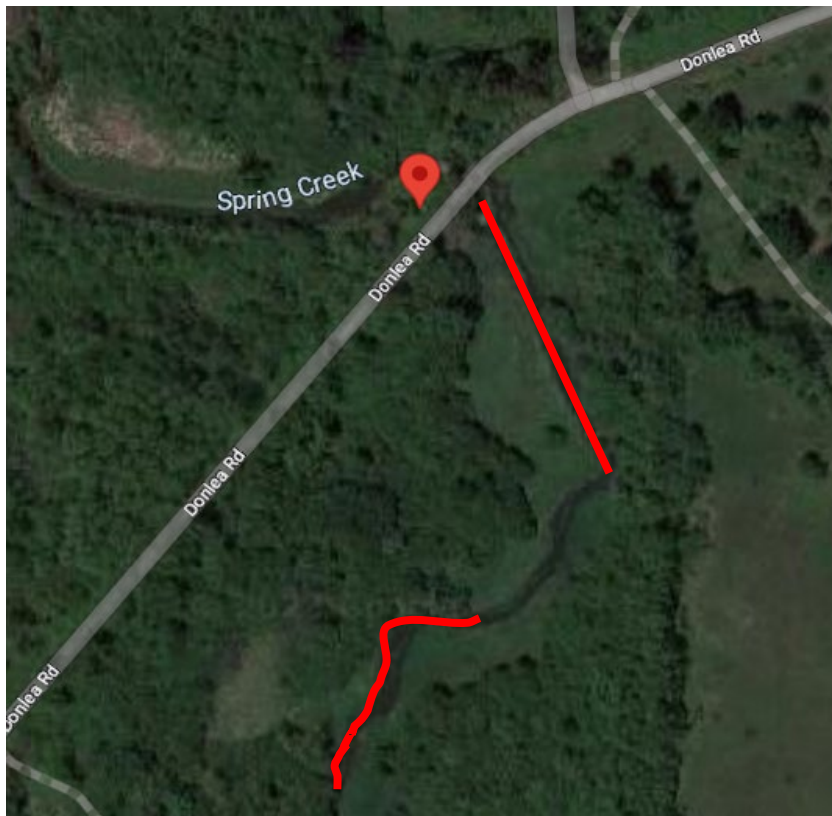
Stream  
Reach  
Assessment  
Plan for  
NRES 499  
Class

We had planned full day exploration of Spring Creek

1. Flow measurement
2. Physical conditions – Unified Stream Assessment
3. Chemical water quality
  - Field parameters – temp, pH, dissolved oxygen
  - Lab parameters – conductivity, nutrients, chloride, fecal coliform bacteria, total suspended solids
4. Biological survey – plants, fish (FPD survey), macro-invertebrates and dead mussels on streambanks
5. Collector/ArcGIS online – record features and produce a site map
6. Conferences to compare reaches and discuss restoration opportunities.

# Spring Creek Plan

Goal was for class to compare two reaches and discuss implications for restoration - Donlea Road Bridge and an un-channelized reach upstream






# June 7, 2022 – Summary of Findings

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- 3 participants after a date change due to bad weather
- Stream flow 3.15 cfs – very little effect from rains of June 6
- Unified Stream Assessment – overall score 112/160
  - In-stream habitat 11/20 – SUBOPTIMAL
  - Vegetative protection (reed canarygrass) 10/20 – MARGINAL
  - Bank erosion 14/20 – SUBOPTIMAL
  - Vegetated buffer – 18/20 OPTIMAL
  - Floodplain connection, habitat, encroachment 59/80 – SUBOPTIMAL
- Chemical – no field parameters and 3 of 6 analytes analyzed at the lab exceed Illinois-EPA limits
- Biological – quick survey and review of 2021 FPDCC fish survey
  - Low diversity of macro-invertebrates, mussels, and fish
  - Stream banks and buffers dominated by reed canarygrass and brush

# FPDCC Research Permit – new permit application filed for 2023



## RESEARCH ACCESS PERMIT APPLICATION

CONTACT INFORMATION	
Applicant Name*	Jeff Weiss
Title	instructor
University or Institution Affiliation	UIUC
Complete Address	821 Heatherdown Way, Buffalo Grove, IL 60089
Phone	(847) 224-0965
Email Address	marjeff1@aol.com

\*Graduate Students: Please list your name and your graduate advisor's name. Permits issued in advisor's name.

ACTIVITY DETAILS	
Proposed Research Title	Spring Creek Stream Assessment
Requested Location(s) (list official Forest Preserve Name)	Spring Creek Forest Preserve
Date(s) and Time of Activities	June 6, 2022 8am - 5pm
Summary of Proposed Research (attach additional sheet as necessary)	Physical, chemical and biological surveys, with management reccs.
Research Methodology (attach additional sheet as necessary)	See attached
List and describe equipment used (Any equipment left in the field must be marked with contact institution and a contact phone)	Stream flow gage/kicknet, macro sampling kit, Probe for DO, temp, pH, EC, Collecting bottles for stream water
Detail any expected collections (i.e. plants, animals, soil, seeds, rocks, etc...)	Stream water for testing in a certified laboratory
Detail any proposed site disturbances	Wading to measure stream flow, macro- and mussel survey
Number and names of additional researchers/participants	10-15 graduate students, two instructors and 3-4 guest experts
Cell phone/contact information for staff in the field	Jeff Weiss (847) 224-0965 Mark Krivchenia (224) 545-1604



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**Name(s):** Jeff Weiss, Mark Krivchenia, Graduate Students

**Organization:** University of Illinois

**Address:** 821 Heatherdown Way Buffalo Grove, IL 60089

**Phone:** 847-224-0965, 224-545-1604

**E-Mail:** marjeff1@aol.com, mark.krivchenia@gmail.com

**Permitted Activity:** Conducting stream quality assessments using monitoring instruments, wading into the waterway to survey macroinvertebrates and collect water samples for laboratory analysis.

*Permittees are expected to obtain separate permits from the Illinois Department of Natural Resources for research involving handling aquatic organisms. All equipment should be cleaned and sanitized with 3% bleach solution before used in the Creek to prevent the transmission of invasive species and diseases.*

**Sites:** Spring Creek Donlea to Algonquin

**Dates:** 6 June 2022 - 10 June 2022

**Time:** Normal daylight hours of operation.

- 1. No collecting is allowed unless express authorization is permitted herein.** It is understood that all living material taken under this permit is intended for research purposes only and that no more will be collected than necessary.
- 2. An additional permit from the Illinois Nature Preserves Commission is required for any activity within dedicated Illinois Nature Preserves.**
- 3. All field research equipment that is to be left on site must be labeled clearly for Forest Preserve staff and volunteers.** Equipment should be labeled with "For Research Purposes" and the name of the research institution. Any unlabeled equipment may be removed.

Any alteration to the environment other than that mentioned in the above permit must be authorized by the Department of Resource Management. In no case shall this permit be interpreted as giving authorization to collect any bird protected by the U.S. Migratory Bird Act, or any bird, mammal, or fish protected by the Illinois Game and Fish Codes.

Send a copy of the final report based on the study or work performed under this permit to Rebecca Collings, Forest Preserves Senior Resource Ecologist at 536 N. Harlem Ave., River Forest, IL 60305.

Senior Resource Ecologist Rebecca Collings Date: 5 April 2022

**PERMIT EXPIRES: 10 June 2022**

# Spring Creek – Unified Stream Assessment

Forms completed

ER Erosion

IB Impacted Buffers

SC Stream Crossing (bridge)

CM Channel Modification

TR Trash

RCH Reach Level Assessment

Reach assessment score

Instream 54/80

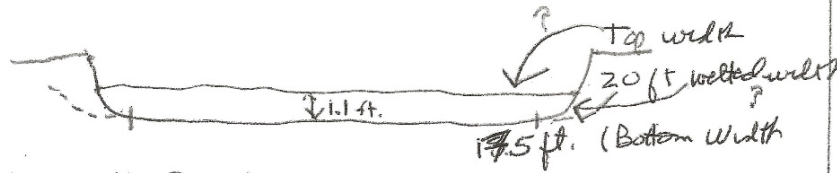
Buffer/Floodplain 58/80

Total 112/160

The exercise generated a lot of good discussion and documentation!

Severe Bank Erosion

**ER**

WATERSHED/SUBSHED: <u>Spring Creek Watershed</u>		DATE: <u>6/6/22</u>	ASSESSED BY: <u>MKJW</u>
SURVEY REACH: <u>SC-2; 1st stream</u>		TIME: : AM/PM	PHOTO ID (CAMERA-PICTURE #): #
SITE ID: (Condition-#)		GPS: (Unit ID)	
ER-	START LAT ° ' " LONG ° ' "	LMK	
	END LAT ° ' " LONG ° ' "	LMK	
<b>PROCESS:</b> <input type="checkbox"/> Currently unknown <input type="checkbox"/> Downcutting <input type="checkbox"/> Bed scour <input checked="" type="checkbox"/> Widening <input checked="" type="checkbox"/> Bank failure <input type="checkbox"/> Headcutting <input checked="" type="checkbox"/> Bank scour ↓ <input checked="" type="checkbox"/> Aggrading <input type="checkbox"/> Slope failure <input type="checkbox"/> Sed. deposition <input checked="" type="checkbox"/> Channelized		<b>BANK OF CONCERN:</b> <input type="checkbox"/> LT <input type="checkbox"/> RT <input checked="" type="checkbox"/> Both (looking downstream) <b>LOCATION:</b> <input type="checkbox"/> Meander bend <input checked="" type="checkbox"/> Straight section <input type="checkbox"/> Steep slope/valley wall <input type="checkbox"/> Other: <b>DIMENSIONS:</b> Length (if no GPS) LT _____ ft and/or RT _____ ft Bottom width _____ ft Bank Ht LT <u>25</u> ft and/or RT _____ ft Top width _____ ft Bank Angle LT ~ <u>30</u> ° and/or RT <u>30</u> ° Wetted Width _____ ft	
LAND OWNERSHIP: <input type="checkbox"/> Private <input checked="" type="checkbox"/> Public <input type="checkbox"/> Unknown		LAND COVER: <input type="checkbox"/> Forest <input type="checkbox"/> Field/Ag <input type="checkbox"/> Developed:	
<b>POTENTIAL RESTORATION CANDIDATE:</b> <input type="checkbox"/> Grade control <input type="checkbox"/> Bank stabilization <input type="checkbox"/> No <input type="checkbox"/> Other:			
<b>THREAT TO PROPERTY/INFRASTRUCTURE:</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Describe):			
<b>EXISTING RIPARIAN WIDTH:</b> <input type="checkbox"/> ≤25 ft <input type="checkbox"/> 25 - 50 ft <input type="checkbox"/> 50-75 ft <input type="checkbox"/> 75-100 ft <input checked="" type="checkbox"/> >100ft			
<b>EROSION SEVERITY (circle #)</b> Channelized- <u>1</u>	Active downcutting; tall banks on both sides of the stream eroding at a fast rate; erosion contributing significant amount of sediment to stream; obvious threat to property or infrastructure.	Pat downcutting evident; active stream widening; banks actively eroding at a moderate rate; no threat to property or infrastructure.	Grade and width stable; isolated areas of bank failure/erosion; likely caused by a pipe outfall, local scour, impaired riparian vegetation or adjacent use.
<b>ACCESS:</b>	Good access: Open area in public ownership, sufficient room to stockpile materials, easy stream channel access for heavy equipment using existing roads or trails. <u>5</u>	Fair access: Forested or developed area adjacent to stream. Access requires tree removal or impact to landscaped areas. Stockpile areas small or distant from stream. <u>4</u>	Difficult access. Must cross wetland, steep slope or other sensitive areas to access stream. Minimal stockpile areas available and/or located a great distance from stream section. Specialized heavy equipment required. <u>1</u>
<b>NOTES/CROSS SECTION SKETCH:</b> Silt/sediment deposited in channel and peninsula  Vegetation? - <u>Sedge intro.</u> , native Re meander Pool / riffle / run REPORTED TO AUTHORITIES <input type="checkbox"/> Yes <input type="checkbox"/> No			

## Water quality – field parameters

### Spring Creek – June 7, 2023, 11 am

- Water temperature – 67.3 F
- Barometric pressure – 738 mm Hg
- Dissolved oxygen – 7.44 mg/L (81.5% of saturation)
- Standard conductivity 947 microSiemens/cm
- Turbidity – FNU – 8.2 (very light brown stain)
- Phycocyanin – 0.3 mg/L
- Chlorophyll – 3.3 mg/L

All of these values were within normal ranges.



Water quality – comparison with similar assessments at Flint Creek Savanna

## Spring Creek

Site	Date	Analyte	Result	Units
Spring Creek A1	6/7/2023	Chloride	131	mg/L
Spring Creek A1	6/7/2023	Electrical Conductivity	958	µS/cm
Spring Creek A1	6/7/2023	Fecal coliform	220	cfu/100ml
Spring Creek A1	6/7/2023	Phosphorus	0.061	mg/L
Spring Creek A1	6/7/2023	Total Suspended Solids	43	mg/L
Spring Creek A1	6/7/2023	Nitrogen	0.771	mg/L

## Flint Creek – July 26 2022

Project	SampleName	Analyte	Result	Units
Flint Creek	Flint Creek	Chloride	186	mg/L
Flint Creek	Flint Creek	Conductivity, at 25° C	1039	uS/cm
Flint Creek	Flint Creek	Fecal Coliform	570 EST	CFU/100 ml
Flint Creek	Flint Creek	Phosphorus, Total (as P)	0.242	mg/L
Flint Creek	Flint Creek	Residue, Non-Filterable (TSS)	61.6	mg/L
Flint Creek	Flint Creek	Total Kjeldahl Nitrogen (as N)	1.8	mg/L

Red indicates values that exceed Illinois WQ guidelines.

# Illinois EPA Water Quality Guidelines

\* Illinois EPA General Use Standard

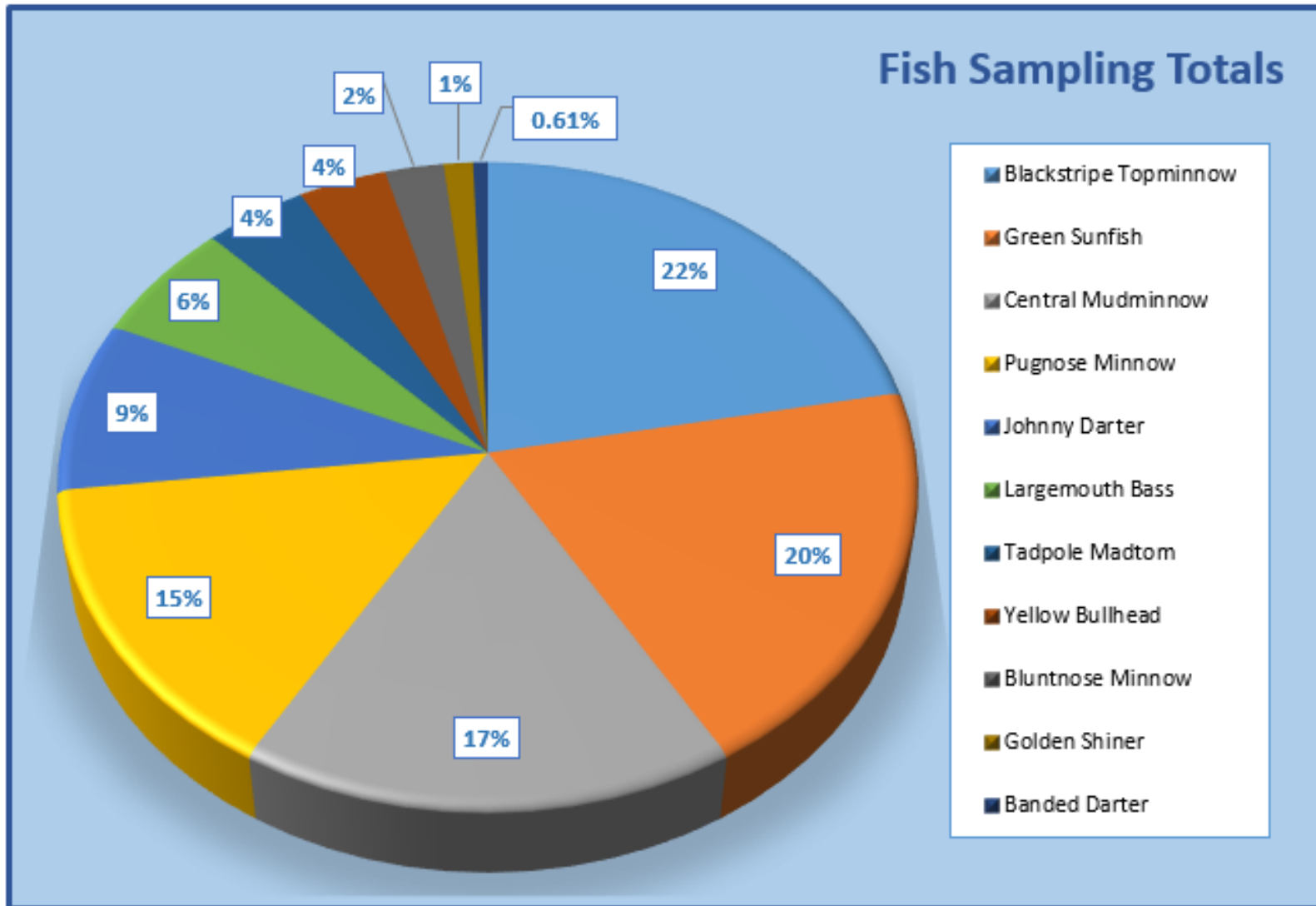
\*\* Ambient Water Quality Criteria Recommendations:  
Rivers and Streams in Nutrient Ecoregion VI (USEPA 2000)

\*\*\* Present and Reference Concentrations and Yields of  
Suspended Sediment in Streams in the Great Lakes Region  
and Adjacent Areas (USGS 2006)

<b>Parameter</b>	<b>Statistical, Numerical, or General Use Guidelines</b>
<b>Dissolved Oxygen (DO) (mg/l)</b>	<b>&gt;5.0 mg/l*</b>
<b>pH</b>	<b>&gt;6.5 or &lt;9.0*</b>
<b>Total Phosphorus (TP) (m/l)</b>	<b>&lt;0.0725 mg/l**</b>
<b>Average Total Kjeldahl Nitrogen (TKN)</b>	<b>0.663 mg/l**</b>
<b>Total Suspended Solids (TSS) (mg/l)</b>	<b>&lt;19 mg/l***</b>
<b><i>E. coli</i> (MPN/mL)</b>	<b>&lt;200 CFU/100ml*</b>
<b>Chloride (mg/l)</b>	<b>&lt;500 mg/l*</b>

# Fish survey results – FPDCC, Oct. 2021

**FIGURE 3: FISH SAMPLING TOTALS**



N=164

# Fish survey results – FPDCC, Oct. 2021

## 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		STATION #: 1
		END:	42° 8' 31.3044" N X 88° 12' 25.4124" W		
	AVERAGE CONDUCTIVITY: 1102.0 $\mu$ S	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: $\emptyset$	NUMBER OF TRAPS: $\emptyset$			

Almost no flow

Air temp. 72, water temp. 62 degrees F in early October