2018 Monitoring Strategy for the Des Plaines River Watershed

Purpose

This Monitoring Strategy for the Des Plaines River Watershed in Lake County Illinois was developed by the Monitoring Committee of the Des Plaines River Watershed Workgroup (DRWW). The 2016 Monitoring Strategy and a revised Monitoring Strategy in 2017 were written and submitted to comply with the terms of Illinois Environmental Protection Agency's (Illinois EPA) Financial Assistance Agreement (FAA) 3191506. That agreement ends in June, 2018. This 2018 Monitoring Strategy update is being written to document changes to the DRWW's monitoring program in 2018.

The Monitoring Strategy is considered a living document. The DRWW Monitoring Committee will use adaptive management to review the results of the monitoring program and will revise and update the Monitoring Strategy if changes are needed.

In 2016, 44 locations were sampled for water chemistry (6 sites that should have been sampled were not due to a miscommunication), 49 locations for sediment (1 site that should have been sampled was not due to a miscommunication), and 69 locations were sampled for biology. Baseline data was completed at the end of 2016. MBI's Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries (2016) report documents the results of the baseline sampling.

In 2017, the DRWW sampled 70 locations; 50 locations for water chemistry, and 1/3 of the 70 sites for biological/sediment each year for the next three years. Indian Creek, Aptaksic Creek, and Buffalo Creek subwatersheds plus direct tributaries to Des Plaines River adjacent those subwatersheds and nested between the mainstem and the subwatershed boundaries (23 sites) were sampled for biology/sediment (1/3 of the watershed). Continuous Flow Monitoring was conducted at 21 locations. Chlorophyll-a sampling and continuous monitoring at 14 locations for temp, pH, DO, and specific conductance.

In 2018, the DRWW will sample 71 locations; 71 locations for water chemistry, and 1/3 of the 71 sites for biological/sediment each year for the next three years. The Upper Des Plaines mainstem (18 sites) plus small direct tributaries to the lower one-half of the mainstem (2 sites) will be sampled for biology/sediment in 2018 (1/3 of the watershed). Continuous Flow Monitoring will be conducted at 21 locations. Chlorophyll-a sampling and continuous monitoring at 14 locations for temp, pH, DO, and specific conductance. Winter season Continuous Monitoring program for conductivity as a surrogate for chlorides at 9 locations.

In addition to sampling in 2018, DRWW has contracted with MBI for Integrated Prioritization System (IPS) Modeling - An in-depth analysis of all chemical, physical, and biological data collected.

It is planned for 2019 to sample the last 1/3 of the watershed for biology/sediment, which would include sites in the Mill Creek and Bull Creek subwatersheds plus direct tributaries to Des Plaines River

adjacent those two subwatersheds and nested between the mainstem and the subwatershed boundaries (30 Sites).

Two Quality Assurance Project Plans (QAPPs) were developed for the monitoring program. The Bioassessment QAPP and the Flow Monitoring QAPP are appended to and inform this Monitoring Strategy.

Introduction and Background

The Des Plaines River Watershed covers over 130,000 acres or just over 200 square miles. The river starts just west of Kenosha, Wisconsin and flows south through Racine and Kenosha Counties in Wisconsin, and then through Lake, Cook, and Will Counties in Illinois. The river then joins the Sanitary and Ship Canal in Lockport, flows west through Joliet, before converging with the Kankakee River to form the Illinois River. The Illinois River then flows into the Mississippi River which flows south to the Gulf of Mexico.

Portions of the Des Plaines River, tributaries and lakes within the watershed in Lake County are listed as impaired by the Illinois EPA and do not meet their designated uses under the Clean Water Act. Segments are listed as impaired for pollutants including arsenic, chloride, dissolved oxygen, fecal coliform, iron, manganese, methoxychlor, mercury, phosphorous, polychlorinated biphenyls, and total suspended solids. Phosphorous is currently limited by regulatory action through Publicly Owned Treatment Works (POTWs) National Pollutant Discharge Elimination System (NPDES) permits. In addition, Total Maximum Daily Loads (TMDLs) have been completed for some stream segments and lakes within the watershed and more will continue to be developed. However, it is unclear as to whether any of these regulatory mechanisms will ultimately allow for the impaired waterbodies to meet Clean Water Act standards.

The Des Plaines River Watershed Workgroup (DRWW) brings together local stakeholders to 1) better determine stressors to the aquatic system through a long term water quality monitoring program; and 2) to work together to preserve and enhance water quality in the Des Plaines River and its tributaries. This 2018 monitoring strategy was developed by the DRWW Monitoring Committee.

Program Goals

The DRWW will undertake a comprehensive monitoring program to fulfill the following goals:

- Develop and implement a comprehensive monitoring program that will include chemical, physical, and biological components that will accurately identify the quality of stream and river ecosystems as well as stressors associated with non-attainment of water quality standards and designated uses. The DRWW monitoring program will establish baseline conditions, and then measure progress towards meeting water quality standards. Baseline conditions were established and documented in MBI's report Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries (2016).

- Assist NPDES permittees in meeting monitoring permit requirements, including monitoring requirements for upstream and downstream of POTWs and Municipal Separate Storm Sewer Systems (MS4s).

The proposed monitoring program will document the existing water quality status of the rivers and streams of the Des Plaines River watershed within Lake County, Illinois. The monitoring program will emphasize the direct assessment of biological assemblages by sampling fish and macroinvertebrates using standardized sampling and assessment methodologies. In addition to determining aquatic life status, the monitoring program will also ascertain the associated causes and sources associated with biological impairments by using paired chemical, physical, and other stressor data and information within a systematic analytical process detailed in a comprehensive plan of study, specifically monitoring habitat and water and sediment chemistry.

Water Column and Sediment Chemistry Monitoring

Water column and sediment chemistry is being sampled using a tiered site design to allow for more frequent monitoring of sites with greater flow and tributary area while still allowing for comprehensive coverage of the watershed. Water samples will be collected using grab samples upstream of the monitoring station unless otherwise noted in site description maps. If high pollutant loads are detected, follow up sampling at a refined scale may be undertaken to further determine the cause.

- Tier 1: 10 sites located on the mainstem Des Plaines River and Mill Creek, monitored five times per year; (February, May, July, August, and October) for all demand, nutrient, and bacteria parameters; will also be monitored annually under low flow conditions for water column metals, water organics, and in 2017-2019 once every three years concurrent with the bioassessment for sediment metals and sediment organics.
- Tier 2: 11 sites located on the Des Plaines and tributary streams for water and sediment chemistry will occur five times per year; (February, May, July, August, and October) for the majority of demand, nutrient, and bacteria parameters; annually under low flow conditions for water column metals, water organics, and once every three years concurrent with the bioassessment for sediment metals and sediment organics.
- Tier 3: 29 stream stations located on the Des Plaines and tributary streams within the watershed for water and sediment chemistry will occur five times per year; (February, May, July, August, and October) for the majority of demand, nutrient, and bacteria parameters and once every three years concurrent with the bioassessment for sediment metals and sediment organics.
- Tier 4: 21 stream stations located on tributary streams within the watershed monitored once every three years for bioassessment and five times per year; (February, May, July, August, and October) for the majority of demand, nutrient, and bacteria parameters.

The Master Spreadsheet of Sampling Sites (updated 1/11/2018) is attached as Attachment 2.

Quality Assurance Project Plan

All monitoring is being conducted under two Illinois EPA approved QAPPs. The DRWW used the DuPage River Salt Creek Workgroup's (DRSCW) approved QAPP and adapted it to be watershed specific for the Des Plaines Watershed bioassessment monitoring. A separate QAPP was developed and submitted to Illinois EPA for flow monitoring.

Illinois EPA requires the development of a QAPP for any activity involving the collection and analysis of environmental data. A QAPP presents the policies and procedures, organization, objectives, quality

assurance requirements, and quality control activities designed to achieve the type and quality of environmental data necessary to support project or program objectives. It is the policy of Illinois EPA that no data collection or analyses will occur without an approved QAPP. All in-house and external environmental data collection activities are subject to this requirement. All contracts must address quality assurance requirements (e.g., data quality and reporting requirements) when those contracts pertain to, or have an impact on, data collection or analysis activities. Additionally, all grants and contracts need to address quality assurance requirements specified in applicable state acquisition or procurement regulations. The DRWW QAPP follows U.S. and Illinois EPA guidance for the development of a project specific QAPP.

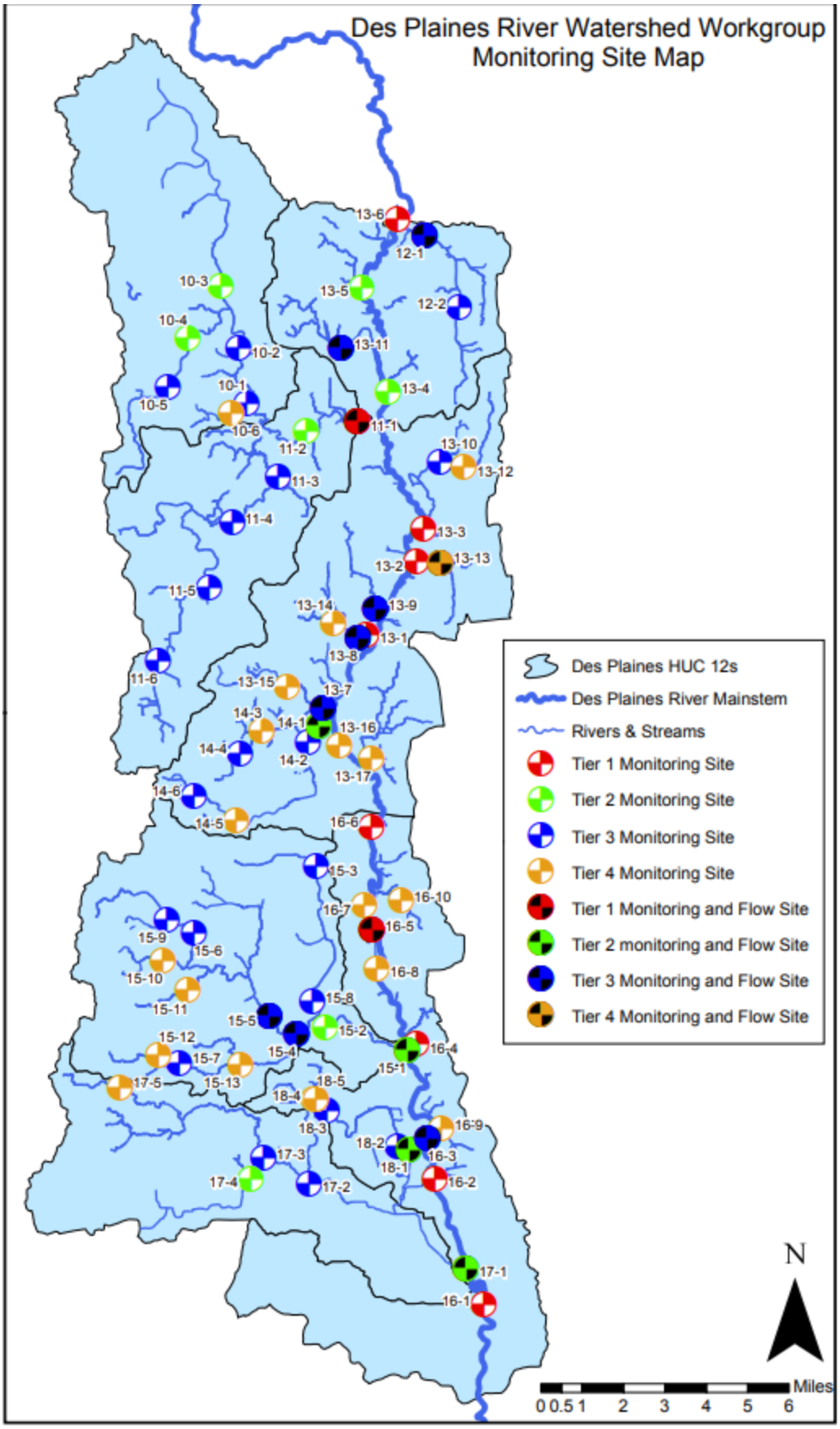
Data and Reporting

Suburban Labs, the water and sediment chemistry contractor, sends water column and sediment chemistry data to the DRWW following analysis via email in the format of one final report of laboratory analysis in pdf form per site. After data is collected at each site for that sampling event (occurring five times in 2018), the laboratory sends an Excel spreadsheet summarizing all sites and parameters. DRWW staff take this data and format it to fit the Illinois EPA requirements for reporting surface-water - monitoring data format (EDDMasterStructureAndFormat_VersionAsOf2015_06_30_ToChrisDavis_2016_02_1...) .

Midwest Biodiversity Institute (MBI), the bioassessment contractor, will send biological data to the DRWW and will be appended to the project database.

MBI will also be responsible for completing a final monitoring report, analyzing the results of the water column and sediment chemistry as well as the fish, macroinvertebrate, and habitat data. Interpretative statistics, such as long-term central tendencies, will be based on all available data within the database, developed over time, including past data collection efforts.

Data will be submitted annually to Illinois EPA by March 31, 2017


Des Plaines River Watershed Workgroup
Monitoring Site Map
Des Plaines HUC 12s
Des Plaines River Mainstem
Rivers & Streams
Tier 1 Monitoring Site
Tier 2 Monitoring Site
Tier 3 Monitoring Site
Tier 4 Monitoring Site
Tier 1 Monitoring and Flow Site
Tier 2 monitoring and Flow Site
Tier 3 Monitoring and Flow Site
Tier 4 Monitoring and Flow Site
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Attachment #2

Des Plaines River Watershed Workgroup

Sample Site Data Table

(Updated 1/11/2018)

DRWW ID	NewDRNAREA	Year	Lat	Long	River/Stream Name	Subwatershed	Tier 1	Tier 2	Tier 3	Tier 4	Location	Comment
10-1	31.90	2019	42.4248	-87.9973	North Mill	North Mill Creek			3		Milbourne Road	
10-2	29.38	2019	42.4442	-88.0007	North Mill	North Mill Creek			3		Kelly Road	Dam removal site - dam is notched
10-3	20.79	2019	42.4661	-88.0090	North Mill Creek	North Mill Creek		2			Route 173	
10-4	5.64	2019	42.4479	-88.0247	North Mill	North Mill Creek		2			Hastings Creek @ Miller Rd	
10-5	3.91	2019	42.4308	-88.0343	North Mill	North Mill Creek			3		Hastings Creek @ Grass Lake Rd	
10-6	0.99	2019	42.4215	-88.0045	Unnamed Trib to North Mill Creek	North Mill Creek				4	Ust. (W) of Route 45 - need better parking access	
11-1	63.80	2019	42.4183	-87.9451	Mill Creek	Mill Creek	1				Dilley's Road	
11-2	59.88	2019	42.4154	-87.9690	Mill Creek	Mill Creek		2			Hunt Club Road	sample at POTW call Austin 847-377-7134
11-3	21.34	2019	42.3989	-87.9824	Mill Creek	Mill Creek			3		Sterns School Road	
11-4	18.33	2019	42.3833	-88.0041	Mill Creek	Mill Creek			3		Route 45	
11-5	9.35	2019	42.3605	-88.0151	Mill Creek	Mill Creek			3		Washington St	
11-6	4.32	2019	42.3350	-88.0397	Mill Creek	Mill Creek			3		Wick Street	
12-1	7.35	2019	42.4835	-87.9128	Newport Drainage Ditch	Newport Drainage Ditch			3		Newport Drainage Ditch @ Kilbourne Ave	
12-2	2.82	2019	42.4581	-87.8968	Newport Drainage Ditch	Newport Drainage Ditch			3		W. 21st Street along Union Pacific RR	
13-1	232.03	2018	42.3438	-87.9411	Des Plaines River	Upper Des Plaines River	1				Hwy 120	
13-10	4.02	2019	42.4042	-87.9061	Suburban Country Club Trib	Upper Des Plaines River			3		Suburban Country Club Trib @ Shirley Dr	
13-11	2.37	2019	42.4444	-87.9527	Slocum Corners Creek	Upper Des Plaines River			3		N. Mill Creek Rd.; E. of I-94	
13-12	2.35	2019	42.4023	-87.8949	Suburban County Club Trib	Upper Des Plaines River				4	E. of Northwestern Ave.	
13-13	1.06	2019	42.3654	-87.9014	Unnamed trib. - Greenleaf Creek	Upper Des Plaines River				4	Swanson Trigg Conservation Area - 42.3700-87.9085	
13-14	1.10	2019	42.3480	-87.9570	Unnamed Trib to Belvidere Rd Trib.	Upper Des Plaines River				4	Leonard Dr.	
13-15	1.92	2019	42.3259	-87.9784	Bull's Brook	Upper Des Plaines River				4	Almond Rd.	
13-16	253.75	2018	42.3051	-87.9542	Des Plaines River	Upper Des Plaines River				4	Dst. Buckley Rd.	Need to access via Desplaines Trail (Sed. Analyses)
13-17	0.84	2019	42.3002	-87.9390	Unnamed Trib to Des Plaines River	Upper Des Plaines River				4	Behind pump station off of Sprucewood Lane	
13-18	214.84	2018	42.3975	-87.9245	Des Plaines River	Upper Des Plaines River				4	40' Above Riffle Structure	Access through Wetlands Research property (Sed. Analyses)
13-2	225.36	2018	42.3691	-87.9176	Des Plaines River	Upper Des Plaines River	1				McClure Ave	Canoe launch
13-3	220.39	2018	42.3808	-87.9140	Des Plaines River	Upper Des Plaines River	1				Above Hwy 41	
13-4	145.54	2018	42.4288	-87.9304	Des Plaines River	Upper Des Plaines River		2			Wadsworth Road	
13-5	137.29	2018	42.4653	-87.9428	Des Plaines River	Upper Des Plaines River		2			Hwy 173	
13-6	123.67	2018	42.4892	-87.9258	Des Plaines River	Upper Des Plaines River	1				Russel Road	
13-7	2.69	2019	42.3184	-87.9617	Bull's Brook @ Rt 21	Upper Des Plaines River			3		N. Milwaukee Ave.	
13-8	3.71	2019	42.3427	-87.9454	Belvidere Rd Tributary	Upper Des Plaines River			3		Belvidere Rd Tributary @ Highway 21 and 120	
13-9	4.08	2019	42.3528	-87.9367	Stone Roller @ Lake Carina	Upper Des Plaines River			3		Stone Roller @ Lake Carina	
14-1	11.67	2019	42.3119	-87.9637	Bull Creek	Bull Creek		2			Hwy 21	
14-2	2.87	2019	42.3061	-87.9690	Bull Creek	Bull Creek			3		Route 137	
14-3	0.99	2019	42.3101	-87.9906	Bull Creek	Bull Creek				4	N. Countryryside Drive	
14-4	5.08	2019	42.3025	-88.0008	W. Branch Bull Creek	Bull Creek			3		Northwind Blvd. - access 1600 behind warehouse	
14-5	1.33	2019	42.2793	-88.0028	Bull Creek	Bull Creek				4	Adj. University Drive	call Clay K 847-312-3657
14-6	2.39	2019	42.2877	-88.0229	Bull Creek	Bull Creek			3		Hazelnut Xing	
15-1	36.43	2017	42.1981	-87.9231	Indian Creek	Indian Creek		2			Marriot Inn parking lot - adj. Cranes Landing GC	
15-10	2.22	2017	42.2301	-88.0376	West Branch Indian Creek	Indian Creek				4	Gilmer Rd.	
15-11	1.70	2017	42.2196	-88.0256	Forest Lake Drain	Indian Creek				4	Hawthorne Grove Rd.	
15-12	2.06	2017	42.1969	-88.0399	Kildeer Creek	Indian Creek				4	IL Rt. 22	
15-13	3.43	2017	42.1937	-88.0012	Kildeer Creek	Indian Creek				4	Willowbrook Rd. S. of Half Day Rd.	
15-2	35.02	2017	42.2065	-87.9616	Indian Creek	Indian Creek		2			Sullivan Woods Preserve, North of Creekview Dr.	
15-3	5.07	2017	42.2627	-87.9655	Indian Creek	Indian Creek			3		Gregg's Parkway	
15-4	6.78	2017	42.2044	-87.9750	Indian Creek	Indian Creek			3		Port Clinton Rd at Kildeer Creek	
15-5	17.26	2017	42.2105	-87.9876	Indian Creek	Indian Creek			3		Oakwood Rd.	
15-6	3.66	2017	42.2394	-88.0231	Indian Creek	Indian Creek			3		Washitay Ave	
15-7	2.85	2017	42.1943	-88.0300	Indian Creek	Indian Creek			3		Salem Lake Drive S. of Rt 22	
15-8	9.36	2017	42.2149	-87.9662	Seavey Drainage Ditch	Indian Creek			3		Near Vernon Hills GC	

Attachment #2

Des Plaines River Watershed Workgroup

Sample Site Data Table

(Updated 1/11/2018)

15-9	2.68	2017	42.2445	-88.0356	Indian Creek	Indian Creek			3		N. Midlothian Rd.	
16-1	358.85	2018	42.1094	-87.8878	Des Plaines River	Lower Des Plaines River	1				Palantine Frontage Rd.	
16-10	2.00	2018	42.2505	-87.9255	Werhane Lake Drain	Lower Des Plaines River				4	St. Marys Rd.	
16-2	323.96	2018	42.1531	-87.9102	Des Plaines River	Lower Des Plaines River	1				E. Lake Cook Rd.	
16-3	314.68	2018	42.1676	-87.9134	Des Plaines River	Lower Des Plaines River			3		Deerfield Rd.	
16-4	273.21	2018	42.2004	-87.9185	Des Plaines River	Lower Des Plaines River	1				Half Day Rd.	
16-5	268.06	2018	42.2405	-87.9392	Des Plaines River	Lower Des Plaines River	1				Illinois Route 60 - Town Line Rd.	
16-6	260.11	2018	42.2767	-87.9391	Des Plaines River	Lower Des Plaines River	1				Rockland Rd.	
16-7	266.48	2018	42.2490	-87.9426	Des Plaines River	Lower Des Plaines River				4	Hollister Dam site - adj. to Hollister Intl.	Sediment Analyses
16-8	268.90	2018	42.2271	-87.9368	Des Plaines River	Lower Des Plaines River				4	Wright Woods Dam site - immediately ust. bike bridge	Dam removal access route - need key (Sed. Analyses)
16-9	1.19	2018	42.1709	-87.9069	Unnamed Trib to Des Plaines River	Lower Des Plaines River				4	Timberleaf Lane	
17-1	29.23	2017	42.1218	-87.8960	Buffalo Creek	Buffalo Creek		2			Route 21	
17-2	22.10	2017	42.1519	-87.9692	Lake Cook Rd @ Farington Ditch	Buffalo Creek			3		Lake Cook Rd @ Farington Ditch	
17-3	9.59	2017	42.1609	-87.9907	Buffalo Creek	Buffalo Creek			3		Checker Road	
17-4	8.55	2017	42.1536	-87.9966	Buffalo Creek	Buffalo Creek		2			Lake Cook Rd @ Buffalo Creek Trib	
17-5	1.19	2017	42.1858	-88.0580	Unnamed trib.	Buffalo Creek				4	Quentin Rd.	
18-1	5.50	2017	42.1635	-87.9224	Aptakisic	Aptakisic Creek		2			Aspen Road	
18-2	4.94	2017	42.1646	-87.9277	Aptakisic	Aptakisic Creek			3		Pekara Rd, West of Hwy. 21	
18-3	2.26	2017	42.1777	-87.9608	Aptakisic Creek	Aptakisic Creek			3		Copperwood Dr. bike xing	
18-4	1.09	2017	42.1812	-87.9667	Aptakisic Creek	Aptakisic Creek				4	N. Buffalo Grove Rd.	
18-5	0.99	2017	42.1815	-87.9657	Unnamed Trib to Aptakisic Creek	Aptakisic Creek				4	Dst. Aptakapsic Rd.; W of N. Buffalo Grove Rd.	
							10	11	29	21		