Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries 2016

Des Plaines River at Wright Woods Dam (removed)

Indian Creek at Sullivan Woods Preserve

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Lake County, IL

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TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

PLATES

LIST OF TABLES

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FOREWORD

What is a Biological and Water Quality Survey?

A biological and water quality survey, or "bioassessment", is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire watersheds, multiple and overlapping stressors, and tens of sites. The 2016 study included the Upper Des Plaines River mainstem and all tributaries in Lake Co., IL for a total of 69 sites. This is the first baseline bioassessment of the entire watershed at this intensity of sampling. The principal focus of the 2016 bioassessment is on the status of the Illinois General Use for aquatic life and recreational contact.

Scope of the 2016 Biological and Water Quality Assessment

The Midwest Biodiversity Institute (MBI) was contracted by the Des Plaines Watershed Workgroup (DRWW) to develop a biological and water quality monitoring and assessment plan for Upper Des Plaines River and tributaries within Lake County, IL. The plan was incorporated into Quality Assurance Project Plan (QAPP; DRWW 2016) that submitted to and approved by Illinois EPA. The spatial sampling design consisted of an intensive pollution survey and geometric allocation of sites. This design was employed to fulfill multiple purposes and goals in addition to the determination of the existing status of the biological assemblages and their relationship to chemical, physical, and biological stressors. Targeted sites were positioned upstream and downstream from major discharges, other sources of potential pollution releases and contamination, and major tributaries to provide a "pollution profile" of the major mainstem streams and rivers. Sampling locations in the smaller tributaries were allocated by a geometric progression of drainage area to a resolution of 0.5-1.0 square miles. The major objectives include:

1. Determine the aquatic life status of each sampling location in quantitative terms, i.e., not only if a waterbody is impaired, but the spatial extent and severity of the impairment and the respective departures from established criteria;

2. Determine the proximate stressors that correspond to observed impairments for the purpose of targeting appropriate management actions to those stressors; and,

3. Screen for any potential issues with use attainability.

To meet these objectives data was collected with methods that provide high quality results and in conformance with the practices of Illinois EPA (IEPA 2010a,b; 2011; 2014a,b) and Illinois DNR (2010a,b) and under a project QAPP approved by IEPA (DRWW 2016).

Previous biological assessments of the Upper Des Plaines River basin streams and rivers include major surveys by Illinois EPA (IEPA 1988,), Illinois DNR (IDNR; Pescitelli 2016; Pescitelli and Rung 2010a,b; Pescitelli and Rung 2005; Day 1991; Heidinger 1989; Bertrand 1984; Langbein and Wright 1976; Muench 1968), Illinois Natural History Survey (Bilger et al. 2016; Sherwood et al. 2016), U.S. Geological Survey (Steffeck and Streigl 1989), Shedd Aquarium (Bland and Willink 2015), and others (Slawski et al. 2008). Some of these surveys included the entirety of the Des Plaines River and others focused on the Upper Des Plaines defined as the mainstem and tributaries upstream from the confluence with Salt Creek. Several other smaller surveys of specific tributaries in Lake Co. have also been conducted. The spatial coverage in terms of site density were less than the 2016 survey of the Lake Co. portion of the Upper Des Plaines watershed, but some were sufficient to provide a baseline against which the 2016 results could be compared.

EXECUTIVE SUMMARY

Summary of Findings

Aquatic Life Condition Assessment

The primary indicator of overall condition in terms of aquatic life is the status of the Illinois General Use using the Illinois fish and macroinvertebrate Indices of Biotic Integrity and generally following the guidance in the 2016 Integrated Report (IEPA 2016). The status of aquatic life is portrayed in an attainment table (Table 1) and expressed as full or non-support and based on the most limiting of either the fish or macroinvertebrate results. Non-support is further subdivided into non-support fair and non-support poor; a partial support category was added to clarify instances where only one of the two assemblages attained the General Use support threshold. Of the 69 sites assessed for General Use aquatic life use none were in full support, 22 non-support-fair, 26 non-support poor, and 21 partial support. One site was sampled for macroinvertebrates only and while it attained the mIBI threshold for full support, the attainment status was not determined. The fish assemblage was the limiting factor in many of the non-support and all of the partial support determinations failing to meet the IEPA General Use threshold for the fIBI at any sampling site in the 2016 study area which is similar to results observed in 2013 by IDNR (Pescitelli 2016). The Modified Index of Well-Being (MIwb; Ohio EPA 1987) was calculated for the fish assemblage at sites >20 mi.^{2} and met an interim General Use support threshold at 10 of 24 sites. Macroinvertebrate assemblages attained the General Use threshold for the mIBI at 34 of the 69 biological sampling sites including all except the uppermost three mainstem sites.

Causes and Sources of Non-attainment[1]

Causes and sources were determined for each impaired site and included categorical or parameter level associations and their sources (if known). These were compared to the IEPA derived causes listed in the 2016 Integrated Report (IEPA 2016) for coinciding sites. Assigning causes involves using a lines of evidence approach where chemical and physical indicators of a causal category or parameter is logically related to a biological impairment, not just simply based on the coincidental exceedance of a criterion or other threshold. Knowing about relationships that are supported by prior empirical observations in other studies or our own experiences helps boost the confidence in causal assignments. This process varies somewhat from that of IEPA in that additional effect thresholds were used to assign causes beyond those used by IEPA.

Eleven (11) different causal categories and four different source categories were identified for the 2016 study area (Table 1; Figure 1). Of these causes, four (4) were habitat related (siltation, no riparian, bank erosion, and channel modification) and seven (7) were chemical (low dissolved oxygen, organic enrichment, nutrients, chlorides, conductivity, manganese, and

[1] A ***Cause*** is an agent or agents associated with an aquatic life or recreational use impairment; a ***Source*** is the origin of the causal agent. Nomenclature generally follows U.S. EPA and state 303[d] listing guidelines.

Table 1. *Aquatic life use attainment status in the 2016 Upper Des Plaines River watershed study area with associated causes and sources of impairment listed for partial and non-supporting sites determined by this study and by IEPA (2016) for matching sites (see footnote for fIBI and mIBI use support thresholds). fIBI, MIwb, and mIBI values that do not meet the threshold are asterisked (*) and poor values are underlined. The most limiting assemblage for partial support is indicated by a F (fish) or M (macroinvertebrates). Causes of impairment that exceed thresholds in the Illinois 2016 Integrated Report guidance are underlined.*

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
Des Plaines River										
13-6	109.30	123.7	22*	5.9*	21.2*	51.0	Non - Fair	Siltation; Dissolved Oxygen; Org. Enrich.; Nutrients; Chlorides	Urban runoff	D.O., TSS
13-5	106.60	137.3	24*	7.7*	29.5*	50.3	Non - Fair	Siltation; Chlorides	Urban runoff	D.O., TSS
13-4	102.90	145.6	23*	7.8^{ns}	35.3*	48.5	Non - Fair	Siltation; Chlorides	Urban runoff	D.O., Siltation, TSS
13-3	98.70	220.3	33*	9.7	57.9	81.0	Partial (F)[3]	Org. Enrich; Siltation; Chlorides, PAHs	WWTP, Urban runoff	NA[4]
13-2	96.82	225.4	31*	9.2	49.4	83.0	Partial (F)	Org. Enrich; Siltation; Chlorides	WWTP, Urban runoff	NA
13-1	94.20	232.0	32*	9.4	42.2	80.8	Partial (F)	Org. Enrich; Nutrient; Siltation; Chlorides	WWTP, Urban runoff	NA
13-16	90.60	253.8	28*	6.9*	44.8	74.8	Partial (F)	Org. Enrich; Nutrients; Siltation; Chlorides	WWTP, Urban runoff	Arsenic, Chlorides, TP

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
16-7	84.60	266.5	35*	9.3	51.6	78.3	Partial (F)	Org. Enrich; Nutrients; Siltation; Chlorides[5]	WWTP, Urban runoff	NA
16-5	83.60	268.1	19*	7.1*	54.9	71.0	Non - Poor	Org. Enrich; Nutrients; Siltation; Chlorides, PAHs	WWTP, Urban runoff	NA
16-8	82.90	268.9	33*	9.1	49.8	79.8	Partial (F)	Org. Enrich; Nutrients; Siltation; Chlorides[5]	WWTP, Urban runoff	NA
16-4	80.00	273.2	34*	8.6	58.8	73.5	Partial (F)	Org. Enrich; Nutrients; Siltation; Chlorides	WWTP, Urban runoff	NA
16-3	76.70	314.7	19*	4.9*	57.4	80.5	Non - Poor	Org. Enrich; Nutrients; Siltation; Chlorides	WWTP, Urban runoff	NA
16-2	75.40	324.0	36*	8.8	45.4	77.5	Partial (F)	Nutrients; Siltation; Chlorides	WWTP, Urban runoff	NA
16-1	71.70	358.7	38*	8.5	53.2	78.0	Partial (F)	Nutrients; Siltation; Chlorides; PAHs	WWTP, Urban runoff	NA
Seavey Drainage Ditch										
15-3	3.66	5.05	15	N/A	26.0	65.6	Non-Poor	Channelization; Siltation; Chlorides	Habitat Alteration; Urban Runoff	

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
15-8	0.45	9.77	24	N/A	25.7	54.0	Non-Fair	No riparian; Siltation; Channelization	Habitat Alteration; Urban Runoff	
Bull Creek										
14-6	5.95	1.32	12	N/A	22.1	54.5	Non-Poor	Dissolved Oxygen; Siltation	Habitat Alteration; Urban Runoff	
14-5	4.70	2.42	25	N/A	17. 5	52.0	Non-Poor	Dissolved Oxygen; Siltation	Habitat Alteration; Urban Runoff	
14-2	1.00	8.44	28	N/A	35.3	57.5	Non-Fair	Siltation; Chlorides	Habitat Alteration; Urban Runoff	
14-1	0.50	11.69	36	N/A	62. 9	89.5	Partial	Chlorides	Urban Runoff	
Aptakisic Creek										
18-4	4.70	1.09	27*	N/A	18.5*	52.5	Non - Poor	Dissolved Oxygen; Siltation	Urban Runoff; Altered Hydrology	NA
18-3	4.30	2.30	17*	N/A	25.6*	57.0	Non - Poor	No riparian; Channelization; PAHs	Habitat Alteration; Urban Runoff; Altered Hydrology	NA
18-2	0.80	4.94	26*	N/A	30.7*	46.0	Non - Fair	Siltation; Bank Erosion; Channelization; Chlorides	Habitat Alteration; Urban Runoff; Altered Hydrology	NA

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
18-1	0.50	5.50	24*	N/A	23.0*	52.0	Non - Fair	Channelized; Siltation; No riparian; Chlorides	WWTP; Habitat Alteration; Urban Runoff; Altered Hydrology	NA
Hastings Creek										
10-5	3.12	3.91	13*	N/A	31.6*	57.0	Non - Poor	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
10-4	1.68	6.80	11*	N/A	17. 5	38.5	Non - Poor	Channelized, Siltation; Chlorides	Habitat Alteration; Urban Runoff; Altered Hydrology	Arsenic, TP, siltation
Buffalo Creek										
17-5	14.00	1.37	25*	N/A	24.6*	66.0	Non - Fair	Siltation; Bank erosion;	Urban Runoff; Altered Hydrology	TSS
17-3	7.70	9.61	12*	N/A	48.1	69.0	Non - Poor	Siltation; Bank erosion; Chlorides	Urban Runoff; Altered Hydrology	TSS
17-2	6.10	22.1	21*	6.9*	50. 5	60.5	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	TSS

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
17-1	0.75	29.2	25*	6.2*	42.6	51.0	Partial (F)	Channelization; Chlorides; PAHs	Habitat Alteration; Urban Runoff; Altered Hydrology	TSS
Bull's Brook										
13-15	1.95	1.92	15*	N/A	32.4*	63.3	Non - Poor	Siltation; Bank erosion;	Urban Runoff; Altered Hydrology	NA
13-7	0.25	2.69	26*	N/A	39.9*	64.0	Non - Fair	Siltation; Conductivity; Manganese	Urban Runoff; Altered Hydrology	NA
Forest Lake Drain										
15-11	0.83	1.70	16*	N/A	28.5*	58.0	Non - Poor	Siltation	Urban Runoff; Altered Hydrology	NA
Indian Creek										
15-9	10.83	2.68	18*	N/A	20.9*	62.3	Non - Poor	Siltation; Manganese	Urban Runoff; Altered Hydrology	D.O.
15-6	9.83	3.70	21*	N/A	23.7*	65.5	Non - Fair	Siltation; Bank erosion; Chlorides; Manganese	Urban Runoff; Altered Hydrology	D.O.

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
15-5	5.40	17.3	27*	N/A	37.7*	59.8	Non - Fair	Siltation; Chlorides	Urban Runoff; Altered Hydrology	D.O.
15-2	2.41	35.0	35*	6.7*	58.5	79.0	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	D.O.
15-1	0.17	36.4	22*	4.9*	57.3	64.5	Partial (F)	Channelization; Siltation; Chlorides; Manganese	Habitat Alteration; Urban Runoff; Altered Hydrology	D.O.
Killdeer Creek										
15-12	5.20	2.08	20*	N/A	37.0*	46.5	Non - Fair	Siltation	Urban Runoff; Altered Hydrology	NA
15-7	4.60	2.86	17*	N/A	32.4*	53.5	Non - Poor	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
15-13	2.21	5.01	20*	N/A	56.1	58.0	Partial (F)	Siltation; Bank erosion;	Urban Runoff	NA
15-4	0.17	6.80	23*	N/A	42.0	61.0	Partial (F)	Siltation; Bank erosion; No riparian; Chlorides	Urban Runoff; Altered Hydrology	NA

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
Newport Drainage Ditch										
12-2	3.03	2.81	21*	N/A	33.7*	38.0	Non - Fair	Siltation; Channelization	Habitat Alteration; Urban Runoff; Altered Hydrology	NA
12-1	0.70	7.35	29*	N/A	46.5	47.0	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
Stoneroller Creek										
13-9	0.42	4.08	34*	N/A	57.9	72.8	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
Suburban Country Club Tributary										
13-12	2.75	2.37	15*	N/A	31.6*	41.5	Non - Poor	Siltation; Channelization	Habitat Alteration; Urban Runoff; Altered Hydrology	NA
13-10	2.00	4.02	22*	N/A	19.2*	47	Non - Poor	Siltation; Channelization; Chlorides	Habitat Alteration; Urban Runoff	NA

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
Slocum Corners Creek										
13-11	1.36	2.39	24*	N/A	41.4	61.5	Non - Fair	Siltation; No riparian; Chlorides	Urban Runoff; Altered Hydrology	NA
Unnamed Tributary to Aptakisic Creek										
18-5	0.05	0.99	27*	N/A	21.7*	47	Non - Fair	Channelization; Siltation	Habitat Alteration;	NA
Unnamed Tributary to Buffalo Creek										
17-4	0.68	8.55	12*	N/A	27.0*	63	Non - Poor	Siltation; No riparian; Chlorides	Urban Runoff; Altered Hydrology	NA
Unnamed Tributary to Des Plaines River										
13-17	0.13	0.86	18*	N/A	22.9*	62	Non - Poor	Siltation	Urban Runoff; Altered Hydrology	NA
Unnamed Tributary to North Branch Mill Creek										
10-6	0.04	0.99	12*	N/A	26.8*	61	Non - Poor	Siltation	Urban Runoff; Altered Hydrology	NA
Unnamed Tributary to Greenleaf Creek										
13-13	0.40	1.06	28*	N/A	20.3*	68.5	Non - Poor	Siltation	Urban Runoff; Altered Hydrology	NA

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
West Branch Indian Creek										
15-10	0.80	2.22	13*	N/A	25.9*	63	Non - Poor	Bank erosion; Siltation	Urban Runoff; Altered Hydrology	NA
West Branch Bull Creek										
14-4	2.54	5.10	16*	N/A	18.7*	32.5	Non - Poor	Dissolved Oxygen; Channelized; Siltation	Habitat Alteration; Urban Runoff	NA
14-3	1.60	7.05	26*	N/A	64.2	64	Partial	Siltation; No riparian;	Urban Runoff; Altered Hydrology	NA
West Fork Belvidere Rd. Tributary										
13-14	0.21	2.30	15*	N/A	28.3*	57.5	Non - Poor	Siltation; Channelization; Manganese	Habitat Alteration; Urban Runoff; Altered Hydrology	NA
13-8	0.15	3.75	31*	N/A	48.9	69.5	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
Werhane Lake Drain										
16-9	0.40	1.19	35*	N/A	41.4	59	Non - Fair	Siltation	Urban Runoff; Altered Hydrology	NA

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
Unnamed Tributary to Werhane Lake Drain										
16-10	0.10	0.22	22*	N/A	-	49.5	Non - Fair	Siltation	Urban Runoff; Altered Hydrology	NA
16-10B	0.80	0.22	-	-	43.4	-	NA			
Mill Creek										
11-6	17.20	4.51	21*	N/A	32.5*	40	Non - Fair	Siltation; Chlorides; PAHs	Urban Runoff; Altered Hydrology	NA
11-5	13.80	10.4	20*	N/A	30. 8*	49	Non - Fair	Siltation; Chlorides	Urban Runoff; Altered Hydrology	NA
11-4	10.10	18.3	22*	N/A	36. 6*	57	Non - Fair	Siltation; Chlorides	Urban Runoff; Altered Hydrology	D.O., pH
11-3	7.20	21.4	14*	4.6*	48.3	63	Non - Poor	Siltation; Bank erosion; Chlorides	Urban Runoff; Altered Hydrology	D.O., pH
11-2	1.71	62.3	32*	9.3	25. 8*	79	Non - Fair	Siltation; Chlorides	Urban Runoff; Altered Hydrology	D.O., pH
11-1	0.70	63.8	31*	7.9^{ns}	50.7	71	Partial (F)	Siltation; Chlorides	Urban Runoff; Altered Hydrology	D.O., pH

DRWW Site ID	River Mile	Drain-age Area (mi.^{2})	fIBI	MIwb[1]	mIBI	QHEI	Attain-ment Status[2]	MBI Causes	MBI Sources	IEPA Causes
North Branch Mill Creek										
10-3	10.20	20.8	14*	7.3*	33.1*	52	Non - Poor	Siltation; Conductivity	Urban Runoff; Altered Hydrology	D.O., TP
10-2	8.10	29.4	13*	3.8*	31.6*	75.5	Non - Poor	Siltation; Conductivity	Urban Runoff; Altered Hydrology	NA
10-1	1.10	32.0	22*	5.3*	55.3	70	Partial (F)	Siltation; Conductivity	Urban Runoff; Altered Hydrology	As, Mn, TP, Siltation

[1] The Modified Index of Well-Being (MIwb; Gammon 1976; Ohio EPA 1987) does not have a biocriterion in IL – the default is the Ohio value for the E. Corn Belt Plains (ECBP) ecoregion wading (8.3) and boat sites (8.5) with a 0.5 unit allowable departure designated as [ns]; the MIwb is not calculated for headwater sites <20 mi.^{2}.

[2] - **IEPA Aquatic Life Use Support Thresholds**

AQLU Status	fIBI	mIBI
Full Support	≥41	≥41.8
Non-Support Fair	>20,<41	≥20.9,<41.8
Non-Support Poor	≤20	<20.9

[3] Partial support is a non-IEPA designation to a site with the non-attaining assemblage below the full support level for the fIBI or mIBI.

[4] NA – Status and causes were not assessed at this location by IEPA.

[5] – Extrapolated from field conductivity measures.

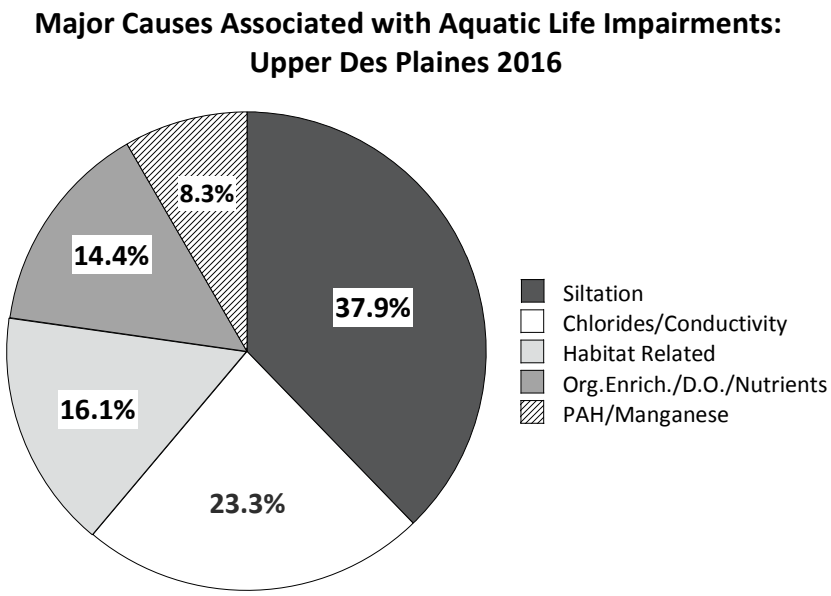

***Figure 1**. Major causes associated with aquatic life impairments in the Upper Des Plaines study area, 2016.*

PAHs). Certain causes such as siltation (66 of 69 sites) and chlorides (41 of 69 sites) were pervasive throughout the study area while others were either localized or sporadic throughout the study area. Sources included urban runoff, habitat alterations, altered hydrology, and WWTP effluent. These constitute the principal causes and sources that would need to be addressed to resolve the aquatic life impairments listed in Table 1. Illinois EPA (2016a) listed a different set of causes at 20 of the 64 biological sites including arsenic, chlorides, low dissolved oxygen, pH, fecal coliform bacteria, iron, manganese, methoxychlor, mercury, phosphorous, polychlorinated biphenyls, and total suspended solids. Some of this is likely due to the different interpretation of effect threshold exceedances and that IEPA sampled less than one-third of the sites sampled in the 2016 Upper Des Plaines watershed bioassessment.

Synthesis of Results

Biological signatures of siltation related impacts, altered hydrology, and organic enrichment from multiples sources were evident throughout the 2016 study area. Organic enrichment related biological responses in the form of increases in tolerant species, reductions in numbers and biomass, and increased DELT anomalies on fish occurred downstream from WWTPs in Aptakisic Creek and Mill Creek with the former revealing a toxic response signature in the macroinvertebrate results. Sediment contamination was revealed with PAH compounds exceeding consensus based threshold and probable effect levels in the mainstem and several tributaries correlated with the degree of urbanization. Only a few D.O. exceedances were measured by daytime grab sampling and those were largely in the very sluggish and highly enriched upper Des Plains River mainstem - continuous monitoring is needed to better reveal where such exceedances may be limiting to aquatic life. Continuous monitoring is also needed to reveal where nutrient enrichment is contributing to excessive diel D.O. fluctuations that rarely coincide with exceedances of the average and minimum D.O. criteria. The most prevalent stressor across all sites in the Upper Des Plaines River watershed is heavy siltation associated with habitat alterations and altered hydrology from urban and suburban runoff. Dissolved materials in the form of elevated chlorides and conductivity were prevalent in the most urbanized parts of the mainstem Upper Des Plaines River and tributary subwatersheds. A trend analysis revealed that chlorides are increasing at the rate of 1.7 to 3.6 mg/L on an annual

basis. Chlorides were the second most prevalent cause associated with the biological impairments.

Recreational Use Assessment

Levels of fecal bacteria in the form of *Escherichia coli* (*E. coli*) cfu/100 mL were used to assess the status of the General Use for recreational in and on the water. The IEPA criteria are expressed as counts of fecal coliform bacteria, which were not measured, so the U.S. EPA national criteria for *E. coli* were used instead. Fecal bacteria criteria are generally in terms of a geometric mean and a statistical threshold value (STV) which is the 90th percentile of the data distribution that is not be exceeded by more than 10 percent of the samples. Given the low sample size, the maximum values were used here as an approximation of the STV. The recommended geometric mean criteria value is 126 cfu/100 ml and the STV criteria value is 410 cfu/100 ml (U.S. EPA 2012). There were numerous exceedances of the U.S. EPA recommended criteria (Table 2). With one exception, the exceedances of both the geometric mean and maximum in the Des Plaines mainstem occurred downstream from the discharge of treated sewage effluent. An exceedance of the maximum occurred at RM 102.9 (site 13-4) which is upstream of all major WWTPs. Two tributaries with exceedances of the geometric mean and maximum included Hastings Creek and Aptakisic Creek and both were downstream of WWTP discharges. Exceedances of both the geometric mean and maximum occurred in other tributaries and with no apparent relationship to a specific source or sources, except generalized urban and agricultural runoff. Even so, these results will be valuable for more detailed investigation of possible sources of fecal contamination. The low frequency of sampling is less than what IEPA requires for an impaired waters listing based on recreational use impairment.

Table 2. *E. coli values (cfu/100 ml) for samples collected in the Upper Des Plaines study area during May-October 2016. Yellow shaded values exceed the recommended U.S. EPA (2012) recreation use criteria.*

DRWW Site ID	Basin Code	Stream Code	River Mile	N	Minimum (cfu/100 mL)	Geometric Mean (cfu/100 mL)	Maximum (cfu/100 mL)
Des Plaines River							
13-6	95	656	109.3	6	27.2	92.6	387
13-5	95	656	106.6	5	6.3	49.9	131
13-4	95	656	102.9	6	42.2	111.6	548
13-3	95	656	98.7	5	65.7	214.4	1050
13-2	95	656	96.82	6	1.0	106.1	816
13-1	95	656	94.2	6	88.4	147.1	219
16-6	95	656	87.1	6	81.6	126.3	326
16-5	95	656	83.6	6	55.4	139.6	435
16-4	95	656	80	6	64.4	145.8	228
16-3	95	656	76.7	6	65.1	138.3	411
16-2	95	656	75.4	6	54.6	121.1	308
16-1	95	656	71.7	6	2.0	49.9	387

DRWW Site ID	Basin Code	Stream Code	River Mile	N	Minimum (cfu/100 mL)	Geometric Mean (cfu/100 mL)	Maximum (cfu/100 mL)
Hastings Creek							
10-5	95	702	3.12	5	3.1	106.2	921
10-4	95	702	1.68	5	179	390.9	980
North Mill Creek							
10-3	95	996	10.2	5	1.0	115.3	816
10-2	95	996	8.1	6	98.5	374.2	1050
10-1	95	996	1.1	6	1.0	150	866
Mill Creek							
11-6	95	995	17.2	6	435	656.3	921
11-5	95	995	13.8	6	1.0	50.8	201
11-4	95	995	10.1	6	115	189.7	345
11-3	95	995	7.2	5	1.0	74.5	488
11-2	95	995	1.71	6	52.1	239.4	866
11-1	95	995	0.7	6	80.9	258.9	727
Newport Drainage Ditch							
12-1	95	708	0.7	6	1.0	90.4	517
Hastings Creek							
13-9	95	702	0.42	5	27.9	106.9	649
Bull's Brook							
13-7	95	704	0.25	6	1.0	16.9	980
Suburban Country Club Tributary							
13-10	95	710	2	6	1.0	130.7	816
Slocum Corners Creek							
13-11	95	711	1.36	5	162	655.7	1200
West Fork Belvidere Rd. Tributary							
13-8	95	720	0.15	6	21.6	86.7	326
Bull Creek							
14-2	95	051	1	6	86.5	216.2	345
14-1	95	051	0.5	6	201	410.4	921
Seavey Drainage Ditch							
15-3	95	390	3.66	5	196	**346.3**	649
Indian Creek							
15-6	95	706	9.83	5	1.0	101.8	770
15-5	95	706	5.4	6	1.0	105.3	579
15-2	95	706	2.41	6	131	296.1	579
15-1	95	706	0.17	6	59.8	299.9	980
Killdeer Creek							
15-7	95	707	4.6	6	93.3	156	219
15-4	95	707	0.01	6	88.4	368.7	886

DRWW Site ID	Basin Code	Stream Code	River Mile	N	Minimum (cfu/100 mL)	Geometric Mean (cfu/100 mL)	Maximum (cfu/100 mL)
Buffalo Creek							
17-3	95	703	7.7	5	1.0	84.7	687
17-2	95	703	6.1	5	30.9	73.4	167
17-1	95	703	0.75	4	1.0	66.3	816
Unnamed Tributary to Buffalo Creek							
17-4	95	713	0.68	6	1.0	15.2	276
Aptakisic Creek							
18-2	95	701	0.8	6	1.0	94.7	345
18-1	95	701	0.5	6	93.3	225.4	488

Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries 2016

STUDY AREA DESCRIPTION

The 2016 study area included the entirety of the Des Plaines River mainstem and all attendant tributaries within Lake Co., IL. The County is comprised of 53 individual communities and 18 townships with a total area of 1368 square miles of which a significant fraction are waterbodies comprised of lakes, wetlands, rivers, and streams. According to the 2010 U.S. Census the population of Lake Co. is 703,462 (272,957 in the Des Plaines watershed) with a density of 1,572 people per square mile and 260,310 housing units making it the third most populated county in Illinois ranking behind nearby Cook and DuPage counties. The Des Plaines River originates in Wisconsin near Racine in Kenosha Co. north of where it enters Illinois in Lake County. The mainstem flows due south for 110 miles joining the Kankakee River to form the Illinois River. The total watershed area is approximately 2110 square miles of which 1231 are in Illinois (Healy 1979). The watershed in Lake Co. is "trellised" meaning it is narrow in width relative to the length of the mainstem thus the tributaries are of comparatively shorter lengths.

General Landscape Setting

The study area occurs in the Kettle Moraine subregion of the Southeastern Wisconsin Till Plains Level III ecoregion and the Valparaiso-Wheaton Morainal Complex subregion of the Central Corn Belt Plains Level III ecoregion (Table 3; Woods et al. 2006). The Kettle Moraine subregion occupies the majority of the study area to the west and northwest of the mainstem. It is characterized by poorly drained, hilly to hummocky morainal areas that include conspicuous glacial landforms, numerous lakes, and wetlands including bogs, fens, and marshes. Drainage networks are less integrated and more poorly developed than on the older till and outwash plains of adjacent Rock River Drift Plain subregion. Lakes are typically larger and more concentrated than to the south in the Valparaiso Morainal Complex subregion and much more common than in other neighboring subecoregions. Soils are largely derived from thick late-Wisconsinan glacial drift and loess deposits, where they occur, are thin. Alfisols are common, but Mollisols and Histosols also occur. Overall, organic soils are more extensive than elsewhere in Illinois, and Mollisols are less common than in subregions to the west. In the early 1800s moraines were covered by savanna, prairie, and forest (oak-hickory) with depressions containing wetlands. Landscape alterations in the 1900s reduced the tracts of forest and nonforested wetlands replacing them with urban and suburban development. However, wooded areas, lakes, and wetlands are still common especially in the extensive forest preserves.

The Valparaiso-Wheaton Morainal Complex subregion is a hilly, hummocky to rolling area containing moraines, kames, eskers, and outwash plains with numerous small lakes and marshes. Soils are largely derived from thick, late-Wisconsinan glacial drift and loess deposits,

Table 3. *Level IV subregions of the 2016 Upper Des Plaines River watershed study area and their key attributes (from Woods et al. 1995).*

Level IV Subregion	Physiography	Geology	Soils	Potential Natural Vegetation	Land Use/Land Cover
Kettle Moraine (53b)	Glaciated, hummocky to hilly area with steeply sloping moraines, outwash plains, closed depressions, mounds, level areas, and many wetlands and natural lakes.	Wisconsinan-age glacial till, outwash gravels, and thin loess (<20"). Silurian & Ordovician dolomite, lime-stone, and shale bedrock.	Mostly Alfisols (Hapludalfs, Epiaqualfs); also, Mollisols (Argiudolls, Endoaquolls), Histosols.	Oak–hickory forest, oak savanna, & blue-stem prairie occur on moraines. Wet-lands (bogs, fens, seeps, sedge meadows, marshes) were common.	Forest, pasture-land, & wetland. Home sites common on moraines and lakes.
Valparaiso-Wheaton Morainal Complex (54f)	Glaciated, hilly, hummocky, rolling area containing moraines, kames, eskers, rolling till plains, outwash plains, kettle holes, and ravines. Small lakes and marshes are common.	Wisconsinan-age glacial till, Quarter-nary lake deposits, thin loess (<20") & alluvium. Ordovician & Silurian dolomite, limestone, & shale bedrock buried by glacial drift with outcrops along some streams.	Alfisols (Epiaqualfs, Hapludalfs), Mollisols (Endoaquolls, Argiudolls), Inceptisols (Eutrudepts).	A mosaic of oak–hickory forest & bluestem prairie. Dry prairies and dry upland forests on dry soils; mesic forests on poorly drained uplands. Floodplain forests in river bottoms.	Mostly growing urban/suburban development, but wooded areas, wetlands, and pastureland are common in preserves.

where they occur are thin. Alfisols are common and Mollisols also occur, but are less common than in neighboring subregions. In the early 1800s prairie and forest (oak-hickory) dominated the moraines with swamp white oak forests and marshes occurring in poorly drained areas. Prairie covered slightly more than half of this subregion. Subsequent fire suppression has reduced the number of prairie openings, thereby increasing forest density. Today, pastureland is common and urban and suburban development is increasing. However, wooded areas, lakes, and wetlands are still common especially in the extensive County owned forest preserves. Land uses are varied and include residential (26.3%), public/private open space (19.4%), agricultural (12.2%), transportation (10.6%), forest/grassland (9.3%), water (7.0%), wetlands (5.4%), and the remainder comprised of six additional land use types (Lake Co. Local Planning Committee 2012).

Major Point Sources

Significant point sources of pollution were inventoried to understand the extent of their potential impact and for the intensive pollution survey design. There are a total of 18 wastewater treatment plants (WWTP) in the 2016 study area of which eight (8) are major discharges (Table 3) comprising a total of more than 80 million gallons per day (MGD; average annual flows) of treated wastewater. Of this total the majority is discharged by The North Shore Water Reclamation District Gurnee (NSWRD; 23.6 MGD), NSWRD Waukegan (22.0 MGD), and Lake Co. Dept. of Public Works (LCDPW) Des Plaines River WWTP (16.0 MGD). All except

one of the facilities have advanced treatment for oxygen demanding wastes (BOD), ammonia-N (NH_3-N), and suspended solids (TSS). The Mundelein WWTP is a secondary treatment facility. Two facilities have phosphorus removal and all except Mundelein monitor for N and P.

Nonpoint Sources

Nonpoint sources in the 2016 study area include agricultural and urban sources, the latter of varying intensities ranging from light suburban to heavy urban and industrial land uses. These have been extensively classified and delineated by the Lake Co. SMC. Hydromodification of stream and river flows and habitat also occurs with the former being influenced by varying land uses and the latter mostly in the form of legacy channelization and riparian encroachment by urban and suburban development. Some of the hydromodification is the remains of past attempts to drain the extensive wetlands especially in the upper watershed.

Dams

Four dams are located on the Upper Des Plaines mainstem and 3 were scheduled for removal in late 2016 including the Wetlands Research, Hollister, and Wright Woods dams. These are small low head dams, Wetlands Research (RM 100.0), Hollister at RM 84.5, and Wright Woods at RM 82.7. The Ryerson Dam is located at RM 77.5.

Sampling Sites Selection and Locations

A Monitoring Strategy for the Des Plaines River Watershed was developed by the Monitoring Committee of the Des Plaines River Watershed Workgroup (DRWW). The spatial allocation of sites was already established by the DRWW for water sampling and this was used as the core for the initial allocation of biological and habitat sites.

Spatial Survey Design

A tiered site design was adopted by the DRWW to allow for more frequent monitoring of sites with greater flow and tributary area while still allowing for comprehensive coverage of the watershed (DRWW 2016). This initially resulted in 44 sites located throughout the Upper Des Plaines River watershed. MBI later proposed to develop a combined intensive pollution survey and geometric allocation of sites in the original bioassessment project plan. This consisted of defining geometric panels of drainage area and then assigning sampling sites where these occurred throughout the Upper Des Plaines watershed. This process resulted in the addition of 25 sites with most being located in the upper reaches of smaller tributaries, but a few sites were added to the Des Plaines mainstem to fill gaps left in the longitudinal continuum and to address two dam removal projects. The result was a total of 69 sites sampled for biological assemblages and habitat with the 44 DRWW sites also sampled for water chemistry via grab samples and 49 for sediment chemistry. Each sampling site was assigned a unique DRWW numeric site code, a river mile, and UTM coordinates (Figure 1; Appendix Table A-1).

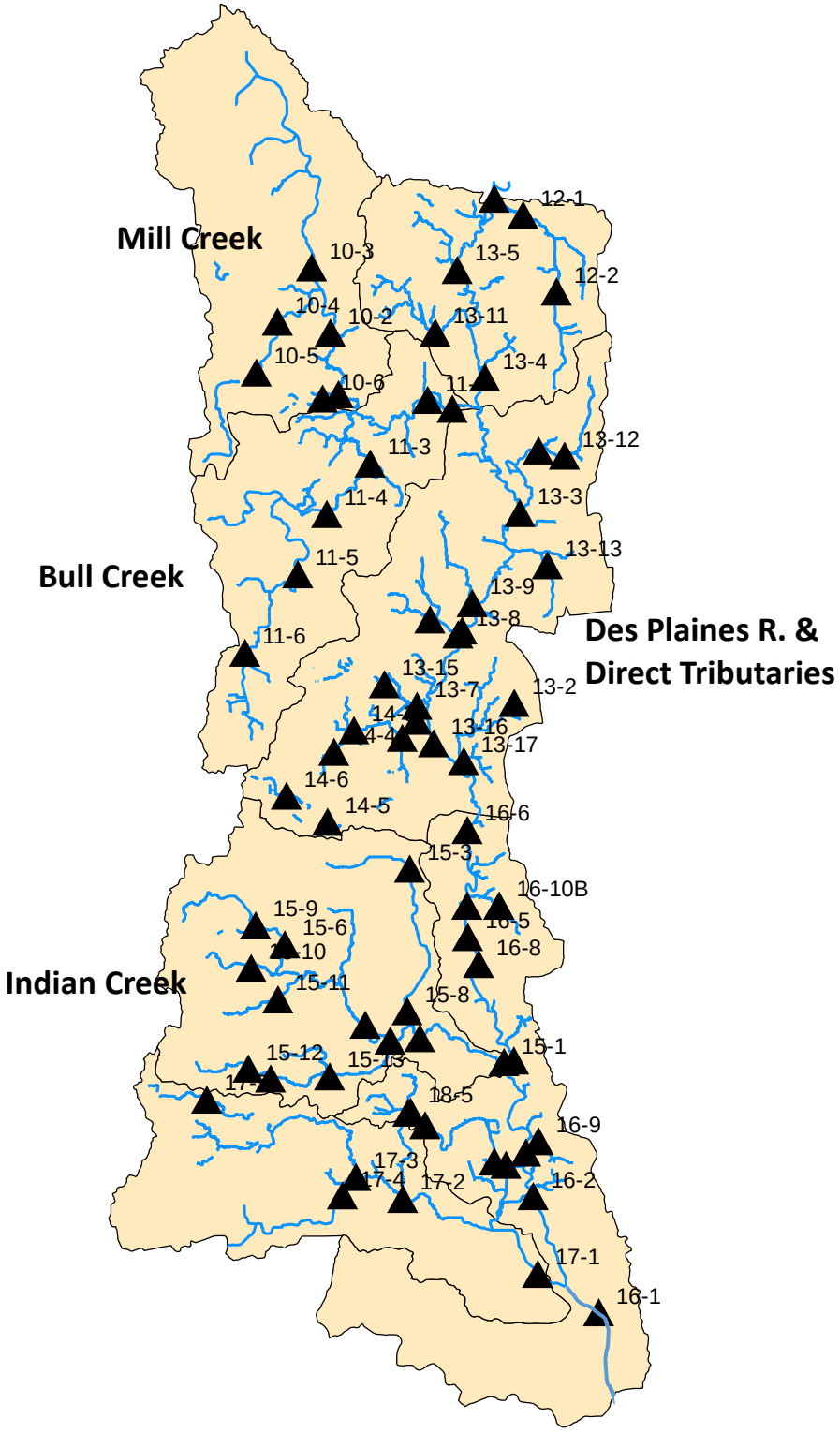

Figure 2. *Location of biological, chemical, and habitat sampling sites in the Upper Des Plaines River and tributaries, 2016. Site codes correspond to sites listed in Appendix A-1.*

Table 4. *Major wastewater treatment facilities in the 2016 Upper Des Plaines River study area (DPW – Dept. of Public Works; NSWRD – North Shore Water Reclamation District; WRF – Water Reclamation Facility; WWTP – Wastewater Treatment Plant). Treatment levels and nutrient information from U.S. EPA Discharge Monitoring Report (DMR) Pollutant Loading Tool (https://cfpub.epa.gov/dmr/facility_detail.cfm).*

Facility	Receiving Water Body	River Mile	Latitude	Longitude	Average Flow 2016 (MGD)	Permitted Design Flow (MGD)	Treatment Type[1]	Nutrient Removal[2]
Lake Co. DPW Mill Creek WWTP	Mill Creek/Des Plaines R.	1.0/102.0	42°25'00"N	87°55'40"W	2.1	7.8	AWT	M
NSWRD Waukegan WRF	Des Plaines R.	98.1	42°22'15"N	87°54'53"W	22.0	44.0	AWT	P
NSWRD Gurnee WRF	Des Plaines R.	95.5	42°21'25"N	87°55'36"W	23.6	47.2	AWT	P
Libertyville WWTP (IL0029530)	Des Plaines R.	84.8	42°15'15"N	88°56'10"W	4.0	8.0	AWT	M
Mundelein WWTP (IL0022501)	Des Plaines R.	84.6	42°15'11"N	87°50'34"W	5.0	15.0	Secondary	M
Lake Co. DPW New Town Century WWTP (IL0071366)	Des Plaines R.	82.3	42°13'30"N	87°56'15"W	6.0	18.0	AWT	M
Lake Co. DPW Des Plaines WWTP (IL0022055)	Aptakisic Cr./ Des Plaines R.	0.8/76.4	42°09'47"N	87°55'40"W	16.0	51.8	AWT	M
Lindenhurst SD WWTP (IL0020796)	Hastings Cr.	2.8	42°26'01"N	88°01'56"W	2.0	5.7	AWT	M

[1] AWT – Advanced Wastewater Treatment – generally 8-10 mg/L $CBOD_5$, 1.0-1.5 NH_3-N; 12 mg/L TSS; Secondary – generally 30 mg/L $CBOD_5$/TSS, no added NH_3-N removal.
[2] M – nutrient (N and P) monitoring only; P – 1.0 mg/L limitation.

METHODS

Chemical/Physical Water Quality

Water Sampling

The specific methods of collection followed IEPA (2012a) and chemical laboratory analyses were provided by Suburban Labs. The chemical/physical parameter categories (demand, nutrients, metals, organics) and the frequency of sample collection are summarized in DRWW (2016). DRWW assigned tiers to the original 44 sampling sites as follows:

- **Tier 1**: 10 sites located on the mainstem Des Plaines River and Mill Creek that are sampled monthly for water May through September and in November and March (seven times per year) for all demand[2], 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 2**: 10 sites located on the Des Plaines and tributary streams are monitored monthly from May through September and in November and March (seven times per year) 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**: 24 sites located on the Des Plaines and tributary streams within the watershed are monitored for water chemistry that will occur monthly from May through September and in November and March (seven times per year) for the majority of demand, nutrient, and bacteria parameters; and once every three years concurrent with the bioassessment for sediment metals and sediment organics.

A summary of the number of parameters and samples available from the survey for the report are found in Table 5. The parameters analyzed and frequencies of collection varied by tier assignment. Twenty-five (25) sites were added for the 2016 biological and habitat assessment and consisted of small, headwater sites generally with catchments of less than 1-2 square miles. These are designated as Tier 4 sites in the revised monitoring strategy and they were not sampled for water chemistry in 2016 with the exception of field parameters collected by the biological crews.

Sediment Sampling

Surficial sediments were sampled for bulk chemical analysis at 49 locations including the 44 sampled for water chemistry following IEPA methods (IEPA 2011b). Samples were collected in mid-October 2016 and were analyzed by Suburban Labs.

[2] Demand parameters include: chlorides, conductivity, pH, TOC, sulfate, total suspended solids, volatile suspended solids, dissolved oxygen, temperature, and turbidity.

Table 5. *Summary of the number of water chemistry parameters and samples collected by parameter category for water column (left) and surficial sediment (right).*

Parameters Category	Water		Sediment	
	Parameters	Samples	Parameters	Samples
All	109	5453	118	6523
pH	1	345	-	-
Demand	2	690	-	-
Nutrient	6	1251	2	102
Ionic (Dissolved)	5	1097	-	-
Suspended	2	341	-	-
Metal	9	139	19	969
Organic	82	900	94	5299

Biological Assemblage Sampling

Biological assemblages in the 2016 Upper Des Plaines watershed bioassessment included fish/habitat and macroinvertebrates at 69 instream locations. Biological and habitat sampling adhered to a summer-early fall index period of June 16-October 15 for fish and July 1-September 30 for macroinvertebrates. For fish and QHEI all sites were sampled once and macroinvertebrates once the latter with a 10% resample. All sampling occurred during periods of summer-fall base flows – periods of higher flows and high runoff were avoided.

Fish Assemblage Methods

Fish were collected once at each site with pulsed D.C. electrofishing units ranging from a Wisconsin AbP-3 battery-powered back pack unit, T&J 1736 DCV, and Smith-Root GPP generator powered units of 2500W capacity mounted on a 16' raft (Appendix Table A-1). Deference was given to the most effective method given the prevailing site and water characteristics. The upper boundary for using the battery-powered back pack electrofishing unit was two times the depth or five times the width of the net ring (anode). Wider and deeper sites were sampled with the T&J 1736 DCV generator powered unit as either a bank set longline or floated on a roller barge. All wading sites were sampled in an upstream direction. The primary net ring served as the anode and a woven steel cable cathode trailed from the back pack unit, the longline, or the roller barge. A long handled dip net was used to assist in the capture of stunned fish. The 2500W Smith-Root unit mounted on a 16' raft was used in the Des Plaines River mainstem. A boom array of anodes and dropper cathodes transmitted the electric current through the water. A single netter standing on a bow platform collected fish and a driver maneuvered the raft through the site with a small outboard motor in a downstream

direction. A two or three-person crew consisting of a fish crew leader and one or two field technicians conducted the sampling under summer-fall base flow conditions. Sampling effort was standardized by distance and included a 150-200 meter long reach for wading sites and 500 meters for the raft method.

Captured fish were placed in a live well, bucket, or live net for later processing. Water was regularly replaced and/or aerated to maintain adequate oxygen levels in the water and to minimize mortality. Samples from each site were processed by enumerating and recording weights by species and by life stage (young-of-the-year, juvenile, and adult) on a field sheet. The incidence of external anomalies was recorded following procedures outlined by Ohio EPA (2006, 2015) and refinements made by Sanders et al. (1999). Fish were released back into the water after they were identified to species, examined for external anomalies, and weighed either individually or in batches. Larval fish were not included in a sample and fish measuring less than 15-20 mm in length were generally excluded as a matter of practice. All sites were marked with GPS coordinates (beginning, middle, and end of a sampling reach) and site data was recorded on a standard field form.

While the majority of captured fish were identified to species in the field, any uncertainty about a field identification required vouchering for laboratory identification. Voucher specimens were preserved in borax buffered 10% formalin solution and labeled by date, stream, and geographic identifier (e.g., river mile and site number). Identification was made to the species level at a minimum. Regional ichthyology keys were used including the Fishes of Illinois (Smith 1979) and updates available through the Illinois Natural History Survey (INHS). Scientific nomenclature followed Page et al. (2012). Vouchers were deposited at The Ohio State University Museum of Biodiversity (OSUMB) in Columbus, OH.

The data were used to calculate the Illinois Fish Index of Biotic Integrity (fIBI; Smogor 2000, 2005) as the primary assessment of fish assemblage quality. The Modified Index of Well-Being (MIwb; Ohio EPA 1987) was used as a supplemental assessment at wading and raft sites. The MIwb is a measure of fish community abundance and diversity using numbers and weight information and is a modification of the original Index of Well-Being originally applied to fish community information (Gammon 1976; Gammon *et al.* 1981).

Macroinvertebrate Methods

Macroinvertebrate methods followed the Illinois EPA multi-habitat method (IEPA 2011c,d) at all sites (Appendix Table A-1). The IEPA multi-habitat method involves the selection of a sampling reach that has instream and riparian habitat conditions typical of the assessment reach. Sampling reach requirements included flow conditions that approximate typical summer base flows, the absence of highly influential tributary streams, the presence of one riffle/pool sequence or analog (i.e., run/bend meander or alternate point-bar sequence), if present, and a length of at least 300 feet. The collection of macroinvertebrates was accomplished with a dip net in all bottom-zone and bank-zone habitat types that occurred within a sampling site. Water conditions must allow a sampler to apply the 11-transect habitat-sampling method or to estimate with reasonable accuracy via visual or tactile cues the amount of each of several

bottom-zone and bank-zone habitat types. All sites were marked with GPS coordinates (beginning and end of a sampling reach) and site data was recorded on a standard field form.

Multi-habitat macroinvertebrate samples were field preserved in 10% formalin. Upon delivery to the MBI lab in Hilliard, OH the preserved samples were transferred to 70% ethyl alcohol. Laboratory procedures followed the IEPA (2011e) methodology which requires the production of a 300-organism subsample from a gridded tray following a scan and pre-pick of large and/or rare taxa. Taxonomic resolution was at the lowest practicable resolution for the common macroinvertebrate assemblage groups such as mayflies, stoneflies, caddisflies, midges, and crustaceans, which goes beyond the genus level requirement of IEPA (2011g). However, calculation of the Macroinvertebrate IBI (mIBI) adhered to the IEPA methods by using genera as the benchmark level of taxonomic resolution for mIBI scoring.

Habitat Assessment

The QHEI (Rankin 1989, 1995; Ohio EPA 2006) was employed as the principal aquatic habitat assessment methodology at each site. The protocol was accomplished as part of the fish assemblage method by the fish crew leader who is trained and experienced in using the QHEI. The QHEI measures six categories of habitat that are important to the aquatic biota with a scoring range of 0-100. QHEI scores of 60 are generally regarded as sufficient to support the General Use for aquatic life. Scores below 45 indicate substantial deficiencies in habitat that can preclude attainment of the General Use. A QHEI matrix showing the occurrence of good and modified attributes was also examined to evaluate the specific attributes of stream habitat at each site (see Table 12).

Data Management

All data was managed by MBI in internal databases that permit ready access and analysis. Biological and habitat data is stored in a routine based on the Ohio ECOS format that MBI uses for all biological data management tasks. Biological data analysis included the calculation of Illinois fish and macroinvertebrate IBIs for determining General Use aquatic life status and the accompanying data attributes to enhance the diagnosis of impairments. Habitat data was analyzed using the QHEI and also via a QHEI attributes matrix to aid in assessing habitat related impairments. Summaries of species/taxa relative abundance and QHEI metrics at each site and by sampling date are provided in Appendices B-D.

Determining Use Attainability

In Illinois there is a single aquatic life use designation that applies to all rivers and streams through the General Use provision of the Illinois WQS. This is the presumed use applicable to all rivers and streams in Illinois which includes the 2016 study area. An assessment of aquatic life use attainability is therefore not a routine outcome of a biological and water quality assessment and was not considered herein.

Determining Use Attainment

The determination of the attainment status of the Illinois General Use for aquatic life generally followed the guidance in the 2016 IEPA Integrated Report (IEPA 2016a) relying primarily on the biological results and attainment of the fIBI and mIBI thresholds expressed as fully supporting, non-supporting fair, and non-supporting poor, with the most limiting result of either the fish or macroinvertebrates determining the assignment of fair or poor. The addition of a partial attainment category was done where only one of the two assemblages attained the thresholds for full support and also where the MIwb indicated similar conditions based on thresholds used in Ohio. This differs from IEPA practices in that it is possible to have full support where the macroinvertebrate assemblage is not attaining the full support threshold. In 2016 this would not have applied anyway as all of the instances of a single assemblage non-support was for the fish assemblage.

Determining Causal Associations

Using the results, conclusions, and recommendations of this assessment requires an understanding of the methodology used to determine biological status and assigning associated causes and sources of impairment utilizing the accompanying chemical/physical data and source information (e.g., point source loadings, land use).

Causal Diagnosis

Describing the causes and sources associated with observed biological impairments relies on an interpretation of multiple lines of evidence including water chemistry data, sediment chemistry data, habitat data, effluent data, land use data, and biological response signatures (Yoder and Rankin 1995; Yoder and DeShon 2003). Thus the assignment of associated causes and sources of biological impairment in this report represents the association of impairments (based on response indicators) with stressor and exposure indicators using linkages to the bioassessment data based on previous experiences with analogous situations and impact types. This was done by relating exceedances of chemical thresholds such as chronic and acute water quality criteria and relevant biological effects thresholds for water and sediment chemistry associated with biological impairments to determine categorical and/or parameter specific causes. The reliability of the identification of associated causes and sources is increased where other such prior associations have been observed. This process relies on multiple lines of evidence concerning the biological response which is the ultimate measure of success in water quality management. Exceedance thresholds for chemical parameters used in the causal analyses are provided in Table 6 and as used in the tabular and graphical presentation of the chemical water and sediment results.

Hierarchy of Water Indicators

A carefully conceived ambient monitoring approach, using cost-effective indicators comprised of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. A tiered approach that

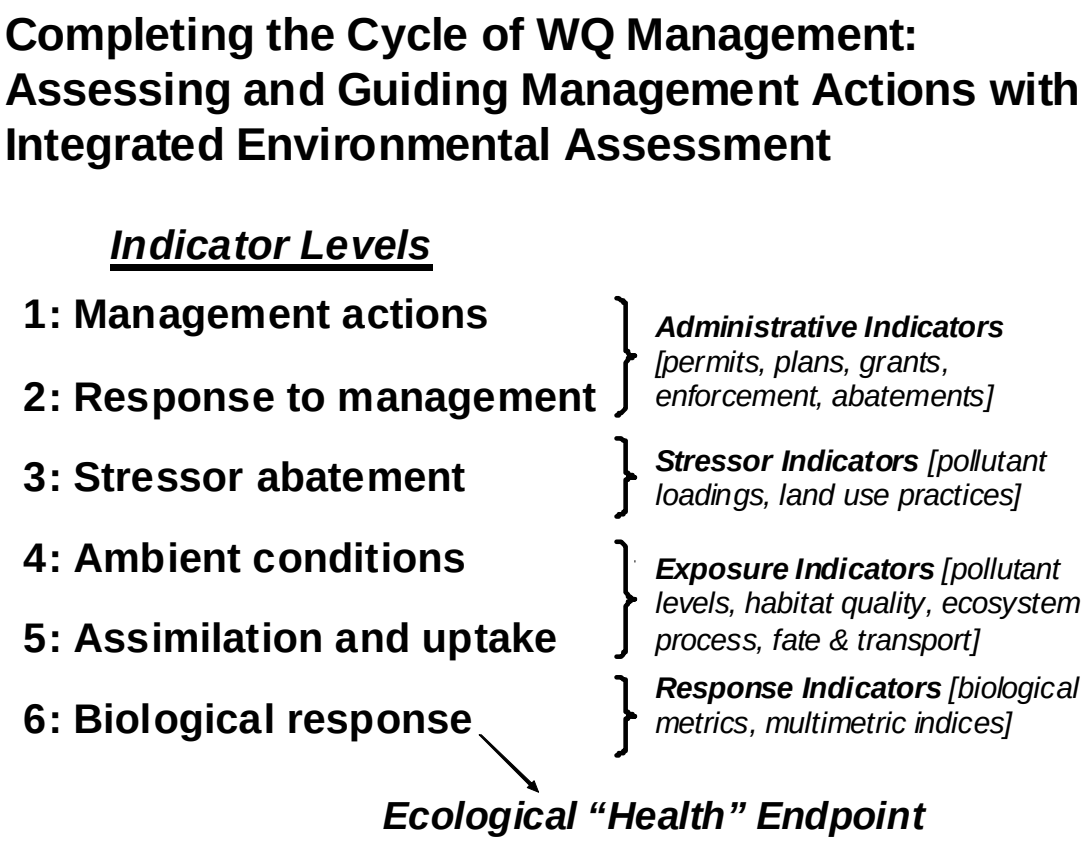

Figure 3*. The hierarchy of administrative and environmental indicators which can be used to support monitoring and assessment, reporting, and an evaluation of the effectiveness of pollution controls on a receiving stream. This is patterned after a model developed by U.S. EPA (1995) and enhanced by Karr and Yoder (2004).*

links the results of administrative actions with true environmental measures was employed in our analyses. This integrated approach is outlined in Figure 3 and includes a hierarchical continuum from administrative to true environmental indicators. The six "levels" of indicators include:

- Level 1 - actions taken by regulatory agencies (permitting, enforcement, grants);
- Level 2 - responses by the regulated entity (treatment works, pollution prevention);
- Level 3 - changes in discharged quantities (pollutant loadings);
- Level 4 - changes in ambient conditions (chemical/physical water quality, habitat);
- Level 5 - changes in uptake and/or assimilation (tissue contamination, biomarkers, assimilative capacity); and,
- Level 6 - changes in health, ecology, or other effects (ecological condition, human and wildlife health).

In this process the results of administrative activities (levels 1 and 2) are linked to water quality (levels 3, 4, and 5) which translates to a response (level 6). An example is the aggregate effect of billions of dollars spent on water pollution control in the U.S. since the early 1970s that have

been determined with quantifiable measures of environmental condition. In this case the hierarchy was applied to a specific stream reach that is impacted by multiple point and nonpoint sources. The administrative steps taken by Illinois EPA to issue NPDES permits (Level 1) and the steps taken by the permit holders (Level 2) are easily described and quantified. Quantifying changes in the loadings of pollutants (Level 3) can be affected by the quality and completeness of the effluent monitoring which includes the capture of stressors that actually affect the receiving streams. Likewise, documenting changes in ambient conditions (Level 4) can also be affected by the quality and completeness of the chemical/physical monitoring that not only includes the parameters but also the spatial design in relation to sources of pollution. This in turn informs about how pollution sources tax the assimilative capacity (Level 5) of a receiving stream. The end result of all the above is portrayed by the response in the biological indicators which is expressed as attainment or non-attainment of the Illinois General Use aquatic life thresholds for the fish and macroinvertebrate IBIs (IEPA 2016). Symptoms expressed by the biota beyond the index scores can be useful in aiding the causal diagnosis as a feedback loop in the hierarchy of indicators process.

Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators.

- *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications.
- *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to a stressor or bioaccumulative agent.
- *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise the Illinois EPA biological endpoints.

This classification of indicators represents the essential technical elements for the pollution survey design that was employed in the Des Plaines bioassessment by using each indicator *within* its most appropriate role which are most appropriate for each (Yoder and Rankin 1998).

Causal Associations

Describing the causes and sources associated with biological impairments in the study area involved the interpretation of multiple lines of evidence that included water chemistry, sediment chemistry, habitat, and effluent data, a general knowledge about upstream land uses, and biological response signatures within the biological data itself. The assignment of causes and sources of biological impairment result from the association of the impairment with exceedances of water quality criteria or other response-based thresholds and the proximity to sources of pollution.

RESULTS

Chemical/Physical Water Quality

Chemical/physical water quality in the 2016 Upper Des Plaines River watershed study area was characterized by grab sample data collected from the water column six times at each Tier 1-3 site during summer-fall base flows. Sediment chemistry was determined from samples collected at these same sites in mid-October 2016. Commonly detected chemical parameters were compared either to the criteria in the Illinois WQS or IEPA non-standard, reference, and biologically derived thresholds for stressors that are commonly associated with urban runoff, wastewater treatment plant discharges, and for nutrient parameters. As such, the chemical/physical data herein serves as an indicator of the degree of exposure and stress in support of using the biological data to assess the attainment of designated aquatic life uses and to assist in assigning associated causes and sources. Parameter groupings included field, demand, ionic strength, nutrients, heavy metals, and organic compounds. Bacteria data were collected by grab samples at all sites and were used primarily to determine the status of recreational uses in accordance with U.S. EPA national water quality criteria (U.S. EPA 2012).

Flow Regime

The flow regime in the Upper Des Plaines River mainstem during the period January 1 – December 31, 2016 is depicted in Figure 4 based on the gauges operated by the U.S. Geological Survey at Gurnee. Summer-fall flows were generally well below the 75th percentile flow and approached the $Q_{7,10}$ flow of 15.2 cubic feet/second (cfs). Peak flows occurred in the winter, spring, and late fall months of 2016 following significant precipitation events.

Water Column Chemistry

The water column chemistry results were analyzed for spatial patterns, longitudinally in the mainstem, and by subwatershed for the tributaries. Exceedances of Illinois WQS, Illinois non-standard thresholds, biological effect thresholds, and regional reference benchmarks were assessed. Exceedances of these thresholds are indicated on the plots and tables of the 2016 chemical results (see Figures 5-13; Tables 7-11).

Exceedances of Biological Effect and Reference Thresholds

The principal purpose of the chemical assessment is to provide data that supports the interpretation of observed biological impairments and to assist in assigning associated causes of biological impairments. Chemical exceedance thresholds and benchmarks are essential to that process and included the Illinois water quality criteria, biological effect thresholds derived from regional analyses of stress/response relationships, regional reference values, and national and regional water quality effects compendia. Some of these consist of correlations between concentrations of substances that correspond to biological quality gradients across significant geographical areas while others are toxicological endpoints derived from laboratory studies.

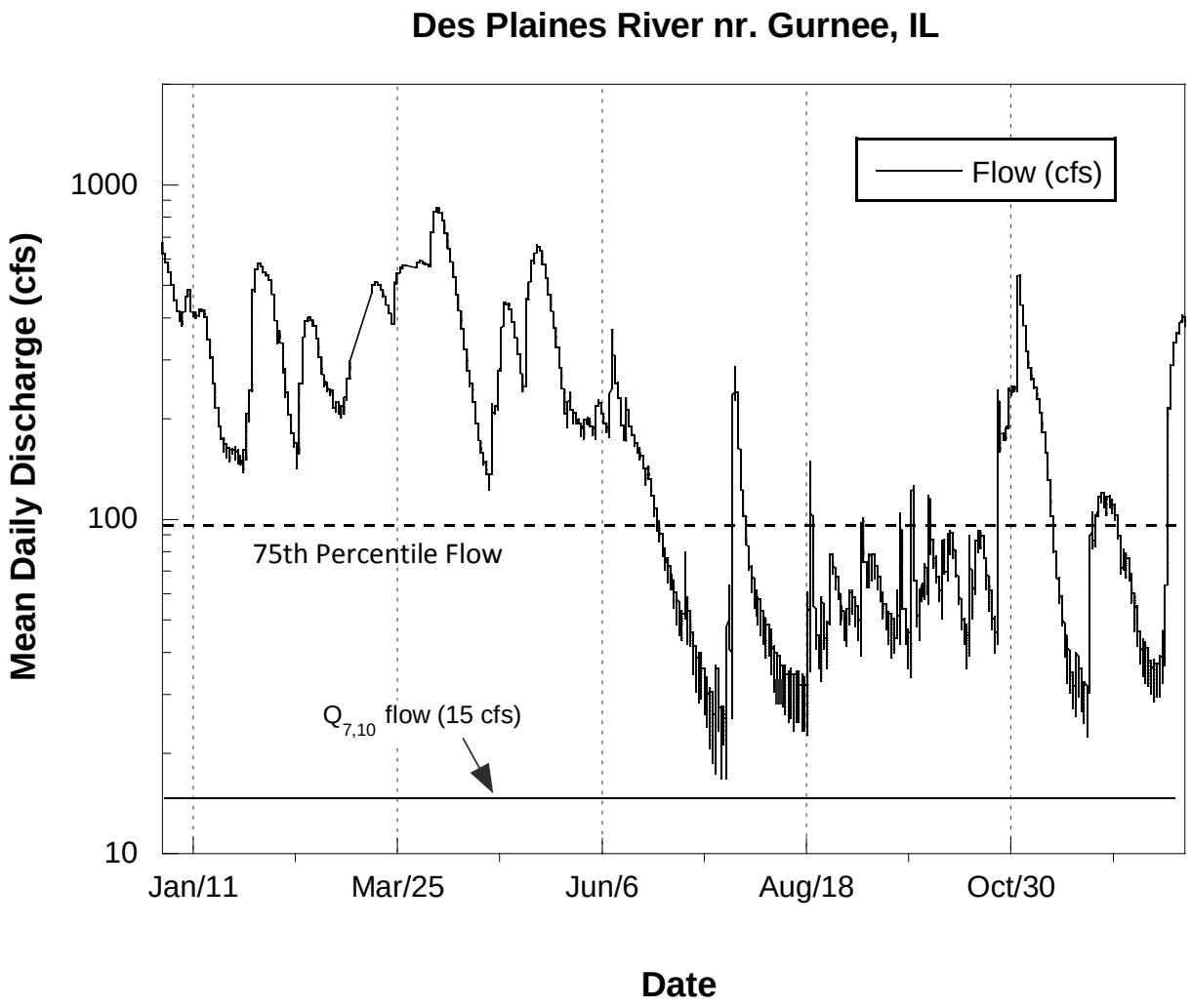

Figure 4*. Daily flow measured at the USGS gage on the Upper Des Plaines River mainstem near Gurnee, IL during calendar year 2016. The dashed line is the 75th percentile flow; the critical low flow is indicated by the solid line.*

Two recent regional studies that were used include correlative effects levels of different chemicals by the DuPage River Salt Creek Working Group (DRSCWG; Miltner et al. 2010) in northeastern Illinois and the Metropolitan Sewer District of Greater Cincinnati (MSDGC; MBI 2015) in southwest Ohio. NOAA Screening Quick Reference Tables (SQRT; Buchman 2008) were also used especially for chemicals that are not included in the Illinois WQS. A compendia of biological and toxicological effect thresholds are listed in Table 6 and are cited as they are used. Sediment chemical results were evaluated against threshold and probable effect levels (TEL and PEL) established by MacDonald et al. (2000). Exceedances of these values were used to support the assignment of causes of biological impairment provided that there was a logical linkage of the chemical exceedance with the biological impairment.

Chemical water quality is highly influenced by the concentration and composition of chemical constituents in WWTP effluents and in various sources of runoff in the watershed. Most

parameters are plotted for the upper Des Plaines River mainstem along the longitudinal continuum (upstream to downstream) in relation to major sources and tributaries and with water quality criteria or other effect benchmarks indicated[3]. Chemical parameter values in the tributary subwatersheds are displayed in box-and-whisker plots (shaded boxes) and for the Upper Des Plaines River mainstem sites (open boxes). Values on these plots represent a median, interquartile range (IQR), maximum, minimum, and with outliers (>2X IQR) depicted by independent symbols.

Total Ammonia

There were no exceedances of the Illinois water quality criteria for ammonia-N at any site in the Des Plaines River study area. All 2016 mean ammonia-N concentrations were well below the 1.0 mg/L threshold associated with chronic toxicity and below the DuPage-Salt IPS (Miltner et al. 2010) threshold of 0.15 mg/L which is an effect threshold associated with impaired biological assemblages (Figure 5, upper). This pattern was also observed in the tributaries (Figure 5, lower). A few maximum values exceeded the DRSCWG IPS threshold, but were generally less than 0.25 mg/L. All ammonia-N values were below the SW Ohio IPS (MBI 2015) threshold of 0.56 mg/L. The consistently low ammonia-N values can be attributed to point source controls from major WWTPs in the watershed.

Total Kjeldahl Nitrogen (TKN)

Total Kjeldahl Nitrogen (TKN), an indicator of the living or recently dead fraction of sestonic algae, and can be an indicator of nutrient enrichment. TKN values exceeded the DuPage-Salt IPS threshold at the upper-most and middle Upper Des Plaines mainstem sites (Figure 6, top). In the tributaries, samples in Mill Creek and North Mill Creek were generally above the DuPage-Salt IPS threshold (Figure 6, bottom). While TKN is not a direct effect parameter, it is indicative of the effects of organic enrichment by nitrogenous biomass.

Nitrate and Total Phosphorus

Nitrate and total phosphorus can be useful indicators of both point and nonpoint sources of nutrients to streams and rivers and their effects can vary with stream habitat, shading vs. direct sunlight, temperature and other factors than can moderate or exacerbate the influence on dissolved oxygen dynamics in streams that is typically the mode of effect (i.e., depressed dissolved oxygen) on aquatic life.

Nitrate and phosphorus levels increased from the upstream reaches downstream in the mainstream Des Plaines River (Figure 7 and 8, upper) in association with the addition of effluent. Nitrate often increases downstream of WWTPs from the nitrification of ammonia (the most toxic form of nitrogen) and is a primary focus of effluent reductions. Nitrate levels approached, but did not exceed the Illinois non-standard benchmark for nitrate (7.8 mg/L) in the mainstem Upper Des Plaines river and were well above the U.S. EPA ecoregional reference

[3] Key to tributaries and discharges: **A**. Newport Drainage Ditch, **B**. Slocum Corners Creek, **C**. Mill Creek, **D**. Suburban County Trib. to E. Stoneroller Creek, **F**. W. Fk. Belvidere Rd. Trib., **G**. Bulls Brook, **H**. Bull Creek, **I**. Werhane Lake Drain, **J**. Indian Creek, **K**. Aptakisic Creek, **L**. Buffalo Creek; **1**. Lindhurst SD WWTP **2**. LCPWD Mill Creek WWTP **3**. NSWRD Gurnee WRF, **4**. NSWRD Waukegan WRF, **5**. Libertyville WWTP, **6**. Mundelein WWTP, **7**. LCPWD New County WWTP **8**. LCPWD Des Plaines River WWTP.

Table 6. *Chemical thresholds consisting of Illinois water quality criteria, biological effects thresholds, and non-effect reference benchmarks used to support the assignment of causes to observed biological impairments in the Upper Des Plaines watershed. Only chemical parameters that were detected in water samples are included.*

Parameter[1]	Water Quality Criteria[2]		Effect Thresholds[3]				Non-effect Benchmarks[4]	
	IL Chronic	IL Acute	Ohio EPA[5]	SW Ohio[6]	NOAA SQRT[7]	Other	Regional Reference[8]	IL Non-Standard[9]
Demand Group								
BOD_5	NA[10]	NA	--	2.48 mg/L [HW Streams] 2.96 mg/L [WD Streams] 2.60 mg/L [BT Rivers]	--	--	2.00 mg/L [HW Streams]	--
Dissolved Oxygen (D.O.)	5.5./6.0 mg/L [7-day rolling avg.]	3.5/5.0 mg/L [minimum]	7.2 mg/L [HW Streams]	5.32 mg/L [All Streams]	--	--	6.6 mg/L [HW Streams]	--
Suspended Solids (TSS)	NA	NA	16.0 mg/L [HW Streams]	65.7 mg/L [HW Streams] 70.8 mg/L [WD Streams] 74.3 mg/L [BT Rivers]	--	--	28.0 mg/L [HW Streams]	--
Nutrients Group								
Ammonia-N (NH_3-N)	1.24 mg/L [pH 8.0/25°C]	8.40 mg/L [pH 8.0/25°C]	0.05 mg/L [HW Streams]	0.31 mg/L [HW Streams]	--	0.15 mg/L [DRSCW IPS[11]]	0.025 mg/L [HW Streams]	--

Parameter[1]	Water Quality Criteria[2]		Effect Thresholds[3]				Non-effect Benchmarks[4]	
	IL Chronic	IL Acute	Ohio EPA[5]	SW Ohio[6]	NOAA SQRT[7]	Other	Regional Reference[8]	IL Non-Standard[9]
Total Kjeldahl Nitrogen (TKN)	NA	NA	0.50 mg/L [HW Streams]	0.51 mg/L [HW Streams] 0.58 mg/L [WD Streams] 1.05 mg/L [BT Rivers]	--	1.00 mg/L [DRSCW IPS[11]]	0.70 mg/L	--
Phosphorus	NA	NA	0.216 mg/L [HW Streams]	0.080 mg/L [HW Streams] 0.010 mg/L [WD Streams] 0.17 mg/L [BT Rivers]	--		0.072 mg/L	0.610 mg/L
Nitrate-N (NO_3-N)	NA	NA	0.90 mg/L [HW Streams]	0.96 mg/L [HW Streams] 1.38 mg/L [WD Streams] 1.68 mg/L [BT Rivers]	--		1.87 mg/L [HW Streams] 1.80 mg/L [EPA Ecoregion 54]	7.80 mg/L
Ionic Strength Group								
Chlorides	NA	500 mg/L;	46.0 mg/L [HW Streams]	52.6 mg/L [HW Streams] 59.1 mg/L [WD Streams] 68.4 mg/L [BT Rivers]	--	112 (fish); 141 (macro.) mg/L [DRSCW IPS[12]]	35.0 mg/L [HW Streams] 31 mg/L (WD Streams) 55 mg/L [BT Rivers]	--

Parameter[1]	Water Quality Criteria[2]		Effect Thresholds[3]				Non-effect Benchmarks[4]	
	IL Chronic	IL Acute	Ohio EPA[5]	SW Ohio[6]	NOAA SQRT[7]	Other	Regional Reference[8]	IL Non-Standard[9]
Conductance, Specific	NA	NA	966 µS/cm [HW Streams] 861 µS/cm [WD Streams] 770 µS/cm [BT Rivers]	703 µS/cm [HW Streams] 660 µS/cm [WD Streams] 730 µS/cm [BT Rivers]	--	300 µS/cm [EPA draft[13]]	751 µS/cm [HW Streams]	--
Dissolved Solids (TDS)	NA	1500 mg/L [Dec. 1-Apr. 30; expires 2018]	--	364 mg/L [HW Streams] 384 mg/L [WD Streams] 395 mg/L [BT Rivers]	--	--	296 mg/L [SW Ohio HW]	--
Sulfate	1809 mg/L	--	334 mg/L [HW Streams]	119 mg/L [HW Streams]	--	--	118.8 mg/L [HW Streams] 120 mg/L [WD Streams] 115 mg/L [BT Rivers]	--
Metals Group[14]								
Arsenic (As)	0.190 mg/L	0.360 mg/L	0.002 mg/L [HW Streams]	--	0.190 mg/L [Chronic]	See SQRT	0.001 mg/L [HW Streams]	--
Copper (Cu)	0.022 mg/L	0.036 mg/L	0.010 mg/L [HW Streams]	5.9 µg/L [HW Streams] 8.9 µg/L [WD Streams] 10.4 µg/L [BT Rivers]	0.009 mg/L[C] 0.130 mg/L[A]	See SQRT	5.0 µg/L [HW Streams] 5.0 µg/L [WD Streams] 5.0 µg/L [BT Rivers]	--

Parameter[1]	Water Quality Criteria[2]		Effect Thresholds[3]				Non-effect Benchmarks[4]	
	IL Chronic	IL Acute	Ohio EPA[5]	SW Ohio[6]	NOAA SQRT[7]	Other	Regional Reference[8]	IL Non-Standard[9]
Lead (Pb)	0.051 mg/L	0.245 mg/L	0.002 mg/L [HW Streams]	2.7 µg/L [HW Streams] 17.4 µg/L [WD Streams] 26.8 µg/L [BT Rivers]	0.0025 mg/L[C] 0.065 mg/L[A]	See SQRT	2.5 µg/L [HW Streams] 2.5 µg/L [WD Streams] 3.0 µg/L [BT Rivers]	--
Manganese (Mn)	3.52 mg/L	8.15 mg/L	0.942 mg/L [HW Streams]	98 µg/L [HW Streams] 347 µg/L [WD Streams] 472 µg/L [BT Rivers]	0.080 mg/L[C] 2.300 mg/L[A]	See SQRT	0.185 mg/L [HW Streams]	--
Zinc (Zn)	0.073 mg/L	0.273 mg/L	0.010 mg/L [HW Streams]	16.4 µg/L [HW Streams] 39.3 µg/L [WD Streams] 60.8 µg/L [BT Rivers]	0.120 mg/L [Chronic]	See SQRT	15 µg/L [HW Streams] 15 µg/L [WD Streams] 20 µg/L [BT Rivers]	--

[1] All parameter values as total unless specific otherwise.
[2] Illinois water quality criteria (Illinois Administrative Code Part 302) - http://www.epa.illinois.gov/topics/water-quality/standards/derived-criteria/index.
[3] Field-based thresholds using fish and macroinvertebrate assemblage endpoints;
[4] Values represent analyses of large scale ambient chemical databases with statistical approaches.
[5] Biocriteria derived threshold values (2 Interquartile Ranges [2IQR] above median) in *Appendices to Association Between Nutrients and the Aquatic Biota of Ohio River and Streams* (Ohio EPA 1999).
[6] Biological assemblage effect thresholds derived for SW Ohio in *Integrated Prioritization System (IPS) Documentation and Atlas of Biological Stressor Relationships for Southwest Ohio* (MBI 2015).
[7] NOAA Screening Quick Reference Tables (SQRT; NOAA 2008) – hardness dependent parameters at 100 mg/L hardness; with EPA EcoUpdate Ecotox Thresholds EPA/F-95-038.
[8] Ohio regional reference values (2 Interquartile Ranges [2IQR] above median) in *Appendices to Association Between Nutrients and the Aquatic Biota of Ohio River and Streams* (Ohio EPA 1999) unless otherwise specified.
[9] Values are 1 and 2 standard deviations (SD) above the mean of all values measured statewide.
[10] NA – not applicable, not included in IL WQS.
[11] DRSCW IPS – DuPage River Salt Creek Workgroup integrated Prioritization System derived threshold.
[12] DRSCW IPS – DuPage River Salt Creek Workgroup integrated Prioritization System derived threshold.
[13] U.S. EPA field-based threshold for Central Appalachian streams in A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams (U.S. EPA 2011)
[14] Hardness dependent metals shown at 300 mg/L total hardness – see IAC Part 302 for formulae.

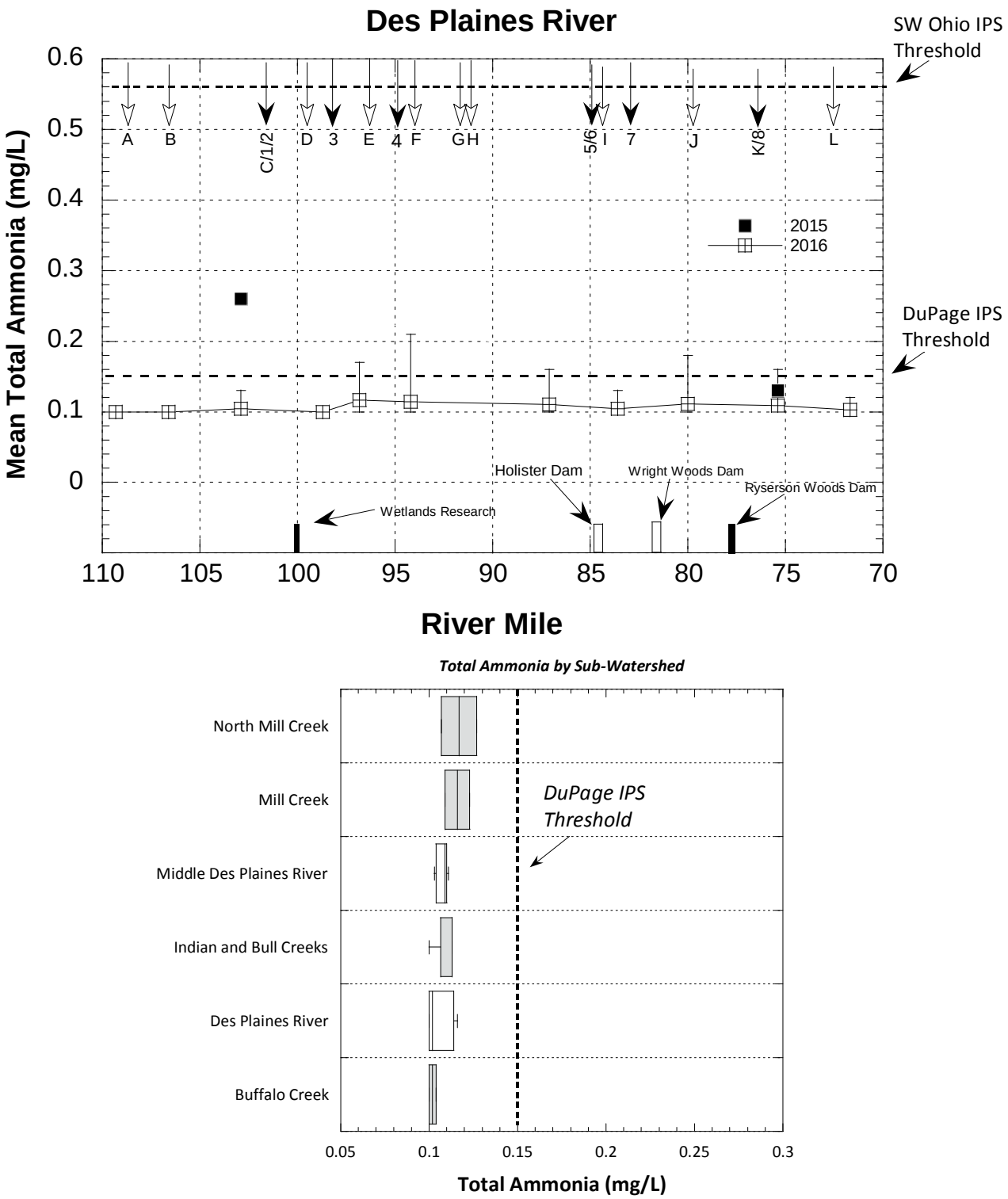

Figure 5. *Concentrations of ammonia-N by river mile (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. Dashed lines represent effect levels correlated with impaired biota in the DuPage River-Salt Creek IPS study (0.15 mg/L) and the SW Ohio IPS study (0.56 mg/L). The key to the arrows in the upper panel are in footnote 3 on p. 15.*

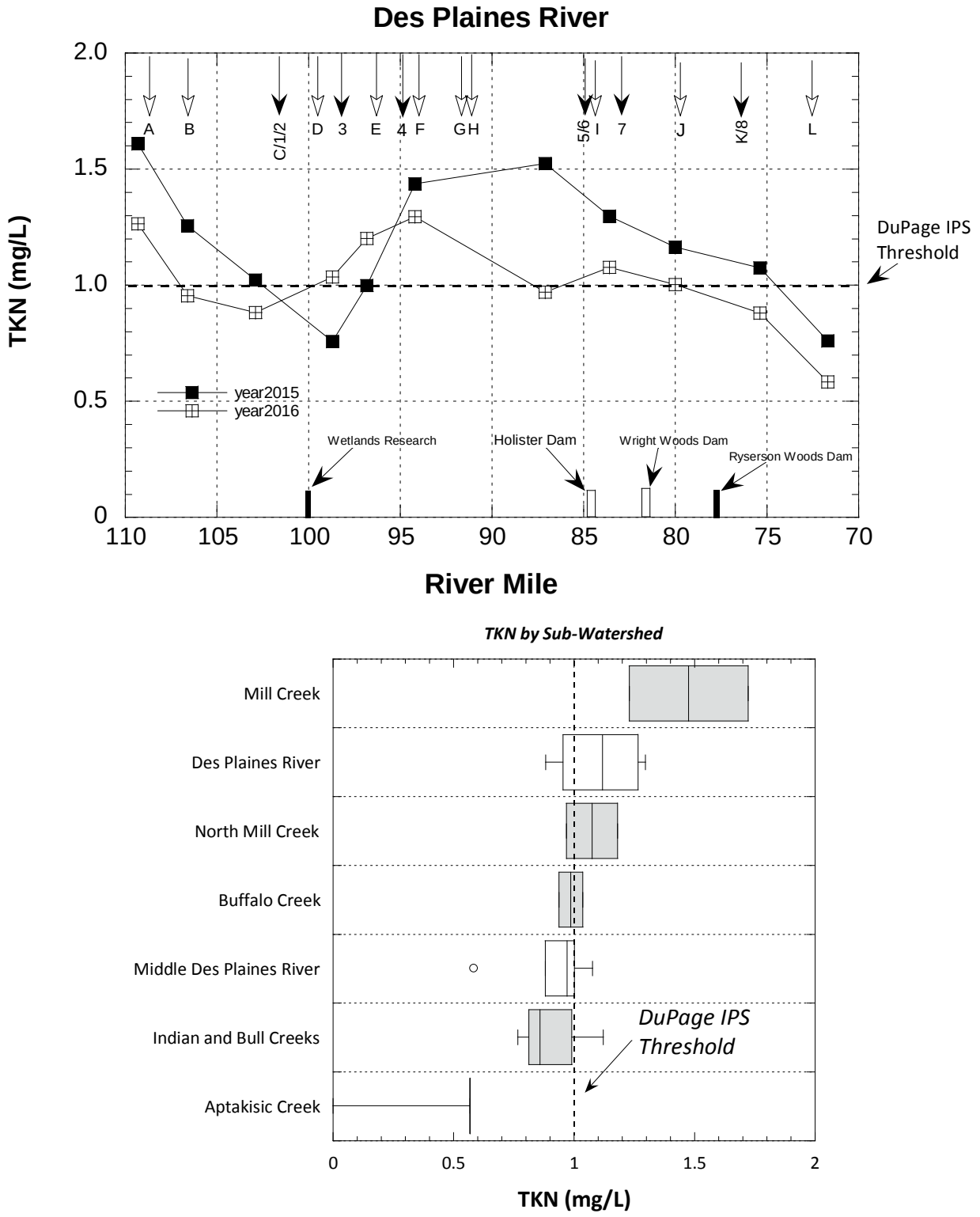

Figure 6. *Concentrations of total Kjeldahl nitrogen (TKN; upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. A dashed line represent effect levels correlated with impaired biota in the DuPage River-Salt Creek IPS study (1.0 mg/L).*

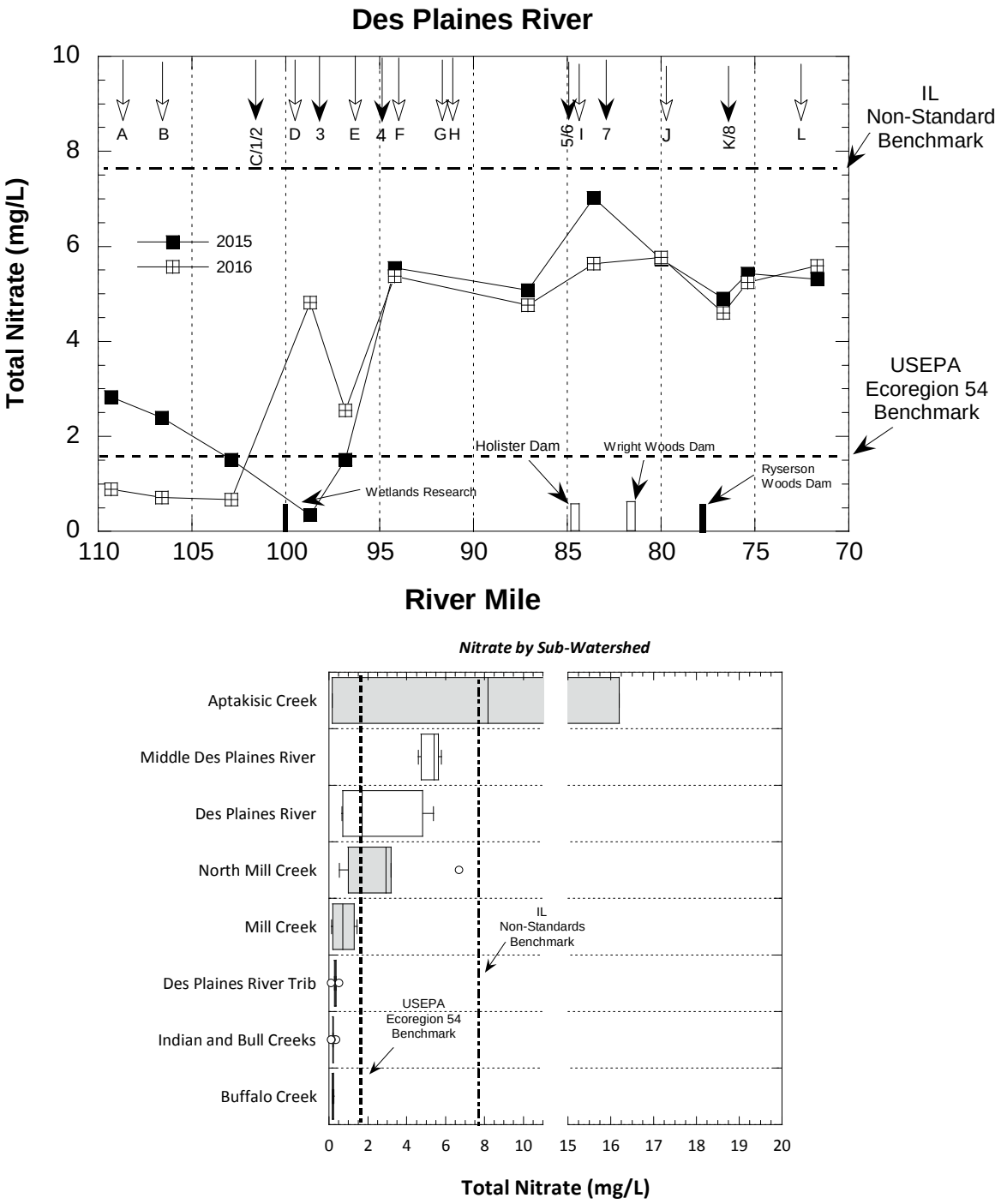

Figure 7. *Concentrations of total nitrate-N (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The lower dashed line represents the U.S. EPA Ecoregion 54 background reference site concentration (1.8 mg/L) and the upper dashed line the IL non-standard benchmark (7.8 mg/L).*

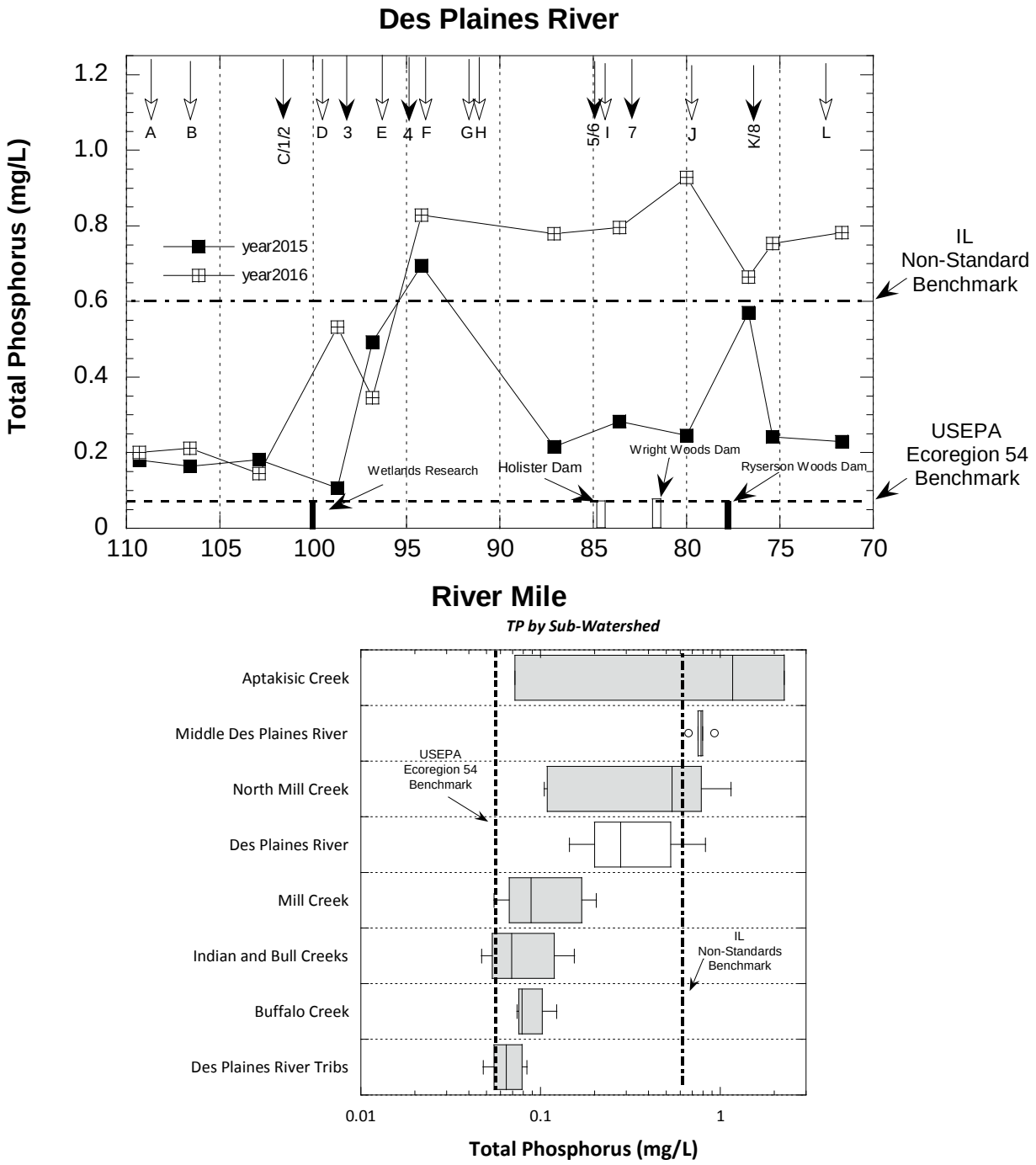

Figure 8. *Concentrations of total phosphorus (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The lower dashed line represents the U.S. EPA Ecoregion 54 background reference site concentration (0.07 mg/L) and the upper dashed line the IL non-standard benchmark (0.61 mg/L).*

background value of 1.798 mg/L. These values were also above biological effects benchmarks from SW Ohio rivers and streams (see Table 7). Such concentrations do not reflect a "toxic" response, but rather concentrations where trophic dynamics and species replacements begin to negatively influence trophic relationships within the biological assemblages. For example, the effect of excessive nutrients can shift assemblages away from complex insectivore based food webs towards simpler filter-feeding and detritivore assemblages. Although elevated phosphorus is frequently associated with agricultural and urban nonpoint source runoff, the highest values in Upper Des Plaines River watershed are associated with WWTP effluents.

Nitrate and total phosphorus values varied in the tributaries (Figure 6 and 7, lower) with the highest values in Aptakisic Creek. Within Aptakisic Creek the high values are associated with the LCDPW Des Plaines WWTP discharge at the downstream site (Site 18-1, mean nitrate = 15.58 mg/L; mean TP = 2.1 mg/L) compared to the upstream site (Site 18-2, mean nitrate = 0.186 mg/L; mean TP = 0.065 mg/L).

Total Suspended Solids (TSS)

Total suspended solids are a measure of filterable material in water and have long been an indicator of sewage and industrial wastes that are often associated with particulates, but also can be related to decaying plant and animal matter and suspended silts. In the Des Plaines mainstem somewhat elevated TSS (compared to upstream) increase with the addition of wastewater effluent (Figure 8), but are below values associated with biological assemblage impairment in SW Ohio and also lower than a recent TSS criteria established by Minnesota for its Southern streams and rivers (MPCA 2014). Tributary values were highest in North Mill Creek (Figure 7) at Sites 10-1 and 10-2 and in Mill Creek downstream from the LCDPW Mill Creek WWTP, but were lower than the biological effect levels from SW Ohio and Minnesota.

Dissolved Oxygen (D.O.)

Diel variations in D.O. is best measured with continuous data that can identify night time minimum values, but such data was not collected. Grab, daytime values can, however, identify particularly acute dissolved oxygen impact that can occur during day time hours. All day time grab dissolved oxygen values in the Des Plaines mainstem were above Illinois "not to exceed" water quality criteria (Figure 9) that are most applicable to grab sample data (5.0 mg/L from Mar-Jul and 3.5 mg/L from Aug-Feb) at all sites except the most upstream. The next two downstream sites had D.O. values less than 5 mg/L, but above the 3.5 mg/L not to exceed criterion that applied when the samples were collected in September. These values reflect the sluggish flow, duckweed-covered condition of the upstream most sites (Plate 1).

To illustrate dissolved oxygen patterns watershed-wide we plotted the mean, maximum, and minimum values for each site (Figure 10). As expected, most tributary sites did not have minimum values below the not-to-exceed criteria. Sites where ambient values were below the 3.5 mg/L not-to-exceed criteria include the two most upstream sites on Bull Creek (14-5 and 14-6), the upstream most site on the West Fork of Bull Creek (14-4), the upstream most site on

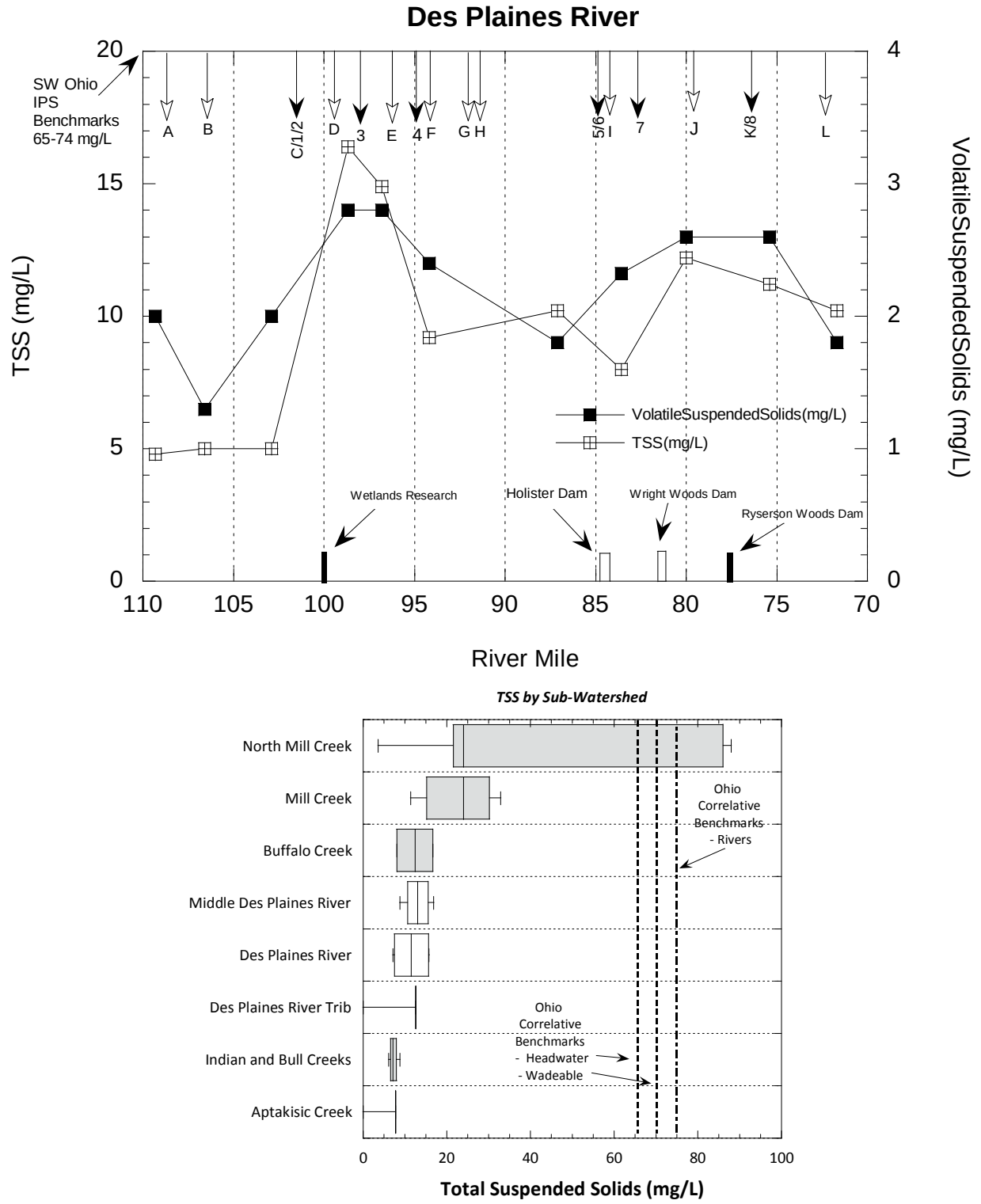

Figure 9. *Concentrations of total suspended and volatile solids (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The SW Ohio IPS benchmarks for headwater, wadeable, and boatable sites (65.7 mg/L) and rivers (74.3 mg/L) are shown on the lower panel.*

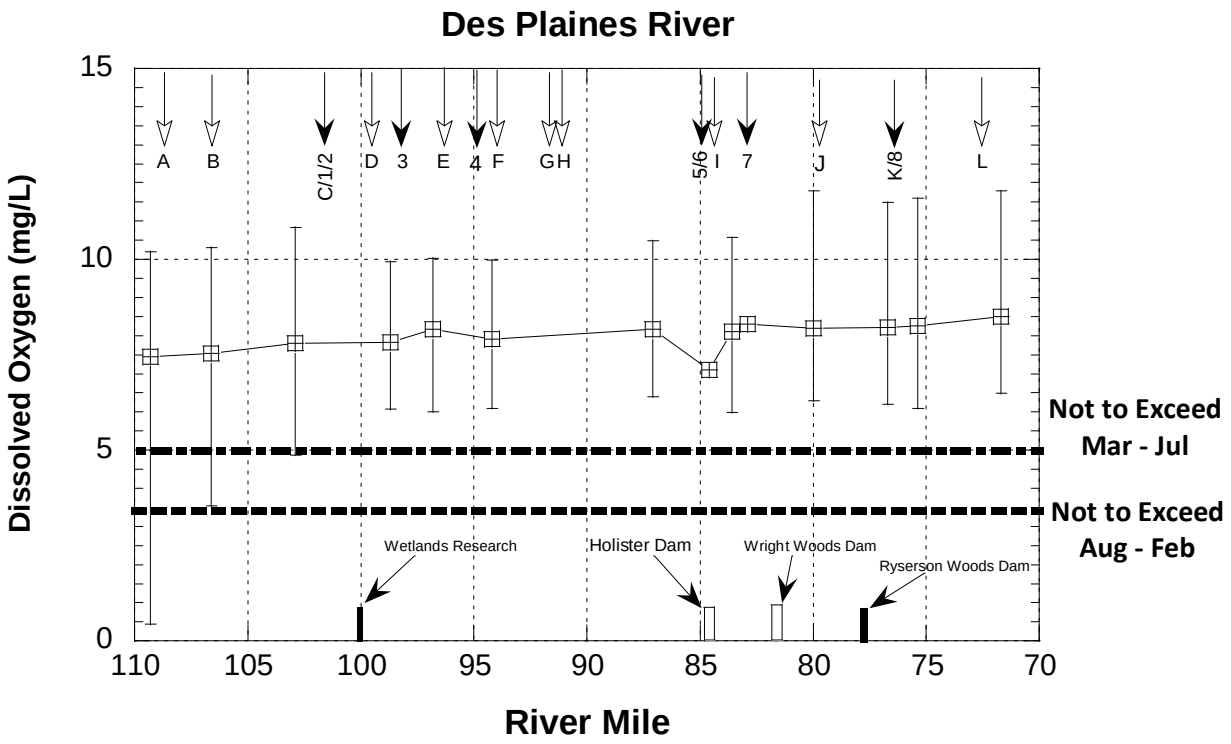

Figure 10. *Mean, maximum, and minimum daytime (grab) dissolved oxygen (D.O., mg/L) in the Upper Des Plaines River mainstem in 2016 in relation to municipal WWTP discharges and tributaries. The solid and dashed lines represent the "never to exceed" water quality criteria for Illinois streams and rivers during March-July (solid line) and August-February (dashed line).*

Plate 2. *Photograph of the most upstream site on the mainstem of the Upper Des Plaines river (Site 13-6, RM 109.3) illustrating the straight channel and sluggish flow in the upper mainstem downstream from the Illinois-Wisconsin state line.*

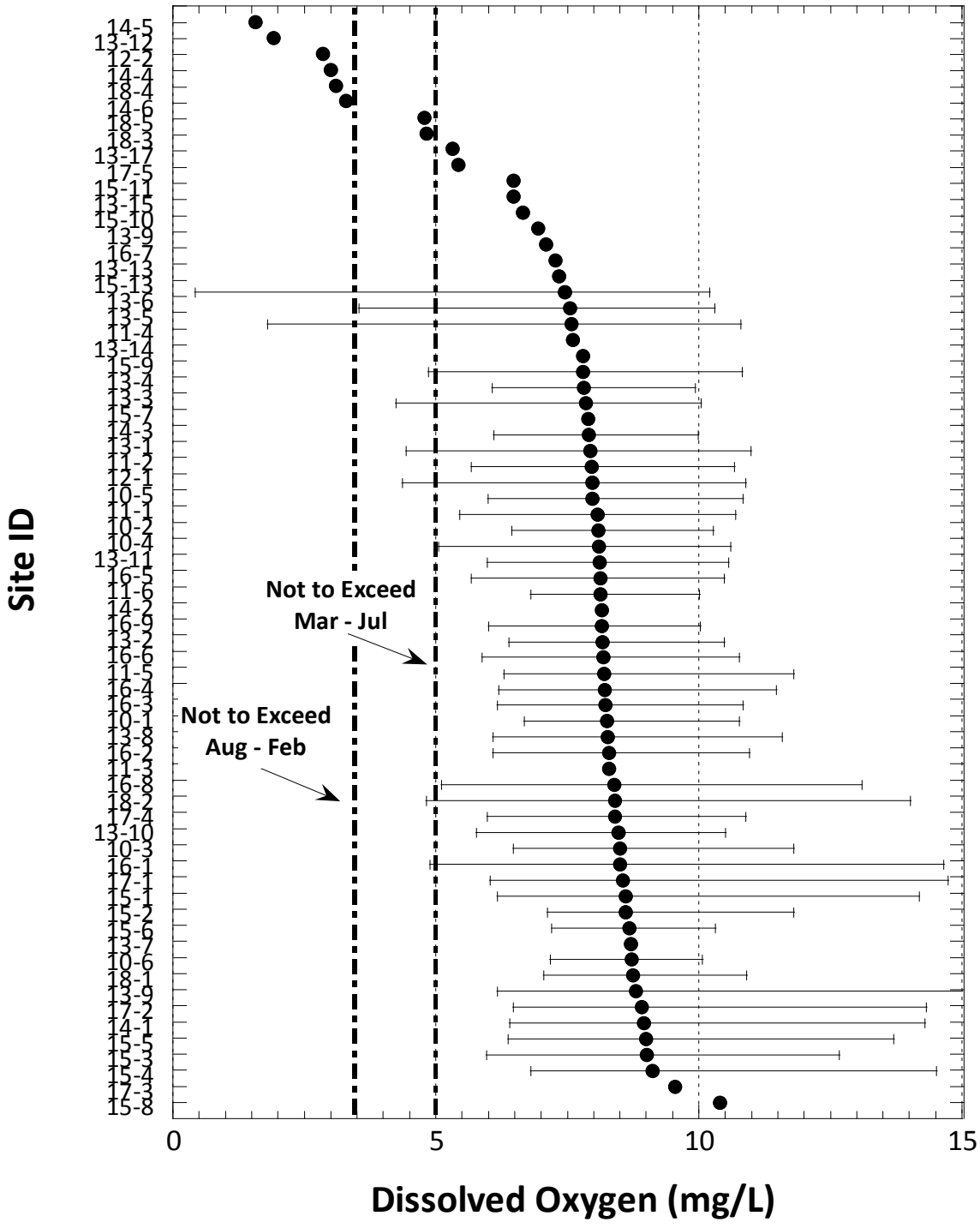

Figure 11. *Mean, maximum, and minimum concentrations of daytime dissolved oxygen (D.O.) at all Upper Des Plaines River watershed tier 1-3 locations in 2016. The solid and dashed lines represent the "never to exceed" water quality criteria for Illinois streams and rivers during March-July (solid line) and August-February (dashed line).*

Aptakisic Creek (18-4). None of these were associated with WWTP discharges are the likely result of a combination of nutrient runoff and low flows allowing localized reaches of low D.O. It is likely, based on the frequency of very high values in the watershed that continuous monitoring would not only identify other localities with low D.O., but excessive diel swings indicative of these combined effects. High D.O. values >10-12 mg/L suggest that such excessive diel swings likely occur as a result of increased algal activity fostered by nutrients and low flows.

Nutrient Conditions in the Des Plaines River Watershed

The impact of nutrients on aquatic life has been well documented (e.g., Allan 2004), but the derivation of criteria and their form and application are only now emerging. Unlike toxicants, the influence of nutrients on aquatic life is indirect through the influence on algal photosynthesis and respiration and resulting increased diel D.O. swings and by the biochemical oxygen demand exerted by algal decomposition. Nutrients can also affect food sources for macroinvertebrates and fish and the response of aquatic life to elevated nutrients is co-influenced by habitat (e.g., substrate composition), stream flow (e.g., scouring and dilution), temperature, and shading. Illinois is the leading state in terms of percent of nitrogen (16.8%) and phosphorus (12.9%) loadings exported towards the Gulf of Mexico (U.S. EPA 2009) where an anoxic zone has developed (U.S. EPA 2008). In Illinois, as in neighboring Midwestern states that drain to the Mississippi River, efforts are underway to modernize nutrient water quality criteria.

Table 7 provides the results for four nutrient enrichment-related parameters in the Upper Des Plaines mainstem and subwatershed sites where data was collected. The results are color coded in accordance with various benchmarks that have been established to associate nutrient concentrations with impaired aquatic life. The cell shading color reflects the probability of risk to aquatic life (White – none; Yellow – minor; Orange – moderate; Purple – high; Red – very high). At this point, there are no formal water quality criteria for aquatic life for nitrate-N, TKN, or total P in Illinois for streams and rivers. U.S. EPA regional nutrient targets (U.S. EPA 2000) for the Central Corn Belt Plains (CCBP) ecoregion for nitrate-N and total P and which *"represent conditions of surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses"* (U.S. EPA, 2000) were used. The TKN and total ammonia-N thresholds represent change point derived thresholds derived based on aquatic assemblage impacts by quartile regressions in the DRSCWG IPS (Miltner et al. 2010). Illinois statistical thresholds termed "non-standards-based numeric criteria" for total P (0.61 mg/L) and nitrate-N (7.8 mg/L) were also used. These non-effect thresholds are based on 85th percentile values from the statewide Illinois EPA Ambient Water Quality Monitoring Network (AWQMN) dataset for 1978-1996 (Illinois EPA 2011). The 10 mg/L human health-based water quality criterion for the Public Water Supply use was used to screen extreme values of nitrate+nitrite-N even though it technically applies only where water is withdrawn for public water supplies.

***Table 7**. Concentrations of nutrient parameters including ammonia-N, total nitrate -N, TKN, and total phosphorus in the Upper Des Plaines River watershed study area in 2016. Shading represents different levels of exceedance of various criteria or thresholds for each parameter (see footnotes). Only sites with one or more nutrient parameters are included.*

Site ID	Basin code	Stream Code	RM	Drain. Area (mi.^{2})	Ammonia[1] (mg/L)	Nitrate-N[2,3,4] (mg/L)	TKN[5] (mg/L)	Total Phosphorus[6,7,8,9] (mg/L)
Des Plaines River								
13-6	95	656	109.30	123.7	0.1	1.2	1.4	0.16
13-5	95	656	106.60	137.3	0.1	0.7	1.1	0.22
13-4	95	656	102.90	145.6	0.1	0.5	0.9	0.15
13-3	95	656	98.70	220.3	0.1	0.5	0.7	0.14
13-2	95	656	96.82	225.4	0.1	1.6	1.04	0.20
13-1	95	656	94.20	232.0	0.1	3.6	1.2	0.79
16-6	95	656	87.10	261.4	0.1	3.0	1.01	0.56
16-7	95	656	84.60	266.5	-	-	-	-
16-5	95	656	83.60	268.1	0.1	4.8	1.02	0.48
16-8	95	656	82.90	268.9	-	-	-	-
16-4	95	656	80.00	273.2	0.1	4.5	0.9	0.64
16-3	95	656	76.7	314.7	-	3.3	-	0.61
16-2	95	656	75.40	324.0	0.1	3.9	0.9	*0.53*
16-1	95	656	71.7	358.7	0.1	4.2	0.5	*0.63*
Newport Drainage Ditch								
12-1	95	708	0.70	7.4	-	0.4	-	0.08
Slocum Corners Creek								
13-11	95	711	1.36	2.4	-	0.2	-	0.08
North Mill Creek								
10-3	95	996	10.20	20.8	0.1	1.0	1.2	0.12
10-2	95	996	8.10	29.4	-	2.6	-	0.43
10-1	95	996	1.10	32.0	-	2.5	-	0.36
Hastings Creek								
10-5	95	702	3.12	3.9	-	0.1	-	0.07
10-4	95	702	1.68	5.6	0.1	5.1	1.5	0.69
Mill Creek								
11-6	95	995	17.20	4.5	-	1.0	-	0.07
11-5	95	995	13.80	10.4	-	0.6	-	0.08
11-4	95	995	10.10	18.3	-	0.1	-	0.05
11-3	95	995	7.20	21.4	-	0.2	1.2	0.05
11-2	95	995	1.71	62.3	0.1	0.7	1.1	0.19
11-1	95	995	0.70	63.8	0.1	1.4	1.6	0.15
Suburban Country Club Tributary								
13-10	95	710	2.00	4.0	-	0.1	-	0.05

Site ID	Basin code	Stream Code	RM	Drain. Area (mi.^{2})	Ammonia[1] (mg/L)	Nitrate-N[2,3,4] (mg/L)	TKN[5] (mg/L)	Total Phosphorus[6,7,8,9] (mg/L)
Stoneroller Creek								
13-9	95	709	0.42	4.1	-	0.2	-	0.05
West Fork Belvidere Rd. Tributary								
13-8	95	720	0.15	3.8	-	0.3	-	0.06
Bull's Brook								
13-7	95	704	0.25	2.7	-	0.5	-	0.05
Bull Creek								
14-2	95	051	1.00	8.4	-	0.2	-	0.05
14-1	95	051	0.5	11.69	0.1	0.3	0.8	0.05
Indian Creek								
15-6	95	706	9.83	3.7	-	0.1	-	0.12
15-5	95	706	5.40	17.3	-	0.2	-	0.08
15-2	95	706	2.41	35.0	0.1	0.2	0.8	0.05
15-1	95	706	0.17	36.4	0.1	0.2	0.8	0.05
Killdeer Creek								
15-7	95	707	4.6	2.9	-	0.1	-	0.11
15-4	95	707	0.01	6.8	-	0.1	-	0.13
Seavey Drainage Ditch								
15-3	95	390	3.66	5.05	-	0.3	-	0.05
Aptakisic Creek								
18-2	95	701	0.8	4.9	-	0.2	-	0.07
18-1	95	701	0.50	5.5	0.1	17.4	0.5	2.42
Buffalo Creek								
17-3	95	703	7.7	9.61	-	0.2	-	0.10
17-2	95	703	6.10	22.1	-	0.1	-	0.05
17-1	95	703	0.75	29.1	0.1	0.3	0.8	0.06
Buffalo Creek Tributary								
17-4	95	713	0.68	8.6	0.1	0.3	0.99	0.07

[1]IPS ammonia-N aquatic life threshold (0.15 mg/L).

[2]U.S. EPA Ecoregion 54 reference target for nitrate (1.798 mg/L).

[3]Non-standards based numeric criteria for total nitrate (7.8 mg/L) based on the 85th %ile values determined from a statewide dataset from the Ambient Water Quality Monitoring Network, for water years 1978-1996 (Illinois EPA 2011).

[4]Illinois water quality criterion for nitrate-N (10.0 mg/L).

[5]IPS TKN aquatic life threshold (1.0 mg/L).

[6]U.S. EPA Ecoregion 54 reference target for total phosphorus (0.072 mg/L).

[7]Non-standards based numeric criteria for total phosphorus (0.61 mg/L) in water based on the 85th percentile values determined from a statewide set of observations from the Ambient Water Quality Monitoring Network, for water years 1978-1996 (Illinois EPA 2011).

[8]Suggested effluent limit for total phosphorus (1.0 mg/L).

[9]Eutrophication Criteria, Southern Minnesota (0.15 mg/L; Heiskary and Bouchard 2015).

Upper Des Plaines River Mainstem – Nutrient Parameters
The Upper Des Plaines River mainstem is moderately enriched in a downstream direction and as WWTP effluent and urban runoff are added (Table 7). In 2016 mean total phosphorus was elevated above the Illinois non-standard benchmark of 0.61 mg/L particularly in the lower reaches of the Upper Des Plaines River. The highest nitrate and total phosphorus levels occurred downstream of the LCDPW Des Plaines WWTP on Aptakisic Creek (Aptakisic Creek enters the Upper Des Plaines River at RM 76.4). No ammonia-N exceedances were detected in any grab samples during the 2016 survey, although a few maximum values exceeded the DRSCWG IPS target of 0.15 mg/L (Miltner et al. 2010).

Upper Des Plaines River Tributaries - Nutrient Parameters
A number of tributaries had relatively low levels of nitrate and total phosphorus including Bull Creek, Buffalo Creek, Indian Creek, and number of the smaller direct tributaries. Sites with elevated nutrients included the North Branch Mill Creek, Mill Creek, at the mouth of Aptakisic Creek, and at the mouth of Hastings Creek. Both Aptakisic Creek and Hastings Creek have major WWTPs that contribute to the elevated nitrate and phosphorus levels.

Dissolved Materials in Urban Runoff
Urban runoff can typically have high concentrations of dissolved materials. In Northern climates such as Illinois, these dissolved materials are an emerging problem because they accumulate in soils and shallow groundwater and have been documented to reach concentrations that can threaten aquatic life. Of particular concern in urban areas with high road densities is the concentration of chlorides from winter road salt applications and point source loadings from water softening blowdown. Kelly et al. (2012) identified a steadily increasing trend in chloride levels in the Illinois River at Peoria where the median increased from 20 mg/L in 1947 to nearly 100 mg/L in 2004 with high values in the 1940s of <40 mg/L and spikes in 2003 of >300 mg/L.

Table 8 shows the results for a group of parameters associated with dissolved materials in urban runoff. The highlighted values exceed DRSCWG IPS derived thresholds (total chlorides, TKN) or statewide reference levels from similar Ohio waters (conductivity, TDS, TSS, metals; Ohio EPA 1999). For chlorides, the DRSCWG IPS thresholds for fish and macroinvertebrates (112 and 141 mg/L, respectively) are lower than the current Illinois (500 mg/L) and U.S. EPA (230 mg/L) criteria for aquatic life. The DRSCWG IPS thresholds were exceeded throughout the watershed (Table 8, and Figure 12) at all except four sites (out of 44 with data). In studies of neighboring Salt Creek and the West, East, and Lower DuPage River watersheds, multi-year sampling has identified increasing trends of elevated concentrations of dissolved materials, particularly chlorides (MBI 2013, 2014, 2016a, 2016b).

Rather than a simple runoff and export mode of effect, chlorides accumulate in near surface groundwater (Kelly 2008), soils, and land surfaces adjacent to streams. Seasonal studies have shown that elevated summer concentrations are correlated with acute concentrations during late winter and spring periods (Kaushal et al. 2005). Research in New England (Kaushal et al. 2005) and Minnesota (Novotny et al. 2008) show that chlorides can accumulate in watersheds

***Table 8**. Urban parameter results (medians) in the Upper Des Plaines River study area, 2016. Values that exceed the DRSCWG IPS effects-based thresholds are yellow highlighted and values below the effects threshold, but above reference concentrations are rose highlighted. Only sites with chemical data for any one of the parameters are included.*

Site ID	Basin code	Stream Code	RM	Chlorides (mg/L)[1]	Conductivity (µS/cm)	Specific Conductivity (µmhos/cm)[2]	Sodium (mg/L)[3]	Sulfate (mg/L)[4]	TSS (mg/L)[5]	Volatile Susp. Solids (mg/L)
Des Plaines River										
13-6	95	656	109.30	150.0	1061	1050	118.7	55.9	4.8	2.0
13-5	95	656	106.60	145.0	1034	1010	-	-	5.0	1.3
13-4	95	656	102.90	119.0	1027	1000	-	-	5.0	2.0
13-3	95	656	98.70	141.0	1022	991	95.3	52.4	16.4	2.8
13-2	95	656	96.82	149.5	1045	1018	99.8	57.0	14.9	2.8
13-1	95	656	94.20	154.0	1063	1110	121.0	62.9	9.2	2.4
16-6	95	656	87.10	161.0	1040	1125	128.0	64.8	10.2	1.8
16-5	95	656	83.60	164.0	1070	1095	131.0	58.6	8.0	2.3
16-4	95	656	80.00	167.0	1026	1075	123.5	61.3	12.2	2.6
16-3	95	656	76.7	160.0	999	1060	-	-	-	-
16-2	95	656	75.40	176.0	1030	1075	124.5	61.1	11.2	2.6
16-1	95	656	71.7	171.0	1007	989	121.5	59.7	10.2	1.8
Newport Drainage Ditch										
12-1	95	708	0.70	130.0	1079	1045	-	-	12.6	2.2
Slocum Corners Creek										
13-11	95	711	1.36	147.0	1011	1300	-	-	-	-
North Mill Creek										
10-3	95	996	10.20	55.2	924	856	-	-	15.6	3.4
10-2	95	996	8.10	97.9	1078	1033	-	-	88.0	11.0
10-1	95	996	1.10	98.0	1053	997	-	-	86.0	12.0

Site ID	Basin code	Stream Code	RM	Chlorides (mg/L)[1]	Conductivity (µS/cm)	Specific Conductivity (µmhos/cm)[2]	Sodium (mg/L)[3]	Sulfate (mg/L)[4]	TSS (mg/L)[5]	Volatile Susp. Solids (mg/L)
Hastings Creek										
10-5	95	702	3.12	199.5	1019	1005	-	-	3.6	1.2
10-4	95	702	1.68	182.0	1078	1230	-	-	20.2	3.2
Mill Creek										
11-6	95	995	17.20	136.0	967	1027	-	-	11.4	1.8
11-5	95	995	13.80	190.0	1059	1125	-	-	24.0	6.4
11-4	95	995	10.10	215.5	1068	1115	-	-	15.2	4.6
11-3	95	995	7.20	206.0	1070	1075	-	48.3	9.4	3.0
11-2	95	995	1.71	156.0	1060	1030	-	-	25.7	5.9
11-1	95	995	0.70	155.0	1015	1070	106.2	52.2	24.4	7.0
Suburban Country Club Tributary										
13-10	95	710	2.00	169.0	1074	1180	-	-	-	-
Stoneroller Creek										
13-9	95	709	0.42	296.0	1100	1385	-	-	-	-
West Fork Belvidere Rd. Tributary										
13-8	95	720	0.15	278.0	1175	1520	-	-	-	-
Bull's Brook										
13-7	95	704	0.25	104.5	952	985	-	-	-	-
Bull Creek										
14-2	95	051	1.00	208.0	1066	1140	-	-	-	-
14-1	95	051	0.5	218.0	999	1050	-	-	5.8	1.8
Indian Creek										
15-6	95	706	9.83	127.0	968	907	-	-	-	-
15-5	95	706	5.40	164.5	1091	1105	-	-	-	-

Site ID	Basin code	Stream Code	RM	Chlorides (mg/L)[1]	Conductivity (µS/cm)	Specific Conductivity (µmhos/cm)[2]	Sodium (mg/L)[3]	Sulfate (mg/L)[4]	TSS (mg/L)[5]	Volatile Susp. Solids (mg/L)
15-2	95	706	2.41	150.0	1014	947	-	-	5.2	1.6
15-1	95	706	0.17	148.0	918	856	-	-	5.0	1.2
Killdeer Creek										
15-7	95	707	4.6	170.0	1053	1060	-	-	-	-
15-4	95	707	0.01	141.5	1027	986	-	-	-	-
Seavey Drainage Ditch										
15-3	95	390	3.66	188.0	1030	1170	-	-	-	-
Aptakisic Creek										
18-2	95	701	0.8	173.0	1001	929	-	-	-	-
18-1	95	701	0.50	252.0	1152	1470	-	-	6.4	2.0
Buffalo Creek										
17-3	95	703	7.7	159.0	938	936	-	-	-	-
17-2	95	703	6.10	172.0	906	844	-	-	-	-
17-1	95	703	0.75	174.0	912	824	-	-	7.9	2.3
Buffalo Creek Tributary										
17-4	95	713	0.68	202.0	970	916	-	-	6.7	2.8

[1] DuPage IPS thresholds (lowest, 112 µg/L) derived in the IPS study (total chlorides)

[2] Median specific conductivity values above statewide reference levels (75th percentiles) from similar Ohio waters (e.g., headwater - 600, wadeable streams - 610, large river - 810).

[3] Median sodium values above statewide reference levels (75th percentiles) from similar Ohio waters (e.g., headwater - 27.5, wadeable streams - 26.0, large river - 59.9).

[4] Median sulfate values above statewide reference levels (75th percentiles) from similar Ohio waters (e.g., headwater - 118.8 wadeable streams - 120, large river - 170.25).

[5]- Median TSS values above statewide reference levels (75th percentiles) from similar Ohio waters (e.g., headwater - 16, wadeable streams - 24.75, large river - 50).

and that there is a strong association between high winter and elevated summer concentrations. Novotny et al. (2008) identified that 78% of the road salt applied in a Minnesota watershed accumulated in a given year and contributed to an increase in summer chloride concentrations. High levels of chlorides during the summer in the Upper Des Plaines tributaries suggest that late winter and early spring chloride levels are much higher during runoff events and likely contribute to the disproportionate impairment in headwater streams. Actual concentrations that result in adverse effects on fish and invertebrates likely occur during peak runoff events in late winter and early spring when values approach or exceed the 230 mg/L U.S. EPA recommended chronic criterion or the 500 mg/L Illinois acute criterion.

Upper Des Plaines Mainstem – Dissolved Materials

Chlorides in the Upper Des Plaines mainstem showed little variation being elevated above the DRSCWG IPS thresholds at every site in 2016 (Figure 12, upper). Data from 2015 was also elevated and showed lower concentrations more than half of which were below the macroinvertebrate threshold that is presumably due to dilution from higher flows. Conductivity values followed a similar pattern in the mainstem in 2016 and exceed reference thresholds (Figure 13, upper).

Upper Des Plaines Tributaries - Dissolved Materials

Although actual concentrations of total chlorides vary between watersheds, values are considered elevated even in those with the lowest chloride levels (North Mill Creek) and tended to be higher in the tributary subwatersheds with higher urban land uses (e.g., Aptakisic Creek; Figure 12, lower). As with the mainstem, conductivity followed a similar pattern (Figure 13, lower). Aptakisic Creek had the highest concentrations of chlorides and North Mill Creek the lowest.

Heavy Metals in the Water Column

No heavy metals exceeded water quality criteria in 2016 although the frequency of samples was low and incomplete at most sites (Table 9). Nevertheless, acute and persistent problem areas can be identified with this level of sampling. Chronic issues with heavy metals in situations where water column exceedances are few are better identified with sediment metal concentrations (see next section) that can accumulate from episodic and historical releases of metals.

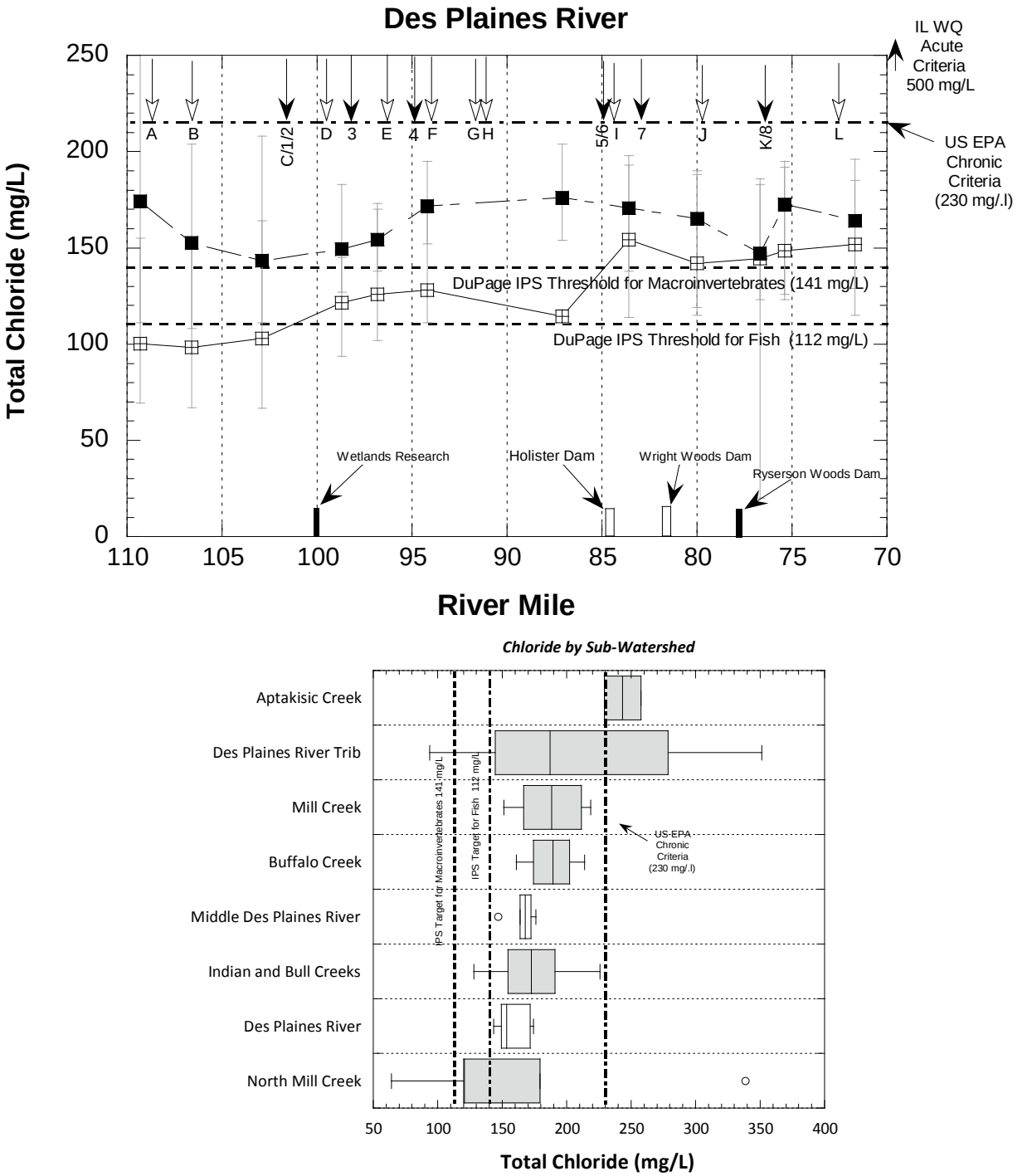

Figure 12. *Mean, maximum, and minimum concentrations of total chlorides (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The Illinois water quality criterion (500 mg/L), the U.S. EPA national criterion (230 mg/L), and the DuPage IPS thresholds for fish (141 mg/L) and macroinvertebrates (112 mg/L) are indicated in each graph.*

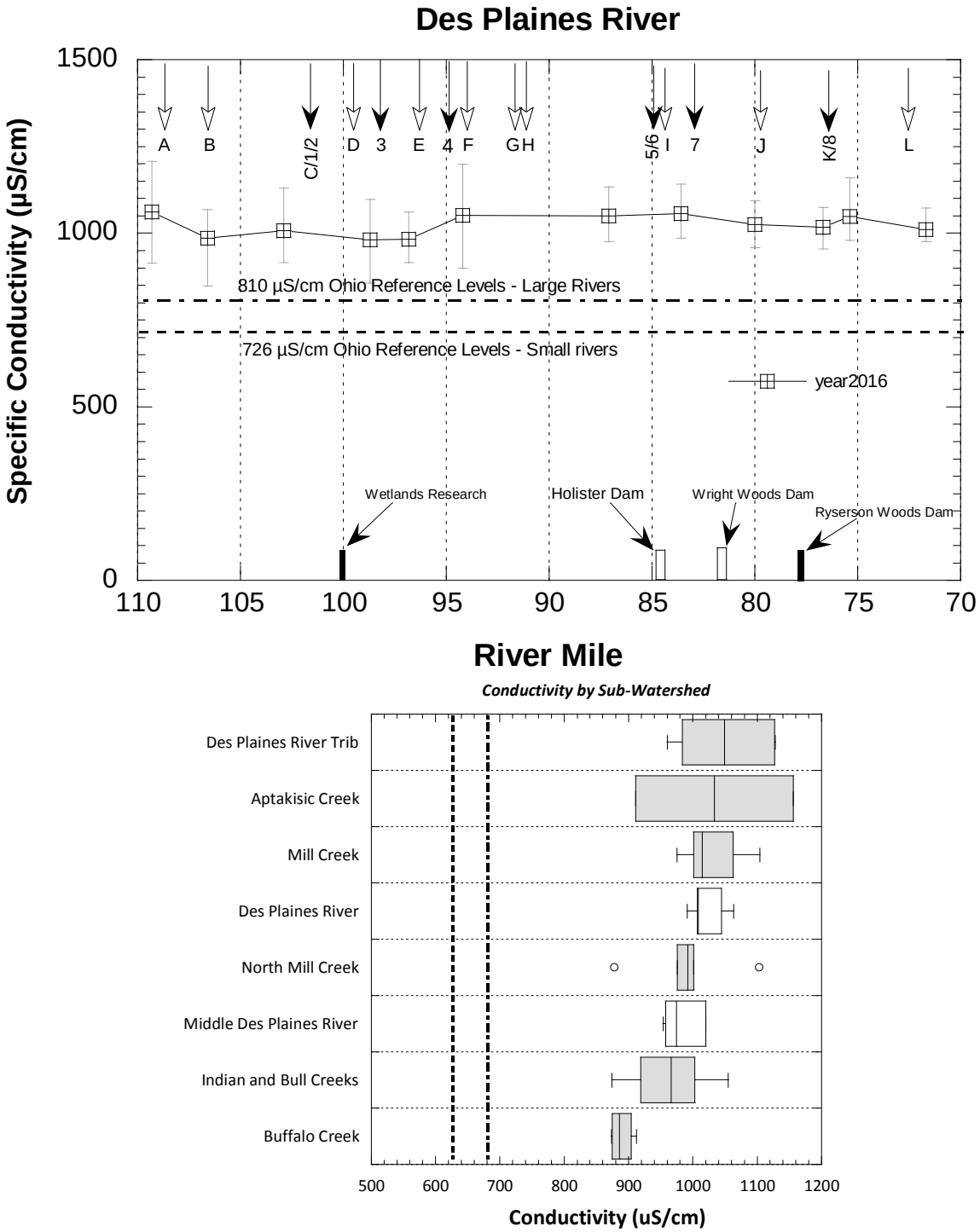

Figure 13. *Mean, maximum, and minimum concentrations of total chlorides (upper panel) in the Upper Des Plaines River mainstem in 2015 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The Ohio statewide reference levels are shown as dashed lines for large rivers (810 µS/cm) and small rivers (726 µS/cm).*

Sediment Chemistry

Sediment samples were evaluated against guidelines compiled by McDonald et al. (2000) and the Ontario Ministry of Environment (1993) that list ranges of contaminant concentrations by threshold (TEL) or probable (PEL) effects on aquatic life supplemented with some other parameters summarized in the NOAA SQUIRT documents (Buchman et al. 2008) and for sediment metals the report of Short (1998) from Illinois that identified elevated and extremely elevated sediment metal concentrations. Specifically, threshold effect levels (TEL) are where toxic effects are initially apparent and likely to affect the most sensitive organisms. Probable effect levels (PEL) are where toxic effects are more likely to be observed over a wider range of organism sensitivities. Sediment metal sampling results from 2016 are summarized by concentration rating and parameter class in Table 10 and organic compounds in Table 11. Polycyclic aromatic hydrocarbons (PAHs) result from the incomplete combustion of hydrocarbons and are a common component of stormwater runoff in urban areas.

Excessive levels of heavy metals in urban landscapes are commonly associated with runoff from roads and highways and industrial and municipal sources. Given the development in the upper Des Plaines watershed some elevated metals were expected, particularly were roads and industries are dense and downstream of some effluents and stormwater sources. Manganese was the parameter most frequently above TEL/PEL benchmarks in 36 of 49 samples collected (Table 10). Most of these were values above the TEL benchmark, but we also had sites with values above PEL benchmarks in the West Fork Belvidere Rd. Tributary, Stoneroller Creek, Bull's Brook, and Indian Creek (3 of 5 sites).

Other metal exceedances above the PEL or Highly Elevated category of Short (1998) were more scattered. There is no PEL benchmark for barium, but there was a value at the mouth of Aptakisic Creek that was above the extremely elevated threshold of Short (1998) which is downstream of the LCPWD Des Plaines River WWTP. There were extremely elevated concentrations of arsenic in Bull Creek and one site in Indian Creek, but both were below the PEL benchmark of 33 µg/kg. There were scattered values above the TEL benchmarks for a few metals and these were more common in the heavily developed Aptakisic Creek, Mill Creek, and Indian Creek watersheds.

Upper Des Plaines River Watershed - Sediment Chemistry

Sediment samples were evaluated against the consensus based guidelines of McDonald et al. (2000) and the Ontario Ministry of Environment (1993) that provide a range of contaminant concentrations between threshold (TEL) and probable (PEL) effect levels. These were supplemented for selected parameters with the NOAA SQuiRT values (Buchman et al. 2008) and Illinois based non-effect values for metals including elevated and extremely elevated metal concentrations (Short 1998). Specifically, threshold effect levels (TEL) are where toxic effects are initially apparent and likely to affect the most sensitive organisms. Probable effect levels (PEL) are where toxic effects are more likely to be observed over a wider range of organism sensitivities. Sediment metal sampling results from 2016 are summarized by concentration and parameter class in Table 10 and organic compounds in Table 11.

***Table 9**. Water column metals concentrations on study sites on the Des Plaines River study area during 2016. There were no exceedances of Illinois water quality criteria. Values are means of multiple samples at a site.*

Site ID	River Mile	Arsenic (µg/L)	Copper (µg/L)	Iron (µg/L)	Mercury (ng/L)	Manganese (µg/L)	Nickel (µg/L)	Zinc (µg/L)
Des Plaines River								
13-6	109.3	1.1	1.1	471	1.23	245	1.4	-
13-5	106.6	-	-	-	-	70.5	-	-
13-4	102.9	-	-	-	-	156	-	-
13-3	98.7	1.5	1.3	497	0.63	120	1.7	20.1
13-2	96.82	9.4	1.7	365	0.92	63.9	1.3	7.5
13-1	94.2	7.6	2.3	271	1.14	38.2	2.4	9.9
16-6	87.1	-	-	250	1.71	44.2	-	9.2
16-5	83.6	6.2	4.1	221	1.13	40.2	2.8	9.1
16-4	80	5.8	3.1	210	1.28	32.5	2.6	10.2
16-2	75.4	4.9	5.3	250	1.54	25.1	2.7	14.5
16-1	71.7	4.7	4.4	206	0.82	17.6	2.4	10.6
Bull Creek								
14-1	0.5	-	-	-	-	34.7	-	-
Aptakisic Creek								
18-1	0.5	-	-	-	1.71	5.6	-	9.2
Hastings Creek								
10-4	1.7	-	-	-	-	20.3	-	-
Buffalo Creek								
17-1	0.8	-	-	-	-	33.5	-	-
Indian Creek								
15-2	2.4	-	-	-	-	28.4	-	-
15-1	0.2	-	-	-	-	24.1	-	-
Buffalo Creek Tributary								
17-4	0.7	-	-	-	-	24.4	-	9.2
Mill Creek								
11-2	1.7	-	-	-	-	-	-	-
11-1	0.7	1.4	2.2	531	0.8	56	1.7	10.5
North Mill Creek								
10-3	10.2	-	-	-	-	343	-	-

Table 10. *Sediment metals concentrations (mg/kg) at Tier 1-3 sites in the Upper Des Plaines River study area October 2016. Values above the MacDonald et al. (2000) TEL and PEL thresholds or the elevated and extremely elevated ranges of Short (1998) are shaded in accordance with the color-code key at the end of the table.*

Site ID	Basin code	Stream Code	RM	AL mg/ kg	As mg/ kg	Ba mg/ kg	Be mg/ kg	Bo mg/ kg	Cd mg/ kg	Cr mg/ kg	Co mg/ kg	Cu mg/ kg	Fe mg/ kg	Pb mg/ kg	Mn mg/ kg	Hg mg/ kg	Ni mg/ kg	K mg/ kg)	Silver mg/ kg	Na mg/ kg	Sr mg/ kg	Va mg/ kg	Zn mg/ kg
Des Plaines River																							
13-6	95	656	109.30	7390	2.20	67.2	0.42	14.90	0.68	13.00	6.53	27.4	15400	15.3	436	0.06	14.7	1040	0.06	501	154.0	16.7	66.5
13-5	95	656	106.60	6620	2.10	56.9	0.38	6.04	0.40	11.20	6.46	16.9	13500	17.0	577	0.20	12.8	781	0.06	245	46.7	13.6	57.8
13-4	95	656	102.90	7670	2.53	69.2	0.39	10.40	0.63	13.10	6.93	29.5	15600	23.3	872	0.15	14.9	1160	0.06	759	46.7	16.3	95.0
13-3	95	656	98.70	4360	3.63	42.7	0.29	5.42	0.48	10.40	5.51	16.5	13000	23.3	462	0.04	11.2	579	0.06	269	56.2	12.9	77.2
13-2	95	656	96.82	6240	4.02	55.1	0.46	2.87	0.36	11.20	5.85	10.0	15100	13.3	507	0.04	11.3	516	0.06	185	36.4	18.5	42.7
13-1	95	656	94.20	6330	4.01	69.3	0.40	10.10	0.67	13.50	6.06	27.7	15300	24.8	742	0.05	13.8	924	0.14	516	88.9	13.1	114.0
16-5	95	656	83.60	5480	3.93	73.3	0.38	9.70	0.90	20.10	5.80	36.1	14800	25.4	783	0.21	12.8	919	0.15	560	101.0	12.0	130.0
16-4	95	656	80.00	4060	1.53	44.7	0.25	5.87	0.48	10.20	4.10	18.5	9280	10.4	513	0.05	7.9	692	0.06	278	56.5	8.9	65.7
16-3	95	656	76.7	2480	1.13	21.4	0.14	3.15	0.21	6.51	2.83	6.2	6040	5.4	258	0.04	5.2	401	0.06	155	43.4	6.3	30.3
16-2	95	656	75.40	4500	2.15	71.0	0.28	6.40	0.50	10.90	4.47	22.8	11300	12.0	581	0.04	9.5	774	0.07	270	85.5	10.6	82.2
16-1	95	656	71.7	4790	7.74	50.9	0.31	5.01	0.57	8.74	7.97	18.3	14400	13.8	1000	0.04	15.0	747	0.15	481	76.4	13.6	48.6
Newport Drainage Ditch																							
12-2	95	708	3.03	11950	1.91	83.1	0.64	13.50	0.64	18.25	8.71	30.1	19150	21.0	445	0.08	20.8	1430	0.06	878	57.1	20.8	90.9
12-1	95	708	0.70	6600	2.45	53.3	0.38	5.69	0.52	11.60	5.51	16.2	12300	14.4	591	0.04	11.9	663	0.06	308	38.4	18.1	62.0
Slocum Corners Creek																							
13-11	95	711	1.36	7950	2.78	55.2	0.40	7.42	0.63	14.80	8.65	33.8	17900	23.8	743	0.17	19.1	1140	0.06	748	85.1	17.5	95.6
North Mill Creek																							
10-3	95	996	10.20	6170	1.96	47.6	0.33	6.44	0.32	10.40	6.21	14.0	12900	12.2	471	0.08	12.1	682	0.06	195	31.5	13.5	43.4
10-2	95	996	8.10	5350	2.06	33.5	0.28	6.35	0.30	9.09	5.34	18.6	12300	11.0	431	0.05	11.7	848	0.06	350	127.0	13.1	44.1
10-1	95	996	1.10	8200	2.45	51.7	0.41	8.83	0.39	12.80	7.18	21.3	15200	15.0	609	0.06	15.6	1180	0.06	669	120.0	16.5	58.3
Hastings Creek																							
10-5	95	702	3.12	6670	2.15	38.2	0.33	5.40	0.30	12.00	6.56	20.8	14400	17.9	433	0.06	15.8	868	0.06	927	50.8	15.7	52.4
10-4	95	702	1.68	7210	3.21	64.4	0.37	8.44	0.38	12.25	7.38	29.4	15950	13.9	673	0.06	17.0	1240	0.06	523	182.0	15.8	69.0

Site ID	Basin code	Stream Code	RM	AL mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Bo mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg	Pb mg/kg	Mn mg/kg	Hg mg/kg	Ni mg/kg	K mg/kg)	Silver mg/kg	Na mg/kg	Sr mg/kg	Va mg/kg	Zn mg/kg
Mill Creek																							
11-6	95	995	17.20	5790	4.97	42.5	0.34	6.08	0.61	12.50	7.01	26.2	14400	14.3	572	0.06	16.0	1040	0.06	322	70.1	14.2	64.5
11-5	95	995	13.80	6800	4.25	38.8	0.33	5.65	0.57	11.80	5.84	25.0	12300	17.8	321	0.08	13.2	653	0.06	402	54.9	12.3	114.0
11-4	95	995	10.10	6800	2.85	59.7	0.41	7.59	0.61	17.10	6.57	34.0	13300	22.7	476	0.07	15.4	902	0.06	964	55.8	13.9	114.0
11-3	95	995	7.20	2470	2.09	16.8	0.13	2.24	0.17	5.19	3.10	8.4	6740	8.2	334	0.03	5.6	319	0.06	315	26.9	7.3	32.5
11-2	95	995	1.71	11900	4.27	74.5	0.55	7.21	0.50	17.00	9.03	28.6	20800	17.4	918	0.08	21.5	1680	0.06	734	145.0	19.5	82.3
11-1	95	995	0.70	4630	2.41	35.3	0.27	3.69	0.22	8.70	5.54	9.9	10600	12.1	609	0.03	10.0	580	0.06	287	67.5	11.8	36.8
Suburban Country Club Tributary																							
13-10	95	710	2.00	5540	2.92	43.0	0.37	4.26	0.35	10.10	5.54	26.8	12400	15.3	432	0.03	10.8	592	0.06	440	47.0	13.1	100.0
Stoneroller Creek																							
13-9	95	709	0.42	6530	10.40	91.5	0.41	4.96	0.76	13.20	7.34	24.0	18400	17.4	1230	0.05	15.7	738	0.07	525	46.5	21.3	69.9
West Fork Belvidere Rd. Tributary																							
13-8	95	720	0.15	6750	6.24	70.5	0.44	2.97	0.53	12.10	8.88	22.5	12000	18.7	802	0.05	15.8	796	0.06	366	34.7	19.7	53.4
Bull's Brook																							
13-7	95	704	0.25	4760	6.25	51.8	0.31	7.05	0.55	9.11	7.24	15.7	18000	16.1	1180	0.04	13.0	704	0.07	206	50.3	14.0	50.9
Bull Creek																							
14-6	95	051	5.95	7610	4.14	85.3	0.43	10.20	0.44	13.70	7.88	19.6	20800	15.2	855	0.07	17.7	1320	0.06	319	49.1	17.1	46.9
14-2	95	051	1.00	6020	18.00	69.6	0.39	10.10	1.18	16.00	6.25	35.8	18200	24.7	961	0.08	13.6	745	0.06	576	157.0	19.2	126.0
14-1	95	051	0.5	4530	10.10	53.5	0.28	5.89	0.70	9.99	4.72	19.5	15100	15.3	844	0.03	10.5	616	0.06	459	65.3	13.7	67.0
West Branch Bull Creek																							
14-4	95	719	2.54	8390	5.09	57.9	0.49	5.89	0.57	14.70	7.30	26.8	18500	19.3	288	0.04	18.5	1150	0.06	504	54.1	19.8	63.3
Indian Creek																							
15-9	95	706	10.83	9570	8.52	80.4	0.56	12.40	0.70	16.60	9.76	28.6	18400	17.5	2110	0.14	20.0	1680	0.21	438	72.9	23.0	59.6
15-6	95	706	9.83	9060	22.10	99.6	0.54	13.70	1.32	16.30	9.79	32.7	20100	19.1	2950	0.06	19.6	1330	0.45	587	74.3	18.9	100.0
15-5	95	706	5.40	12100	8.81	83.4	0.67	10.40	0.82	21.70	9.91	30.5	22000	21.6	754	0.07	21.8	1630	0.06	842	58.2	24.6	98.0
15-2	95	706	2.41	8500	7.18	69.9	0.50	8.48	0.85	18.40	8.02	36.9	19100	19.8	841	0.07	17.3	1260	0.41	451	67.0	20.3	93.5
15-1	95	706	0.17	8480	7.97	73.9	0.48	9.93	0.87	17.90	8.69	36.7	18600	23.3	1120	0.06	19.1	1360	0.29	831	85.9	20.3	98.2

Site ID	Basin code	Stream Code	RM	AL mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Bo mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg	Pb mg/kg	Mn mg/kg	Hg mg/kg	Ni mg/kg	K mg/kg)	Silver mg/kg	Na mg/kg	Sr mg/kg	Va mg/kg	Zn mg/kg
Killdeer Creek																							
15-7	95	707	4.6	12900	3.77	79.8	0.72	22.60	0.67	20.50	8.15	30.1	17600	18.6	702	0.05	23.1	1950	0.06	818	120.0	23.6	77.9
15-4	95	707	0.01	6960	7.38	46.7	0.44	6.14	0.68	13.10	7.65	22.2	17800	19.0	565	0.04	16.1	1040	0.06	331	71.0	19.2	132.0
Seavey Drainage Ditch																							
15-3	95	390	3.66	1500	2.94	10.3	0.11	2.31	0.24	4.35	2.29	7.1	6960	9.3	211	0.03	5.3	216	0.06	119	30.1	6.9	28.1
15-8	95	390	0.45	5000	3.03	38.8	0.29	7.52	0.77	20.30	5.13	43.9	12000	17.5	323	0.06	12.7	867	0.92	343	60.0	13.9	99.3
Aptakisic Creek																							
18-3	95	701	4.30	8520	5.46	70.2	0.49	10.90	0.74	17.60	7.73	39.6	17400	19.4	889	0.07	18.3	1420	0.06	777	126.0	19.3	128.0
18-2	95	701	0.8	12100	6.97	83.6	0.71	9.02	0.75	20.00	10.50	31.2	20300	23.7	531	0.06	23.0	1580	0.06	665	79.1	27.1	91.9
18-1	95	701	0.50	9500	2.90	251.0	0.55	11.30	0.52	15.90	7.76	40.3	16200	17.8	441	0.04	17.3	1550	0.06	1100	257.0	18.8	135.0
Buffalo Creek																							
17-3	95	703	7.7	3160	2.17	58.6	0.21	4.53	0.47	11.20	4.04	18.4	9790	15.8	559	0.06	7.8	502	0.10	279	91.0	7.6	69.6
17-2	95	703	6.10	6440	5.55	55.6	0.38	6.19	0.54	12.90	7.51	27.1	15900	15.4	1060	0.06	16.2	983	0.10	360	77.3	16.3	65.4
17-1	95	703	0.75	5930	5.16	49.5	0.36	6.83	0.69	13.40	6.69	29.7	14300	24.3	640	0.08	15.3	888	0.06	414	83.3	14.6	95.6
Buffalo Creek Tributary																							
17-4	95	713	0.68	5100	7.75	47.5	0.36	4.02	0.60	11.10	7.61	24.0	18500	17.7	727	0.05	14.9	649	0.06	330	38.2	16.5	62.7

MacDonald et al. 2000	TEC		None	9.79	None	None	None	0.99	43.40	None	31.6	20000	35.8	460	0.18	22.7	None	1.60	None	None	None	121.0
	PEC		None	33.00	None	None	None	4.98	111.0	None	149.0	40000	128.0	1100	1.06	48.6	None	2.20	None	None	None	459.0
Ohio EPA 2008	OH SRVs		29000		190.0	0.80	None	0.79	29.00	12.00	32.0	41000	47.0	1500	0.12	33.0	6800	0.43	None		40.0	
Short 1998	IL Elevated	None		7.20	145.0	None	None	2.00	37.00	None	37.0	26100	60.0	1100	0.28	26.0	1500	None	None	None	None	170.0
	IL Highly Elevated	None		18.00	230.0	None	None	9.30	110.0	None	170.0	53000	245.0	2300	1.40	45.0	2200	5.00	None	None	None	760.0

Sediment Metals

Excessive levels of heavy metals in urban landscapes are commonly associated with runoff from roads and highways and industrial and municipal sources. Given the level of urban development in parts of the Upper Des Plaines watershed some elevated metals were expected, particularly where roads and industries are dense and downstream of some effluents and stormwater sources. Manganese was the parameter that most frequently exceeded the TEL benchmarks in 36 of 49 samples collected (Table 10). Values above PEL benchmarks occurred in the West Fork Belvidere Rd. Tributary, Stoneroller Creek, Bull's Brook, and Indian Creek (3 of 5 sites).

Other metal exceedances above the PEL or the highly elevated category of Short (1998) were scattered. There are no TEL or PEL values for barium, but there was a value at the mouth of Aptakisic Creek that was above the extremely elevated threshold of Short (1998) which is downstream of the LCPWD Des Plaines River WWTP. There were extremely elevated concentrations of arsenic at a site in Bull Creek and one in Indian Creek, but both were below the PEL benchmark of 33 µg/kg. There were scattered values above the TEL benchmarks for a few metals and more commonly in the more developed Aptakisic Creek, Mill Creek, and Indian Creek watersheds.

Sediment Organics

There were some issues with organic sediment parameter detection levels being greater than TEL benchmarks which limited the assessment of exceedances. Table 11 shows concentrations of PAH compounds in the sediment in relation to the PEL benchmarks and TEL values where these are higher than the minimum detection limits. Values greater than the PELs are color coded red and greater than the TELs and less than the PEL are color coded orange (Table 11). Values that are below the minimum detection value are grey shaded.

PAH compounds above TEL and PEL thresholds are widespread throughout the Upper Des Plaines watershed. The mainstem had three sites with multiple PAH parameters above the PEL benchmarks: four parameters above PELs, Site 13-3, RM 98.7; eight parameters above PELs, Site 16-5, RM 83.6; and six parameters above PELs, Site 16-1, RM 71.7 (Table 11). Five tributary sites also had multiple PAH parameters above PELs; Mill Creek, Site 11-6 (RM 17.2) for 7 parameters; Bull Creek, Site 14-2 (RM 1.0) for 7 parameters; Seavey Drainage Ditch, Site 15-8 (RM 0.45) for 8 parameters; Aptakisic Creek, Site 18-3 (RM 4.3) for 8 parameters; and Buffalo Creek, Site 17-1 (RM 0.75) for 8 parameters. Most of these sites also had other parameters above TELs, but less than PEL levels. Position in the watershed (e.g., headwaters vs. downstream) does not seem to be a factor in the presence of elevated PAH compounds. PAHs are associated with runoff from roads, parking lots, and other transportation related land uses as well as industrial sources. While many of the sites are in proximity to roads, parking lots, and other impervious surfaces, other sites without such values are also near these features. It will take a more detailed examination of potential sources to identify the origins of the hot spots in the results. Lower detection levels for some of the PAH parameters (e.g., acenaphthene and acenapthylene) could help to determine whether lower levels of contamination above TELs at least are more widespread in these watersheds.

Table 11. *Concentrations of organic compounds (mg/kg) in sediments at sites in the Upper Des Plaines River study area October 2016. Values above the MacDonald et al. (2000) PEL and TEL thresholds or the elevated and extremely elevated ranges of Short (1998) are shaded in accordance with the color-code key at the end of the table. Grey shaded values are below the minimum detection limits.*

Site ID	Basin code	Stream Code	RM	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
Des Plaines River																			
13-6	95	656	109.30	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
13-5	95	656	106.60	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
13-4	95	656	102.90	169	169	169	297	292	519	267	210	402	169	869	169	202	169	380	600
13-3	95	656	98.70	79	79	156	891	926	1460	797	480	1090	141	2700	90	617	79	1300	1950
13-2	95	656	96.82	61	61	61	61	61	61	61	61	61	61	65	61	61	61	61	61
13-1	95	656	94.20	86	86	86	88	116	195	112	86	157	86	282	86	89	86	86	221
16-5	95	656	83.60	133	133	199	1730	1970	3430	1720	897	2490	302	5800	133	1360	133	1820	3960
16-4	95	656	80.00	72	72	72	273	317	573	298	194	439	72	849	72	235	72	231	648
16-3	95	656	76.7	80	80	80	142	187	364	177	104	266	80	485	80	136	80	160	367
16-2	95	656	75.40	90	90	90	279	365	692	357	223	510	90	1050	90	274	90	334	723
16-1	95	656	71.7	444	71	729	3590	2790	3960	1760	1080	3080	412	10200	529	1550	71	4880	5750
Newport Drainage Ditch																			

Site ID	Basin code	Stream Code	RM	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
12-2	95	708	3.03	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135
12-1	95	708	0.70	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Slocum Corners Creek																			
13-11	95	711	1.36	120	120	120	120	120	120	120	120	120	120	155	120	120	120	120	129
North Mill Creek																			
10-3	95	996	10.20	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
10-2	95	996	8.10	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
10-1	95	996	1.10	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108
Hastings Creek																			
10-5	95	702	3.12	113	113	113	245	296	596	282	171	481	113	1040	113	230	113	379	704
10-4	95	702	1.68	105	105	105	105	105	105	105	105	105	105	151	105	105	105	105	115
Mill Creek																			
11-6	95	995	17.20	94	89	269	1840	1940	3210	1560	947	2280	299	5830	135	1290	89	2290	4130
11-5	95	995	13.80	73	73	73	155	221	405	229	151	311	73	583	73	169	73	179	438
11-4	95	995	10.10	153	153	153	280	388	731	372	247	545	153	982	153	286	153	336	760
11-3	95	995	7.20	60	60	60	162	176	316	164	95	256	60	553	60	135	60	190	393

Site ID	Basin code	Stream Code	RM	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
11-2	95	995	1.71	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159	159
11-1	95	995	0.70	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Suburban Country Club Tributary																			
13-10	95	710	2.00	64	64	64	159	174	329	167	92	230	64	495	64	140	64	159	367
Stoneroller Creek																			
13-9	95	709	0.42	102	102	102	102	109	205	102	102	154	102	276	102	102	102	126	222
West Fork Belvidere Rd. Tributary																			
13-8	95	720	0.15	61	61	61	61	61	102	61	61	72	61	109	61	61	61	61	94
Bull's Brook																			
13-7	95	704	0.25	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Bull Creek																			
14-6	95	051	5.95	120	120	120	120	120	120	120	120	120	120	120	120	235	120	120	120
14-2	95	051	1.00	172	118	370	3370	3820	6140	3600	1760	4430	581	9210	215	2800	118	3520	7270
14-1	95	051	0.5	68	68	68	309	387	650	356	223	489	68	1020	68	286	68	351	737
West Branch Bull Creek																			
14-4	95	719	2.54	72	72	72	72	72	101	72	72	72	72	117	72	72	72	72	94

Site ID	Basin code	Stream Code	RM	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
Indian Creek																			
15-9	95	706	10.83	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
15-6	95	706	9.83	108	108	108	173	187	336	152	109	276	108	478	108	130	108	220	350
15-5	95	706	5.40	139	139	139	139	139	222	139	139	160	139	246	139	139	139	139	187
15-2	95	706	2.41	97	97	97	409	689	1340	707	342	860	112	1650	97	543	97	449	1170
15-1	95	706	0.17	116	116	116	239	357	726	384	238	522	116	914	116	293	116	281	664
Killdeer Creek																			
15-7	95	707	4.6	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
15-4	95	707	0.01	72	72	72	77	78	132	76	72	103	72	252	72	72	72	139	188
Seavey Drainage Ditch																			
15-3	95	390	3.66	52	52	52	221	258	414	244	150	308	52	651	52	183	52	287	478
15-8	95	390	0.45	98	98	208	2250	2710	4640	2360	1110	3320	401	6980	134	1930	98	1940	5210
Aptakisic Creek																			
18-3	95	701	4.30	135	135	178	1570	2010	3650	1720	980	2590	311	6110	135	1390	135	2090	4050
18-2	95	701	0.8	84	84	84	84	84	156	102	84	120	84	178	84	84	84	84	133
18-1	95	701	0.50	88	88	88	567	549	760	373	270	603	88	1480	88	321	88	478	1070

Site ID	Basin code	Stream Code	RM	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
Buffalo Creek																			
17-3	95	703	7.7	63	63	63	63	63	65	63	63	63	63	99	63	63	63	63	84
17-2	95	703	6.10	93	93	93	275	340	577	281	192	446	93	865	93	225	93	344	662
17-1	95	703	0.75	89	89	121	1160	1430	2540	1270	732	1790	214	3680	89	1000	89	1200	2620
Buffalo Creek Tributary																			
17-4	95	713	0.68	76	76	82	421	498	917	517	291	700	86	1560	76	403	76	612	1140

MacDonald et al. 2000

TEL	6.7	5.87	46.9	31.7	31.9	**None**	**None**	**None**	57.1	6.22	111	77.4	**None**	34.6	41.9	53
PEL	88.9	128	245	385	782	**None**	**None**	**None**	862	135	2,355	144	**None**	391	875	875
TEC	**None**	**None**	57.2	108	150	240	170	240	166	33	423	77.4	200	176	204	195
PEC	**None**	**None**	845	1050	1450	13,400	320	13,400	1,290	135	2,230	536	3,200	561	1,170	1,520
LEL	**None**	**None**	220	320	150	**None**	170	240	340	60	750	190	200	None	560	490
SEL	**None**	**None**	3,700	14,800	14,400	**None**	3,200	13,400	4,600	1,300	10,200	1,600	3,200	None	9,500	8,500

Physical Habitat Quality for Aquatic Life - QHEI

The physical habitat of a stream or river is a primary determinant of biological quality. Streams in the glaciated Midwest, left in their natural state, typically offer pool-run-riffle sequences, high sinuosity, and well-developed channels with deep pools, heterogeneous substrates, and cover in the form of woody debris, hard substrates, and aquatic macrophytes. Lower gradient streams may not offer distinct riffle habitats and are oftentimes more run and glide dominated, but still offer a diversity of substrate materials, well developed pool habitats, and well developed instream cover features associated with trees and aquatic vegetation. The Qualitative Habitat Evaluation Index (QHEI) categorically scores the basic components of stream habitat into ranks according to the degree to which those components are found in a natural state, or conversely, in an altered or modified state. In the Upper Des Plaines River study area, QHEI scores and physical habitat attributes were recorded in conjunction with the fish collections at each site (Table 12).

Upper Des Plaines River Mainstem

Based on QHEI scores, aside from the three upstream-most sites which had fair habitat, the habitat quality in the mainstem was mostly in the very good to excellent ranges and varied only slightly by location (Figure 14 and 15, upper). Although habitat conditions were not limiting to attainment of the General aquatic life use in the mainstem, siltation and substrate embeddedness were evident throughout the mainstem and in the tributaries. The number of habitat attributes of the QHEI considered poor or good are illustrated in Figure 16. The occurrence of modified attributes in the mainstem are associated with excessive siltation and embeddedness at sites with high numbers of other good habitat attributes.

Upper Des Plaines River Tributaries

Habitat conditions in the tributaries was more variable with most subwatersheds having sites that were good and others that were fair, but only a few that were considered poor (e.g., sites in Aptakisic Creek and Hastings Creek). These Aptakisic Creek sites were the most modified and having the highest number of modified attributes (Figure 16, bottom). As with the mainstem the common modified attribute at nearly all sites was excessive levels of silt and riffle and pool embeddedness. There is a long history of stream modification and wetland filling in the upper Des Plaines watershed (Heidinger 1989) although many of channels no longer show obvious effects of being directly channelized. The low average gradient, down-cut channels and relict wetland characteristics of the landscape can contribute to excessive siltation and substrate embeddedness. There is an abundance of fine sediment in the natural supply of streambed materials and the low gradients foster conditions where deposition rather than export is more common, particularly where connections to flood prone areas have been altered.

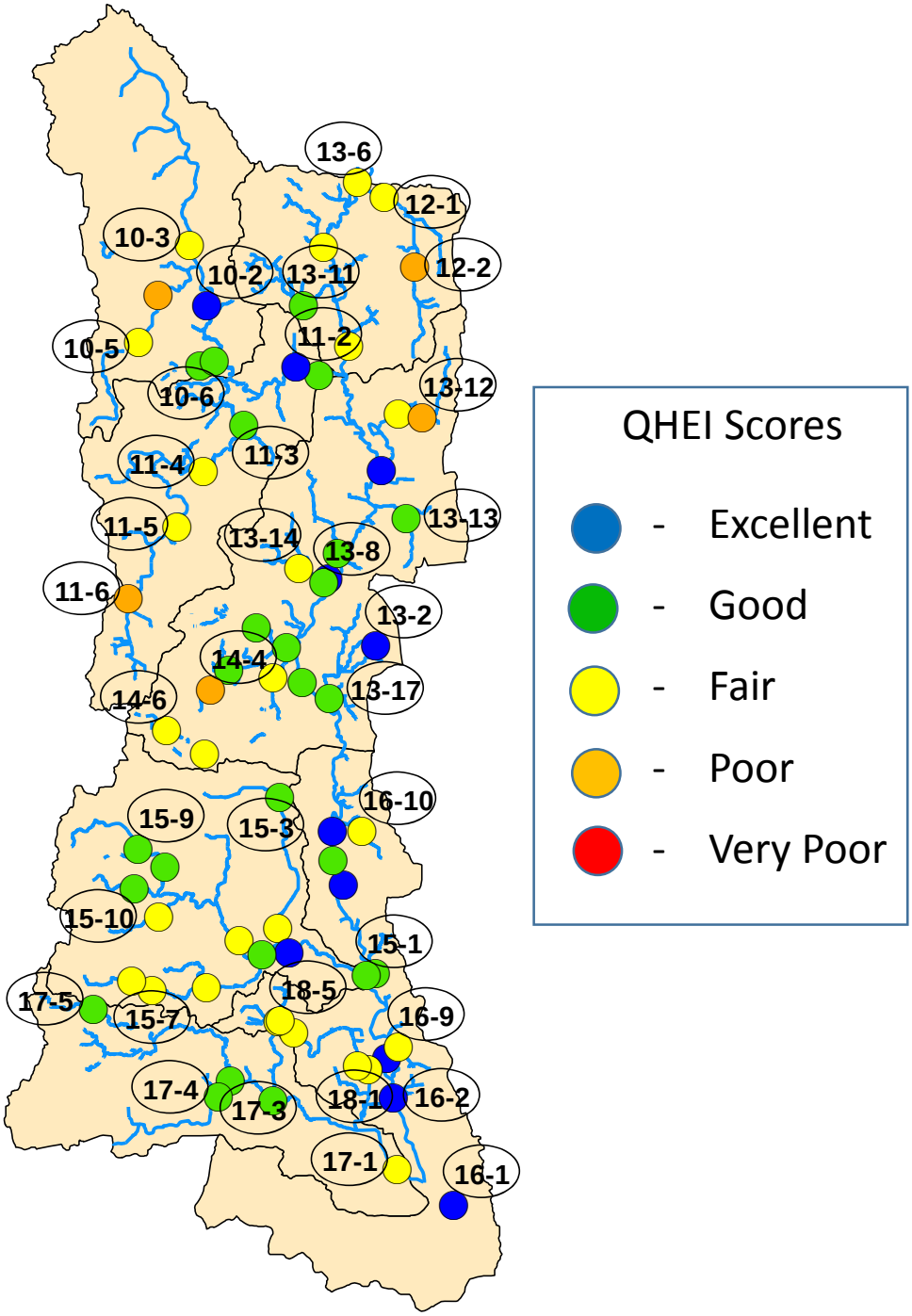

Figure 14. *Upper Des Plaines River watershed site QHEI scores in 2016 color coded in accordance with narrative ratings from excellent to very poor.*

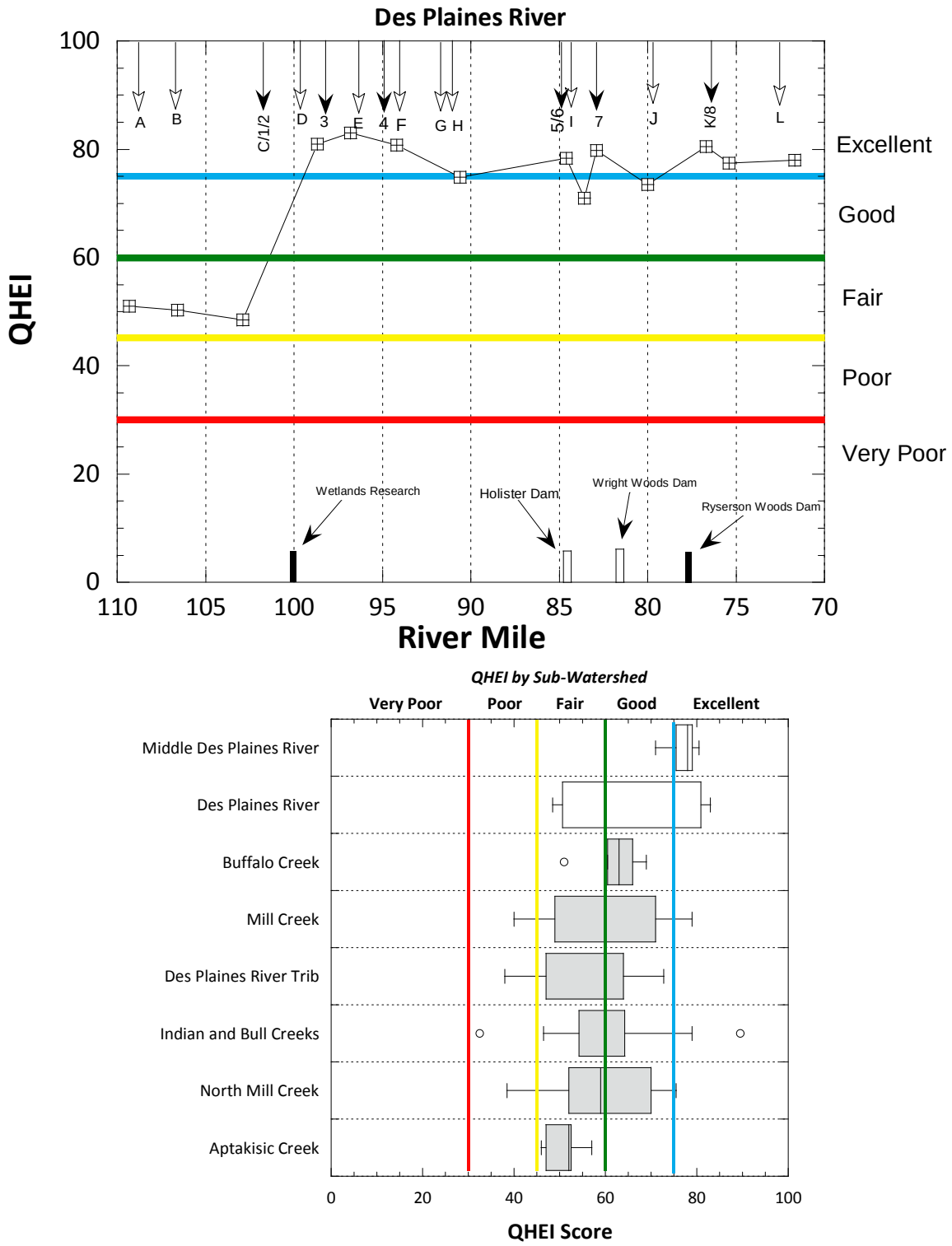

***Figure 15**. Qualitative Habitat Evaluation Index (QHEI) scores in the Upper Des Plaines River mainstem (upper panel) in 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. The narrative ranges of the QHEI scores from excellent to very poor are indicated.*

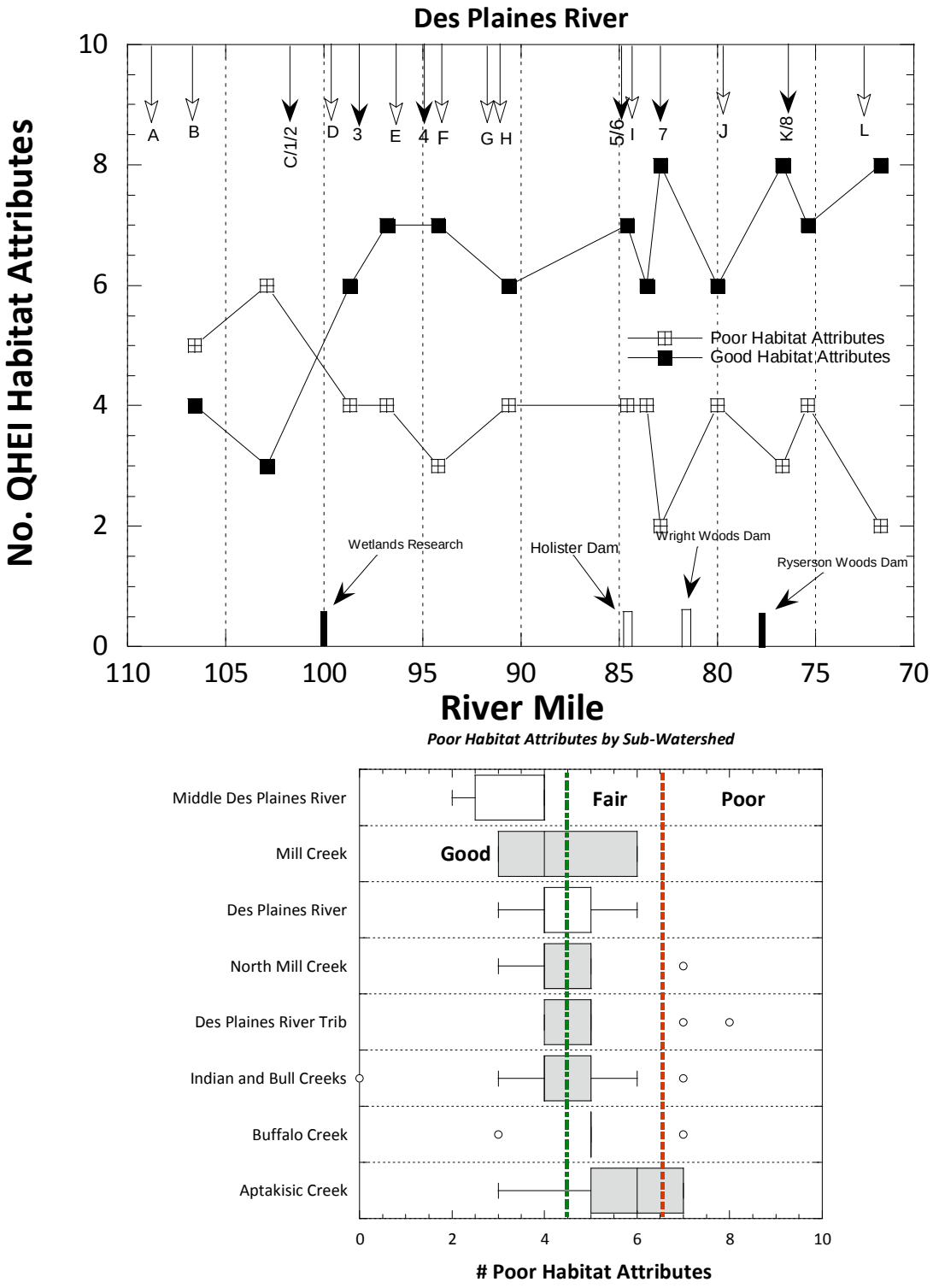

***Figure 16**. Number of good and poor QHEI attributes in the Upper Des Plaines River mainstem (upper panel) in 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel, shaded boxes). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. General narrative ranges of the number of attributes considered good to poor are indicated.*

Table 12. *Qualitative Habitat Evaluation Index (QHEI) matrix showing good and modified habitat attributes at each site in the Upper Des Plaines River study area in 2016. (■- good habitat attribute; ● - high influence modified attribute; ●- moderate influence modified attribute).*

			Good Habitat Attributes											High Influence Modified Attributes						Moderate Influence Modified Attributes													Ratios	
Site ID	River Mile	QHEI Score	No Channelization	Boulder, Cobble, Gravel	Silt Free	Good-Excellent Development	Moderate-High Sinuosity	Moderate-Extensive Cover	Fast Flow w Eddies	Little to No Embeddedness	Max Depth > 40 cm	No Riffle Embeddedness	"Good" Habitat Attributes	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse No Cover	Max Depths <40 cm	High Influence Poor Attributes	Recovering from Channelization	Mod-High Silt Cover	Sand Substrates (Boatable sites)	Hardpan Origin	Fair- Poor Development	Low Sinuosity	≤ 2 Cover Types	Intermittent Flow or Pools <20 cm	No Fast Current Types	Mod-Extensive Embeddedness	Mod-Extensive Riffle Embeddedness	No Riffle	Poor Habitat Attributes	Ration of Poor (High) to Good	Ration of Poor (All) to Good
Des Plaines River																																		
13-6	109.3	**51.0**	■				■	■			■		4		●				1		●			●				●	●		●	5	0.83	1.20
13-5	106.6	**50.3**	■				■	■			■		4		●				1		●			●				●	●		●	5	0.83	1.20
13-4	102.9	**48.5**	■					■			■		3		●				1		●			●	●			●	●		●	6	0.57	1.75
13-3	98.7	**81.0**	■			■	■	■	■		■		6						0		●	●						●	●	●		5	1.17	0.86
13-2	96.8	**83.0**	■	■		■	■	■	■		■		7						0		●	●						●	●	●		5	1.33	0.75
13-1	94.2	**80.8**	■	■		■	■	■	■		■		7						0			●						●	●	●		4	1.60	0.63
13-16	90.6	**74.8**	■	■		■	■	■			■		6						0		●	●						●	●	●		5	1.17	0.86
16-7	84.6	**78.3**	■	■		■	■	■	■		■		7						0		●	●						●	●	●		5	1.33	0.75
16-5	83.6	**71.0**	■	■		■	■	■			■		6						0		●	●						●	●	●		5	1.17	0.86
16-8	82.9	**79.8**	■	■		■	■	■	■	■	■		8						0			●						●		●		3	2.25	0.44
16-4	80.0	**73.5**	■	■		■	■	■			■		6						0		●	●						●	●	●		5	1.17	0.86
16-3	76.7	**80.5**	■	■		■	■	■	■	■	■		8						0		●	●						●		●		4	1.80	0.56
16-2	75.4	**77.5**	■	■		■	■	■	■		■		7						0		●	●						●	●	●		5	1.33	0.75
16-1	71.7	**78.0**	■	■		■	■	■	■	■	■		8						0			●						●		●		3	2.25	0.44
Aptakisic Creek																																		
18-4	4.7	**52.5**	■	■			■	■		■			5		●		●	●	3					●				●		●		3	1.50	0.67
18-3	4.3	**57.0**		■				■				■	3					●	1	●	●			●	●			●	●			6	0.57	1.75
18-2	0.8	**46.0**		■				■			■		3				●		1	●	●			●	●			●	●	●		7	0.50	2.00

Site ID	River Mile	QHEI Score	Good Habitat Attributes											High Influence Modified Attributes						Moderate Influence Modified Attributes												Ratios	
			No Channelization	Boulder, Cobble, Gravel	Silt Free	Good-Excellent Development	Moderate-High Sinuosity	Moderate-Extensive Cover	Fast Flow w Eddies	Little to No Embeddedness	Max Depth > 40 cm	No Riffle Embeddedness	"Good" Habitat Attributes	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse No Cover	Max Depths <40 cm	High Influence Poor Attributes	Recovering from Channelization	Mod-High Silt Cover	Sand Substrates (Boatable sites)	Hardpan Origin	Fair- Poor Development	Low Sinuosity	≤ 2 Cover Types	Intermittent Flow or Pools <20 cm	No Fast Current Types	Mod-Extensive Embeddedness	Mod-Extensive Riffle Embeddedness	No Riffle	Poor Habitat Attributes	Ration of Poor (High) to Good	Ration of Poor (All) to Good
18-1	0.5	**52.0**						■			■		2	●		●			2		●			●				●	●	●		5	0.50	2.00
Hastings Creek																																	
10-5	3.12	**57.0**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
10-4	1.68	**38.5**		■									1	●		●	●	●	4		●		●	●	●			●	●	●		7	0.25	4.00
Buffalo Creek																																	
17-5	14.0	**66.0**	■	■		■	■	■			■	■	7						0		●							●	●			3	2.00	0.50
17-3	7.7	**69.0**	■	■		■	■	■			■		6						0		●		●					●	●	●		5	1.17	0.86
17-2	6.1	**60.5**	■	■		■	■	■					5				●	●	2		●		●					●	●	●		5	1.00	1.00
17-1	0.75	**51.0**		■							■		2	●		●	●		3		●			●				●	●	●		5	0.50	2.00
Bull's Brook																																	
13-15	1.95	**63.3**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
13-7	0.25	**64.0**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
Forest Lake Drain																																	
15-11	0.83	**58.0**	■			■	■	■				■	5		●			●	2		●							●	●			3	1.50	0.67
Indian Creek																																	
15-9	10.83	**62.3**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
15-6	9.83	**65.5**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
15-5	5.4	**59.8**	■	■			■	■			■		5		●		●		2		●			●				●	●	●		5	1.00	1.00
15-2	2.41	**79.0**	■	■		■	■	■			■	■	7						0		●							●	●			3	2.00	0.50
15-1	0.17	**64.5**		■				■			■		3	●					1	●	●			●	●			●	●	●		7	0.50	2.00
Killdeer Creek																																	
15-12	5.2	**46.5**	■			■	■	■					4		●			●	2		●			●				●	●	●		5	0.83	1.20
15-7	4.6	**53.5**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
15-13	2.21	**58.0**	■	■		■	■	■			■		6						0		●							●	●	●		4	1.40	0.71

Site ID	River Mile	QHEI Score	Good Habitat Attributes											High Influence Modified Attributes						Moderate Influence Modified Attributes												Ratios	
			No Channelization	Boulder, Cobble, Gravel	Silt Free	Good-Excellent Development	Moderate-High Sinuosity	Moderate-Extensive Cover	Fast Flow w Eddies	Little to No Embeddedness	Max Depth > 40 cm	No Riffle Embeddedness	"Good" Habitat Attributes	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse No Cover	Max Depths <40 cm	High Influence Poor Attributes	Recovering from Channelization	Mod-High Silt Cover	Sand Substrates (Boatable sites)	Hardpan Origin	Fair- Poor Development	Low Sinuosity	≤ 2 Cover Types	Intermittent Flow or Pools <20 cm	No Fast Current Types	Mod-Extensive Embeddedness	Mod-Extensive Riffle Embeddedness	No Riffle	Poor Habitat Attributes	Ration of Poor (High) to Good	Ration of Poor (All) to Good
15-4	0.17	**61.0**	■	■		■	■	■			■		6						0		●			●				●	●	●		5	1.17	0.86
Seavey Drainage Ditch																																	
15-3	3.66	**65.5**	■	■		■	■	■		■	■		7				●		1		●		●		●			●	●	●		6	1.14	0.88
15-8	0.45	**54.0**		■			■	■					3					●	1	●	●			●				●	●	●		6	0.57	1.75
Newport Drainage Ditch																																	
12-2	3.03	**38.0**					■	■			■		3		●				1	●	●			●	●			●	●		●	7	0.50	2.00
12-1	0.7	**47.0**	■	■			■	■			■		5						0		●			●				●	●	●		5	1.00	1.00
Stoneroller Creek																																	
13-9	0.42	**72.8**	■	■		■	■	■			■		6						0		●							●	●	●		4	1.40	0.71
Suburban Country Club Tributary																																	
13-12	2.75	**41.5**						■			■		2		●				1	●	●			●	●			●	●		●	7	0.38	2.67
13-10	2.0	**47.0**		■							■		2				●		1	●	●		●	●	●			●	●		●	8	0.33	3.00
Slocum Corners Creek																																	
13-11	1.36	**61.5**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
Unnamed Tributary to Aptakisic Creek																																	
18-5	0.05	**47.0**						■					1		●			●	2	●	●			●	●			●	●	●		7	0.25	4.00
Unnamed Tributary to Buffalo Creek @ RM XX.X																																	
17-4	0.68	**63.0**	■	■		■		■			■		5						0		●		●	●	●			●	●	●		7	0.75	1.33
Unnamed Tributary to Des Plaines River																																	
13-17	0.13	**62.0**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
Unnamed Tributary to N. Mill Creek																																	
10-6	0.04	**61.0**	■	■		■	■	■					5				●	●	2		●							●	●	●		4	1.20	0.83
Unnamed Tributary-Greenleaf Creek																																	
13-13	0.4	**68.5**	■	■		■	■	■					5					●	1		●		●					●	●	●		5	1.00	1.00

Site ID	River Mile	QHEI Score	Good Habitat Attributes											High Influence Modified Attributes						Moderate Influence Modified Attributes													Ratios	
			No Channelization	Boulder, Cobble, Gravel	Silt Free	Good-Excellent Development	Moderate-High Sinuosity	Moderate-Extensive Cover	Fast Flow w Eddies	Little to No Embeddedness	Max Depth > 40 cm	No Riffle Embeddedness	"Good" Habitat Attributes	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse No Cover	Max Depths <40 cm	High Influence Poor Attributes	Recovering from Channelization	Mod-High Silt Cover	Sand Substrates (Boatable sites)	Hardpan Origin	Fair- Poor Development	Low Sinuosity	≤ 2 Cover Types	Intermittent Flow or Pools <20 cm	No Fast Current Types	Mod-Extensive Embeddedness	Mod-Extensive Riffle Embeddedness	No Riffle	Poor Habitat Attributes	Ration of Poor (High) to Good	Ration of Poor (All) to Good
W. Branch Indian Creek																																	
15-10	0.8	**63.0**	■	■		■	■	■	■				6					●	1		●							●	●	●		4	1.40	0.71
Tributary to Werhane Lake Drain																																	
16-10	0.1	**49.5**	■	■			■	■					4					●	1		●			●				●	●	●		5	0.83	1.20
Bull Creek																																	
14-6	5.95	**54.5**	■			■	■	■					4		●			●	2		●							●	●	●		4	1.00	1.00
14-5	4.7	**52.0**	■				■	■			■		4		●				1		●			●				●	●	●		5	0.83	1.20
14-2	1	**57.5**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
14-1	0.5	**89.5**	■	■		■	■	■	■	■	■	■	9						0													0	10.0	0.10
West Branch Bull Creek																																	
14-4	2.54	**32.5**						■					1	●	●	●		●	4		●			●				●	●	●		5	0.33	3.00
14-3	1.6	**64.0**	■	■		■	■	■					5					●	1		●							●	●	●		4	1.20	0.83
West Fork Belvidere Rd. Tributary																																	
13-14	0.21	**57.5**	■	■		■	■	■					5					●	1	●	●							●	●	●		5	1.00	100.
13-8	0.15	**69.5**	■	■		■	■	■			■		6						0		●							●	●	●		4	1.40	0.71
Unnamed Tributary to Des Plaines River																																	
16-9	0.4	**59.0**	■	■			■	■					4				●	●	2		●			●				●	●	●		5	0.83	1.20
Mill Creek																																	
11-6	17.2	**40.0**	■					■			■		3		●		●		2		●			●	●			●	●	●		6	0.57	1.75
11-5	13.8	**49.0**	■				■	■			■		4		●				1		●			●	●			●	●		●	6	0.71	1.40
11-4	10.1	**57.0**	■	■			■	■					4					●	1		●			●				●	●	●		5	0.83	1.20
11-3	7.2	**63.0**	■	■		■	■	■	■		■		7						0		●								●	●		3	2.00	0.50
11-2	1.71	**79.0**	■	■		■	■	■	■		■		7						0		●								●	●		3	2.00	0.50
11-1	0.7	**71.0**	■	■		■	■	■	■		■		7						0		●								●	●		3	2.00	0.50

Site ID	River Mile	QHEI Score	Good Habitat Attributes											High Influence Modified Attributes						Moderate Influence Modified Attributes													Ratios	
			No Channelization	Boulder, Cobble, Gravel	Silt Free	Good-Excellent Development	Moderate-High Sinuosity	Moderate-Extensive Cover	Fast Flow w Eddies	Little to No Embeddedness	Max Depth > 40 cm	No Riffle Embeddedness	"Good" Habitat Attributes	Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse No Cover	Max Depths <40 cm	High Influence Poor Attributes	Recovering from Channelization	Mod-High Silt Cover	Sand Substrates (Boatable sites)	Hardpan Origin	Fair- Poor Development	Low Sinuosity	≤ 2 Cover Types	Intermittent Flow or Pools <20 cm	No Fast Current Types	Mod-Extensive Embeddedness	Mod-Extensive Riffle Embeddedness	No Riffle	Poor Habitat Attributes	Ration of Poor (High) to Good	Ration of Poor (All) to Good
North Mill Creek																																	
10-3	10.2	**52.0**	■				■	■			■		4		●				1		●			●				●	●	●		5	0.83	1.20
10-2	8.1	**75.5**	■	■		■	■	■	■		■		7						0		●								●	●		3	2.00	0.50
10-1	1.1	**70.0**	■	■			■	■	■		■		6						0		●			●					●	●		4	1.40	0.71

Biological Assemblages – Macroinvertebrates

Two hundred unique macroinvertebrate taxa were collected in Upper Des Plaines River study area in 2016. In the mainstem this included 103 taxa with the fifteen most abundant taxa listed in Table 13. The predominant taxa collected were primary facultative or tolerant and most are characteristic of lentic type habitats and are tolerant of the moderate to heavy siltation that is prevalent throughout the study area. The one moderately intolerant taxa is *Tricorythodes sp.* (a mayfly), which is more tolerant of fine substrates than other intolerant mayfly species. Its comparative tolerance to siltation is illustrated by graphs of three mayfly taxa reflecting their sensitivity to the QHEI substrate score (Figure 17). *Isonychia sp.* is very sensitive to siltation and it shows a sharp linear decline with declining substrate condition (Figure 17, upper). *Tricorythodes sp.,* even though it is associated with larger substrates, shows little response to initial siltation until larger materials decline with lower substrate scores (Figure 17, lower). The chironomid *Polypedilum (P.) illinoense* is a highly tolerant taxon to toxics that also increases in its probability of collection as overall substrate quality declines. The prevalence of silt tolerant taxa is a key line of evidence in assigning siltation as a cause contributing to aquatic life impairment in the Upper Des Plaines River watershed.

Table 13. *The fifteen most abundant macroinvertebrate taxa collected in the Upper Des Plaines River in 2016 including number collected, taxa group, functional group, and taxa tolerance assignments.*

Taxa Code	Taxa Name	Number Collected	Taxa Group	IL Functional Group	IL Tolerance Score
06201	*Hyalella azteca*	808	N	CG	5
06800	*Gammarus sp.*	612	N	CG	3
22001	*Coenagrionidae*	380	O	PR	5.5
16700	*Tricorythodes sp.*	278	MA	CG	5
52200	*Cheumatopsyche sp.*	228	CA	CF	6
17200	*Caenis sp.*	176	MA	CG	6
11130	*Baetis intercalaris*	162	MA	CG	4
83040	*Dicrotendipes neomodestus*	124	D	CG	6
97601	*Corbicula fluminea*	108	N	CF	4
01801	*Turbellaria*	103	N	PR	6
03600	*Oligochaeta*	100	N	CG	10
85625	*Rheotanytarsus sp.*	85	T	CF	6
84470	*Polypedilum (P.) illinoense*	83	D	SH	6
78200	*Larsia sp.*	80	D	PR	6
69400	*Stenelmis sp.*	78	CO	SC	7

Taxa Group: N – Non-Insect; MA – Mayfly; O – Odonata; CA – Caddisfly; D – Dipteran; - T - Tribe Tanytarsini; CO - Coleoptera
IL Functional Group: CG – Collector/Gatherer; PR – Predator; CF – Collectors/Filterers; SH – Shredder; SC – Scraper
IL Tolerance Score Ranges from 0 (Least Tolerant) to 10 (Most Tolerant).

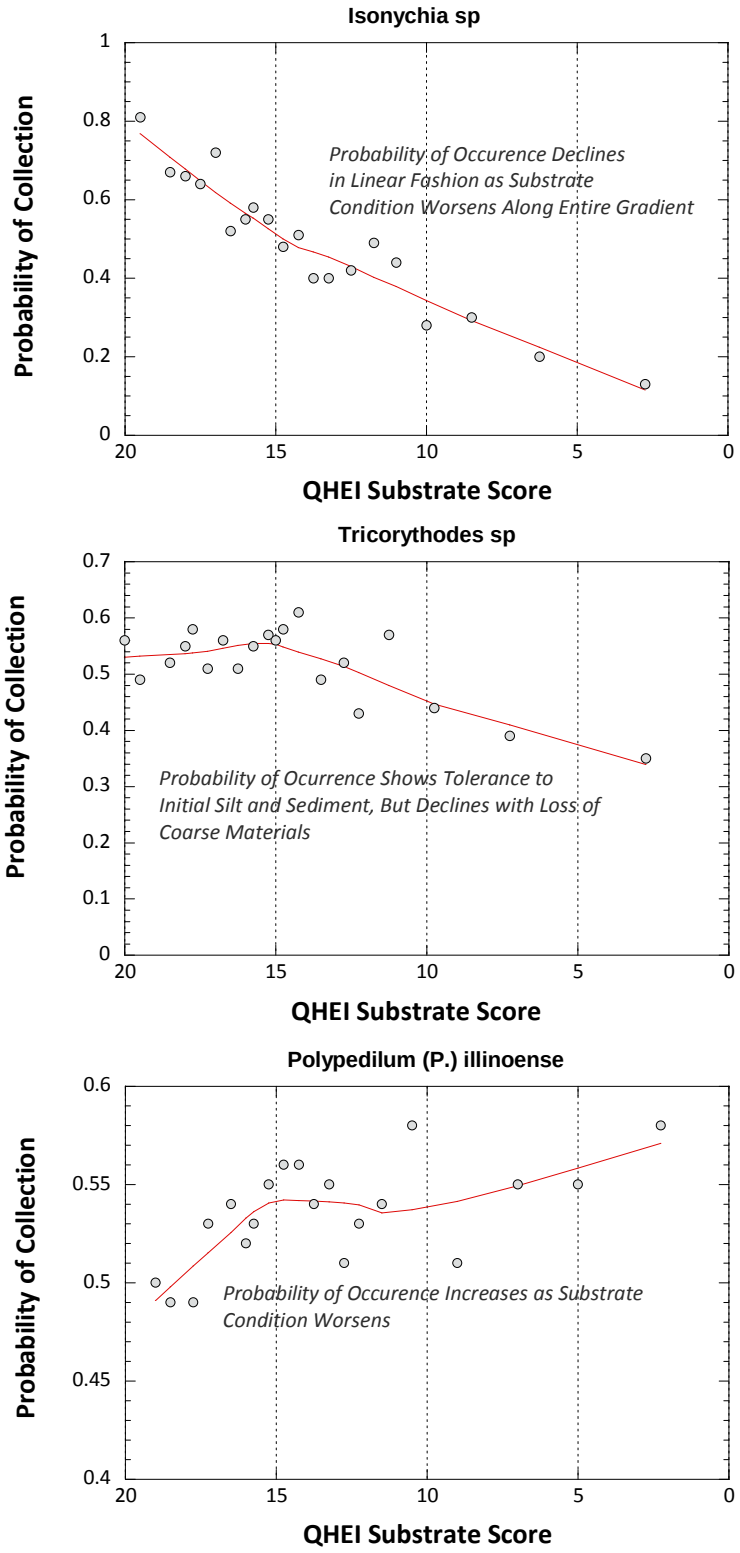

Figure 17*. Plots of the probability of collection in samples vs. QHEI substrate scores for a silt intolerant taxa, Isonychia sp. (upper), a sensitive mayfly that is tolerant to some siltation, Tricorhodes sp. (middle) and a silt tolerant taxa, Polypedilum (P.) illinoense (lower) in Ohio streams. Curves represent a locally weighted least squared error method.*

Upper Des Plaines River Mainstem

Macroinvertebrate assemblage quality in the 2016 Des Plaines River watershed survey ranged from poor to good condition (Table 14). Unlike the fish assemblage where no sites met the fIBI General Use biocriterion, 34 of 69 sites met the mIBI biocriterion of 41.8. In the Upper Des Plaines River mainstem the three upstream most sites were impaired, but unlike the fish assemblage the remainder of mainstem sites met the mIBI biocriterion (Figure 18, upper). Table 14 lists a number of assemblage attributes two of which are key biological response signatures associated with toxic impacts (% toxic tolerant taxa) or organic enrichment (% organic enrichment tolerant taxa; Yoder and DeShon 2003). Although there was considerable site-to-site variation in the degree of organic enrichment, most results were below the response signature threshold of 35%.

For macroinvertebrates there was a definite trend of better assemblage condition and higher mIBI scores as watershed size increased (Figure 18, lower). Figure 19 shows the mIBI score distribution among ranked geometric drainage area panels (1, 2, 4, 8, 16, 32 sq. mi., etc.,) with the median and upper percentile mIBI scores generally increasing with watershed size.

Upper Des Plaines River Tributaries

As mentioned above macroinvertebrate impairments in the tributaries varied by stream size and by subwatershed. In Buffalo Creek, 3 of 4 sites were in good condition with the exception being the upstream site that was in fair condition as was the unnamed tributary to Buffalo Creek (Site 17-4). The upstream site on Buffalo Creek also exceeded the organic enrichment response signature of 35%.

Macroinvertebrate assemblage condition in Bull Creek varied between poor and good quality with the better sites associated with larger drainage areas in Bull Creek and the West Fork of Bull Creek. The sites with poor mIBIs had response signatures associated with organic enrichment and low D.O. The sites in the lower reaches of Bull Creek and the West Fork of Bull Creek had the only mIBI scores that exceeded 60 in the 2016 survey.

Indian Creek is one of the larger subwatersheds and sites in the lower sites in Indian Creek and Killdeer Creek had good macroinvertebrate assemblages while upstream sites were in fair condition as were the smaller tributaries the West Fork of Indian Creek, Seavey Drainage Ditch and Forest Lake Drain.

Aptakisic Creek is one of the smaller subwatersheds, but is also one of the most developed. The three lower sites on Aptakisic Creek had fair mIBI scores and the upper most site was in poor condition. The lower most site is downstream of the LCPWD Des Plaines River WWTP and had no EPT taxa and is the only site where a toxic biological response was observed (47.8%). The mIBI also declined downstream from the effluent discharge (as did the fIBI). An unnamed tributary to Aptakisic Creek (Site 18-5) had a fair mIBI and an organic enrichment biological response signature with 38.1% organic tolerant taxa.

Table 14. *Selected fish and macroinvertebrate assemblage attributes for sites sampled in the Upper Des Plaines watershed study area in 2016. Biological index scores are shaded by level of use support: green – fully supporting; yellow – non-support fair; red – non-support poor.*

			Fish Assemblage							Macroinvertebrate Assemblage								
DRWW Site ID	River Mile	Drain-age Area (mi^2.)	fIBI	MIwb	Native Sp.	%DELT Anom-alies	Intol. Sp.	%Mineral Spawners	%Toler-ant	mIBI	Total Taxa	Intol. Taxa	%Toler-ants	EPT Taxa	% EPTs	MBI	%Toxic Toler-ant	% Org. Enrich. Taxa
Des Plaines River																		
13-6	109.30	123.67	**22**	5.86	11	0	1	3.45	36.36	**21.92**	16	0	0.794	2	3.17	5.3	0	0.6
13-5	106.60	137.29	**24**	7.65	11	0	1	2.74	18.18	**29.53**	20	1	1.379	4	11.03	5.3	0.7	16.2
13-4	102.90	145.55	**23**	7.78	12	0	1	6.67	41.67	**35.3**	17	1	0.794	3	49.21	5.4	0	2.9
13-3	98.70	220.29	**33**	9.74	23	0.2	2	9.49	26.09	**57.86**	34	3	7.958	7	22.82	5.4	3	4.8
13-2	96.82	225.36	**31**	9.15	19	0.21	2	11.78	26.32	**49.39**	34	4	6.571	4	4.49	5.7	9	8.3
13-1	94.20	232.03	**32**	9.41	20	0.37	1	15.38	30	**42.19**	25	2	5.786	7	8.01	4.7	0.3	11.9
13-16	90.60	253.75	**28**	6.91	12	0	1	55.88	41.67	**44.77**	23	5	10.093	5	16.15	5.1	5.9	5.3
16-7	84.60	266.48	**35**	9.25	24	0	3	9.97	25	**51.61**	32	5	2.824	8	7.31	4.8	4.7	11
16-5	83.60	268.07	**19**	7.13	11	2.56	0	15.38	36.36	**54.92**	31.5	4	4.57	6.5	29.45	4.9	0.8	11.1
16-8	82.90	268.9	**33**	9.12	22	0.6	2	14.33	27.27	**49.75**	36	5	9.627	8	8.7	5.7	0.6	19.3
16-4	80.00	273.21	**34**	8.64	18	0.36	2	15.11	27.78	**58.79**	28	6	2.027	9	47.3	5	0	6.8
16-3	76.70	314.68	**18.5**	4.87	10	0.58	1	5.06	13.16	**57.42**	32	5	2.93	11	26.95	3.4	0	4.7
16-2	75.40	323.96	**36**	8.78	22	0.83	3	19.05	27.27	**45.37**	21	3	1.104	5	38.17	4.4	0.3	15.1
16-1	71.70	358.68	**38**	8.53	20	0	3	43.68	30	**53.15**	28	6	2.694	7	38.05	5.1	0.3	16.2
Bull Creek																		
14-6	5.95	2.42	**12**	na	1	0	0	0	0	**22.09**	12	0	19.544	0	0	6.4	0	10.7
14-5	4.70	1.32	**25**	na	4	0	0	0	50	**17.45**	24	1	22.484	0	0	7.4	5	60.1
14-2	1.00	8.44	**28**	na	8	0	0	31.51	37.5	**35.31**	18	2	6.832	1	0.31	5.9	0.3	14.9
14-1	0.50	11.69	**36**	na	21	0	2	20.61	28.57	**62.89**	39	4	9.241	5	5.94	5.8	1	14.2
Seavey Drainage Ditch																		
15-3	3.66	5.05	**15**	na	5	0	0	0	40	**25.99**	24	1	16.667	1	0.65	6.5	0.3	40.5
15-8	0.45	9.77	**24**	na	12	0	1	0.73	50	**25.74**	23	1	21.838	0.5	0.17	7.3	0	50.5
Aptakisic Creek																		
18-4	4.70	1.09	**27**	na	5	0	0	0	60	**18.46**	13	0	12.541	0	0	6.1	0	16.6
18-3	4.30	2.3	**17**	na	7	1.49	0	0	71.43	**25.61**	23	1	8.766	0	0	6	8.1	19.8
18-2	0.80	4.94	**26**	na	18	0.49	1	0.74	33.33	**30.74**	27	2	13.934	3	6.23	6.3	7.9	19.3
18-1	0.50	5.5	**24**	na	12	1.14	1	1.71	33.33	**22.97**	22	2	14.047	0	0	6.9	47.8	33.8

DRWW Site ID	River Mile	Drain-age Area (mi^2.)	Fish Assemblage							Macroinvertebrate Assemblage								
			fIBI	MIwb	Native Sp.	%DELT Anom-alies	Intol. Sp.	%Mineral Spawners	%Toler-ant	mIBI	Total Taxa	Intol. Taxa	%Toler-ants	EPT Taxa	% EPTs	MBI	%Toxic Toler-ant	% Org. Enrich. Taxa
Hastings Creek																		
10-5	3.12	3.91	**13**	na	3	0	0	0	33.33	**31.57**	17	1	40.669	1	0.35	8.4	0	69
10-4	1.68	6.8	**11**	na	3	3.13	0	0	66.67	**17.45**	9	3	13.11	0	0	6.8	0	89.6
Buffalo Creek																		
17-5	14.00	1.37	**25**	na	6	1.29	0	0	50	**24.59**	18	1	10.552	0	0	6.4	0.6	49.7
17-3	7.70	9.61	**12**	na	7	0	0	0	57.14	**48.13**	26	1	15.125	4	17.08	6	2.5	9.6
17-2	6.10	22.1	**21**	6.86	11	1.14	0	8.52	45.45	**50.45**	28	5	12.458	5	3.37	5.8	1	16.2
17-1	0.75	29.14	**25**	6.15	15	5.39	1	2.7	40	**42.59**	33	3	11.658	4.5	3.31	6.1	1.9	36.7
Bull's Brook																		
13-15	1.95	1.92	**15**	na	4	0	0	4.78	50	**32.43**	29	3	17.655	3	7.34	6.4	0.3	11.6
13-7	0.25	2.69	**26**	na	9	0	1	4.17	33.33	**39.9**	17.5	3	2.429	4	3.9	3.7	0.2	2.8
Forest Lake Drain																		
15-11	0.83	1.7	**16**	na	2	0	0	0	50	**28.48**	17	1	6.27	2	1.25	5.7	0.3	13.2
Indian Creek																		
15-9	10.83	2.68	**18**	na	5	0	0	0	40	**20.88**	13	2	28.457	0	0	7.6	0	54.3
15-6	9.83	3.7	**21**	na	6	0	0	5.15	50	**23.69**	22	2	4.455	1	1.65	5.9	0.7	8.3
15-5	5.40	17.26	**27**	na	15	0.53	0	4.74	40	**37.66**	24	3	7.522	1	1.77	5.5	0.3	10.3
15-2	2.41	35.02	**35**	6.66	14	0.66	1	24.45	35.71	**58.53**	36	4	13.245	5	3.64	6.1	0.7	18.5
15-1	0.17	36.43	**22**	4.9	11	0.43	1	13.62	36.36	**57.27**	35.5	4	19.596	5	10.61	6.3	0.8	17.6
Killdeer Creek																		
15-12	5.20	2.08	**20**	na	10	0.17	0	0	60	**37.02**	29	2	11.92	3	0.93	6.4	1.2	43.7
15-7	4.60	2.86	**17**	na	11	2.83	0	0	72.73	**32.37**	20	1	2.196	3	10.14	5.3	0	4.1
15-13	2.21	5.01	**20**	na	12	0.57	0	0	58.33	**56.09**	33	3	18.38	6	38.01	6.3	1.9	11.5
15-4	0.17	6.8	**23**	na	11	1.33	0	1.33	54.55	**42.03**	35	1	13.776	3	6.46	6	1.4	9.5
Newport Drainage Ditch																		
12-2	3.03	2.81	**21**	na	8	0	0	0	25	**33.69**	23	0	30.104	2	2.42	7.6	2.1	45
12-1	0.70	7.35	**29**	na	15	0	0	0.49	33.33	**46.47**	32	4	10.285	3	2.53	5.7	1.3	15.5
Stoneroller Creek																		
13-9	0.42	4.08								**57.94**	37	3	20.758	7	10.6	6.2	1.3	20.3
Suburban Country Club Tributary																		
13-12	2.75	2.37	**15**	na	3	0	0	0	0	**31.63**	15	0	26.724	1	9.66	7	0	25.2

DRWW Site ID	River Mile	Drain-age Area (mi^2.)	Fish Assemblage							Macroinvertebrate Assemblage								
			fIBI	MIwb	Native Sp.	%DELT Anom-alies	Intol. Sp.	%Mineral Spawners	%Toler-ant	mIBI	Total Taxa	Intol. Taxa	%Toler-ants	EPT Taxa	% EPTs	MBI	%Toxic Toler-ant	% Org. Enrich. Taxa
13-10	2.00	4.02	22	na	8	0	0	0	12.5	19.17	14	0	21.028	2	0.93	7.2	0.6	48.6
Slocum Corners Creek																		
13-11	1.36	2.39	24	na	10	0	0	3.47	50	41.43	29	3	18.889	4	3.17	6.2	0.6	28.6
Unnamed Tributary to Aptakisic Creek																		
18-5	0.05	0.99	27	na	5	0	0	0	60	21.7	10.5	0.5	7.606	0	0	6.1	0	38.1
Unnamed Tributary to Buffalo Creek @ RM XX.X																		
17-4	0.68	8.55	12	na	7	0.87	0	0	57.14	27.01	11.5	1	7.997	1	1.01	6.6	3.7	34.7
Unnamed Tributary to Des Plaines River																		
13-17	0.13	0.86	18	na	1	0	0	0	0	22.92	12	0	16.382	1	0.68	6.5	0	31.1
Unnamed Tributary to N. Mill Creek																		
10-6	0.04	0.99	12	na	1	0	0	0	100	26.8	22	2	2.404	5	4.81	4.4	0.3	8.3
Unnamed Tributary to Greenleaf Creek																		
13-13	0.40	1.06	28	na	6	1.52	0	0	66.67	20.3	12	2	4.723	1	0.33	5.9	0.3	24.1
W. Branch Indian Creek																		
15-10	0.80	2.22	13	na	2	0	0	0	0	25.93	18	2	3.909	1	0.65	5.6	0.3	47.9
Unnamed Tributary to Werhane Lake Drain																		
16-10	0.10	0.22	22	na	2	0	0	0	50									
West Branch Bull Creek																		
14-4	2.54	5.1	16	na	10	0	0	0.92	50	18.73	24	1	40.122	3	3.04	8.8	2.1	70.5
14-3	1.60	7.05	26	na	9	0	0	37.08	44.44	64.18	30	3	17.445	8	8.72	5.5	0.6	17.1
West Fork Belvidere Rd. Tributary																		
13-14	0.21	2.3	15	na	7	0	0	0	71.43	28.33	13	1	13.743	0	0	6.2	0	34.5
13-8	0.15	3.75	31	na	13	0.81	1	4.88	30.77	48.93	26	2	24.843	2	1.26	6	0.9	12.6
Unnamed Tributary to Des Plaines River																		
16-9	0.40	1.19	35	na	8	0	0	0	37.5	41.43	35	4	15.556	4	2.54	5.9	0.6	21
Werhane Lake Drain																		
16-10B	0.80	0.22								43.43	26	2.5	8.417	1	0.33	5.5	0	15
Mill Creek																		
11-6	17.20	4.51	21	na	6	0	0	0	33.33	32.49	18	3	3.268	1	0.65	4.7	0	4.2
11-5	13.80	10.43	20	na	15	0.16	0	0	40	30.78	29	1	20.662	4	4.1	7	1.3	32.2
11-4	10.10	18.33	22	na	9	0	0	0	33.33	36.56	20	2	3.934	3	13.11	5.1	0	5.9

DRWW Site ID	River Mile	Drain-age Area (mi^2.)	Fish Assemblage							Macroinvertebrate Assemblage								
			fIBI	MIwb	Native Sp.	%DELT Anom-alies	Intol. Sp.	%Mineral Spawners	%Toler-ant	mIBI	Total Taxa	Intol. Taxa	%Toler-ants	EPT Taxa	% EPTs	MBI	%Toxic Toler-ant	% Org. Enrich. Taxa
11-3	7.20	21.36	**14**	4.56	8	1.74	1	2.61	50	**48.34**	25	4	9.937	2	18.61	4.5	0.3	8.8
11-2	1.71	62.25	**32**	9.31	25	0.69	2	4.14	24	**25.78**	18	1	17.193	4	3.51	7.1	0.4	60.7
11-1	0.70	63.78	**31**	7.92	18	0	1	5.84	27.78	**50.72**	37	4	12.748	6	6.62	6.2	3	46.4
North Mill Creek																		
10-3	10.20	20.79	**14**	7.28	9	0.23	0	0	44.44	**33.09**	24.5	0	13.604	3.5	11.73	6.5	0.9	22.7
10-2	8.10	29.38	**13**	3.79	10	1.19	0	0	70	**31.63**	29	0	32.862	4	3.14	8.2	1.6	65.4
10-1	1.10	31.97	**22**	5.34	13	2.52	2	2.52	46.15	**55.28**	33	3	16.555	4	16.72	6.1	6	16.7

Screening criteria for MIwb, Boatable Sites: Very Poor <5; Poor 5.0 - 6.3; Fair 6.4 – 8.3 [E. Corn Belt Plains ecoregion];
Screening criteria for MIwb, Wadeable Sites: Very Poor < 4.5; Poor 4.5 - 5.8; Fair 5.9 – 8.6 [E. Corn Belt Plains ecoregion].

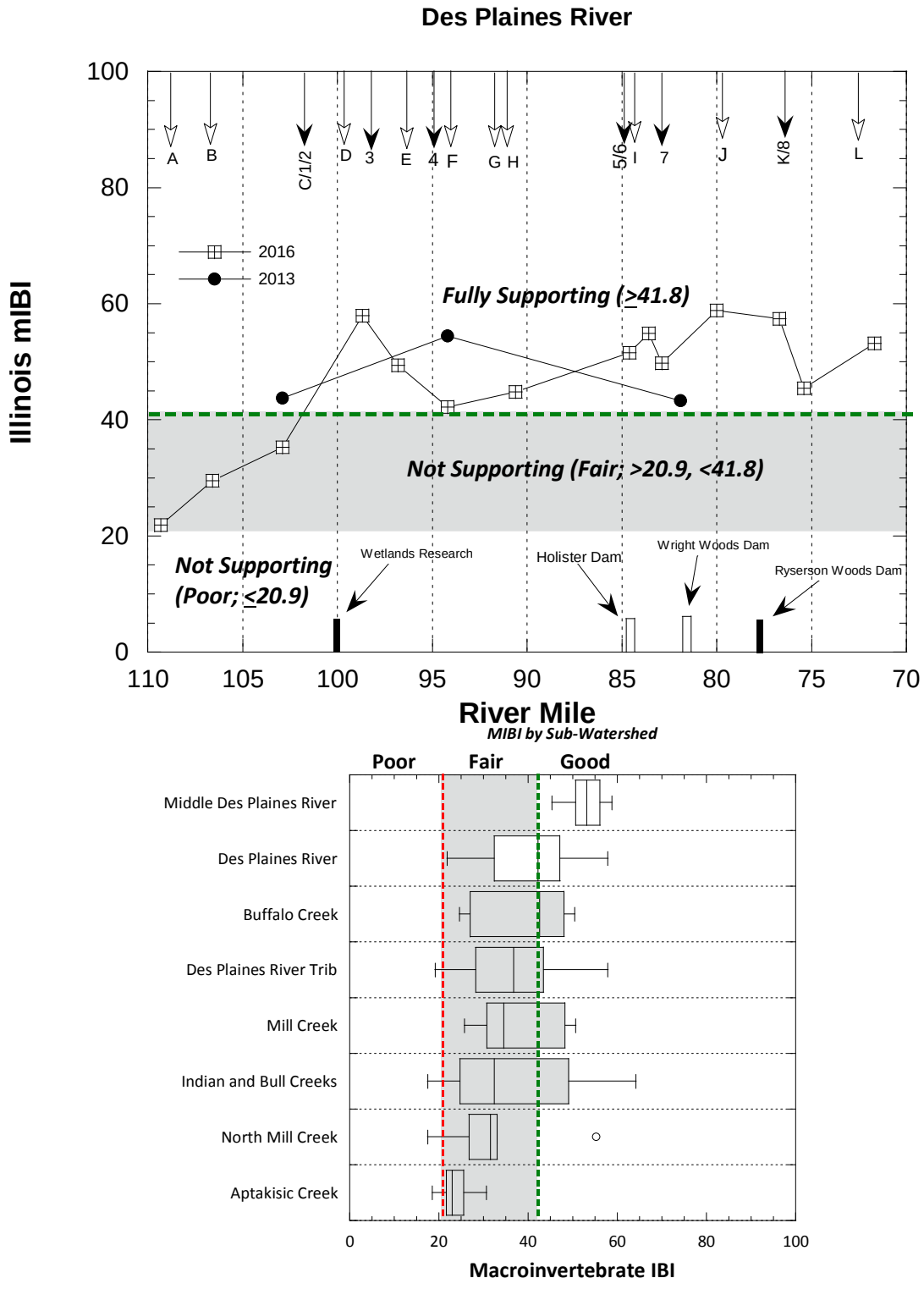

***Figure 18**. Illinois macroinvertebrate IBI scores for samples in the Upper Des Plaines River mainstem (upper panel) in 2013 and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. Thresholds for full and non-support fair and non-support-poor are indicated.*

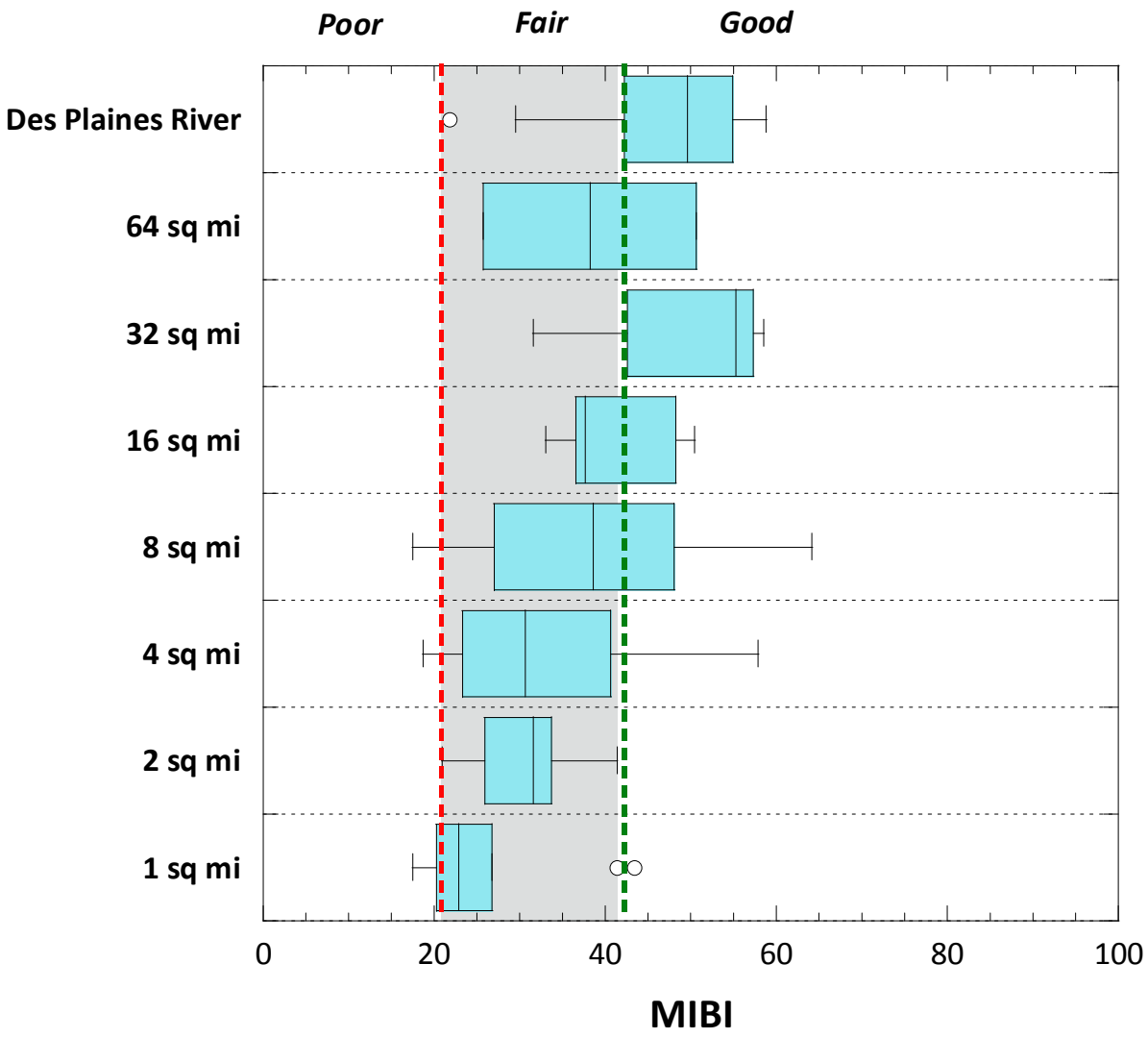

***Figure 19**. Box and whisker plot of macroinvertebrate IBI scores for the Upper Des Plaines River mainstem and subwatersheds arranged by drainage size panels for samples collected in the 2016. The gray shaded area on the plot demarcate the non-support fair range from full support and non-support-poor.*

The North Mill Creek subwatershed is in upper part of the Upper Des Plaines watershed. Although it has more agricultural and less developed land uses overall, the subwatershed surrounding Hastings Creek is more urban (29%) than other parts of the North Mill Creek watershed consistent with the trend of conversion of agricultural land and open space to developed land uses. North Mill Creek had a good mIBI in its lower reach, but only fair scores at the two upstream sites. Hastings Creek had a fair upstream site, but the assemblage declined to poor downstream from the Lindenhurst Sanitary District WWTP. Total taxa declined downstream from the WWTP and no EPT taxa were collected. Both sites were dominated by organic enrichment tolerant taxa with the lower site having the highest proportion of such taxa in the study area (89.6%).

Tributaries that flow directly into the Upper Des Plaines River had mIBI scores that ranged from poor to good. The lower site in the West Fork Belvidere Rd. Tributary (Site 13-9) and the only site in Stoneroller Creek (Site 13-8) had good mIBI scores. The lower site in the Suburban Country Club Tributary (Site 13-10) had a poor mIBI. The remaining sites had fair mIBIs (upstream site on Suburban Country Club Tributary, Slocum Corners Creek, Bull's Brook, and the unnamed tributary to the Des Plaines River).

Tributaries that flowed into the lower reach of the Upper Des Plaines River included an unnamed tributary to the Des Plaines (16-9) which had a fair mIBI score and Werhane Lake Drain (16-10) which had a good mIBI score and good numbers of total taxa for the corresponding drainage area.

The Mill Creek subwatershed has a drainage area of 31 sq. mi. with six sites, two scoring in the good range and the remaining four with fair mIBI scores. The LCDPW Mill Creek WWTP discharges to Mill Creek at RM 1.0 and the site immediately downstream (10-1, RM 0.7) had a good mIBI score of 50.7, high taxa richness, four intolerant, and six EPT taxa, but with a relatively high proportion of organic enrichment tolerant taxa. A similar site (GW-01, RM 0.3) was also sampled by IEPA in 2013 and had a fair (non-support) mIBI score of 39.4. The first site upstream of the WWTP (10-2, RM 1.7) had a fair mIBI score of 25.8 (non-support) with only 1 intolerant taxa and a higher dominance by organic enrichment tolerant taxa (60.7%) than site 10-1. The next upstream site (10-3) had a good mIBI (48.3), 4 intolerant taxa, and only 8.8% of organic enrichment tolerant taxa. As with many of the other subwatersheds the upstream most sites had some level of impairment and in Mill Creek all had fair mIBIs (sites 10-4, 10-5, and 10-6).

Biological Assemblages – Fish

Forty-four (44) fish species were collected along with three hybrids in 2016; the Upper Des Plaines mainstem had 36 species and two hybrids. The assemblage was characterized by a large number of lentic fish species and characteristic of the low gradient and wetland influenced character of the Upper Des Plaines River watershed. Certain species generally associated with moderate gradient rivers and streams were entirely absent, in particular redhorse species and no buffalo or carpsucker species. The 15 most-abundant species comprise an atypical assemblage compared to the lower reaches of the Des Plaines River and its tributaries (Table 15). All of these species are primarily tolerant, moderately tolerant, or of intermediate tolerance. Historical fish assemblage data summarized in Heidinger (1989) identified other fish species that occurred prior to European settlement or in upstream reaches in Wisconsin that include sensitive species such as blackchin shiner that were undoubtedly

***Table 15**. The fifteen most abundant species collected in the Upper Des Plaines River mainstem in 2016 with IL and OH tolerance assignments, numbers collected, and percent collected by number (species with blank tolerance are intermediate).*

Species	Tolerance		Number Collected	% By Number
	IL	OH		
Bluntnose Minnow	T	T	767	18.3
Spotfin Shiner		I	538	12.8
Bluegill Sunfish		P	375	8.9
Largemouth Bass			348	8.3
Blackstripe Topminnow			324	7.7
Green Sunfish	T	T	272	6.5
Rock Bass			241	5.7
Hornyhead Chub	I	I	188	4.5
Spotted Sucker			163	3.9
White Sucker	T	T	152	3.6
Common Carp	T	T	121	2.9
Yellow Bullhead	T	T	117	2.8
Sand Shiner			104	2.5
Redear Sunfish			101	2.4
Northern Pike			91	2.2

I – intolerant; P – moderately tolerant; T – highly tolerant.

present in Illinois. Other sensitive species that were collected in low numbers in 2016 (Appendix B-2) such as rosyface shiner and stonecat madtom were very likely much more abundant.

Upper Des Plaines River Mainstem

No sites in the Upper Des Plaines River mainstem met the General Use biocriterion for the fIBI (Figure 20). The fIBI values were lowest at the three upstream most mainstem sites and upstream from the discharge of significant volumes of treated effluent from the major WWTPs, except for the site (16-5, RM 83.60) downstream from the Libertyville (4.0 MGD) and Mundelein (4.95 MGD) WWTPs and the site (16-3, RM 76.7) downstream from the confluence with Aptakisic Creek (RM 76.4) and the effluent from the LCPWD Des Plaines River WWTP (16 MGD). Although external DELT anomalies on fish were not highly elevated (max of 2.6% at site 16-5) in the Upper Des Plaines mainstem they occurred downstream from the discharges of substantial amounts of treated effluent. Low MIwb scores also occurred at sites immediately downstream from major WWTPs and declines in species richness occurred at sites 16-3 and 16-5. The consistent failure to meet the General Use fIBI at all Upper Des Plaines study area sites was also associated with heavy siltation of the substrates.

Upper Des Plaines River Tributaries

The fish assemblage of the upper Des Plaines tributaries is characterized as a generally lentic and tolerant assemblage reflecting the wetland origins and low gradient of these streams combined with disturbance from development of the land surface which has increase silt and sedimentation and resulted in the loss of turbidity sensitive species that once occurred in this watershed (*e.g.,* blacknose dace, pugnose minnow, *etc.*). Table 16 list the fifteen (15) most abundant species in the Upper Des Plaines watershed tributaries. The assemblages were generally dominated by tolerant species associated with lentic and wetland dominated habitats. Examples of the low gradient, wetland-associated species collected include central mudminnow and golden shiner; other less abundant species include pirate perch, warmouth, grass pickerel, and tadpole madtom.

As with the mIBI, the fIBI in the tributaries varied by stream size (except for the smallest drainage panel) and by subwatershed (Figure 20). In Buffalo Creek, 3 of 4 sites had fair fIBI scores except for 17-7 which was in poor condition as was the unnamed tributary to Buffalo Creek (Site 17-4). The upstream sites and the unnamed tributary were dominated by tolerant species such as creek chub, green sunfish, and yellow bullhead whereas the downstream sites had more sensitive species such as hornyhead chub and stonecat madtom. In 2008, site 17-2 had an fIBI score of 32 (10 species) which was higher than the score of 21 (11 species) in 2016. The downstream most site in Buffalo Creek is channelized and all sites had silt covered and embedded substrates.

Fish assemblage condition in Bull Creek and the West Fork of Bull Creek were poor at the upstream most sites on these streams and had fair fIBI scores at other sites. Bull Creek was also sampled at a single site as part of a IDNR/IEPA Basin survey in 2013 (Pescitelli 2014). There

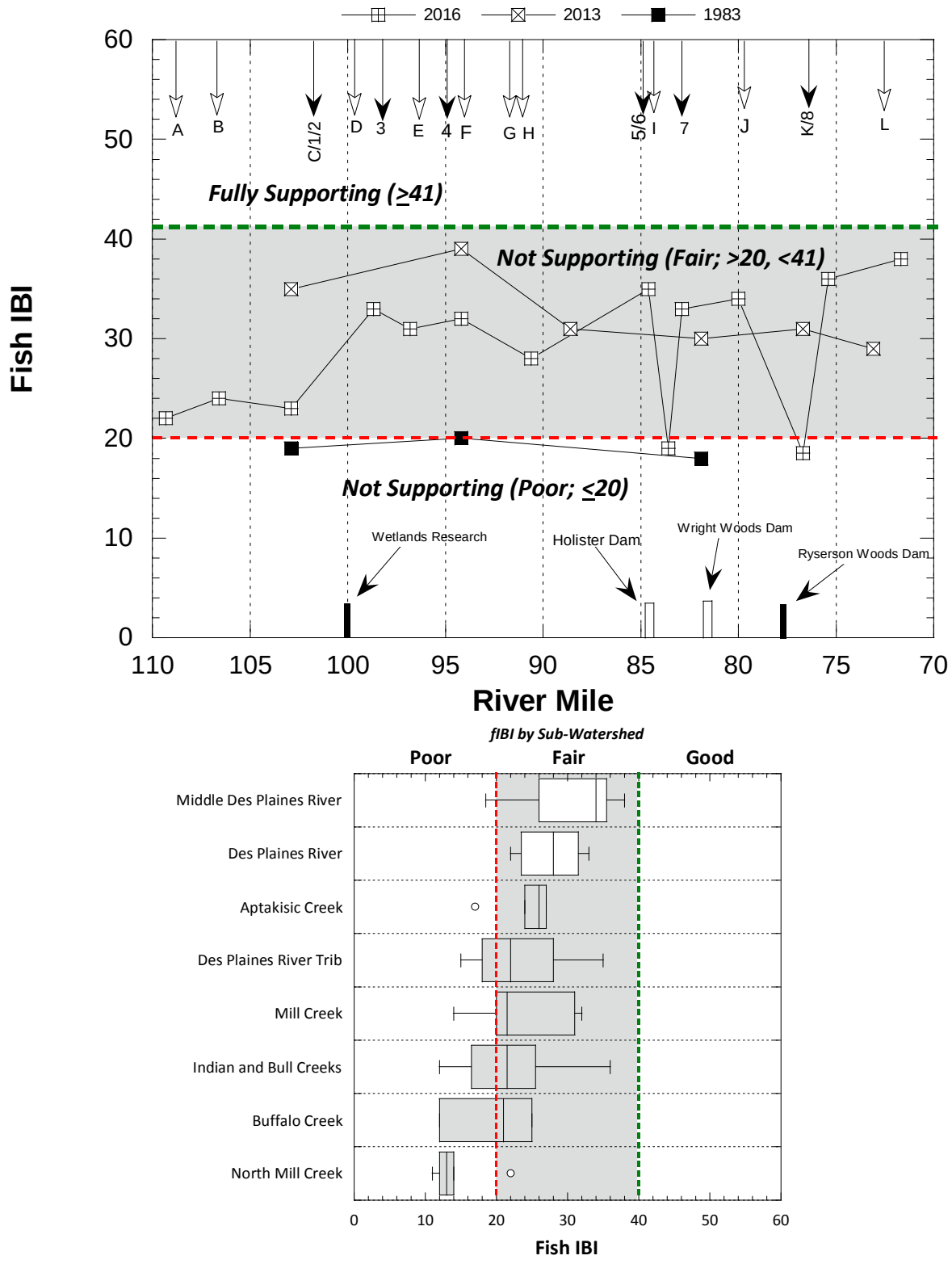

***Figure 20**. Illinois fish IBI scores for samples in the Upper Des Plaines River mainstem (upper panel) in 1983, 2013, and 2016 in relation to municipal WWTP discharges and tributaries. Values in tributary subwatersheds are shown as shaded box plots (lower panel). In the upper panel mainstem dams or weirs (black bars for existing dams) are indicated by bars along the lower x-axis. Thresholds for full and non-support fair and non-support-poor are indicated.*

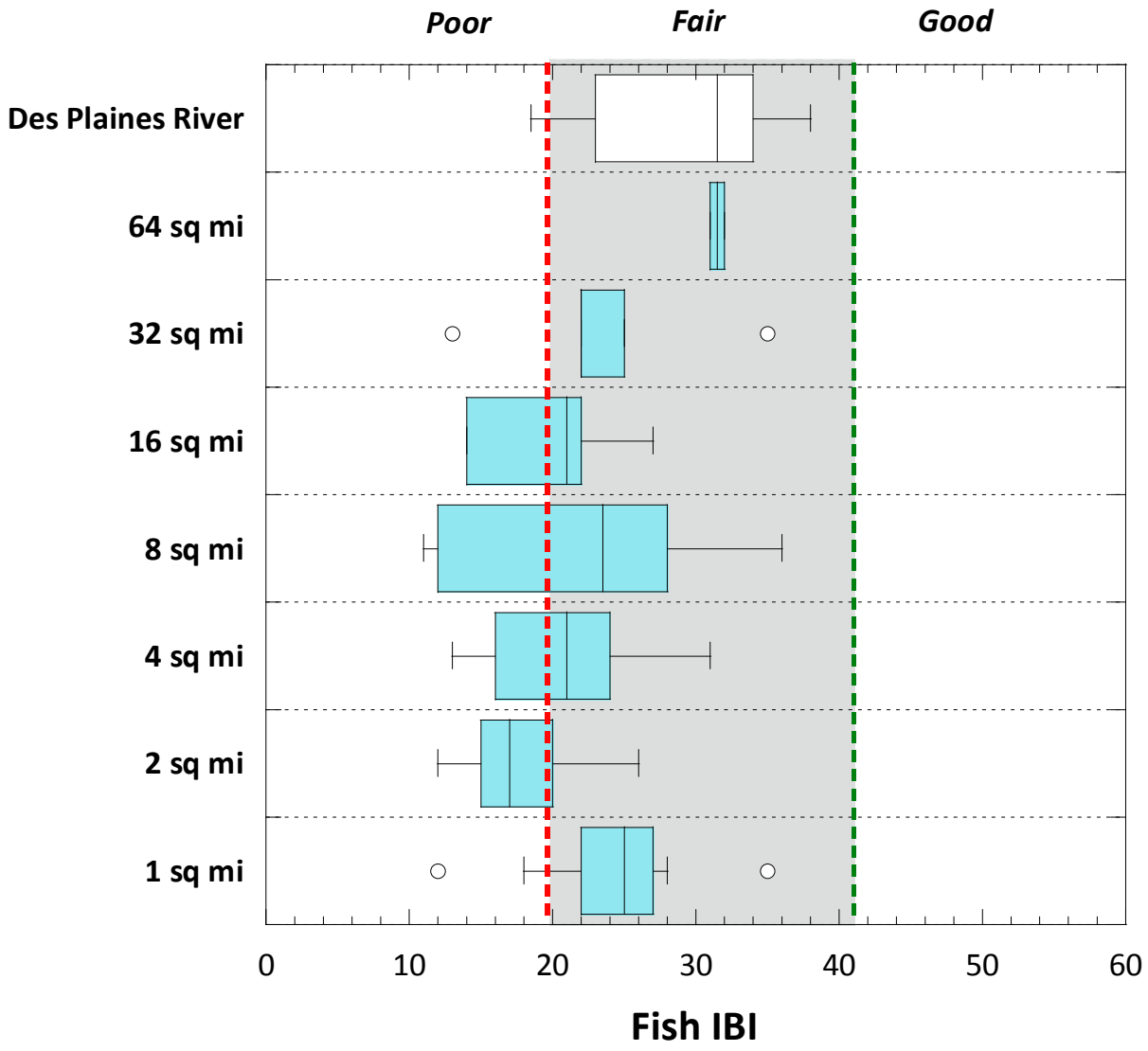

***Figure 21**. Box-and-whisker plot of fish IBI scores for the Upper Des Plaines River mainstem and subwatersheds arranged by drainage size panels for samples collected in the 2016. The gray shaded area on each plot demarcate the non-support fair range from full support and non-support-poor.*

Table 16. *Fifteen most abundant species collected in 2016 in Upper Des Plaines watershed tributary sites in 2016 with IL and OH tolerance assignments, numbers collected, and percent collected by number (species with blank tolerance are intermediate).*

Species	Tolerance		Number Collected	% By Number
	IL	OH		
Green Sunfish	T	T	1937	16.1
Bluegill Sunfish		P	1494	12.4
Blackstripe Topminnow			1441	12.0
Creek Chub	T	T	1232	10.3
Bluntnose Minnow	T	T	1113	9.3
White Sucker	T	T	674	5.6
Largemouth Bass			587	4.9
Yellow Bullhead	T	T	509	4.2
Central Mudminnow		T	504	4.2
Central Stoneroller			429	3.6
Spotfin Shiner			346	2.9
Black Bullhead		P	278	2.3
Johnny Darter			271	2.3
Golden Shiner	T	T	174	1.5
Hornyhead Chub	I	I	168	1.4

I – intolerant; P – moderately tolerant; T – highly tolerant.

result at site 14-1 (their code GV-01) at river mile 0.5 was a fish IBI of 40 (19 species) which is at the 40 threshold for full support, whereas our result was a fish IBI of 36 (21 species) which is just below the General Use biocriterion of 41. The site at 14-1 had the best habitat (QHEI = 89.5) in the subwatershed and was one of the few sites where the QHEI did not reveal heavy silt or heavily embedded substrate conditions and it had 3 species of darters and hornyhead chub. The other sites in the subwatershed all had heavy silt cover and embedded riffle and pool substrates.

Indian Creek is one of the larger subwatersheds (38 sq. mi.) and fIBIs ranged from fair to poor (poor mostly at smaller sites). Streams sampled included Indian Creek, Killdeer Creek, West Fork of Indian Creek, Seavey Drainage Ditch and Forest Lake Drain. The fish assemblages were comprised mostly of tolerant species with more sensitive hornyhead chub at several of the larger sites. Habitat ranged from fair to excellent; however, all sites had moderate to heavy siltation and heavily embedded substrates which is consistent with the dominance by tolerant fish species such as creek chub, white sucker, green sunfish and yellow bullhead. The low gradient character of the habitats was highlighted by the collection of species such as warmouth and northern pike. Highly developed land uses undoubtedly have altered the natural flow regimes and that combined with the highly erodible soils contribute to the degraded substrate conditions throughout the subwatershed.

Aptakisic Creek has a high proportion of urban land uses which contribute to an altered flow regime and the limitation of the fish assemblage to poor-fair fIBIs dominated by tolerant fish species such as white sucker, creek chub, green sunfish, and yellow bullhead and the lack of sensitive species or mineral substrate spawners (i.e., simple lithophils). A site that had a poor fIBI also had an organic enrichment response signature with tolerant fish >70%. The lower most site is downstream from the LCPWD Des Plaines River WWTP. Compared to the upstream site decline from 18 to 12 native species and a slight increase in DELT anomalies (0.5 to 1.1%) even though the IBI only declined by 2 points (26 to 24). It appears that both fish and macroinvertebrates responded to the effluent with the macroinvertebrate showing the stronger response.

The North Mill Creek subwatershed is in upper part of the De Plaines watershed. Stream sampled include North Mill Creek, Hastings Creek and an unnamed tributary to North Mill Creek. Five of the six sites in these streams had poor fish IBIs and sixth was fair (downstream site on North Mill Creek). Hastings Creek is more urban (29%) than other parts of the North Mill Creek watershed although the trend is conversion of agricultural and open space to developed land uses. North Mill Creek had a low fish species richness (9-13 species) for its size and an organic enrichment response signature at the middle site including a very high proportion of tolerant species (70%), no intolerants, and a very poor MIwb score (3.79).

Hastings Creek had poor fIBI scores at both sites (which are upstream and downstream of the Lindenhurst Sanitary District WWTP) with only three species and low numbers of individuals collected at each site. DELT anomalies increased from zero to 3.1% downstream of the WWTP as did the percent tolerant individuals with both sites in poor condition. The mouth site had poor habitat being channelized and the upstream site had fair habitat with heavy siltation and substrate embeddedness.

Tributaries that flow directly into the Upper Des Plaines River had fIBI scores that ranged from poor (n=4) to fair (n=6). Of these 10 sites, seven had good habitat, three had fair habitat, and one had poor habitat, but all had heavy silt cover and substrate embeddedness. The Bull's Brook subwatershed has been the location of recent efforts to attempt the re-establishment of rare and threatened fish species into the lakes in the watershed:

> *"In the mid 1990's, Integrated Lake Management (ILM) stocked the Sanctuary Pond at Prairie Crossing with five State T&E fish species including blackchin shiners (Notropis heterodon), blacknose shiners (Notropis heterolepis), banded killifish (Fundulus diaphanous), Iowa darters (Etheostoma exile), and pugnose shiners (Notropis anogenus)."*

In 2004 the IDNR collected blackchin shiners and Iowa darters in Bull's Brook (LCSMC 2008). None of these species were collected in the 2016 survey which was at a greater level of effort in terms of sampling sites. Habitat was good in Bull's Brook, but like many other sites in the watershed heavy silt cover and riffle and pool substrate embeddedness was prevalent. This was reflected in the 2016 fish assemblage results as a low percentage of mineral substrate

spawners (simple lithophils) at these sites (<5%). Bland (2013) described this reintroduction effort and detailed that further work to reintroduce them in other waters was limited by even moderate amounts of turbidity that limited the survival of these clear water species. The widespread siltation and embeddedness issues in this subwatershed apparently limited the success of these reintroduction efforts for fish species that were likely abundant in suitable habitats in the Upper Des Plaines River watershed.

Tributaries that flow into the lower reach of the Upper Des Plaines River included an unnamed tributary to the Des Plaines River (16-9) and the Werhane Lake Drain (16-10) both of which had fair fIBI scores and good (16-9) and fair (16-10) habitat with siltation and embeddedness problems.

The Mill Creek subwatershed had five of the six sites with fair fIBIs and the sixth with a poor fIBI score. The LCDPW Mill Creek WWTP discharges to lower Mill Creek at RM 1.0 and the first downstream site (11-1, RM 0.7) had a fair fIBI score of 31 compared to the first upstream site (11-2, RM 1.7) with an fIBI score of 32. Species richness declined downstream from 25 to 18 species and the MIwb declined from 9.3 to 7.9 although the proportion of tolerant species were very similar between sites. Habitat was good at both sites although moderate to heavy siltation and embeddedness affected both. While there were some shifts from upstream to downstream of the WWTP reflecting lower numbers and biomass in the MIwb score, the biological signatures were similar being influenced by the nonpoint source issues related to urban runoff and siltation.

Limited historical data was available in an IDNR survey in 2013 (Pescitelli 2016) at sites that MBI sampled in Mill Creek (GW-01, RM 0.3 vs. 11-1 RM 0.7 and GW-04 RM 10.2 vs 11-4, RM 10.2) which revealed similar results between the 2013 and 2016 surveys (Table 17).

Table 17. *Comparison of Illinois fIBI scores at two locations sampled by Illinois DNR in 2013 and MBI in 2016.*

Site	Year	Fish IBI	Species
GW-01, RM 0.3	2013	35	19
11-1, RM 0.7	2016	31	18
GW-04, RM 10.2	2013	18	12
11-4, RM 10.2	2016	22	9

SYNTHESIS

The baseline biological condition of the Upper Des Plaines River mainstem and subwatershed tributary streams is shaped by the natural, low gradient and wetland-origins of the region. The current condition of the biological assemblages reflects changes that have altered these natural landscape features via conversion by urban development and agriculture. The influence of altered hydrology, increased soil erosion, and large volumes of treated wastewater flows were evident in the biological results. The excessive siltation and embeddedness of substrates was the most pervasive of the causes identified in the 2016 biological assessment.

The biological criteria for fish and macroinvertebrates used by Illinois EPA (2016) establish the thresholds by which impaired sites and reaches are determined. The assignment of causes in this analysis generally followed the 2016 Illinois Integrated Report assessment methods, but was supplemented by biological effect thresholds derived by the DuPage River Salt Creek Integrated Prioritization System (IPS; Miltner et al. 2010), southwestern Ohio (MBI 2015), other effect thresholds from the literature (e.g., the consensus-based sediment quality guidelines of MacDonald et al. 2000b); Table 6 summarizes the principle thresholds used in the assignment of causes for the 2016 bioassessment. Additional relationships between biological responses and specific stressors were derived from available Midwestern stream and river databases (e.g., Figure 17 for *Tricorythodes sp.*) as the need arose.

Biological signatures of siltation related impacts, altered hydrology, and organic enrichment from multiples sources were evident throughout the 2016 study area. Organic enrichment related biological responses in the form of increases in tolerant species, reductions in numbers and biomass, and increased DELT anomalies on fish occurred downstream from WWTPs in Aptakisic Creek and Mill Creek with the former revealing a toxic response signature in the macroinvertebrate results. Sediment contamination was revealed with PAH compounds exceeding consensus based threshold and probable effect levels in the mainstem and several tributaries correlated with the degree of urbanization. Only a few D.O. exceedances were measured by daytime grab sampling and those were largely in the very sluggish and highly enriched upper Des Plains River mainstem. Continuous monitoring is needed to better reveal where such exceedances may be limiting to aquatic life. Continuous monitoring is also needed to reveal where nutrient enrichment is contributing to excessive diel D.O. fluctuations that rarely coincide with exceedances of the average and minimum D.O. criteria. The most prevalent stressor across all sites in the Upper Des Plaines River watershed is heavy siltation associated with habitat alterations and altered hydrology from urban and suburban runoff.

An emerging issue in the Upper Des Plaines River watershed is with increased instream concentrations of dissolved materials, which is characterized by elevated chlorides, total dissolved solids, and conductivity in streams and rivers. Figure 22 illustrates the trend in the concentration of chlorides at two sites on the mainstem of the Upper Des Plaines River, Site 13-1 at RM 94.2 (the downstream terminus of the 2016 study area) and Site 13-6 at RM 109. The upstream site (13-6) is continuing to urbanize compared to Site 13-1 which has been urbanized for a longer period of time. The slope of the chloride concentration reflects the annual average

increase over time and at these two sites indicates that chlorides are accumulating at between 1.7 and 3.9 mg/L annually. This rate of accumulation indicates that chlorides and other dissolved materials are continuing to increase in the Upper Des Plaines River watershed. Chlorides was identified as the second most prevalent cause of biological impairment. While the 2016 chloride concentrations are well below the current IEPA standard of 500 mg/L, they likely reflect winter season exceedances of the U.S. EPA national water quality criterion of 230 mg/L. In addition, the summer-fall concentrations in 2016 largely exceeded the DRSCWG IPS thresholds of 112-120 mg/L which triggered listing chloride as an associated cause of biological impairment by this study.

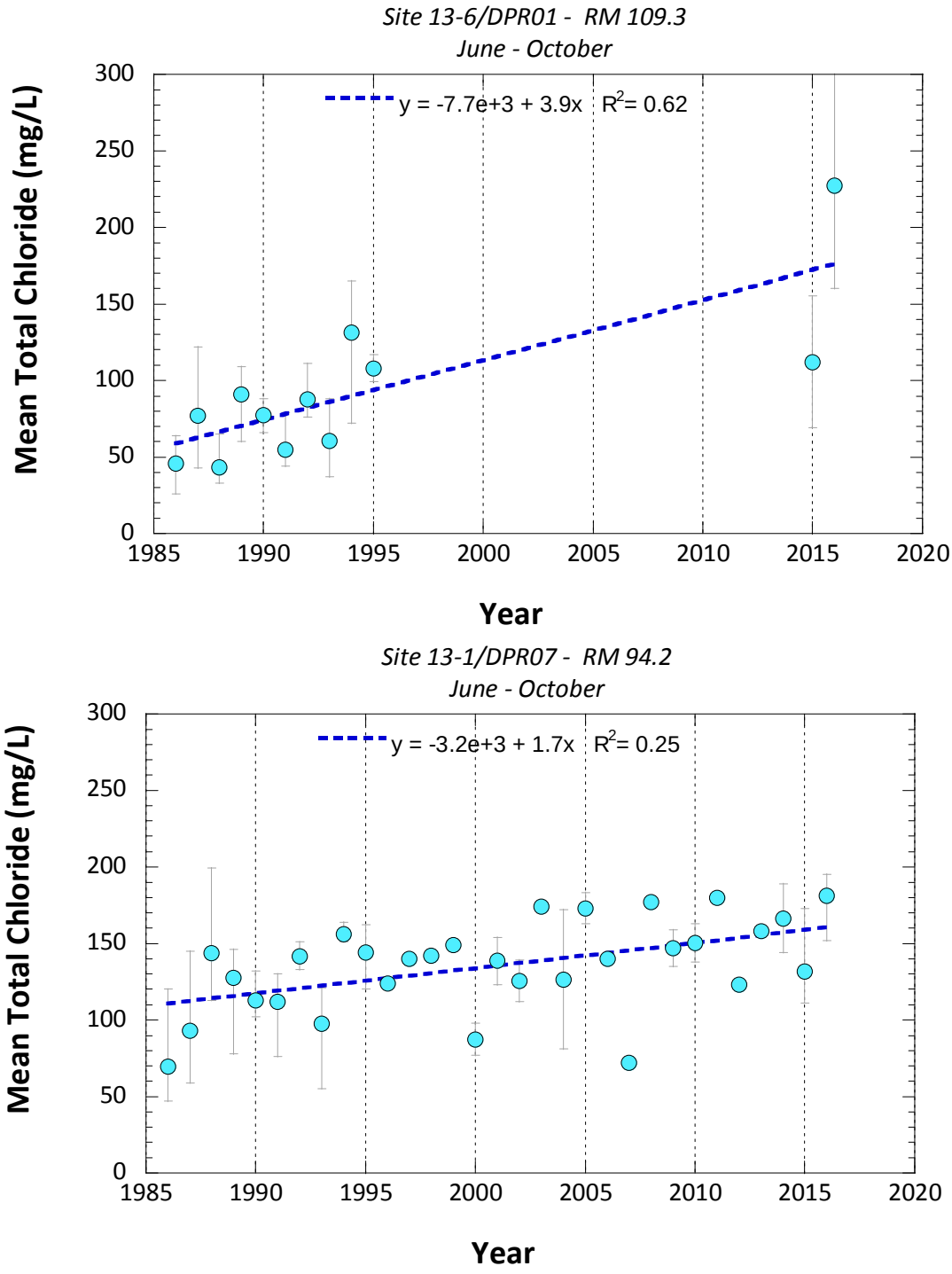

***Figure 22**. Plot of total chlorides vs. year for two sites on the Upper Des Plaines River from 1986 to 2016. Line reflects a general linear regression between the mean of total chlorides and year.*

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APPENDIX A

A-1: Upper Des Plaines 2016 Sites and Indicators

Site ID	River Mile	Latitude	Longitude	Drainage Area (sq. mi.)	Chemistry Data	Biological Data	Sampling Location
Des Plaines River							
13-6	109.3	42.48905	-87.92577	123.67	C, N, H, O, B, S	QN, FB	Russel Road
13-5	106.6	42.46505	-87.94276	137.29	C, N, B, S	QN, FB	Hwy 173
13-4	102.9	42.42875	-87.93027	145.55	C, N, B, S	QN, FB	Wadsworth Road
13-3	98.7	42.38309	-87.91471	220.29	C, N, H, O, B, S	QN, FB	Above Hwy 41
13-2	96.82	42.31906	-87.91776	225.36	C, N, H, O, B, S	QN, FB	McClure Ave
13-1	94.2	42.34366	-87.94116	232.03	C, N, H, O, B, S	QN, FB	Hwy 120
13-16	90.6	42.30564	-87.95442	253.75	None	QN, FB	Dst. Buckley Rd.
16-6	87.1	42.2764	-87.9392	261.38	C, N, H, O, B		Rockland Rd.
16-7	84.6	42.25085	-87.93966	266.48	None	QN, FB	Hollister Dam site - adj. Hollister Intl.
16-5	83.6	42.2403	-87.93931	268.07	C, N, H, O, B, S	QN, FB	Illinois Route 60 - Town Line Rd.
16-8	82.9	42.23116	-87.93429	268.9	None	QN, FB	Wright Woods Dam site
16-4	80	42.19867	-87.91867	273.21	C, N, H, O, B, S	QN, FB	Half Day Rd.
16-3	76.7	42.1676	-87.9134	314.68	C, N, B, S	QN, FB	Deerfield Rd.
16-2	75.4	42.1529	-87.91019	323.96	C, N, H, O, B, S	QN, FB	E. Lake Cook Rd.
16-1	71.7	42.11368	-87.88073	358.68	C, N, H, O, B, S	QN, FB	Palatine Frontage Rd. (Willow Road)
Hastings Creek							
10-5	3.12	42.4307	-88.03447	3.91	C, N, B, S	QN, FHW	Hastings Creek @ Grass Lake Rd
10-4	1.68	42.44793	-88.02477	6.8	C, N, B, S	QN, FHW	Ust. Miller Rd.
Unnamed Tributary to N. Mill Creek							
10-6	0.04	42.42182	-88.00422	0.99	None	QN, FHW	
North Mill Creek							
10-3	10.2	42.46607	-88.00908	20.79	C, N, B, S	QN, FWD	Route 173
10-2	8.1	42.44408	-88.00063	29.38	C, N, B, S	QN, FWD	Kelly Road
10-1	1.1	42.42339	-87.99702	31.97	C, N, B, S	QN, FWD	Milbourne Road
Mill Creek							
11-6	17.2	42.33636	-88.04005	4.51	C, N, B, S	QN, FHW	Wick Street

Site ID	River Mile	Latitude	Longitude	Drainage Area (sq. mi.)	Chemistry Data	Biological Data	Sampling Location
11-5	13.8	42.36284	-88.01585	10.43	C, N, B, S	QN, FHW	Washington St
11-4	10.1	42.383	-88.00266	18.33	C, N, B, S	QN, FHW	Route 45
11-3	7.2	42.40007	-87.98266	21.36	C, N, O, B, S	QN, FWD	Sterns School Road
11-2	1.71	42.42129	-87.95655	62.25	C, N, B, S	QN, FWD	Hunt Club Road
11-1	0.7	42.41832	-87.94527	63.78	C, N, H, O, B, S	QN, FWD	Dilley's Road
Newport Drainage Ditch							
12-2	3.03	42.45755	-87.89753	2.81	S	QN, FHW	21st Street
12-1	0.7	42.48342	-87.91252	7.35	C, N, B, S	QN, FHW	Newport Drain. Ditch @Kilbourne Ave.
Bull's Brook							
13-15	1.95	42.32568	-87.97676	1.92	None	QN, FHW	Almond Rd.
13-7	0.25	42.31829	-87.96195	2.69	C, N, B, S	QN, FHW	N. Milwaukee Ave. (Route 21)
Stoneroller Creek							
13-9	0.42	42.35286	-87.93661	4.08	C, N, B, S	QN, FHW	Stone Roller @ Lake Carina
Suburban Country Club Tributary							
13-12	2.75	42.40234	-87.89422	2.37	None	QN, FHW	E. of Northwestern Ave.
13-10	2	42.40414	-87.90607	4.02	C, N, B, S	QN, FHW	Suburban CC Tributary @ Shirley Dr.
Slocum Corners Creek							
13-11	1.36	42.444	-87.95279	2.39	C, N, B, S	QN, FHW	N. Mill Creek Rd.; E. of I-94
Unnamed Tributary to Des Plaines River							
13-17	0.13	42.2996	-87.94086	0.86	None	QN, FHW	Behind pump station Sprucewood Ln.
Unnamed Tributary-Greenleaf Creek							
13-13	0.4	42.36544	-87.90234	1.06	None	QN, FHW	Swanson Trigg Conservation Area
West Fork Belvidere Rd. Tributary							
13-14	0.21	42.34737	-87.95589	2.3	None	QN, FHW	Leonard Dr.
13-8	0.15	42.34226	-87.94312	3.75	C, N, B, S	QN, FHW	@ IL Highway 21 and 120
Bull Creek							
14-6	5.95	42.28814	-88.0215	2.42	S	QN, FHW	Hazelnut Xing

Site ID	River Mile	Latitude	Longitude	Drainage Area (sq. mi.)	Chemistry Data	Biological Data	Sampling Location
14-5	4.7	42.27935	-88.00281	1.32	None	QN, FHW	Adj. University Drive
14-2	1	42.3075	-87.96869	8.44	C, N, B, S	QN, FHW	Route 137
14-1	0.5	42.31322	-87.96208	11.69	C, N, B, S	QN, FHW	Hwy 21
West Branch Bull Creek							
14-4	2.54	42.30296	-87.99974	5.1	S	QN, FHW	Northwind Blvd. - behind warehouse
14-3	1.6	42.31016	-87.99059	7.05	None	QN, FHW	N. Countyryside Drive
Seavey Drainage Ditch							
15-3	3.66	42.26345	-87.96553	5.05	C, N, B, S	QN, FHW	Gregg's Parkway
15-8	0.45	42.21546	-87.96697	9.77	S	QN, FHW	Vernon Hills GC - hole number 3
Forest Lake Drain							
15-11	0.83	42.21958	-88.0257	1.7	None	QN, FHW	Hawthorne Grove Rd.
Indian Creek							
15-9	10.83	42.24454	-88.03565	2.68	S	QN, FHW	N. Midlothian Rd.
15-6	9.83	42.23809	-88.02246	3.7	C, N, B, S	QN, FHW	Washitay Ave
15-5	5.4	42.21088	-87.98597	17.26	C, N, B, S	QN, FHW	Oakwood Rd.
15-2	2.41	42.20629	-87.96123	35.02	C, N, B, S	QN, FWD	Sullivan Woods Preserve, North of Creekview Dr.
15-1	0.17	42.1981	-87.92312	36.43	C, N, B, S	QN, FWD	Marriot Inn parking lot - adj. Cranes Landing GC
Killdeer Creek							
15-12	5.2	42.19621	-88.03919	2.08	None	QN, FHW	IL Rt. 22
15-7	4.6	42.19297	-88.02905	2.86	C, N, B, S	QN, FHW	Salem Lake Drive S. of Rt. 22
15-13	2.21	42.19357	-88.0023	5.01	None	QN, FHW	Willowbrook Rd. S. of Half Day Rd.
15-4	0.17	42.20552	-87.97467	6.8	C, N, B, S	QN, FHW	Port Clinton Rd at Killdeer Creek
W. Branch Indian Creek							
15-10	0.8	42.23022	-88.0377	2.22	None	QN, FHW	Gilmer Rd.

Site ID	River Mile	Latitude	Longitude	Drainage Area (sq. mi.)	Chemistry Data	Biological Data	Sampling Location
Tributary to Werhane Lake Drain							
16-10	0.1	42.25083	-87.92496	0.22	None	FHW	St. Marys Rd.
Unnamed Tributary to Des Plaines River							
16-9	0.4	42.17148	-87.90768	1.19	None	QN, FHW	Timberleaf Lane
Werhane Lake Drain							
16-10B	0.8	42.25083	-87.92496	0.22	None	QN	St. Marys Rd.
Buffalo Creek							
17-5	14	42.18589	-88.05815	1.37	None	QN, FHW	Quentin Rd.
17-3	7.7	42.1596	-87.99056	9.61	C, N, B, S	QN, FHW	Checker Road
17-2	6.1	42.15216	-87.96938	22.1	C, N, B, S	QN, FWD	Lake Cook Rd @ Farington Ditch
17-1	0.75	42.12671	-87.90835	29.14	C, N, B, S	QN, FWD	Plum Creek Drive (Wolf Dr.)
Unnamed Tributary to Buffalo Creek							
17-4	0.68	42.15345	-87.99661	8.55	C, N, B, S	QN, FHW	Lake Cook Rd @ Buffalo Creek Tributary
Aptakisic Creek							
18-4	4.7	42.18122	-87.96678	1.09	None	QN, FHW	N. Buffalo Grove Rd. (Twin Creeks)
18-3	4.3	42.17702	-87.95915	2.3	S	QN, FHW	Copperwood Dr. bike crossing
18-2	0.8	42.16468	-87.92781	4.94	C, N, B, S	QN, FHW	Pekara Rd, West of Hwy. 21
18-1	0.5	42.16349	-87.92245	5.5	C, N, B, S	QN, FHW	Aspen Road
Unnamed Tributary to Aptakisic Creek							
18-5	0.05	42.18153	-87.96576	0.99	None	QN, FHW	Dst. Aptakisic Rd.; W of N. Buffalo Grove Rd., Twins Creek Park

Key to Chemical Codes: C – Conventional parameters (DO, pH, etc.,); N – Nutrients; H – Heavy metals; O – Organics; B – Bacteria; S – Sediment samples (metals, organics, pesticides, PCBs, PAHs).
Key to Biological Codes: QN –Quantitative macroinvertebrate data; FHW – Fish, Headwater; FWD – Fish, Wadeable; FB – Fish, Boatable.

APPENDIX B

Upper Des Plaines 2016 Fish Assemblage Data

B-1: Index of Biotic Integrity (IBI) Metrics & Scores, Modified Index of Well-Being (MIwb) Scores
B-2: Fish Species Grand (all sites combined)
B-3: Fish Species by Sampling Event

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraenthesis are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg*.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)		IBI	Modified Iwb
Des Plaines River - (95656)																				
Year: 2016																				
13-6	109.30	P	09/15/2016	123.6	84.2	3	11(2)	5(5)	1(1)	1(1)	1(1)	1(1)	3(1)	36(4)	24(6)	0(0)	116	*	22.0	5.9
13-5	106.60	A	09/15/2016	137.2	86.1	3	11(2)	5(5)	1(1)	1(1)	1(1)	1(1)	3(1)	18(6)	29(6)	0(0)	146	*	24.0	7.6
13-4	102.90	A	09/15/2016	145.5	87.2	3	12(2)	4(4)	2(2)	1(1)	1(1)	1(1)	7(2)	42(4)	42(6)	0(0)	180	*	23.0	7.8
13-3	98.70	A	09/28/2016	220.2	94.8	3	23(5)	6(6)	2(2)	2(2)	4(3)	4(3)	9(2)	26(5)	75(4)	1(1)	2024		33.0	9.7
13-2	96.82	A	09/28/2016	225.3	95.2	3	19(4)	6(6)	2(2)	2(2)	4(3)	3(2)	12(2)	26(5)	72(4)	1(1)	968		31.0	9.2
13-1	94.20	A	09/29/2016	232.0	95.8	3	20(4)	5(5)	2(2)	1(1)	3(2)	4(3)	15(3)	30(5)	45(6)	2(1)	546		32.0	9.4
13-16	90.60	A	09/17/2016	253.7	97.4	3	12(2)	3(3)	1(1)	1(1)	2(2)	2(2)	56(6)	42(4)	30(6)	1(1)	204		28.0	6.9
16-7	84.60	P	10/05/2016	266.4	98.3	3	24(5)	6(6)	2(2)	3(3)	4(3)	5(4)	10(2)	25(5)	70(4)	3(1)	782		35.0	9.3
16-5	83.60	P	09/17/2016	268.0	98.4	3	11(2)	5(5)	1(1)	0(0)	0(0)	0(0)	15(3)	36(4)	69(4)	0(0)	156	*	19.0	7.1
16-8	82.90	P	10/05/2016	268.9	98.5	3	22(5)	7(6)	2(2)	2(2)	3(2)	4(3)	14(3)	27(5)	73(4)	3(1)	670		33.0	9.1
16-4	80.00	P	09/30/2016	273.2	98.8	3	18(4)	5(5)	2(2)	2(2)	3(2)	3(2)	15(3)	28(5)	49(6)	7(3)	556		34.0	8.6
16-3	76.70	P	09/30/2016	314.6	101.4	3	19(4)	7(6)	2(2)	2(2)	3(2)	3(2)	10(2)	26(5)	78(3)	3(2)	514		30.0	8.2
16-2	75.40	P	09/30/2016	315.8	101.9	3	22(4)	6(6)	2(2)	3(3)	4(3)	5(4)	19(4)	27(5)	68(4)	2(1)	966		36.0	8.8
16-1	71.70	P	10/05/2016	358.6	103.8	3	20(4)	5(5)	2(2)	3(3)	3(2)	6(4)	44(6)	30(5)	49(6)	2(1)	554		38.0	8.5
Hastings Creek - (95702)																				
Year: 2016																				
10-5	3.12	F	09/16/2016	3.9	20.7	3	3(0)	1(2)	0(0)	0(0)	0(0)	0(0)	0(0)	33(5)	40(6)	0(0)	10	* *	13.0	1.8
10-4	1.68	F	09/16/2016	6.8	30.9	3	3(0)	1(2)	0(0)	0(0)	0(0)	0(0)	0(0)	67(3)	56(6)	0(0)	64	*	11.0	1.9
Unnamed Trib to N. Mill Creek - (95715)																				

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated; *IBI calibration region.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraentheses are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)		IBI	Modified Iwb
Year: 2016																				
10-6	0.04	F	09/10/2016	0.9	1.1 X	3	1(6)	0(0)	0(0)	0(0)	0(0)	1(6)	0(0)	100(0)	100(0)	0(0)	56	*	12.0	0.0
North Mill Creek - (95996)																				
Year: 2016																				
10-3	10.20	D	09/19/2016	20.7	51.5	3	9(2)	4(5)	0(0)	0(0)	0(0)	1(1)	0(0)	44(4)	86(2)	0(0)	639		14.0	7.3
10-2	8.10	D	09/19/2016	29.3	57.8	3	10(2)	2(3)	1(1)	0(0)	1(1)	3(2)	0(0)	70(2)	100(1)	0(1)	641		13.0	3.8
10-1	1.10	D	09/21/2016	31.9	59.4	3	13(3)	4(5)	2(2)	2(2)	1(1)	3(2)	3(1)	46(4)	87(2)	0(0)	179	*	22.0	5.3
Mill Creek - (95995)																				
Year: 2016																				
11-6	17.20	F	09/16/2016	4.5	23.4	3	6(1)	2(4)	1(2)	0(0)	1(1)	0(0)	0(0)	33(5)	36(6)	6(2)	214		21.0	5.2
11-5	13.80	D	09/16/2016	10.4	38.7	3	15(3)	5(6)	1(1)	0(0)	0(0)	2(2)	0(0)	40(4)	68(4)	0(0)	923		20.0	8.4
11-4	10.10	F	09/16/2016	18.3	49.1	3	9(2)	3(4)	0(0)	0(0)	1(1)	1(1)	0(0)	33(5)	56(6)	7(3)	234		22.0	5.9
11-3	7.20	F	09/21/2016	21.3	52.0	3	8(1)	2(3)	0(0)	1(1)	0(0)	3(2)	3(1)	50(4)	84(2)	0(0)	230		14.0	4.6
11-2	1.71	D	09/21/2016	62.2	71.6	3	25(5)	6(6)	2(2)	2(2)	4(3)	6(4)	4(1)	24(5)	83(3)	1(1)	1340		32.0	9.3
11-1	0.70	D	09/21/2016	63.7	72.1	3	18(4)	5(5)	2(2)	1(1)	4(3)	4(3)	6(1)	28(5)	78(3)	9(4)	411		31.0	7.9
Newport Drainage Ditch - (95708)																				
Year: 2016																				
12-2	3.03	F	09/12/2016	2.8	14.6	3	8(2)	3(6)	0(0)	0(0)	0(0)	1(1)	0(0)	25(6)	33(6)	0(0)	566		21.0	5.1
12-1	0.70	F	09/19/2016	7.3	32.5	3	15(3)	4(6)	1(2)	0(0)	2(2)	2(2)	0(1)	33(5)	17(6)	4(2)	812		29.0	6.9
Bull's Brook - (95704)																				

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraentheses are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)	IBI	Modified Iwb
Year: 2016																			
13-15	1.95	F	09/10/2016	1.9	7.5 X	3	4(1)	1(3)	0(0)	0(0)	0(0)	2(2)	5(1)	50(4)	72(4)	0(0)	460	15.0	3.7
13-7	0.25	F	09/12/2016	2.6	14.0	3	9(2)	1(3)	1(3)	1(1)	2(2)	3(2)	4(1)	33(5)	74(4)	8(3)	336	26.0	4.5
Suburban Country Club Trib - (95710)																			
Year: 2016																			
13-12	2.75	F	09/12/2016	2.3	11.8	3	3(0)	1(3)	0(0)	0(0)	0(0)	0(0)	0(0)	0(6)	0(6)	0(0)	38 * *	15.0	3.7
13-10	2.00	E	09/15/2016	4.0	21.2	3	8(2)	5(6)	0(0)	0(0)	1(1)	0(0)	0(0)	13(6)	7(6)	0(1)	960	22.0	6.3
Slocum Conrners Creek - (95711)																			
Year: 2016																			
13-11	1.36	F	09/12/2016	2.3	11.8	3	10(2)	2(5)	1(3)	0(0)	2(2)	2(1)	3(1)	50(4)	87(2)	11(4)	980	24.0	5.7
Unnamed Trib to Des Plaines River - (95714)																			
Year: 2016																			
13-17	0.13	F	09/10/2016	0.8	1.1 X	3	1(6)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(6)	0(6)	0(0)	0 * *	18.0	0.0
Unnamed Trib-Greenleaf Creek - (95716)																			
Year: 2016																			
13-13	0.40	F	09/10/2016	1.0	1.1 X	3	6(6)	2(6)	1(6)	0(0)	0(0)	2(6)	0(0)	67(3)	98(1)	0(0)	132 *	28.0	2.5
West Fork Belvidere Rd. Trib - (95720)																			
Year: 2016																			
13-14	0.21	F	09/10/2016	2.3	11.0	3	7(2)	3(6)	1(3)	0(0)	0(0)	2(1)	0(0)	71(2)	94(1)	0(0)	350	15.0	4.1
13-8	0.15	F	09/17/2016	3.7	20.3	3	13(3)	4(6)	1(2)	1(1)	2(2)	2(1)	5(1)	31(5)	51(6)	10(4)	246	31.0	6.8
Bull Creek - (95051)																			

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraentheses are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)		IBI	Modified Iwb
Year: 2016																				
14-6	5.95	F	09/12/2016	2.4	11.8	3	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(6)	0(6)	0(0)	0	* *	12.0	0.0
14-5	4.70	F	09/20/2016	1.3	0.6 X	3	4(6)	3(6)	0(0)	0(0)	0(0)	1(6)	0(0)	50(4)	82(3)	0(0)	149	*	25.0	4.2
14-2	1.00	F	09/14/2016	8.4	34.8	3	8(2)	1(2)	1(2)	0(0)	1(1)	3(2)	32(4)	38(5)	50(6)	12(4)	476		28.0	5.3
14-1	0.50	F	09/29/2016	11.6	40.9	3	21(5)	7(6)	2(2)	2(2)	4(3)	4(3)	21(3)	29(5)	62(5)	4(2)	1310		36.0	8.9
West Branch Bull Creek - (95719)																				
Year: 2016																				
14-4	2.54	F	09/14/2016	5.1	25.7	3	10(2)	5(6)	0(0)	0(0)	0(0)	3(2)	1(1)	50(4)	96(1)	0(0)	436		16.0	6.4
14-3	1.60	F	09/10/2016	7.0	31.7	3	9(2)	3(5)	1(2)	0(0)	0(0)	3(2)	37(5)	44(4)	53(6)	0(0)	480		26.0	5.6
Seavey Drainage Ditch - (95390)																				
Year: 2016																				
15-3	3.66	F	09/14/2016	5.0	25.7	3	5(1)	4(6)	0(0)	0(0)	0(0)	1(1)	0(0)	40(4)	78(3)	0(0)	128	*	15.0	4.9
15-8	0.45	F	10/05/2016	9.7	37.7	3	12(2)	4(5)	1(1)	1(1)	1(1)	3(2)	1(1)	50(4)	29(6)	2(1)	550		24.0	6.5
Forest Lake Drain - (95705)																				
Year: 2016																				
15-11	0.83	F	09/09/2016	1.7	5.5 X	3	2(0)	2(6)	0(0)	0(0)	0(0)	0(0)	0(0)	50(4)	33(6)	0(0)	6	* *	16.0	2.0
Indian Creek - (95706)																				
Year: 2016																				
15-9	10.83	F	09/14/2016	2.6	14.0	3	5(1)	2(5)	0(0)	0(0)	0(0)	1(1)	0(0)	40(5)	19(6)	0(0)	84	*	18.0	4.3
15-6	9.83	F	09/14/2016	3.7	19.8	3	6(1)	1(2)	0(0)	0(0)	1(1)	3(2)	5(1)	50(4)	72(4)	22(6)	272		21.0	4.1
15-5	5.40	E	09/18/2016	17.2	48.1	3	15(3)	3(4)	1(1)	0(0)	2(2)	4(3)	5(1)	40(4)	61(5)	12(4)	380		27.0	7.4

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraentheses are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)	Modified IBI	Modified Iwb
15-2	2.41	D	09/20/2016	35.0	61.0	3	14(3)	3(4)	1(1)	1(1)	2(2)	4(3)	24(4)	36(5)	49(6)	20(6)	479	35.0	6.7
15-1	0.17	D	09/20/2016	36.4	61.8	3	11(2)	4(5)	1(1)	1(1)	1(1)	3(2)	14(2)	36(4)	84(2)	5(2)	353	22.0	4.9
Kildeer Creek - (95707)																			
Year: 2016																			
15-12	5.20	F	09/09/2016	2.0	9.4 X	3	10(3)	4(6)	0(0)	0(0)	0(0)	3(2)	0(0)	60(3)	35(6)	0(0)	1146	20.0	6.2
15-7	4.60	F	09/08/2016	2.8	15.3	3	11(3)	3(6)	1(2)	0(0)	0(0)	4(2)	0(0)	73(2)	92(2)	0(0)	212	17.0	5.6
15-13	2.21	E	09/08/2016	5.0	25.3	3	12(3)	3(5)	1(2)	0(0)	0(0)	4(2)	0(0)	58(3)	65(5)	0(0)	348	20.0	7.1
15-4	0.17	E	09/14/2016	6.8	30.9	3	11(2)	4(6)	1(2)	0(0)	1(1)	2(2)	1(1)	55(3)	66(5)	1(1)	300	23.0	6.5
W. Branch Indian Creek - (95717)																			
Year: 2016																			
15-10	0.80	F	09/09/2016	2.2	10.2	3	2(0)	2(5)	0(0)	0(0)	0(0)	0(0)	0(0)	0(6)	84(2)	0(0)	38 * *	13.0	2.9
Trib to Werhane Lake Drain - (95718)																			
Year: 2016																			
16-10	0.10	F	09/09/2016	0.2	1.1 X	3	2(6)	2(6)	0(0)	0(0)	0(0)	0(0)	0(0)	50(4)	11(6)	0(0)	36 * *	22.0	2.5
Unnamed Trib to Des Plaines River - (95721)																			
Year: 2016																			
16-9	0.40	F	09/13/2016	1.1	1.1 X	3	8(6)	3(6)	1(6)	0(0)	0(0)	1(6)	0(0)	38(5)	42(6)	0(0)	130 *	35.0	5.4
Buffalo Creek - (95703)																			
Year: 2016																			
17-5	14.00	F	09/09/2016	1.3	1.9 X	3	6(6)	3(6)	1(6)	0(0)	0(0)	1(2)	0(0)	50(4)	99(1)	0(0)	464	25.0	4.8
17-3	7.70	F	09/18/2016	9.6	37.3	3	7(1)	3(4)	0(0)	0(0)	0(0)	2(2)	0(0)	57(3)	88(2)	0(0)	484	12.0	5.0

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table B-1. Des Plaines River study area IBI scores and metrics at sites sampled by MBI in 2016 (numbers in paraentheses are the IBI metric scores).

Site ID	River Mile	Type	Date	DA sq mi	Wetted Width (ft)	IL IBI Reg.	Number of: Native species	Sunfish species	Sucker species	Intolerant species	Benthic Invert. species	Minnow species	Percent: Mineral Substrate Spawners	Tolerant Fish (as Species)	Generalist Feeders	Specialized Benthic Invert-ivores	Rel.No. /(0.3km)		IBI	Modified Iwb
17-2	6.10	E	09/18/2016	22.1	52.6	3	11(2)	3(4)	1(1)	0(0)	2(2)	3(2)	9(2)	45(4)	79(3)	1(1)	540		21.0	6.9
17-1	0.75	D	09/20/2016	29.1	57.6	3	15(3)	4(5)	1(1)	1(1)	2(2)	5(3)	3(1)	40(4)	82(3)	3(2)	557		25.0	6.1
UT to Buffalo Creek @ RM XX.X - (95713)																				
Year: 2016																				
17-4	0.68	D	09/18/2016	8.5	35.3	3	7(1)	3(4)	1(2)	0(0)	0(0)	1(1)	0(0)	57(3)	95(1)	0(0)	462		12.0	6.1
Aptakisic Creek - (95701)																				
Year: 2016																				
18-4	4.70	F	09/08/2016	1.0	1.1 X	3	5(6)	3(6)	0(0)	0(0)	0(0)	1(6)	0(0)	60(3)	32(6)	0(0)	62	*	27.0	3.8
18-3	4.30	F	09/08/2016	2.3	11.0	3	7(2)	3(6)	0(0)	0(0)	0(0)	3(2)	0(0)	71(2)	63(5)	0(0)	134	*	17.0	4.5
18-2	0.80	E	09/18/2016	4.9	24.9	3	18(4)	6(6)	2(3)	1(1)	3(2)	2(1)	1(1)	33(5)	91(2)	1(1)	816		26.0	7.5
18-1	0.50	D	09/20/2016	5.5	27.0	3	12(3)	4(6)	2(3)	1(1)	3(2)	1(1)	2(1)	33(5)	94(1)	2(1)	525		24.0	7.0
Unnamed Trib to Aptakisic Creek - (95712)																				
Year: 2016																				
18-5	0.05	F	09/08/2016	0.9	1.1 X	3	5(6)	3(6)	0(0)	0(0)	0(0)	1(6)	0(0)	60(3)	54(6)	0(0)	33	* *	27.0	4.2

na - Qualitative data, Modified Iwb not applicable.

X - IBI extrapolated

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix B-2: Midwest Biodiversity Institute
Fish Species List - Grand Totals

Rivers: *Bull Creek; Seavey Drainage Ditch; DesPlaines River; Aptakisic Creek; Hastings Creek; Buffalo Creek; Bull's Brook; Forest Lake Drain; Indian Creek; Kildeer Creek; Newport Drainage Ditch; Stoneroller Creek*

Years: 2016

Number of Samples: 70 Data Sources: 99 Data Types: A; D; E; F; P

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
10-004	LONGNOSE GAR	P		M		2	0.1	0.01	13	0.05	105.0
15-001	BOWFIN	P		C		12	0.7	0.07	482	2.03	649.1
20-003	GIZZARD SHAD	O		M		64	4.0	0.39	399	1.67	100.6
34-001	CENTRAL MUDMINNOW	I	T	C		507	31.4	3.13	136	0.57	4.3
37-001	GRASS PICKEREL	P	P	M		3	0.1	0.02	1	0.02	23.3
37-003	NORTHERN PIKE	P		M	F	105	6.5	0.65	1466	6.15	225.2
40-016	WHITE SUCKER	O	T	S	W	826	51.2	5.09	3299	13.84	64.4
40-018	SPOTTED SUCKER	I		S	R	181	11.2	1.12	2001	8.39	178.3
43-001	COMMON CARP	O	T	M	G	206	12.8	1.27	6801	28.52	532.5
43-002	GOLDFISH	O	T	M	G	1	0.0	0.01	0	0.01	30.0
43-003	GOLDEN SHINER	I	T	M	N	212	13.1	1.31	145	0.61	11.0
43-004	HORNYHEAD CHUB	I	I	N	N	356	22.1	2.19	224	0.94	10.1
43-013	CREEK CHUB	G	T	N	N	1232	23.4	7.59	320	4.38	13.6
43-032	SPOTFIN SHINER	I		M	N	884	54.8	5.45	57	0.24	1.0
43-034	SAND SHINER	I	M	M	N	109	6.8	0.67	10	0.04	1.5
43-042	FATHEAD MINNOW	O	T	C	N	117	2.2	0.72	1	0.03	0.8
43-043	BLUNTNOSE MINNOW	O	T	C	N	1880	116.6	11.59	136	0.57	1.1
43-044	CENTRAL STONEROLLER	H		N	N	430	26.7	2.65	224	0.94	8.4
43-117	CARMINE SHINER	I	I	S	N	5	0.3	0.03	0	0.00	3.0
47-002	CHANNEL CATFISH			C	F	76	4.7	0.47	1264	5.30	268.3
47-004	YELLOW BULLHEAD	I	T	C		626	38.8	3.86	1106	4.64	28.5
47-006	BLACK BULLHEAD	I	P	C		297	18.4	1.83	567	2.38	30.8
47-008	STONECAT MADTOM	I	I	C		12	0.7	0.07	14	0.06	19.8
47-013	TADPOLE MADTOM	I		C		5	0.3	0.03	1	0.01	4.2
54-002	BLACKSTRIPE TOPMINNOW	I		M		1765	109.4	10.88	76	0.32	0.7
68-001	PIRATE PERCH	I		C		23	1.4	0.14	9	0.04	6.4
70-001	BROOK SILVERSIDE	I	M	M		7	0.1	0.04	0	0.01	3.1
74-006	YELLOW BASS	P	P	M		13	0.3	0.08	1	0.03	7.6
77-002	BLACK CRAPPIE	I		C	S	50	3.1	0.31	147	0.62	47.6
77-003	ROCK BASS	C		C	S	250	15.5	1.54	390	1.64	25.1
77-004	SMALLMOUTH BASS	C	M	C	F	6	0.4	0.04	47	0.20	126.6
77-006	LARGEMOUTH BASS	C		C	F	935	58.0	5.76	819	3.44	14.1
77-007	WARMOUTH SUNFISH	C		C	S	11	0.7	0.07	31	0.13	46.3
77-008	GREEN SUNFISH	I	T	C	S	2209	137.0	13.62	1217	5.11	8.8
77-009	BLUEGILL SUNFISH	I	P	C	S	1869	115.9	11.52	923	3.87	7.9
77-010	ORANGESPOTTED SUNFISH	I		C	S	26	0.5	0.16	2	0.03	4.8
77-013	PUMPKINSEED SUNFISH	I	P	C	S	261	16.2	1.61	268	1.12	16.5
77-015	GREEN SF X BLUEGILL SF					57	3.5	0.35	66	0.28	18.8
77-016	GREEN SF X PUMPKINSEED					1	0.0	0.01	0	0.01	20.0

Appendix B-2: Midwest Biodiversity Institute
Fish Species List - Grand Totals

Rivers: *Bull Creek; Seavey Drainage Ditch; DesPlaines River; Aptakisic Creek; Hastings Creek; Buffalo Creek; Bull's Brook; Forest Lake Drain; Indian Creek; Kildeer Creek; Newport Drainage Ditch; Stoneroller Creek*

Years: 2016

Number of Samples: 70 Data Sources: 99 Data Types: A; D; E; F; P

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
77-998	GREEN SF X HYBRID					6	0.4	0.04	9	0.04	26.6
80-001	SAUGER	P		S	F	1	0.1	0.01	74	0.31	1200.0
80-002	WALLEYE	P		S	F	2	0.1	0.01	170	0.71	1375.0
80-003	YELLOW PERCH			M		115	7.1	0.71	97	0.41	13.6
80-005	BLACKSIDE DARTER	I		S	D	123	7.6	0.76	36	0.15	4.7
80-014	JOHNNY DARTER	I		C	D	313	19.4	1.93	30	0.13	1.5
80-024	FANTAIL DARTER	I		C	D	33	0.6	0.20	0	0.01	1.0
99-999	NO FISH					0	0.0	0.00	0	0.00	*****.*

No Species: 47 **Nat. Species:** 42 **Hybrids:** 3 **Total Counted:** 16224 **Total Rel. Wt. :** 23101

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-1 River: 95-051 Bull Creek RM: 0.50 Date: 09/29/2016

Time Fished: 3200 Distance: 0.150 Drainge (sq mi): 11.6 Depth: 0

Location: Hwy 21 Lat: 42.31322 Long: -87.96208

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		20	40.0	3.05	202	0.55	5.0
37-003	NORTHERN PIKE	P		M	F	2	4.0	0.31	1060	2.91	265.0
40-016	WHITE SUCKER	O	T	S	W	21	42.0	3.21	6116	16.79	145.6
40-018	SPOTTED SUCKER	I		S	R	3	6.0	0.46	300	0.82	50.0
43-001	COMMON CARP	O	T	M	G	2	4.0	0.31	8880	24.38	2220.0
43-004	HORNYHEAD CHUB	I	I	N	N	89	178.0	13.59	1194	3.28	6.7
43-013	CREEK CHUB	G	T	N	N	2	4.0	0.31	480	1.32	120.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	19	38.0	2.90	104	0.29	2.7
43-044	CENTRAL STONEROLLER	H		N	N	38	76.0	5.80	568	1.56	7.4
47-004	YELLOW BULLHEAD	I	T	C		19	38.0	2.90	900	2.47	23.6
47-006	BLACK BULLHEAD	I	P	C		29	58.0	4.43	2120	5.82	36.5
54-002	BLACKSTRIPE TOPMINNOW	I		M		27	54.0	4.12	52	0.14	0.9
77-002	BLACK CRAPPIE	I		C	S	1	2.0	0.15	6	0.02	3.0
77-003	ROCK BASS	C		C	S	1	2.0	0.15	10	0.03	5.0
77-006	LARGEMOUTH BASS	C		C	F	8	16.0	1.22	400	1.10	25.0
77-007	WARMOUTH SUNFISH	C		C	S	1	2.0	0.15	10	0.03	5.0
77-008	GREEN SUNFISH	I	T	C	S	156	312.0	23.82	5320	14.61	17.0
77-009	BLUEGILL SUNFISH	I	P	C	S	153	306.0	23.36	6900	18.95	22.5
77-013	PUMPKINSEED SUNFISH	I	P	C	S	15	30.0	2.29	880	2.42	29.3
77-015	GREEN SF X BLUEGILL SF					22	44.0	3.36	820	2.25	18.6
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	0.61	44	0.12	5.5
80-014	JOHNNY DARTER	I		C	D	2	4.0	0.31	12	0.03	3.0
80-024	FANTAIL DARTER	I		C	D	21	42.0	3.21	40	0.11	0.9

No Species: 22 **Nat. Species:** 21 **Hybrids:** 1 **Total Counted:** 655 **Total Rel. Wt. :** 36418

IBI: 42.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-2 River: 95-051 Bull Creek RM: 1.00 Date: 09/14/2016

Time Fished: 1346 Distance: 0.150 Drainge (sq mi): 8.4 Depth: 0

Location: Route 137 Lat: 42.30750 Long: -87.96869

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		2	4.0	0.84	30	1.28	7.5
40-016	WHITE SUCKER	O	T	S	W	4	8.0	1.68	30	1.28	3.7
43-013	CREEK CHUB	G	T	N	N	94	188.0	39.50	1460	62.13	7.7
43-043	BLUNTNOSE MINNOW	O	T	C	N	21	42.0	8.82	60	2.55	1.4
43-044	CENTRAL STONEROLLER	H		N	N	75	150.0	31.51	600	25.53	4.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		7	14.0	2.94	20	0.85	1.4
77-006	LARGEMOUTH BASS	C		C	F	7	14.0	2.94	90	3.83	6.4
80-014	JOHNNY DARTER	I		C	D	28	56.0	11.76	60	2.55	1.0

No Species: 8 **Nat. Species:** 8 **Hybrids:** 0 **Total Counted:** 238 **Total Rel. Wt. :** 2350

IBI: 26.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-5 River: 95-051 Bull Creek RM: 4.70 Date: 09/20/2016

Time Fished: 520 Distance: 0.140 Drainge (sq mi): 1.3 Depth: 0

Location: Adj. University Drive Lat: 42.27935 Long: -88.00281

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-003	GOLDEN SHINER	I	T	M	N	2	4.3	2.99	75	12.07	17.5
77-006	LARGEMOUTH BASS	C		C	F	11	23.6	16.42	160	25.86	6.8
77-008	GREEN SUNFISH	I	T	C	S	1	2.1	1.49	32	5.17	15.0
77-009	BLUEGILL SUNFISH	I	P	C	S	52	111.4	77.61	289	46.55	2.6
77-015	GREEN SF X BLUEGILL SF					1	2.1	1.49	64	10.34	30.0

No Species: 4 **Nat. Species:** 4 **Hybrids:** 1 **Total Counted:** 67 **Total Rel. Wt. :** 621

IBI: 38.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-6 River: 95-051 Bull Creek RM: 5.95 Date: 09/12/2016

Time Fished: 873 Distance: 0.150 Drainge (sq mi): 2.4 Depth: 0

Location: Hazelnut Xing Lat: 42.28814 Long: -88.02150

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
99-999	NO FISH					0	0.0	***.**	0	0.00	*****.*

No Species: 0 **Nat. Species:** 1 **Hybrids:** 0 **Total Counted:** 0 **Total Rel. Wt. :** 0

IBI: 12.0 **Mlwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-8 River: 95-390 Seavey Drainage Ditch RM: 0.45 Date: 10/05/2016

Time Fished: 1400 Distance: 0.150 Drainge (sq mi): 9.7 Depth: 0

Location: Vernon Hills GC - hole number 3 Lat: 42.21546 Long: -87.96697

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		24	48.0	8.73	280	7.86	5.8
40-016	WHITE SUCKER	O	T	S	W	41	82.0	14.91	1650	46.32	20.1
43-001	COMMON CARP	O	T	M	G	1	2.0	0.36	60	1.68	30.0
43-004	HORNYHEAD CHUB	I	I	N	N	2	4.0	0.73	14	0.39	3.5
43-013	CREEK CHUB	G	T	N	N	4	8.0	1.45	190	5.33	23.7
43-043	BLUNTNOSE MINNOW	O	T	C	N	10	20.0	3.64	44	1.24	2.2
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	0.73	40	1.12	10.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		92	184.0	33.45	192	5.39	1.0
77-006	LARGEMOUTH BASS	C		C	F	68	136.0	24.73	660	18.53	4.8
77-008	GREEN SUNFISH	I	T	C	S	19	38.0	6.91	340	9.55	8.9
77-009	BLUEGILL SUNFISH	I	P	C	S	4	8.0	1.45	48	1.35	6.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	2	4.0	0.73	20	0.56	5.0
80-014	JOHNNY DARTER	I		C	D	6	12.0	2.18	24	0.67	2.0

No Species: 13 **Nat. Species:** 12 **Hybrids:** 0 **Total Counted:** 275 **Total Rel. Wt. :** 3562

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-3 River: 95-390 Seavey Drainage Ditch RM: 3.66 Date: 09/14/2016

Time Fished: 892 Distance: 0.150 Drainge (sq mi): 5.0 Depth: 0

Location: Gregg's Parkway Lat: 42.26345 Long: -87.96553

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-043	BLUNTNOSE MINNOW	O	T	C	N	11	22.0	17.19	30	2.04	1.3
77-006	LARGEMOUTH BASS	C		C	F	13	26.0	20.31	670	45.58	25.7
77-007	WARMOUTH SUNFISH	C		C	S	1	2.0	1.56	70	4.76	35.0
77-008	GREEN SUNFISH	I	T	C	S	10	20.0	15.63	140	9.52	7.0
77-009	BLUEGILL SUNFISH	I	P	C	S	29	58.0	45.31	560	38.10	9.6

No Species: 5 **Nat. Species:** 5 **Hybrids:** 0 **Total Counted:** 64 **Total Rel. Wt. :** 1470

IBI: 28.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-1 River: 95-656 DesPlaines River RM: 71.70 Date: 10/05/2016

Time Fished: 1454 Distance: 0.500 Drainge (sq mi): 358.6 Depth: 0

Location: Palantine Frontage Rd. (Willow Road) Lat: 42.11368 Long: -87.88073

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		1	2.0	0.36	100	0.11	50.0
37-003	NORTHERN PIKE	P		M	F	5	10.0	1.81	7400	8.34	740.0
40-016	WHITE SUCKER	O	T	S	W	29	58.0	10.47	35200	39.68	606.9
40-018	SPOTTED SUCKER	I		S	R	4	8.0	1.44	3440	3.88	430.0
43-001	COMMON CARP	O	T	M	G	8	16.0	2.89	25200	28.41	1575.0
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	0.72	40	0.05	10.0
43-004	HORNYHEAD CHUB	I	I	N	N	91	182.0	32.85	3340	3.77	18.3
43-032	SPOTFIN SHINER	I		M	N	10	20.0	3.61	60	0.07	3.0
43-034	SAND SHINER	I	M	M	N	2	4.0	0.72	20	0.02	5.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	58	116.0	20.94	388	0.44	3.3
43-117	CARMINE SHINER	I	I	S	N	5	10.0	1.81	38	0.04	3.8
47-002	CHANNEL CATFISH			C	F	5	10.0	1.81	7600	8.57	760.0
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	0.72	740	0.83	185.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		11	22.0	3.97	40	0.05	1.8
77-002	BLACK CRAPPIE	I		C	S	2	4.0	0.72	860	0.97	215.0
77-003	ROCK BASS	C		C	S	17	34.0	6.14	2610	2.94	76.7
77-006	LARGEMOUTH BASS	C		C	F	4	8.0	1.44	720	0.81	90.0
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	0.72	110	0.12	27.5
77-009	BLUEGILL SUNFISH	I	P	C	S	13	26.0	4.69	740	0.83	28.4
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	1.44	44	0.05	5.5
80-014	JOHNNY DARTER	I		C	D	2	4.0	0.72	16	0.02	4.0

No Species: 21 **Nat. Species:** 20 **Hybrids:** 0 **Total Counted:** 277 **Total Rel. Wt. :** 88706

IBI: 32.0 **MIwb:** 8.5

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-2 River: 95-656 DesPlaines River RM: 75.40 Date: 09/30/2016

Time Fished: 2568 Distance: 0.500 Drainge (sq mi): 315.8 Depth: 0

Location: US DEERFIELD RD. Lat: 42.16622 Long: -87.91339

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
10-004	LONGNOSE GAR	P		M		1	2.0	0.21	140	0.07	70.0
37-003	NORTHERN PIKE	P		M	F	4	8.0	0.83	8220	4.34	1027.5
40-016	WHITE SUCKER	O	T	S	W	23	46.0	4.76	33840	17.88	735.6
40-018	SPOTTED SUCKER	I		S	R	10	20.0	2.07	7724	4.08	386.2
43-001	COMMON CARP	O	T	M	G	18	36.0	3.73	118600	62.66	3294.4
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	0.41	40	0.02	10.0
43-004	HORNYHEAD CHUB	I	I	N	N	13	26.0	2.69	700	0.37	26.9
43-032	SPOTFIN SHINER	I		M	N	86	172.0	17.81	640	0.34	3.7
43-034	SAND SHINER	I	M	M	N	14	28.0	2.90	84	0.04	3.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	89	178.0	18.43	674	0.36	3.7
47-002	CHANNEL CATFISH			C	F	5	10.0	1.04	260	0.14	26.0
47-004	YELLOW BULLHEAD	I	T	C		19	38.0	3.93	2860	1.51	75.2
47-006	BLACK BULLHEAD	I	P	C		1	2.0	0.21	340	0.18	170.0
47-013	TADPOLE MADTOM	I		C		1	2.0	0.21	20	0.01	10.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		16	32.0	3.31	44	0.02	1.3
77-003	ROCK BASS	C		C	S	60	120.0	12.42	7750	4.09	64.5
77-004	SMALLMOUTH BASS	C	M	C	F	3	6.0	0.62	180	0.10	30.0
77-006	LARGEMOUTH BASS	C		C	F	43	86.0	8.90	2880	1.52	33.4
77-007	WARMOUTH SUNFISH	C		C	S	2	4.0	0.41	240	0.13	60.0
77-008	GREEN SUNFISH	I	T	C	S	13	26.0	2.69	560	0.30	21.5
77-009	BLUEGILL SUNFISH	I	P	C	S	49	98.0	10.14	2800	1.48	28.5
77-015	GREEN SF X BLUEGILL SF					2	4.0	0.41	540	0.29	135.0
80-005	BLACKSIDE DARTER	I		S	D	6	12.0	1.24	120	0.06	10.0
80-014	JOHNNY DARTER	I		C	D	3	6.0	0.62	20	0.01	3.3

No Species: 23 **Nat. Species:** 22 **Hybrids:** 1 **Total Counted:** 483 **Total Rel. Wt. :** 189276

IBI: 34.0 **MIwb:** 8.8

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-3 River: 95-656 DesPlaines River RM: 76.70 Date: 09/30/2016

Time Fished: 2547 Distance: 0.500 Drainge (sq mi): 314.6 Depth: 0

Location: Deerfield Rd. Lat: 42.16760 Long: -87.91340

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
77-009	BLUEGILL SUNFISH	I	P	C	S	12	24.0	100.00	380	100.00	15.8

No Species: 1 **Nat. Species:** 1 **Hybrids:** 0 **Total Counted:** 12 **Total Rel. Wt. :** 380

IBI: 12.0 **MIwb:** 1.6

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-3 River: 95-656 DesPlaines River RM: 76.70 Date: 09/30/2016

Time Fished: 2547 Distance: 0.500 Drainge (sq mi): 314.6 Depth: 0

Location: Deerfield Rd. Lat: 42.16760 Long: -87.91340

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		3	6.0	1.17	1220	0.81	203.3
37-003	NORTHERN PIKE	P		M	F	2	4.0	0.78	2300	1.53	575.0
40-016	WHITE SUCKER	O	T	S	W	12	24.0	4.67	20700	13.81	862.5
40-018	SPOTTED SUCKER	I		S	R	10	20.0	3.89	15640	10.44	782.0
43-001	COMMON CARP	O	T	M	G	15	30.0	5.84	95000	63.38	3166.6
43-032	SPOTFIN SHINER	I		M	N	68	136.0	26.46	450	0.30	3.3
43-034	SAND SHINER	I	M	M	N	6	12.0	2.33	40	0.03	3.3
43-043	BLUNTNOSE MINNOW	O	T	C	N	61	122.0	23.74	300	0.20	2.4
47-002	CHANNEL CATFISH			C	F	2	4.0	0.78	4860	3.24	1215.0
47-004	YELLOW BULLHEAD	I	T	C		12	24.0	4.67	3040	2.03	126.6
54-002	BLACKSTRIPE TOPMINNOW	I		M		5	10.0	1.95	40	0.03	4.0
77-002	BLACK CRAPPIE	I		C	S	1	2.0	0.39	620	0.41	310.0
77-003	ROCK BASS	C		C	S	9	18.0	3.50	1296	0.86	72.0
77-004	SMALLMOUTH BASS	C	M	C	F	2	4.0	0.78	1720	1.15	430.0
77-006	LARGEMOUTH BASS	C		C	F	27	54.0	10.51	2080	1.39	38.5
77-007	WARMOUTH SUNFISH	C		C	S	1	2.0	0.39	40	0.03	20.0
77-008	GREEN SUNFISH	I	T	C	S	12	24.0	4.67	380	0.25	15.8
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	2.0	0.39	60	0.04	30.0
80-005	BLACKSIDE DARTER	I		S	D	5	10.0	1.95	70	0.05	7.0
80-014	JOHNNY DARTER	I		C	D	3	6.0	1.17	24	0.02	4.0

No Species: 1 **Nat. Species:** 19 **Hybrids:** 0 **Total Counted:** 257 **Total Rel. Wt. :** 149880

IBI: 12.0 **MIwb:** 1.6

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-4 River: 95-656 DesPlaines River RM: 80.00 Date: 09/30/2016

Time Fished: 2320 Distance: 0.500 Drainge (sq mi): 273.2 Depth: 0

Location: Half Day Rd. Lat: 42.19867 Long: -87.91867

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		2	4.0	0.72	920	1.24	230.0
37-003	NORTHERN PIKE	P		M	F	3	6.0	1.08	2580	3.48	430.0
40-016	WHITE SUCKER	O	T	S	W	10	20.0	3.60	15200	20.51	760.0
40-018	SPOTTED SUCKER	I		S	R	3	6.0	1.08	3640	4.91	606.6
43-001	COMMON CARP	O	T	M	G	6	12.0	2.16	34800	46.96	2900.0
43-004	HORNYHEAD CHUB	I	I	N	N	6	12.0	2.16	60	0.08	5.0
43-032	SPOTFIN SHINER	I		M	N	6	12.0	2.16	40	0.05	3.3
43-043	BLUNTNOSE MINNOW	O	T	C	N	15	30.0	5.40	100	0.13	3.3
47-002	CHANNEL CATFISH			C	F	2	4.0	0.72	780	1.05	195.0
47-004	YELLOW BULLHEAD	I	T	C		16	32.0	5.76	1980	2.67	61.8
54-002	BLACKSTRIPE TOPMINNOW	I		M		67	134.0	24.10	160	0.22	1.1
77-002	BLACK CRAPPIE	I		C	S	4	8.0	1.44	1140	1.54	142.5
77-003	ROCK BASS	C		C	S	27	54.0	9.71	4400	5.94	81.4
77-006	LARGEMOUTH BASS	C		C	F	13	26.0	4.68	1910	2.58	73.4
77-008	GREEN SUNFISH	I	T	C	S	58	116.0	20.86	1280	1.73	11.0
77-009	BLUEGILL SUNFISH	I	P	C	S	19	38.0	6.83	1780	2.40	46.8
80-002	WALLEYE	P		S	F	1	2.0	0.36	3200	4.32	1600.0
80-005	BLACKSIDE DARTER	I		S	D	5	10.0	1.80	80	0.11	8.0
80-014	JOHNNY DARTER	I		C	D	15	30.0	5.40	60	0.08	2.0

No Species: 19 **Nat. Species:** 18 **Hybrids:** 0 **Total Counted:** 278 **Total Rel. Wt. :** 74110

IBI: 36.0 **MIwb:** 8.6

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-8 River: 95-656 DesPlaines River RM: 82.90 Date: 10/05/2016

Time Fished: 2448 Distance: 0.500 Drainge (sq mi): 268.9 Depth: 0

Location: Wright Woods Dam site - immediately ust. bike bridge Lat: 42.23116 Long: -87.93429

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
10-004	LONGNOSE GAR	P		M		1	2.0	0.30	280	0.16	140.0
20-003	GIZZARD SHAD	O		M		6	12.0	1.79	1580	0.88	131.6
37-003	NORTHERN PIKE	P		M	F	7	14.0	2.09	2980	1.66	212.8
40-016	WHITE SUCKER	O	T	S	W	21	42.0	6.27	30260	16.86	720.4
40-018	SPOTTED SUCKER	I		S	R	30	60.0	8.96	28480	15.87	474.6
43-001	COMMON CARP	O	T	M	G	20	40.0	5.97	96400	53.72	2410.0
43-003	GOLDEN SHINER	I	T	M	N	8	16.0	2.39	220	0.12	13.7
43-004	HORNYHEAD CHUB	I	I	N	N	1	2.0	0.30	80	0.04	40.0
43-032	SPOTFIN SHINER	I		M	N	14	28.0	4.18	130	0.07	4.6
43-043	BLUNTNOSE MINNOW	O	T	C	N	49	98.0	14.63	240	0.13	2.4
47-002	CHANNEL CATFISH			C	F	3	6.0	0.90	4200	2.34	700.0
47-004	YELLOW BULLHEAD	I	T	C		8	16.0	2.39	2400	1.34	150.0
47-006	BLACK BULLHEAD	I	P	C		7	14.0	2.09	1520	0.85	108.5
54-002	BLACKSTRIPE TOPMINNOW	I		M		16	32.0	4.78	64	0.04	2.0
77-002	BLACK CRAPPIE	I		C	S	2	4.0	0.60	560	0.31	140.0
77-003	ROCK BASS	C		C	S	16	32.0	4.78	1436	0.80	44.8
77-006	LARGEMOUTH BASS	C		C	F	25	50.0	7.46	920	0.51	18.4
77-007	WARMOUTH SUNFISH	C		C	S	4	8.0	1.19	360	0.20	45.0
77-008	GREEN SUNFISH	I	T	C	S	8	16.0	2.39	380	0.21	23.7
77-009	BLUEGILL SUNFISH	I	P	C	S	72	144.0	21.49	6428	3.58	44.6
77-013	PUMPKINSEED SUNFISH	I	P	C	S	8	16.0	2.39	464	0.26	29.0
80-005	BLACKSIDE DARTER	I		S	D	1	2.0	0.30	16	0.01	8.0
80-014	JOHNNY DARTER	I		C	D	8	16.0	2.39	48	0.03	3.0

No Species: 23 **Nat. Species:** 22 **Hybrids:** 0 **Total Counted:** 335 **Total Rel. Wt. :** 179446

IBI: 34.0 **MIwb:** 9.1

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-5 River: 95-656 DesPlaines River RM: 83.60 Date: 09/17/2016

Time Fished: 1709 Distance: 0.500 Drainge (sq mi): 268.0 Depth: 0

Location: Illinois Route 60 - Town Line Rd. Lat: 42.24030 Long: -87.93931

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
37-003	NORTHERN PIKE	P		M	F	2	4.0	2.56	110	0.36	27.5
40-016	WHITE SUCKER	O	T	S	W	5	10.0	6.41	3520	11.59	352.0
43-001	COMMON CARP	O	T	M	G	4	8.0	5.13	14500	47.73	1812.5
47-002	CHANNEL CATFISH			C	F	3	6.0	3.85	6800	22.38	1133.3
47-004	YELLOW BULLHEAD	I	T	C		7	14.0	8.97	1200	3.95	85.7
47-006	BLACK BULLHEAD	I	P	C		2	4.0	2.56	220	0.72	55.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		2	4.0	2.56	4	0.01	1.0
77-003	ROCK BASS	C		C	S	12	24.0	15.38	1150	3.79	47.9
77-006	LARGEMOUTH BASS	C		C	F	4	8.0	5.13	886	2.92	110.7
77-008	GREEN SUNFISH	I	T	C	S	21	42.0	26.92	720	2.37	17.1
77-009	BLUEGILL SUNFISH	I	P	C	S	12	24.0	15.38	850	2.80	35.4
77-013	PUMPKINSEED SUNFISH	I	P	C	S	3	6.0	3.85	300	0.99	50.0
77-015	GREEN SF X BLUEGILL SF					1	2.0	1.28	120	0.40	60.0

No Species: 12 **Nat. Species:** 11 **Hybrids:** 1 **Total Counted:** 78 **Total Rel. Wt. :** 30380

IBI: 32.0 **MIwb:** 7.1

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-7 River: 95-656 DesPlaines River RM: 84.60 Date: 10/05/2016

Time Fished: 2488 Distance: 0.500 Drainge (sq mi): 266.4 Depth: 0

Location: Hollister Dam site - adj. to Hollister Intl. Lat: 42.25085 Long: -87.93966

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		9	18.0	2.30	6680	5.86	371.1
37-003	NORTHERN PIKE	P		M	F	10	20.0	2.56	10620	9.31	531.0
40-016	WHITE SUCKER	O	T	S	W	6	12.0	1.53	5840	5.12	486.6
40-018	SPOTTED SUCKER	I		S	R	4	8.0	1.02	4200	3.68	525.0
43-001	COMMON CARP	O	T	M	G	13	26.0	3.32	67000	58.74	2576.9
43-003	GOLDEN SHINER	I	T	M	N	8	16.0	2.05	380	0.33	23.7
43-004	HORNYHEAD CHUB	I	I	N	N	12	24.0	3.07	540	0.47	22.5
43-032	SPOTFIN SHINER	I		M	N	75	150.0	19.18	332	0.29	2.2
43-034	SAND SHINER	I	M	M	N	82	164.0	20.97	248	0.22	1.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	45	90.0	11.51	184	0.16	2.0
47-002	CHANNEL CATFISH			C	F	1	2.0	0.26	2200	1.93	1100.0
47-004	YELLOW BULLHEAD	I	T	C		6	12.0	1.53	720	0.63	60.0
47-006	BLACK BULLHEAD	I	P	C		4	8.0	1.02	940	0.82	117.5
47-013	TADPOLE MADTOM	I		C		2	4.0	0.51	12	0.01	3.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		36	72.0	9.21	128	0.11	1.7
77-003	ROCK BASS	C		C	S	16	32.0	4.09	3620	3.17	113.1
77-004	SMALLMOUTH BASS	C	M	C	F	1	2.0	0.26	40	0.04	20.0
77-006	LARGEMOUTH BASS	C		C	F	31	62.0	7.93	3740	3.28	60.3
77-008	GREEN SUNFISH	I	T	C	S	4	8.0	1.02	320	0.28	40.0
77-009	BLUEGILL SUNFISH	I	P	C	S	15	30.0	3.84	1456	1.28	48.5
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	2.0	0.26	80	0.07	40.0
80-001	SAUGER	P		S	F	1	2.0	0.26	2400	2.10	1200.0
80-002	WALLEYE	P		S	F	1	2.0	0.26	2300	2.02	1150.0
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	1.02	52	0.05	6.5
80-014	JOHNNY DARTER	I		C	D	4	8.0	1.02	24	0.02	3.0

No Species: 25 **Nat. Species:** 24 **Hybrids:** 0 **Total Counted:** 391 **Total Rel. Wt. :** 114056

IBI: 38.0 **MIwb:** 9.3

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-16 River: 95-656 DesPlaines River RM: 90.60 Date: 09/17/2016

Time Fished: 1611 Distance: 0.500 Drainge (sq mi): 253.7 Depth: 0

Location: Dst. Buckley Rd. Lat: 42.30564 Long: -87.95442

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
37-003	NORTHERN PIKE	P		M	F	2	4.0	1.96	2440	9.37	610.0
40-016	WHITE SUCKER	O	T	S	W	7	14.0	6.86	6460	24.81	461.4
43-001	COMMON CARP	O	T	M	G	2	4.0	1.96	11020	42.32	2755.0
43-004	HORNYHEAD CHUB	I	I	N	N	42	84.0	41.18	1200	4.61	14.2
43-043	BLUNTNOSE MINNOW	O	T	C	N	4	8.0	3.92	16	0.06	2.0
47-004	YELLOW BULLHEAD	I	T	C		15	30.0	14.71	2420	9.29	80.6
47-006	BLACK BULLHEAD	I	P	C		1	2.0	0.98	180	0.69	90.0
47-008	STONECAT MADTOM	I	I	C		1	2.0	0.98	20	0.08	10.0
47-013	TADPOLE MADTOM	I		C		1	2.0	0.98	2	0.01	1.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		6	12.0	5.88	10	0.04	0.8
77-003	ROCK BASS	C		C	S	15	30.0	14.71	1480	5.68	49.3
77-006	LARGEMOUTH BASS	C		C	F	4	8.0	3.92	650	2.50	81.2
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	1.96	140	0.54	35.0

No Species: 13 **Nat. Species:** 12 **Hybrids:** 0 **Total Counted:** 102 **Total Rel. Wt. :** 26038

IBI: 34.0 **MIwb:** 6.9

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-1 River: 95-656 DesPlaines River RM: 94.20 Date: 09/29/2016

Time Fished: 2841 Distance: 0.500 Drainge (sq mi): 232.0 Depth: 0

Location: Hwy 120 Lat: 42.34366 Long: -87.94116

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		1	2.0	0.37	60	0.08	30.0
34-001	CENTRAL MUDMINNOW	I	T	C		2	4.0	0.73	40	0.05	10.0
37-003	NORTHERN PIKE	P		M	F	11	22.0	4.03	16760	22.10	761.8
40-016	WHITE SUCKER	O	T	S	W	13	26.0	4.76	13600	17.93	523.0
40-018	SPOTTED SUCKER	I		S	R	5	10.0	1.83	8420	11.10	842.0
43-001	COMMON CARP	O	T	M	G	2	4.0	0.73	13200	17.41	3300.0
43-003	GOLDEN SHINER	I	T	M	N	3	6.0	1.10	180	0.24	30.0
43-032	SPOTFIN SHINER	I		M	N	8	16.0	2.93	44	0.06	2.7
43-043	BLUNTNOSE MINNOW	O	T	C	N	31	62.0	11.36	276	0.36	4.4
43-044	CENTRAL STONEROLLER	H		N	N	1	2.0	0.37	16	0.02	8.0
47-002	CHANNEL CATFISH			C	F	2	4.0	0.73	5400	7.12	1350.0
47-004	YELLOW BULLHEAD	I	T	C		8	16.0	2.93	660	0.87	41.2
54-002	BLACKSTRIPE TOPMINNOW	I		M		20	40.0	7.33	68	0.09	1.7
77-003	ROCK BASS	C		C	S	32	64.0	11.72	7430	9.80	116.0
77-006	LARGEMOUTH BASS	C		C	F	65	130.0	23.81	5240	6.91	40.3
77-008	GREEN SUNFISH	I	T	C	S	3	6.0	1.10	340	0.45	56.6
77-009	BLUEGILL SUNFISH	I	P	C	S	48	96.0	17.58	3540	4.67	36.8
77-013	PUMPKINSEED SUNFISH	I	P	C	S	11	22.0	4.03	258	0.34	11.7
80-003	YELLOW PERCH			M		1	2.0	0.37	240	0.32	120.0
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	1.47	60	0.08	7.5
80-014	JOHNNY DARTER	I		C	D	2	4.0	0.73	8	0.01	2.0

No Species: 21 **Nat. Species:** 20 **Hybrids:** 0 **Total Counted:** 273 **Total Rel. Wt. :** 75840

IBI: 34.0 **MIwb:** 9.4

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-2 River: 95-656 DesPlaines River RM: 96.82 Date: 09/28/2016

Time Fished: 2673 Distance: 0.500 Drainge (sq mi): 225.3 Depth: 0

Location: McClure Ave Lat: 42.31906 Long: -87.91776

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		2	4.0	0.41	100	0.07	25.0
37-003	NORTHERN PIKE	P		M	F	11	22.0	2.27	7140	4.89	324.5
40-016	WHITE SUCKER	O	T	S	W	20	40.0	4.13	17320	11.85	433.0
40-018	SPOTTED SUCKER	I		S	R	17	34.0	3.51	10760	7.36	316.4
43-001	COMMON CARP	O	T	M	G	11	22.0	2.27	78620	53.81	3573.6
43-004	HORNYHEAD CHUB	I	I	N	N	19	38.0	3.93	1380	0.94	36.3
43-032	SPOTFIN SHINER	I		M	N	155	310.0	32.02	936	0.64	3.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	68	136.0	14.05	384	0.26	2.8
47-002	CHANNEL CATFISH			C	F	2	4.0	0.41	6100	4.17	1525.0
47-004	YELLOW BULLHEAD	I	T	C		6	12.0	1.24	1270	0.87	105.8
47-008	STONECAT MADTOM	I	I	C		1	2.0	0.21	80	0.05	40.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		10	20.0	2.07	36	0.02	1.8
77-002	BLACK CRAPPIE	I		C	S	3	6.0	0.62	420	0.29	70.0
77-003	ROCK BASS	C		C	S	19	38.0	3.93	3556	2.43	93.5
77-006	LARGEMOUTH BASS	C		C	F	49	98.0	10.12	10630	7.28	108.4
77-008	GREEN SUNFISH	I	T	C	S	20	40.0	4.13	1066	0.73	26.6
77-009	BLUEGILL SUNFISH	I	P	C	S	48	96.0	9.92	4810	3.29	50.1
77-013	PUMPKINSEED SUNFISH	I	P	C	S	17	34.0	3.51	1160	0.79	34.1
77-998	GREEN SF X HYBRID					3	6.0	0.62	320	0.22	53.3
80-005	BLACKSIDE DARTER	I		S	D	2	4.0	0.41	20	0.01	5.0
80-014	JOHNNY DARTER	I		C	D	1	2.0	0.21	4	0.00	2.0

No Species: 20 **Nat. Species:** 19 **Hybrids:** 1 **Total Counted:** 484 **Total Rel. Wt. :** 146112

IBI: 40.0 **MIwb:** 9.2

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-3 River: 95-656 DesPlaines River RM: 98.70 Date: 09/28/2016

Time Fished: 3322 Distance: 0.500 Drainge (sq mi): 220.2 Depth: 0

Location: Above Hwy 41 Lat: 42.38309 Long: -87.91471

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
15-001	BOWFIN	P		C		2	4.0	0.20	400	0.26	100.0
34-001	CENTRAL MUDMINNOW	I	T	C		1	2.0	0.10	24	0.02	12.0
37-003	NORTHERN PIKE	P		M	F	27	54.0	2.67	38840	25.32	719.2
40-016	WHITE SUCKER	O	T	S	W	3	6.0	0.30	2980	1.94	496.6
40-018	SPOTTED SUCKER	I		S	R	70	140.0	6.92	19960	13.01	142.5
43-001	COMMON CARP	O	T	M	G	8	16.0	0.79	54800	35.73	3425.0
43-003	GOLDEN SHINER	I	T	M	N	4	8.0	0.40	100	0.07	12.5
43-004	HORNYHEAD CHUB	I	I	N	N	4	8.0	0.40	210	0.14	26.2
43-032	SPOTFIN SHINER	I		M	N	116	232.0	11.46	526	0.34	2.2
43-043	BLUNTNOSE MINNOW	O	T	C	N	347	694.0	34.29	1280	0.83	1.8
47-002	CHANNEL CATFISH			C	F	2	4.0	0.20	7700	5.02	1925.0
47-004	YELLOW BULLHEAD	I	T	C		13	26.0	1.28	1612	1.05	62.0
47-006	BLACK BULLHEAD	I	P	C		3	6.0	0.30	600	0.39	100.0
47-008	STONECAT MADTOM	I	I	C		1	2.0	0.10	100	0.07	50.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		58	116.0	5.73	182	0.12	1.5
68-001	PIRATE PERCH	I		C		3	6.0	0.30	60	0.04	10.0
77-002	BLACK CRAPPIE	I		C	S	6	12.0	0.59	760	0.50	63.3
77-003	ROCK BASS	C		C	S	18	36.0	1.78	5820	3.79	161.6
77-006	LARGEMOUTH BASS	C		C	F	59	118.0	5.83	9240	6.02	78.3
77-008	GREEN SUNFISH	I	T	C	S	126	252.0	12.45	3580	2.33	14.2
77-009	BLUEGILL SUNFISH	I	P	C	S	67	134.0	6.62	1068	0.70	7.9
77-013	PUMPKINSEED SUNFISH	I	P	C	S	63	126.0	6.23	3310	2.16	26.2
77-998	GREEN SF X HYBRID					3	6.0	0.30	160	0.10	26.6
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	0.40	56	0.04	7.0
80-014	JOHNNY DARTER	I		C	D	4	8.0	0.40	22	0.01	2.7

No Species: 24 **Nat. Species:** 23 **Hybrids:** 1 **Total Counted:** 1012 **Total Rel. Wt. :** 153390

IBI: 36.0 **MIwb:** 9.7

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-4 River: 95-656 DesPlaines River RM: 102.90 Date: 09/15/2016

Time Fished: 1842 Distance: 0.500 Drainge (sq mi): 145.5 Depth: 0

Location: Wadsworth Road Lat: 42.42875 Long: -87.93027

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
15-001	BOWFIN	P		C		4	8.0	4.44	6700	13.12	837.5
20-003	GIZZARD SHAD	O		M		5	10.0	5.56	1700	3.33	170.0
37-003	NORTHERN PIKE	P		M	F	2	4.0	2.22	2600	5.09	650.0
40-016	WHITE SUCKER	O	T	S	W	3	6.0	3.33	4940	9.67	823.3
40-018	SPOTTED SUCKER	I		S	R	6	12.0	6.67	8200	16.05	683.3
43-001	COMMON CARP	O	T	M	G	7	14.0	7.78	23800	46.59	1700.0
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	2.22	70	0.14	17.5
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	2.22	540	1.06	135.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		32	64.0	35.56	80	0.16	1.2
77-006	LARGEMOUTH BASS	C		C	F	4	8.0	4.44	270	0.53	33.7
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	2.22	100	0.20	25.0
77-009	BLUEGILL SUNFISH	I	P	C	S	11	22.0	12.22	1020	2.00	46.3
77-013	PUMPKINSEED SUNFISH	I	P	C	S	10	20.0	11.11	1060	2.08	53.0

No Species: 13 **Nat. Species:** 12 **Hybrids:** 0 **Total Counted:** 90 **Total Rel. Wt. :** 51080

IBI: 32.0 **MIwb:** 7.8

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-5 River: 95-656 DesPlaines River RM: 106.60 Date: 09/15/2016

Time Fished: 1595 Distance: 0.500 Drainge (sq mi): 137.2 Depth: 0

Location: Hwy 173 Lat: 42.46505 Long: -87.94276

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
15-001	BOWFIN	P		C		6	12.0	8.22	12280	23.57	1023.3
37-003	NORTHERN PIKE	P		M	F	5	10.0	6.85	2200	4.22	220.0
40-018	SPOTTED SUCKER	I		S	R	2	4.0	2.74	2420	4.64	605.0
43-001	COMMON CARP	O	T	M	G	6	12.0	8.22	27980	53.69	2331.6
43-003	GOLDEN SHINER	I	T	M	N	4	8.0	5.48	90	0.17	11.2
47-002	CHANNEL CATFISH			C	F	1	2.0	1.37	3940	7.56	1970.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		13	26.0	17.81	30	0.06	1.1
77-002	BLACK CRAPPIE	I		C	S	2	4.0	2.74	100	0.19	25.0
77-006	LARGEMOUTH BASS	C		C	F	15	30.0	20.55	1360	2.61	45.3
77-007	WARMOUTH SUNFISH	C		C	S	1	2.0	1.37	230	0.44	115.0
77-009	BLUEGILL SUNFISH	I	P	C	S	8	16.0	10.96	1100	2.11	68.7
77-013	PUMPKINSEED SUNFISH	I	P	C	S	10	20.0	13.70	380	0.73	19.0

No Species: 12 **Nat. Species:** 11 **Hybrids:** 0 **Total Counted:** 73 **Total Rel. Wt. :** 52110

IBI: 36.0 **MIwb:** 7.6

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-6 River: 95-656 DesPlaines River RM: 109.30 Date: 09/15/2016

Time Fished: 2256 Distance: 0.500 Drainge (sq mi): 123.6 Depth: 0

Location: Russel Road Lat: 42.48905 Long: -87.92577

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-018	SPOTTED SUCKER	I		S	R	2	4.0	3.45	3100	29.58	775.0
43-001	COMMON CARP	O	T	M	G	1	2.0	1.72	5800	55.34	2900.0
43-003	GOLDEN SHINER	I	T	M	N	5	10.0	8.62	180	1.72	18.0
47-004	YELLOW BULLHEAD	I	T	C		3	6.0	5.17	660	6.30	110.0
47-006	BLACK BULLHEAD	I	P	C		1	2.0	1.72	260	2.48	130.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		32	64.0	55.17	60	0.57	0.9
68-001	PIRATE PERCH	I		C		2	4.0	3.45	40	0.38	10.0
77-002	BLACK CRAPPIE	I		C	S	1	2.0	1.72	40	0.38	20.0
77-006	LARGEMOUTH BASS	C		C	F	5	10.0	8.62	110	1.05	11.0
77-008	GREEN SUNFISH	I	T	C	S	1	2.0	1.72	10	0.10	5.0
77-009	BLUEGILL SUNFISH	I	P	C	S	1	2.0	1.72	20	0.19	10.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	4	8.0	6.90	200	1.91	25.0

No Species: 12 **Nat. Species:** 11 **Hybrids:** 0 **Total Counted:** 58 **Total Rel. Wt. :** 10480

IBI: 34.0 **MIwb:** 5.9

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 18-1 River: 95-701 Aptakisic Creek RM: 0.50 Date: 09/20/2016

Time Fished: 1374 Distance: 0.200 Drainge (sq mi): 5.5 Depth: 0

Location: Aspen Road Lat: 42.16349 Long: -87.92245

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	33	49.5	9.43	16860	46.71	340.6
40-018	SPOTTED SUCKER	I		S	R	4	6.0	1.14	4995	13.84	832.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	1	1.5	0.29	4	0.01	3.0
47-004	YELLOW BULLHEAD	I	T	C		22	33.0	6.29	1050	2.91	31.8
47-006	BLACK BULLHEAD	I	P	C		8	12.0	2.29	330	0.91	27.5
54-002	BLACKSTRIPE TOPMINNOW	I		M		6	9.0	1.71	15	0.04	1.6
77-006	LARGEMOUTH BASS	C		C	F	8	12.0	2.29	7314	20.26	609.5
77-008	GREEN SUNFISH	I	T	C	S	162	243.0	46.29	3675	10.18	15.1
77-009	BLUEGILL SUNFISH	I	P	C	S	98	147.0	28.00	1815	5.03	12.3
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	1.5	0.29	7	0.02	5.0
80-005	BLACKSIDE DARTER	I		S	D	2	3.0	0.57	22	0.06	7.5
80-014	JOHNNY DARTER	I		C	D	5	7.5	1.43	7	0.02	1.0

No Species: 12 **Nat. Species:** 12 **Hybrids:** 0 **Total Counted:** 350 **Total Rel. Wt. :** 36096

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 18-2 River: 95-701 Aptakisic Creek RM: 0.80 Date: 09/18/2016

Time Fished: 1381 Distance: 0.150 Drainge (sq mi): 4.9 Depth: 0

Location: Pekara Rd, West of Hwy. 21 Lat: 42.16468 Long: -87.92781

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		3	6.0	0.74	160	1.08	26.6
37-003	NORTHERN PIKE	P		M	F	1	2.0	0.25	240	1.62	120.0
40-016	WHITE SUCKER	O	T	S	W	89	178.0	21.81	4440	30.00	24.9
40-018	SPOTTED SUCKER	I		S	R	1	2.0	0.25	40	0.27	20.0
43-001	COMMON CARP	O	T	M	G	7	14.0	1.72	1160	7.84	82.8
43-003	GOLDEN SHINER	I	T	M	N	18	36.0	4.41	500	3.38	13.8
43-043	BLUNTNOSE MINNOW	O	T	C	N	100	200.0	24.51	270	1.82	1.3
47-002	CHANNEL CATFISH			C	F	1	2.0	0.25	80	0.54	40.0
47-004	YELLOW BULLHEAD	I	T	C		50	100.0	12.25	3680	24.86	36.8
47-006	BLACK BULLHEAD	I	P	C		29	58.0	7.11	2280	15.41	39.3
54-002	BLACKSTRIPE TOPMINNOW	I		M		9	18.0	2.21	20	0.14	1.1
77-002	BLACK CRAPPIE	I		C	S	2	4.0	0.49	30	0.20	7.5
77-006	LARGEMOUTH BASS	C		C	F	13	26.0	3.19	260	1.76	10.0
77-008	GREEN SUNFISH	I	T	C	S	39	78.0	9.56	1160	7.84	14.8
77-009	BLUEGILL SUNFISH	I	P	C	S	33	66.0	8.09	360	2.43	5.4
77-010	ORANGESPOTTED SUNFISH	I		C	S	6	12.0	1.47	80	0.54	6.6
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	2.0	0.25	10	0.07	5.0
80-005	BLACKSIDE DARTER	I		S	D	2	4.0	0.49	20	0.14	5.0
80-014	JOHNNY DARTER	I		C	D	4	8.0	0.98	10	0.07	1.2

No Species: 19 **Nat. Species:** 18 **Hybrids:** 0 **Total Counted:** 408 **Total Rel. Wt. :** 14800

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 18-3 River: 95-701 Aptakisic Creek RM: 4.30 Date: 09/08/2016

Time Fished: 1237 Distance: 0.150 Drainge (sq mi): 2.3 Depth: 0

Location: Copperwood Dr. bike xing Lat: 42.17702 Long: -87.95915

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	2.99	20	0.78	5.0
43-013	CREEK CHUB	G	T	N	N	12	24.0	17.91	1500	58.59	62.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	2	4.0	2.99	10	0.39	2.5
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	1.49	10	0.39	5.0
77-006	LARGEMOUTH BASS	C		C	F	25	50.0	37.31	470	18.36	9.4
77-008	GREEN SUNFISH	I	T	C	S	22	44.0	32.84	540	21.09	12.2
77-009	BLUEGILL SUNFISH	I	P	C	S	3	6.0	4.48	10	0.39	1.6

No Species: 7 **Nat. Species:** 7 **Hybrids:** 0 **Total Counted:** 67 **Total Rel. Wt. :** 2560

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 18-4 River: 95-701 Aptakisic Creek RM: 4.70 Date: 09/08/2016

Time Fished: 1172 Distance: 0.150 Drainge (sq mi): 1.0 Depth: 0

Location: N. Buffalo Grove Rd. (Twin Creeks Park) Lat: 42.18122 Long: -87.96678

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	5	10.0	16.13	630	70.00	63.0
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	3.23	10	1.11	5.0
77-006	LARGEMOUTH BASS	C		C	F	21	42.0	67.74	160	17.78	3.8
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	6.45	80	8.89	20.0
77-009	BLUEGILL SUNFISH	I	P	C	S	2	4.0	6.45	20	2.22	5.0

No Species: 5 **Nat. Species:** 5 **Hybrids:** 0 **Total Counted:** 31 **Total Rel. Wt. :** 900

IBI: 34.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-4 River: 95-702 Hastings Creek RM: 1.68 Date: 09/16/2016

Time Fished: 908 Distance: 0.150 Drainge (sq mi): 6.8 Depth: 0

Location: Ust. Miller Rd. Lat: 42.44793 Long: -88.02477

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		13	26.0	40.63	240	14.29	9.2
43-001	COMMON CARP	O	T	M	G	1	2.0	3.13	60	3.57	30.0
47-004	YELLOW BULLHEAD	I	T	C		17	34.0	53.13	1340	79.76	39.4
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	3.13	40	2.38	20.0

No Species: 4 **Nat. Species:** 3 **Hybrids:** 0 **Total Counted:** 32 **Total Rel. Wt. :** 1680

IBI: 28.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-5 River: 95-702 Hastings Creek RM: 3.12 Date: 09/16/2016

Time Fished: 727 Distance: 0.150 Drainge (sq mi): 3.9 Depth: 0

Location: Hastings Creek @ Grass Lake Rd Lat: 42.43070 Long: -88.03447

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		2	4.0	40.00	30	9.49	7.5
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	40.00	280	88.61	70.0
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	20.00	6	1.90	3.0

No Species: 3 **Nat. Species:** 3 **Hybrids:** 0 **Total Counted:** 5 **Total Rel. Wt. :** 316

IBI: 12.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 17-1 River: 95-703 Buffalo Creek RM: 0.75 Date: 09/20/2016

Time Fished: 1294 Distance: 0.200 Drainge (sq mi): 29.1 Depth: 0

Location: Plum Creek Drive (Wolf Dr) Lat: 42.12671 Long: -87.90835

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	16	24.0	4.31	345	6.83	14.3
43-001	COMMON CARP	O	T	M	G	1	1.5	0.27	90	1.78	60.0
43-004	HORNYHEAD CHUB	I	I	N	N	6	9.0	1.62	225	4.45	25.0
43-013	CREEK CHUB	G	T	N	N	29	43.5	7.82	780	15.44	17.9
43-032	SPOTFIN SHINER	I		M	N	2	3.0	0.54	15	0.30	5.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	21	31.5	5.66	180	3.56	5.7
43-044	CENTRAL STONEROLLER	H		N	N	3	4.5	0.81	60	1.19	13.3
47-002	CHANNEL CATFISH			C	F	1	1.5	0.27	4	0.09	3.0
47-004	YELLOW BULLHEAD	I	T	C		51	76.5	13.75	1005	19.89	13.1
54-002	BLACKSTRIPE TOPMINNOW	I		M		26	39.0	7.01	45	0.89	1.1
77-006	LARGEMOUTH BASS	C		C	F	15	22.5	4.04	165	3.27	7.3
77-008	GREEN SUNFISH	I	T	C	S	165	247.5	44.47	1980	39.19	8.0
77-009	BLUEGILL SUNFISH	I	P	C	S	19	28.5	5.12	60	1.19	2.1
77-010	ORANGESPOTTED SUNFISH	I		C	S	1	1.5	0.27	7	0.15	5.0
77-015	GREEN SF X BLUEGILL SF					3	4.5	0.81	52	1.04	11.6
80-005	BLACKSIDE DARTER	I		S	D	1	1.5	0.27	7	0.15	5.0
80-014	JOHNNY DARTER	I		C	D	11	16.5	2.96	30	0.59	1.8

No Species: 16 **Nat. Species:** 15 **Hybrids:** 1 **Total Counted:** 371 **Total Rel. Wt. :** 5052

IBI: 28.0 **MIwb:** 6.1

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 17-2 River: 95-703 Buffalo Creek RM: 6.10 Date: 09/18/2016

Time Fished: 1783 Distance: 0.150 Drainge (sq mi): 22.1 Depth: 0

Location: Lake Cook Rd @ Farington Ditch Lat: 42.15216 Long: -87.96938

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	8	16.0	2.96	980	10.41	61.2
43-013	CREEK CHUB	G	T	N	N	57	114.0	21.11	2240	23.80	19.6
43-043	BLUNTNOSE MINNOW	O	T	C	N	25	50.0	9.26	200	2.12	4.0
43-044	CENTRAL STONEROLLER	H		N	N	23	46.0	8.52	1040	11.05	22.6
47-004	YELLOW BULLHEAD	I	T	C		41	82.0	15.19	2520	26.77	30.7
47-008	STONECAT MADTOM	I	I	C		4	8.0	1.48	100	1.06	12.5
54-002	BLACKSTRIPE TOPMINNOW	I		M		8	16.0	2.96	16	0.17	1.0
77-006	LARGEMOUTH BASS	C		C	F	18	36.0	6.67	280	2.97	7.7
77-008	GREEN SUNFISH	I	T	C	S	50	100.0	18.52	1530	16.26	15.3
77-009	BLUEGILL SUNFISH	I	P	C	S	32	64.0	11.85	420	4.46	6.5
77-015	GREEN SF X BLUEGILL SF					2	4.0	0.74	80	0.85	20.0
80-014	JOHNNY DARTER	I		C	D	2	4.0	0.74	6	0.06	1.5

No Species: 11 **Nat. Species:** 11 **Hybrids:** 1 **Total Counted:** 270 **Total Rel. Wt. :** 9412

IBI: 28.0 **MIwb:** 6.9

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 17-3 River: 95-703 Buffalo Creek RM: 7.70 Date: 09/18/2016

Time Fished: 1253 Distance: 0.150 Drainge (sq mi): 9.6 Depth: 0

Location: Checker Road Lat: 42.15960 Long: -87.99056

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	59	118.0	24.38	1940	36.19	16.4
43-043	BLUNTNOSE MINNOW	O	T	C	N	10	20.0	4.13	20	0.37	1.0
47-004	YELLOW BULLHEAD	I	T	C		17	34.0	7.02	740	13.81	21.7
54-002	BLACKSTRIPE TOPMINNOW	I		M		26	52.0	10.74	60	1.12	1.1
77-006	LARGEMOUTH BASS	C		C	F	2	4.0	0.83	100	1.87	25.0
77-008	GREEN SUNFISH	I	T	C	S	110	220.0	45.45	2100	39.18	9.5
77-009	BLUEGILL SUNFISH	I	P	C	S	16	32.0	6.61	340	6.34	10.6
77-015	GREEN SF X BLUEGILL SF					2	4.0	0.83	60	1.12	15.0

No Species: 7 **Nat. Species:** 7 **Hybrids:** 1 **Total Counted:** 242 **Total Rel. Wt. :** 5360

IBI: 24.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 17-5 River: 95-703 Buffalo Creek RM: 14.00 Date: 09/09/2016

Time Fished: 1321 Distance: 0.150 Drainge (sq mi): 1.3 Depth: 0

Location: Quentin Rd. Lat: 42.18589 Long: -88.05815

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	4	8.0	1.72	140	2.18	17.5
43-013	CREEK CHUB	G	T	N	N	115	230.0	49.57	3520	54.91	15.3
47-006	BLACK BULLHEAD	I	P	C		6	12.0	2.59	680	10.61	56.6
77-006	LARGEMOUTH BASS	C		C	F	2	4.0	0.86	170	2.65	42.5
77-008	GREEN SUNFISH	I	T	C	S	75	150.0	32.33	1440	22.46	9.6
77-009	BLUEGILL SUNFISH	I	P	C	S	30	60.0	12.93	460	7.18	7.6

No Species: 6 **Nat. Species:** 6 **Hybrids:** 0 **Total Counted:** 232 **Total Rel. Wt. :** 6410

IBI: 26.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-7 River: 95-704 Bull's Brook RM: 0.25 Date: 09/12/2016

Time Fished: 1356 Distance: 0.150 Drainge (sq mi): 2.6 Depth: 0

Location: N. Milwaukee Ave. (Route 21) Lat: 42.31829 Long: -87.96195

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		22	44.0	13.10	180	3.48	4.0
37-003	NORTHERN PIKE	P		M	F	1	2.0	0.60	100	1.94	50.0
40-016	WHITE SUCKER	O	T	S	W	4	8.0	2.38	300	5.81	37.5
43-004	HORNYHEAD CHUB	I	I	N	N	5	10.0	2.98	240	4.65	24.0
43-013	CREEK CHUB	G	T	N	N	70	140.0	41.67	3590	69.49	25.6
43-044	CENTRAL STONEROLLER	H		N	N	2	4.0	1.19	80	1.55	20.0
77-008	GREEN SUNFISH	I	T	C	S	50	100.0	29.76	640	12.39	6.4
80-014	JOHNNY DARTER	I		C	D	2	4.0	1.19	6	0.12	1.5
80-024	FANTAIL DARTER	I		C	D	12	24.0	7.14	30	0.58	1.2

No Species: 9 **Nat. Species:** 9 **Hybrids:** 0 **Total Counted:** 168 **Total Rel. Wt. :** 5166

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-15 River: 95-704 Bull's Brook RM: 1.95 Date: 09/10/2016

Time Fished: 1271 Distance: 0.150 Drainge (sq mi): 1.9 Depth: 0

Location: Almond Rd. Lat: 42.32568 Long: -87.97676

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		53	106.0	23.04	400	16.74	3.7
43-013	CREEK CHUB	G	T	N	N	131	262.0	56.96	1460	61.09	5.5
43-044	CENTRAL STONEROLLER	H		N	N	11	22.0	4.78	150	6.28	6.8
77-008	GREEN SUNFISH	I	T	C	S	35	70.0	15.22	380	15.90	5.4

No Species: 4 **Nat. Species:** 4 **Hybrids:** 0 **Total Counted:** 230 **Total Rel. Wt. :** 2390

IBI: 24.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-11 River: 95-705 Forest Lake Drain RM: 0.83 Date: 09/09/2016

Time Fished: 417 Distance: 0.150 Drainge (sq mi): 1.7 Depth: 0

Location: Hawthorne Grove Rd. Lat: 42.21958 Long: -88.02570

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
77-006	LARGEMOUTH BASS	C		C	F	2	4.0	66.67	20	33.33	5.0
77-008	GREEN SUNFISH	I	T	C	S	1	2.0	33.33	40	66.67	20.0

No Species: 2 **Nat. Species:** 2 **Hybrids:** 0 **Total Counted:** 3 **Total Rel. Wt. :** 60

IBI: 12.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-1 River: 95-706 Indian Creek RM: 0.17 Date: 09/20/2016

Time Fished: 1462 Distance: 0.200 Drainge (sq mi): 36.4 Depth: 0

Location: Marriot Inn parking lot - adj. Cranes Landing GC Lat: 42.19810 Long: -87.92312

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	14	21.0	5.96	6300	50.35	300.0
43-004	HORNYHEAD CHUB	I	I	N	N	12	18.0	5.11	450	3.60	25.0
43-013	CREEK CHUB	G	T	N	N	7	10.5	2.98	240	1.92	22.8
43-044	CENTRAL STONEROLLER	H		N	N	1	1.5	0.43	60	0.48	40.0
47-004	YELLOW BULLHEAD	I	T	C		25	37.5	10.64	1957	15.64	52.2
54-002	BLACKSTRIPE TOPMINNOW	I		M		3	4.5	1.28	6	0.05	1.3
77-003	ROCK BASS	C		C	S	8	12.0	3.40	330	2.64	27.5
77-006	LARGEMOUTH BASS	C		C	F	2	3.0	0.85	12	0.10	4.0
77-008	GREEN SUNFISH	I	T	C	S	149	223.5	63.40	2880	23.02	12.8
77-009	BLUEGILL SUNFISH	I	P	C	S	3	4.5	1.28	202	1.62	45.0
80-005	BLACKSIDE DARTER	I		S	D	11	16.5	4.68	75	0.60	4.5

No Species: 11 **Nat. Species:** 11 **Hybrids:** 0 **Total Counted:** 235 **Total Rel. Wt. :** 12513

IBI: 30.0 **MIwb:** 4.9

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-2 River: 95-706 Indian Creek RM: 2.41 Date: 09/20/2016

Time Fished: 1737 Distance: 0.200 Drainge (sq mi): 35.0 Depth: 0

Location: Sullivan Woods Preserve, North of Creekview Dr. Lat: 42.20629 Long: -87.96123

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		1	1.5	0.31	7	0.06	5.0
40-016	WHITE SUCKER	O	T	S	W	43	64.5	13.48	7740	65.77	120.0
43-004	HORNYHEAD CHUB	I	I	N	N	19	28.5	5.96	540	4.59	18.9
43-013	CREEK CHUB	G	T	N	N	23	34.5	7.21	1245	10.58	36.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	58	87.0	18.18	195	1.66	2.2
43-044	CENTRAL STONEROLLER	H		N	N	51	76.5	15.99	915	7.78	11.9
47-004	YELLOW BULLHEAD	I	T	C		1	1.5	0.31	60	0.51	40.0
47-006	BLACK BULLHEAD	I	P	C		3	4.5	0.94	450	3.82	100.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		23	34.5	7.21	30	0.25	0.8
77-006	LARGEMOUTH BASS	C		C	F	6	9.0	1.88	30	0.25	3.3
77-008	GREEN SUNFISH	I	T	C	S	21	31.5	6.58	390	3.31	12.3
77-009	BLUEGILL SUNFISH	I	P	C	S	7	10.5	2.19	30	0.25	2.8
80-005	BLACKSIDE DARTER	I		S	D	8	12.0	2.51	45	0.38	3.7
80-014	JOHNNY DARTER	I		C	D	55	82.5	17.24	90	0.76	1.0

No Species: 14 **Nat. Species:** 14 **Hybrids:** 0 **Total Counted:** 319 **Total Rel. Wt. :** 11767

IBI: 28.0 **MIwb:** 6.7

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-5 River: 95-706 Indian Creek RM: 5.40 Date: 09/18/2016

Time Fished: 1496 Distance: 0.150 Drainge (sq mi): 17.2 Depth: 0

Location: Oakwood Rd. Lat: 42.21088 Long: -87.98597

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		1	2.0	0.53	6	0.05	3.0
37-003	NORTHERN PIKE	P		M	F	1	2.0	0.53	2400	18.81	1200.0
40-016	WHITE SUCKER	O	T	S	W	17	34.0	8.95	5440	42.65	160.0
43-003	GOLDEN SHINER	I	T	M	N	1	2.0	0.53	20	0.16	10.0
43-013	CREEK CHUB	G	T	N	N	7	14.0	3.68	500	3.92	35.7
43-043	BLUNTNOSE MINNOW	O	T	C	N	27	54.0	14.21	100	0.78	1.8
43-044	CENTRAL STONEROLLER	H		N	N	5	10.0	2.63	160	1.25	16.0
47-004	YELLOW BULLHEAD	I	T	C		4	8.0	2.11	420	3.29	52.5
47-006	BLACK BULLHEAD	I	P	C		10	20.0	5.26	1960	15.37	98.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		26	52.0	13.68	100	0.78	1.9
77-006	LARGEMOUTH BASS	C		C	F	20	40.0	10.53	280	2.20	7.0
77-008	GREEN SUNFISH	I	T	C	S	45	90.0	23.68	1240	9.72	13.7
77-009	BLUEGILL SUNFISH	I	P	C	S	4	8.0	2.11	30	0.24	3.7
80-005	BLACKSIDE DARTER	I		S	D	4	8.0	2.11	40	0.31	5.0
80-014	JOHNNY DARTER	I		C	D	18	36.0	9.47	60	0.47	1.6

No Species: 15 **Nat. Species:** 15 **Hybrids:** 0 **Total Counted:** 190 **Total Rel. Wt. :** 12756

IBI: 28.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-6 River: 95-706 Indian Creek RM: 9.83 Date: 09/14/2016

Time Fished: 1321 Distance: 0.150 Drainge (sq mi): 3.7 Depth: 0

Location: Washitay Ave Lat: 42.23809 Long: -88.02246

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	87	174.0	63.97	1170	77.38	6.7
43-043	BLUNTNOSE MINNOW	O	T	C	N	8	16.0	5.88	60	3.97	3.7
43-044	CENTRAL STONEROLLER	H		N	N	7	14.0	5.15	100	6.61	7.1
54-002	BLACKSTRIPE TOPMINNOW	I		M		1	2.0	0.74	2	0.13	1.0
77-008	GREEN SUNFISH	I	T	C	S	3	6.0	2.21	80	5.29	13.3
80-014	JOHNNY DARTER	I		C	D	30	60.0	22.06	100	6.61	1.6

No Species: 6 **Nat. Species:** 6 **Hybrids:** 0 **Total Counted:** 136 **Total Rel. Wt. :** 1512

IBI: 26.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-9 River: 95-706 Indian Creek RM: 10.83 Date: 09/14/2016

Time Fished: 853 Distance: 0.150 Drainge (sq mi): 2.6 Depth: 0

Location: N. Midlothian Rd. Lat: 42.24454 Long: -88.03565

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	5	10.0	11.90	260	45.30	26.0
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	2.38	10	1.74	5.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		13	26.0	30.95	40	6.97	1.5
77-006	LARGEMOUTH BASS	C		C	F	21	42.0	50.00	260	45.30	6.1
77-009	BLUEGILL SUNFISH	I	P	C	S	2	4.0	4.76	4	0.70	1.0

No Species: 5 **Nat. Species:** 5 **Hybrids:** 0 **Total Counted:** 42 **Total Rel. Wt. :** 574

IBI: 36.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-4 River: 95-707 Kildeer Creek RM: 0.17 Date: 09/14/2016

Time Fished: 1196 Distance: 0.150 Drainge (sq mi): 6.8 Depth: 0

Location: Port Clinton Rd at Kildeer Creek Lat: 42.20552 Long: -87.97467

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	4	8.0	2.67	1280	6.16	160.0
43-001	COMMON CARP	O	T	M	G	6	12.0	4.00	12140	58.40	1011.6
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	1.33	10	0.05	2.5
43-043	BLUNTNOSE MINNOW	O	T	C	N	9	18.0	6.00	30	0.14	1.6
47-004	YELLOW BULLHEAD	I	T	C		34	68.0	22.67	3720	17.90	54.7
47-006	BLACK BULLHEAD	I	P	C		9	18.0	6.00	1280	6.16	71.1
54-002	BLACKSTRIPE TOPMINNOW	I		M		32	64.0	21.33	90	0.43	1.4
77-006	LARGEMOUTH BASS	C		C	F	6	12.0	4.00	978	4.71	81.5
77-008	GREEN SUNFISH	I	T	C	S	22	44.0	14.67	800	3.85	18.1
77-009	BLUEGILL SUNFISH	I	P	C	S	13	26.0	8.67	360	1.73	13.8
77-010	ORANGESPOTTED SUNFISH	I		C	S	9	18.0	6.00	50	0.24	2.7
77-015	GREEN SF X BLUEGILL SF					2	4.0	1.33	30	0.14	7.5
80-005	BLACKSIDE DARTER	I		S	D	2	4.0	1.33	18	0.09	4.5

No Species: 12 **Nat. Species:** 11 **Hybrids:** 1 **Total Counted:** 150 **Total Rel. Wt. :** 20786

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-13 River: 95-707 Kildeer Creek RM: 2.21 Date: 09/08/2016

Time Fished: 1154 Distance: 0.150 Drainge (sq mi): 5.0 Depth: 0

Location: Willowbrook Rd. S. of Half Day Rd. Lat: 42.19357 Long: -88.00230

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		8	16.0	4.60	300	7.97	18.7
34-001	CENTRAL MUDMINNOW	I	T	C		3	6.0	1.72	50	1.33	8.3
40-016	WHITE SUCKER	O	T	S	W	5	10.0	2.87	700	18.61	70.0
43-001	COMMON CARP	O	T	M	G	3	6.0	1.72	300	7.97	50.0
43-003	GOLDEN SHINER	I	T	M	N	2	4.0	1.15	30	0.80	7.5
43-013	CREEK CHUB	G	T	N	N	9	18.0	5.17	580	15.42	32.2
43-042	FATHEAD MINNOW	O	T	C	N	1	2.0	0.57	4	0.11	2.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	14	28.0	8.05	60	1.59	2.1
47-006	BLACK BULLHEAD	I	P	C		2	4.0	1.15	100	2.66	25.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		30	60.0	17.24	70	1.86	1.1
77-006	LARGEMOUTH BASS	C		C	F	26	52.0	14.94	190	5.05	3.6
77-008	GREEN SUNFISH	I	T	C	S	26	52.0	14.94	560	14.89	10.7
77-009	BLUEGILL SUNFISH	I	P	C	S	43	86.0	24.71	800	21.27	9.3
77-015	GREEN SF X BLUEGILL SF					2	4.0	1.15	18	0.48	4.5

No Species: 13 **Nat. Species:** 12 **Hybrids:** 1 **Total Counted:** 174 **Total Rel. Wt. :** 3762

IBI: 36.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-7 River: 95-707 Kildeer Creek RM: 4.60 Date: 09/08/2016

Time Fished: 1292 Distance: 0.150 Drainge (sq mi): 2.8 Depth: 0

Location: Salem Lake Drive S. of Rt 22 Lat: 42.19297 Long: -88.02905

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	4	8.0	3.77	40	3.91	5.0
43-001	COMMON CARP	O	T	M	G	13	26.0	12.26	490	47.85	18.8
43-003	GOLDEN SHINER	I	T	M	N	12	24.0	11.32	44	4.30	1.8
43-013	CREEK CHUB	G	T	N	N	12	24.0	11.32	200	19.53	8.3
43-042	FATHEAD MINNOW	O	T	C	N	7	14.0	6.60	30	2.93	2.1
43-043	BLUNTNOSE MINNOW	O	T	C	N	26	52.0	24.53	80	7.81	1.5
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	1.89	20	1.95	5.0
47-006	BLACK BULLHEAD	I	P	C		2	4.0	1.89	20	1.95	5.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		8	16.0	7.55	20	1.95	1.2
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	0.94	10	0.98	5.0
77-008	GREEN SUNFISH	I	T	C	S	15	30.0	14.15	40	3.91	1.3
77-009	BLUEGILL SUNFISH	I	P	C	S	4	8.0	3.77	30	2.93	3.7

No Species: 12 **Nat. Species:** 11 **Hybrids:** 0 **Total Counted:** 106 **Total Rel. Wt. :** 1024

IBI: 22.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-12 River: 95-707 Kildeer Creek RM: 5.20 Date: 09/09/2016

Time Fished: 1233 Distance: 0.150 Drainge (sq mi): 2.0 Depth: 0

Location: IL Rt. 22 Lat: 42.19621 Long: -88.03919

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-001	COMMON CARP	O	T	M	G	2	4.0	0.35	40	1.59	10.0
43-003	GOLDEN SHINER	I	T	M	N	9	18.0	1.57	40	1.59	2.2
43-042	FATHEAD MINNOW	O	T	C	N	1	2.0	0.17	4	0.16	2.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	5	10.0	0.87	16	0.63	1.6
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.17	10	0.40	5.0
47-006	BLACK BULLHEAD	I	P	C		2	4.0	0.35	60	2.38	15.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		366	732.0	63.87	550	21.83	0.7
77-002	BLACK CRAPPIE	I		C	S	2	4.0	0.35	20	0.79	5.0
77-006	LARGEMOUTH BASS	C		C	F	7	14.0	1.22	100	3.97	7.1
77-008	GREEN SUNFISH	I	T	C	S	117	234.0	20.42	880	34.92	3.7
77-009	BLUEGILL SUNFISH	I	P	C	S	61	122.0	10.65	800	31.75	6.5

No Species: 11 **Nat. Species:** 10 **Hybrids:** 0 **Total Counted:** 573 **Total Rel. Wt. :** 2520

IBI: 42.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 12-1 River: 95-708 Newport Drainage Ditch RM: 0.70 Date: 09/19/2016

Time Fished: 1030 Distance: 0.150 Drainge (sq mi): 7.3 Depth: 0

Location: Newport Drainage Ditch @ Kilbourne Ave Lat: 42.48342 Long: -87.91252

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		97	194.0	23.89	740	13.13	3.8
37-003	NORTHERN PIKE	P		M	F	1	2.0	0.25	100	1.77	50.0
40-016	WHITE SUCKER	O	T	S	W	32	64.0	7.88	2660	47.21	41.5
43-013	CREEK CHUB	G	T	N	N	11	22.0	2.71	180	3.19	8.1
43-042	FATHEAD MINNOW	O	T	C	N	2	4.0	0.49	14	0.25	3.5
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.25	40	0.71	20.0
47-006	BLACK BULLHEAD	I	P	C		2	4.0	0.49	200	3.55	50.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		189	378.0	46.55	460	8.16	1.2
68-001	PIRATE PERCH	I		C		17	34.0	4.19	190	3.37	5.5
77-006	LARGEMOUTH BASS	C		C	F	14	28.0	3.45	370	6.57	13.2
77-008	GREEN SUNFISH	I	T	C	S	16	32.0	3.94	440	7.81	13.7
77-009	BLUEGILL SUNFISH	I	P	C	S	5	10.0	1.23	100	1.77	10.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	3	6.0	0.74	90	1.60	15.0
80-005	BLACKSIDE DARTER	I		S	D	2	4.0	0.49	20	0.35	5.0
80-014	JOHNNY DARTER	I		C	D	14	28.0	3.45	30	0.53	1.0

No Species: 15 **Nat. Species:** 15 **Hybrids:** 0 **Total Counted:** 406 **Total Rel. Wt. :** 5634

IBI: 38.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 12-2 River: 95-708 Newport Drainage Ditch RM: 3.03 Date: 09/12/2016

Time Fished: 1291 Distance: 0.150 Drainge (sq mi): 2.8 Depth: 0

Location: 21st Street Lat: 42.45755 Long: -87.89753

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		186	372.0	65.72	1470	21.47	3.9
43-042	FATHEAD MINNOW	O	T	C	N	1	2.0	0.35	8	0.12	4.0
47-006	BLACK BULLHEAD	I	P	C		76	152.0	26.86	4740	69.22	31.1
54-002	BLACKSTRIPE TOPMINNOW	I		M		1	2.0	0.35	4	0.06	2.0
68-001	PIRATE PERCH	I		C		1	2.0	0.35	6	0.09	3.0
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	0.35	20	0.29	10.0
77-008	GREEN SUNFISH	I	T	C	S	15	30.0	5.30	500	7.30	16.6
77-009	BLUEGILL SUNFISH	I	P	C	S	2	4.0	0.71	100	1.46	25.0

No Species: 8 **Nat. Species:** 8 **Hybrids:** 0 **Total Counted:** 283 **Total Rel. Wt. :** 6848

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-9 River: 95-709 Stoneroller Creek RM: 0.42 Date: 09/19/2016

Time Fished: 1110 Distance: 0.150 Drainge (sq mi): 4.0 Depth: 0

Location: Stone Roller @ Lake Carina Lat: 42.35286 Long: -87.93661

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
37-003	NORTHERN PIKE	P		M	F	2	4.0	0.48	480	5.30	120.0
40-016	WHITE SUCKER	O	T	S	W	12	24.0	2.85	1880	20.75	78.3
43-004	HORNYHEAD CHUB	I	I	N	N	8	16.0	1.90	200	2.21	12.5
43-013	CREEK CHUB	G	T	N	N	43	86.0	10.21	400	4.42	4.6
43-043	BLUNTNOSE MINNOW	O	T	C	N	115	230.0	27.32	460	5.08	2.0
43-044	CENTRAL STONEROLLER	H		N	N	121	242.0	28.74	1760	19.43	7.2
47-004	YELLOW BULLHEAD	I	T	C		7	14.0	1.66	340	3.75	24.2
47-006	BLACK BULLHEAD	I	P	C		1	2.0	0.24	20	0.22	10.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		20	40.0	4.75	60	0.66	1.5
77-006	LARGEMOUTH BASS	C		C	F	3	6.0	0.71	80	0.88	13.3
77-008	GREEN SUNFISH	I	T	C	S	4	8.0	0.95	1960	21.63	245.0
77-009	BLUEGILL SUNFISH	I	P	C	S	43	86.0	10.21	920	10.15	10.7
77-013	PUMPKINSEED SUNFISH	I	P	C	S	14	28.0	3.33	300	3.31	10.7
77-015	GREEN SF X BLUEGILL SF					1	2.0	0.24	30	0.33	15.0
77-016	GREEN SF X PUMPKINSEED					1	2.0	0.24	40	0.44	20.0
80-005	BLACKSIDE DARTER	I		S	D	8	16.0	1.90	80	0.88	5.0
80-014	JOHNNY DARTER	I		C	D	18	36.0	4.28	50	0.55	1.3

No Species: 15 **Nat. Species:** 15 **Hybrids:** 2 **Total Counted:** 421 **Total Rel. Wt. :** 9060

IBI: 34.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-10 River: 95-710 Suburban Country Club Tributary RM: 2.00 Date: 09/15/2016

Time Fished: 1408 Distance: 0.150 Drainge (sq mi): 4.0 Depth: 0

Location: Suburban Country Club Trib @ Shirley Dr Lat: 42.40414 Long: -87.90607

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		1	2.0	0.21	16	0.38	8.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		412	824.0	85.83	1100	26.27	1.3
77-006	LARGEMOUTH BASS	C		C	F	13	26.0	2.71	340	8.12	13.0
77-007	WARMOUTH SUNFISH	C		C	S	1	2.0	0.21	70	1.67	35.0
77-008	GREEN SUNFISH	I	T	C	S	13	26.0	2.71	400	9.55	15.3
77-009	BLUEGILL SUNFISH	I	P	C	S	21	42.0	4.38	1260	30.09	30.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	18	36.0	3.75	1000	23.88	27.7
80-014	JOHNNY DARTER	I		C	D	1	2.0	0.21	2	0.05	1.0

No Species: 8 **Nat. Species:** 8 **Hybrids:** 0 **Total Counted:** 480 **Total Rel. Wt. :** 4188

IBI: 38.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-12 River: 95-710 Suburban Country Club Tributary RM: 2.75 Date: 09/12/2016

Time Fished: 632 Distance: 0.150 Drainge (sq mi): 2.3 Depth: 0

Location: E. of Northwestern Ave. Lat: 42.40234 Long: -87.89422

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		6	12.0	31.58	70	49.30	5.8
54-002	BLACKSTRIPE TOPMINNOW	I		M		8	16.0	42.11	22	15.49	1.3
77-006	LARGEMOUTH BASS	C		C	F	5	10.0	26.32	50	35.21	5.0

No Species: 3 **Nat. Species:** 3 **Hybrids:** 0 **Total Counted:** 19 **Total Rel. Wt. :** 142

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-11 River: 95-711 Slocum Conrners Creek RM: 1.36 Date: 09/12/2016

Time Fished: 1213 Distance: 0.150 Drainge (sq mi): 2.3 Depth: 0

Location: N. Mill Creek Rd.; E. of I-94 Lat: 42.44400 Long: -87.95279

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		1	2.0	0.20	16	0.40	8.0
40-016	WHITE SUCKER	O	T	S	W	73	146.0	14.90	980	24.28	6.7
43-013	CREEK CHUB	G	T	N	N	136	272.0	27.76	1640	40.63	6.0
43-042	FATHEAD MINNOW	O	T	C	N	101	202.0	20.61	390	9.66	1.9
47-004	YELLOW BULLHEAD	I	T	C		3	6.0	0.61	130	3.22	21.6
54-002	BLACKSTRIPE TOPMINNOW	I		M		4	8.0	0.82	8	0.20	1.0
77-006	LARGEMOUTH BASS	C		C	F	3	6.0	0.61	12	0.30	2.0
77-008	GREEN SUNFISH	I	T	C	S	115	230.0	23.47	660	16.35	2.8
80-005	BLACKSIDE DARTER	I		S	D	17	34.0	3.47	100	2.48	2.9
80-014	JOHNNY DARTER	I		C	D	37	74.0	7.55	100	2.48	1.3

No Species: 10 **Nat. Species:** 10 **Hybrids:** 0 **Total Counted:** 490 **Total Rel. Wt. :** 4036

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 18-5 River: 95-712 Unnamed Trib to Aptakisic Creek RM: 0.05 Date: 09/08/2016

Time Fished: 600 Distance: 0.120 Drainge (sq mi): 0.9 Depth: 0

Location: Dst. Aptakapsic Rd.; W of N. Buffalo Grove Rd., Twins Cr Prk. Lat: 42.18153 Long: -87.96576

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	2	5.0	15.38	100	29.63	20.0
47-004	YELLOW BULLHEAD	I	T	C		1	2.5	7.69	25	7.41	10.0
77-006	LARGEMOUTH BASS	C		C	F	6	15.0	46.15	125	37.04	8.3
77-008	GREEN SUNFISH	I	T	C	S	3	7.5	23.08	62	18.52	8.3
77-009	BLUEGILL SUNFISH	I	P	C	S	1	2.5	7.69	25	7.41	10.0

No Species: 5 **Nat. Species:** 5 **Hybrids:** 0 **Total Counted:** 13 **Total Rel. Wt. :** 337

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 17-4 River: 95-713 Buffalo Creek Tributary RM: 0.68 Date: 09/18/2016

Time Fished: 1008 Distance: 0.150 Drainge (sq mi): 8.5 Depth: 0

Location: Lake Cook Rd @ Buffalo Creek Trib Lat: 42.15345 Long: -87.99661

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	30	60.0	12.99	7830	47.06	130.5
43-013	CREEK CHUB	G	T	N	N	37	74.0	16.02	3120	18.75	42.1
47-004	YELLOW BULLHEAD	I	T	C		4	8.0	1.73	300	1.80	37.5
47-006	BLACK BULLHEAD	I	P	C		3	6.0	1.30	370	2.22	61.6
77-006	LARGEMOUTH BASS	C		C	F	10	20.0	4.33	190	1.14	9.5
77-008	GREEN SUNFISH	I	T	C	S	70	140.0	30.30	2300	13.82	16.4
77-009	BLUEGILL SUNFISH	I	P	C	S	76	152.0	32.90	2520	15.14	16.5
77-015	GREEN SF X BLUEGILL SF					1	2.0	0.43	10	0.06	5.0

No Species: 7 **Nat. Species:** 7 **Hybrids:** 1 **Total Counted:** 231 **Total Rel. Wt. :** 16640

IBI: 26.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-17 River: 95-714 Unnamed Trib to DesPlaines River RM: 0.13 Date: 09/10/2016

Time Fished: 617 Distance: 0.150 Drainge (sq mi): 0.8 Depth: 0

Location: Behind pump station off of Sprucewood Lane Lat: 42.29960 Long: -87.94086

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
99-999	NO FISH					0	0.0	***.**	0	0.00	*****.*

No Species: 0 **Nat. Species:** 1 **Hybrids:** 0 **Total Counted:** 0 **Total Rel. Wt. :** 0

IBI: 12.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-6 River: 95-715 Unnamed Trib to N. Mill Creek RM: 0.04 Date: 09/10/2016

Time Fished: 590 Distance: 0.150 Drainge (sq mi): 0.9 Depth: 0

Location: Lat: 42.42182 Long: -88.00422

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-013	CREEK CHUB	G	T	N	N	28	56.0	100.00	90	100.00	1.6

No Species: 1 **Nat. Species:** 1 **Hybrids:** 0 **Total Counted:** 28 **Total Rel. Wt. :** 90

IBI: 20.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-13 River: 95-716 Unnamed Trib - Greenleaf Creek RM: 0.40 Date: 09/10/2016

Time Fished: 1492 Distance: 0.150 Drainge (sq mi): 1.0 Depth: 0

Location: Swanson Trigg Conservation Area - (Kenwood Av) 42.3700 Lat: 42.36544 Long: -87.90234 -87.9085

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	3	6.0	4.55	120	6.34	20.0
43-013	CREEK CHUB	G	T	N	N	52	104.0	78.79	1700	89.76	16.3
43-042	FATHEAD MINNOW	O	T	C	N	1	2.0	1.52	4	0.21	2.0
47-006	BLACK BULLHEAD	I	P	C		5	10.0	7.58	40	2.11	4.0
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	1.52	10	0.53	5.0
77-008	GREEN SUNFISH	I	T	C	S	4	8.0	6.06	20	1.06	2.5

No Species: 6 **Nat. Species:** 6 **Hybrids:** 0 **Total Counted:** 66 **Total Rel. Wt. :** 1894

IBI: 26.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 15-10 River: 95-717 W. Branch Indian Creek RM: 0.80 Date: 09/09/2016

Time Fished: 812 Distance: 0.150 Drainge (sq mi): 2.2 Depth: 0

Location: Gilmer Rd. Lat: 42.23022 Long: -88.03770

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
77-006	LARGEMOUTH BASS	C		C	F	3	6.0	15.79	20	28.57	3.3
77-009	BLUEGILL SUNFISH	I	P	C	S	16	32.0	84.21	50	71.43	1.5

No Species: 2 **Nat. Species:** 2 **Hybrids:** 0 **Total Counted:** 19 **Total Rel. Wt. :** 70

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-10 River: 95-718 Trib to Werhane Lake Drain RM: 0.10 Date: 09/09/2016

Time Fished: 445 Distance: 0.150 Drainge (sq mi): 0.2 Depth: 0

Location: St. Marys Rd. Lat: 42.25083 Long: -87.92496

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
77-006	LARGEMOUTH BASS	C		C	F	16	32.0	88.89	150	83.33	4.6
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	11.11	30	16.67	7.5

No Species: 2 **Nat. Species:** 2 **Hybrids:** 0 **Total Counted:** 18 **Total Rel. Wt. :** 180

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-3 River: 95-719 West Branch Bull Creek RM: 1.60 Date: 09/10/2016

Time Fished: 1127 Distance: 0.150 Drainge (sq mi): 7.0 Depth: 0

Location: N. Countyryside Drive Lat: 42.31016 Long: -87.99059

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		8	16.0	3.33	100	1.53	6.2
40-016	WHITE SUCKER	O	T	S	W	3	6.0	1.25	550	8.41	91.6
43-013	CREEK CHUB	G	T	N	N	74	148.0	30.83	3400	51.99	22.9
43-043	BLUNTNOSE MINNOW	O	T	C	N	1	2.0	0.42	6	0.09	3.0
43-044	CENTRAL STONEROLLER	H		N	N	89	178.0	37.08	1440	22.02	8.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		1	2.0	0.42	4	0.06	2.0
77-006	LARGEMOUTH BASS	C		C	F	6	12.0	2.50	50	0.76	4.1
77-008	GREEN SUNFISH	I	T	C	S	39	78.0	16.25	830	12.69	10.6
77-009	BLUEGILL SUNFISH	I	P	C	S	9	18.0	3.75	20	0.31	1.1
77-015	GREEN SF X BLUEGILL SF					10	20.0	4.17	140	2.14	7.0

No Species: 9 **Nat. Species:** 9 **Hybrids:** 1 **Total Counted:** 240 **Total Rel. Wt. :** 6540

IBI: 32.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 14-4 River: 95-719 West Branch Bull Creek RM: 2.54 Date: 09/14/2016

Time Fished: 1445 Distance: 0.150 Drainge (sq mi): 5.1 Depth: 0

Location: Northwind Blvd. - access 1600 behind warehouse Lat: 42.30296 Long: -87.99974

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-001	COMMON CARP	O	T	M	G	2	4.0	0.92	2940	33.37	735.0
43-003	GOLDEN SHINER	I	T	M	N	16	32.0	7.34	370	4.20	11.5
43-013	CREEK CHUB	G	T	N	N	8	16.0	3.67	500	5.68	31.2
43-044	CENTRAL STONEROLLER	H		N	N	2	4.0	0.92	40	0.45	10.0
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.46	50	0.57	25.0
47-006	BLACK BULLHEAD	I	P	C		31	62.0	14.22	2300	26.11	37.1
77-002	BLACK CRAPPIE	I		C	S	1	2.0	0.46	30	0.34	15.0
77-006	LARGEMOUTH BASS	C		C	F	1	2.0	0.46	60	0.68	30.0
77-008	GREEN SUNFISH	I	T	C	S	73	146.0	33.49	1940	22.02	13.2
77-009	BLUEGILL SUNFISH	I	P	C	S	79	158.0	36.24	480	5.45	3.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	2.0	0.46	50	0.57	25.0
77-015	GREEN SF X BLUEGILL SF					3	6.0	1.38	50	0.57	8.3

No Species: 11 **Nat. Species:** 10 **Hybrids:** 1 **Total Counted:** 218 **Total Rel. Wt. :** 8810

IBI: 34.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-8 River: 95-720 West Fork Belvidere Rd. Trib RM: 0.15 Date: 09/17/2016

Time Fished: 1108 Distance: 0.150 Drainge (sq mi): 3.7 Depth: 0

Location: Belvidere Rd Tributary @ Highway 21 and 120 Lat: 42.34226 Long: -87.94312

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
37-003	NORTHERN PIKE	P		M	F	2	4.0	1.63	300	5.45	75.0
40-016	WHITE SUCKER	O	T	S	W	11	22.0	8.94	1730	31.45	78.6
43-004	HORNYHEAD CHUB	I	I	N	N	5	10.0	4.07	220	4.00	22.0
43-013	CREEK CHUB	G	T	N	N	19	38.0	15.45	1260	22.91	33.1
47-004	YELLOW BULLHEAD	I	T	C		2	4.0	1.63	40	0.73	10.0
47-006	BLACK BULLHEAD	I	P	C		3	6.0	2.44	250	4.55	41.6
54-002	BLACKSTRIPE TOPMINNOW	I		M		24	48.0	19.51	50	0.91	1.0
77-006	LARGEMOUTH BASS	C		C	F	3	6.0	2.44	100	1.82	16.6
77-008	GREEN SUNFISH	I	T	C	S	20	40.0	16.26	880	16.00	22.0
77-009	BLUEGILL SUNFISH	I	P	C	S	8	16.0	6.50	280	5.09	17.5
77-013	PUMPKINSEED SUNFISH	I	P	C	S	11	22.0	8.94	200	3.64	9.0
77-015	GREEN SF X BLUEGILL SF					3	6.0	2.44	130	2.36	21.6
80-005	BLACKSIDE DARTER	I		S	D	1	2.0	0.81	20	0.36	10.0
80-014	JOHNNY DARTER	I		C	D	11	22.0	8.94	40	0.73	1.8

No Species: 13 **Nat. Species:** 13 **Hybrids:** 1 **Total Counted:** 123 **Total Rel. Wt. :** 5500

IBI: 36.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 13-14 River: 95-720 West Fork Belvidere Rd. Trib RM: 0.21 Date: 09/10/2016

Time Fished: 1337 Distance: 0.150 Drainge (sq mi): 2.3 Depth: 0

Location: Leonard Dr. Lat: 42.34737 Long: -87.95589

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	63	126.0	36.00	3980	49.61	31.5
43-002	GOLDFISH	O	T	M	G	1	2.0	0.57	60	0.75	30.0
43-013	CREEK CHUB	G	T	N	N	32	64.0	18.29	1760	21.94	27.5
43-042	FATHEAD MINNOW	O	T	C	N	2	4.0	1.14	12	0.15	3.0
47-006	BLACK BULLHEAD	I	P	C		1	2.0	0.57	170	2.12	85.0
77-006	LARGEMOUTH BASS	C		C	F	9	18.0	5.14	60	0.75	3.3
77-008	GREEN SUNFISH	I	T	C	S	65	130.0	37.14	1900	23.68	14.6
77-009	BLUEGILL SUNFISH	I	P	C	S	1	2.0	0.57	20	0.25	10.0
77-015	GREEN SF X BLUEGILL SF					1	2.0	0.57	60	0.75	30.0

No Species: 8 **Nat. Species:** 7 **Hybrids:** 1 **Total Counted:** 175 **Total Rel. Wt. :** 8022

IBI: 22.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 16-9 River: 95-721 Unnamed Trib to Des Plaines River RM: 0.40 Date: 09/13/2016

Time Fished: 944 Distance: 0.150 Drainge (sq mi): 1.1 Depth: 0

Location: Timberleaf Lane Lat: 42.17148 Long: -87.90768

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		5	10.0	7.69	30	1.37	3.0
40-016	WHITE SUCKER	O	T	S	W	7	14.0	10.77	700	31.96	50.0
43-013	CREEK CHUB	G	T	N	N	9	18.0	13.85	820	37.44	45.5
47-006	BLACK BULLHEAD	I	P	C		9	18.0	13.85	260	11.87	14.4
54-002	BLACKSTRIPE TOPMINNOW	I		M		5	10.0	7.69	10	0.46	1.0
77-006	LARGEMOUTH BASS	C		C	F	27	54.0	41.54	280	12.79	5.1
77-008	GREEN SUNFISH	I	T	C	S	2	4.0	3.08	80	3.65	20.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	1	2.0	1.54	10	0.46	5.0

No Species: 8 **Nat. Species:** 8 **Hybrids:** 0 **Total Counted:** 65 **Total Rel. Wt. :** 2190

IBI: 34.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-1 River: 95-995 Mill Creek RM: 0.70 Date: 09/21/2016

Time Fished: 1620 Distance: 0.200 Drainge (sq mi): 63.7 Depth: 0

Location: Dilley's Road Lat: 42.41832 Long: -87.94527

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
37-003	NORTHERN PIKE	P		M	F	1	1.5	0.36	240	1.86	160.0
40-016	WHITE SUCKER	O	T	S	W	2	3.0	0.73	285	2.21	95.0
40-018	SPOTTED SUCKER	I		S	R	2	3.0	0.73	247	1.92	82.5
43-003	GOLDEN SHINER	I	T	M	N	2	3.0	0.73	75	0.58	25.0
43-032	SPOTFIN SHINER	I		M	N	70	105.0	25.55	255	1.98	2.4
43-034	SAND SHINER	I	M	M	N	5	7.5	1.82	15	0.12	2.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	63	94.5	22.99	225	1.75	2.3
47-002	CHANNEL CATFISH			C	F	8	12.0	2.92	7035	54.57	586.2
47-004	YELLOW BULLHEAD	I	T	C		15	22.5	5.47	1395	10.82	62.0
47-008	STONECAT MADTOM	I	I	C		4	6.0	1.46	120	0.93	20.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		13	19.5	4.74	30	0.23	1.5
77-002	BLACK CRAPPIE	I		C	S	1	1.5	0.36	45	0.35	30.0
77-006	LARGEMOUTH BASS	C		C	F	13	19.5	4.74	1035	8.03	53.0
77-008	GREEN SUNFISH	I	T	C	S	23	34.5	8.39	645	5.00	18.7
77-009	BLUEGILL SUNFISH	I	P	C	S	23	34.5	8.39	1035	8.03	30.0
77-013	PUMPKINSEED SUNFISH	I	P	C	S	3	4.5	1.09	105	0.81	23.3
80-005	BLACKSIDE DARTER	I		S	D	14	21.0	5.11	75	0.58	3.5
80-014	JOHNNY DARTER	I		C	D	12	18.0	4.38	30	0.23	1.6

No Species: 18 **Nat. Species:** 18 **Hybrids:** 0 **Total Counted:** 274 **Total Rel. Wt. :** 12892

IBI: 38.0 **MIwb:** 7.9

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-2 River: 95-995 Mill Creek RM: 1.71 Date: 09/21/2016

Time Fished: 1812 Distance: 0.200 Drainge (sq mi): 62.2 Depth: 0

Location: Hunt Club Road Lat: 42.42129 Long: -87.95655

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
20-003	GIZZARD SHAD	O		M		24	36.0	2.69	1380	8.30	38.3
37-001	GRASS PICKEREL	P	P	M		1	1.5	0.11	105	0.63	70.0
37-003	NORTHERN PIKE	P		M	F	1	1.5	0.11	1470	8.84	980.0
40-016	WHITE SUCKER	O	T	S	W	6	9.0	0.67	840	5.05	93.3
40-018	SPOTTED SUCKER	I		S	R	7	10.5	0.78	1425	8.57	135.7
43-003	GOLDEN SHINER	I	T	M	N	21	31.5	2.35	480	2.89	15.2
43-004	HORNYHEAD CHUB	I	I	N	N	17	25.5	1.90	750	4.51	29.4
43-013	CREEK CHUB	G	T	N	N	2	3.0	0.22	75	0.45	25.0
43-032	SPOTFIN SHINER	I		M	N	274	411.0	30.68	892	5.36	2.1
43-043	BLUNTNOSE MINNOW	O	T	C	N	295	442.5	33.03	885	5.32	2.0
43-044	CENTRAL STONEROLLER	H		N	N	1	1.5	0.11	15	0.09	10.0
47-002	CHANNEL CATFISH			C	F	28	42.0	3.14	3075	18.48	73.2
47-004	YELLOW BULLHEAD	I	T	C		8	12.0	0.90	825	4.96	68.7
47-006	BLACK BULLHEAD	I	P	C		2	3.0	0.22	300	1.80	100.0
47-008	STONECAT MADTOM	I	I	C		1	1.5	0.11	12	0.07	8.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		43	64.5	4.82	90	0.54	1.4
70-001	BROOK SILVERSIDE	I	M	M		1	1.5	0.11	3	0.02	2.0
77-002	BLACK CRAPPIE	I		C	S	2	3.0	0.22	75	0.45	25.0
77-006	LARGEMOUTH BASS	C		C	F	50	75.0	5.60	975	5.86	13.0
77-008	GREEN SUNFISH	I	T	C	S	37	55.5	4.14	900	5.41	16.2
77-009	BLUEGILL SUNFISH	I	P	C	S	41	61.5	4.59	1560	9.38	25.3
77-010	ORANGESPOTTED SUNFISH	I		C	S	10	15.0	1.12	82	0.50	5.5
77-013	PUMPKINSEED SUNFISH	I	P	C	S	8	12.0	0.90	345	2.07	28.7
80-005	BLACKSIDE DARTER	I		S	D	12	18.0	1.34	75	0.45	4.1
80-014	JOHNNY DARTER	I		C	D	1	1.5	0.11	1	0.01	1.0

No Species: 25 **Nat. Species:** 25 **Hybrids:** 0 **Total Counted:** 893 **Total Rel. Wt. :** 16636

IBI: 36.0 **MIwb:** 9.3

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-3 River: 95-995 Mill Creek RM: 7.20 Date: 09/21/2016

Time Fished: 1094 Distance: 0.150 Drainge (sq mi): 21.3 Depth: 0

Location: Sterns School Road Lat: 42.40007 Long: -87.98266

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
43-001	COMMON CARP	O	T	M	G	3	6.0	2.61	7600	85.11	1266.6
43-004	HORNYHEAD CHUB	I	I	N	N	3	6.0	2.61	110	1.23	18.3
43-013	CREEK CHUB	G	T	N	N	50	100.0	43.48	710	7.95	7.1
43-043	BLUNTNOSE MINNOW	O	T	C	N	11	22.0	9.57	30	0.34	1.3
47-002	CHANNEL CATFISH			C	F	4	8.0	3.48	60	0.67	7.5
47-004	YELLOW BULLHEAD	I	T	C		1	2.0	0.87	8	0.09	4.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		5	10.0	4.35	12	0.13	1.2
77-006	LARGEMOUTH BASS	C		C	F	10	20.0	8.70	150	1.68	7.5
77-009	BLUEGILL SUNFISH	I	P	C	S	28	56.0	24.35	250	2.80	4.4

No Species: 9 **Nat. Species:** 8 **Hybrids:** 0 **Total Counted:** 115 **Total Rel. Wt. :** 8930

IBI: 24.0 **MIwb:** 4.6

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-4 River: 95-995 Mill Creek RM: 10.10 Date: 09/16/2016

Time Fished: 1342 Distance: 0.150 Drainge (sq mi): 18.3 Depth: 0

Location: Route 45 Lat: 42.38300 Long: -88.00266

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		21	42.0	17.95	200	12.27	4.7
37-001	GRASS PICKEREL	P	P	M		2	4.0	1.71	0	0.00	0.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	5	10.0	4.27	80	4.91	8.0
47-004	YELLOW BULLHEAD	I	T	C		7	14.0	5.98	100	6.13	7.1
54-002	BLACKSTRIPE TOPMINNOW	I		M		3	6.0	2.56	10	0.61	1.6
77-006	LARGEMOUTH BASS	C		C	F	18	36.0	15.38	240	14.72	6.6
77-008	GREEN SUNFISH	I	T	C	S	31	62.0	26.50	600	36.81	9.6
77-009	BLUEGILL SUNFISH	I	P	C	S	22	44.0	18.80	360	22.09	8.1
80-014	JOHNNY DARTER	I		C	D	8	16.0	6.84	40	2.45	2.5

No Species: 9 **Nat. Species:** 9 **Hybrids:** 0 **Total Counted:** 117 **Total Rel. Wt. :** 1630

IBI: 28.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-5 River: 95-995 Mill Creek RM: 13.80 Date: 09/16/2016

Time Fished: 2406 Distance: 0.200 Drainge (sq mi): 10.4 Depth: 0

Location: Washington St Lat: 42.36284 Long: -88.01585

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		5	7.5	0.81	42	0.17	5.6
40-016	WHITE SUCKER	O	T	S	W	1	1.5	0.16	180	0.74	120.0
43-001	COMMON CARP	O	T	M	G	4	6.0	0.65	4890	20.06	815.0
43-003	GOLDEN SHINER	I	T	M	N	79	118.5	12.85	1095	4.49	9.2
43-043	BLUNTNOSE MINNOW	O	T	C	N	14	21.0	2.28	45	0.18	2.1
47-004	YELLOW BULLHEAD	I	T	C		9	13.5	1.46	2190	8.99	162.2
47-006	BLACK BULLHEAD	I	P	C		4	6.0	0.65	1035	4.25	172.5
54-002	BLACKSTRIPE TOPMINNOW	I		M		8	12.0	1.30	15	0.06	1.2
70-001	BROOK SILVERSIDE	I	M	M		6	9.0	0.98	30	0.12	3.3
74-006	YELLOW BASS	P	P	M		13	19.5	2.11	150	0.62	7.6
77-002	BLACK CRAPPIE	I		C	S	14	21.0	2.28	1755	7.20	83.5
77-006	LARGEMOUTH BASS	C		C	F	21	31.5	3.41	4230	17.36	134.2
77-008	GREEN SUNFISH	I	T	C	S	4	6.0	0.65	90	0.37	15.0
77-009	BLUEGILL SUNFISH	I	P	C	S	305	457.5	49.59	4650	19.08	10.1
77-013	PUMPKINSEED SUNFISH	I	P	C	S	14	21.0	2.28	525	2.15	25.0
80-003	YELLOW PERCH			M		114	171.0	18.54	3450	14.16	20.1

No Species: 16 **Nat. Species:** 15 **Hybrids:** 0 **Total Counted:** 615 **Total Rel. Wt. :** 24372

IBI: 38.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 11-6 River: 95-995 Mill Creek RM: 17.20 Date: 09/16/2016

Time Fished: 1044 Distance: 0.150 Drainge (sq mi): 4.5 Depth: 0

Location: Wick Street Lat: 42.33636 Long: -88.04005

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		23	46.0	21.50	220	14.77	4.7
40-016	WHITE SUCKER	O	T	S	W	24	48.0	22.43	460	30.87	9.5
47-006	BLACK BULLHEAD	I	P	C		1	2.0	0.93	30	2.01	15.0
77-006	LARGEMOUTH BASS	C		C	F	40	80.0	37.38	440	29.53	5.5
77-008	GREEN SUNFISH	I	T	C	S	13	26.0	12.15	320	21.48	12.3
80-014	JOHNNY DARTER	I		C	D	6	12.0	5.61	20	1.34	1.6

No Species: 6 **Nat. Species:** 6 **Hybrids:** 0 **Total Counted:** 107 **Total Rel. Wt. :** 1490

IBI: 30.0 **MIwb:** N/A

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-1 River: 95-996 North Mill Creek RM: 1.10 Date: 09/21/2016

Time Fished: 1735 Distance: 0.200 Drainge (sq mi): 31.9 Depth: 0

Location: Milbourne Road Lat: 42.42339 Long: -87.99702

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	19	28.5	15.97	3352	9.21	117.6
40-018	SPOTTED SUCKER	I		S	R	1	1.5	0.84	90	0.25	60.0
43-001	COMMON CARP	O	T	M	G	20	30.0	16.81	29490	81.01	983.0
43-004	HORNYHEAD CHUB	I	I	N	N	2	3.0	1.68	52	0.14	17.5
43-013	CREEK CHUB	G	T	N	N	1	1.5	0.84	45	0.12	30.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	3	4.5	2.52	3	0.01	0.6
47-002	CHANNEL CATFISH			C	F	1	1.5	0.84	4	0.01	3.0
47-004	YELLOW BULLHEAD	I	T	C		9	13.5	7.56	1695	4.66	125.5
47-006	BLACK BULLHEAD	I	P	C		3	4.5	2.52	607	1.67	135.0
54-002	BLACKSTRIPE TOPMINNOW	I		M		2	3.0	1.68	4	0.01	1.5
77-002	BLACK CRAPPIE	I		C	S	6	9.0	5.04	90	0.25	10.0
77-006	LARGEMOUTH BASS	C		C	F	6	9.0	5.04	292	0.80	32.5
77-008	GREEN SUNFISH	I	T	C	S	6	9.0	5.04	180	0.49	20.0
77-009	BLUEGILL SUNFISH	I	P	C	S	40	60.0	33.61	495	1.36	8.2

No Species: 14 **Nat. Species:** 13 **Hybrids:** 0 **Total Counted:** 119 **Total Rel. Wt. :** 36402

IBI: 26.0 **MIwb:** 5.3

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-2 River: 95-996 North Mill Creek RM: 8.10 Date: 09/19/2016

Time Fished: 1561 Distance: 0.200 Drainge (sq mi): 29.3 Depth: 0

Location: Kelly Road Lat: 42.44408 Long: -88.00063

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
40-016	WHITE SUCKER	O	T	S	W	81	121.5	18.97	8970	56.31	73.8
43-001	COMMON CARP	O	T	M	G	13	19.5	3.04	2190	13.75	112.3
43-003	GOLDEN SHINER	I	T	M	N	2	3.0	0.47	15	0.09	5.0
43-042	FATHEAD MINNOW	O	T	C	N	1	1.5	0.23	4	0.03	3.0
43-043	BLUNTNOSE MINNOW	O	T	C	N	239	358.5	55.97	660	4.14	1.8
47-002	CHANNEL CATFISH			C	F	5	7.5	1.17	187	1.18	25.0
47-004	YELLOW BULLHEAD	I	T	C		80	120.0	18.74	3600	22.60	30.0
47-006	BLACK BULLHEAD	I	P	C		3	4.5	0.70	232	1.46	51.6
47-013	TADPOLE MADTOM	I		C		1	1.5	0.23	6	0.04	4.0
77-008	GREEN SUNFISH	I	T	C	S	1	1.5	0.23	4	0.03	3.0
77-009	BLUEGILL SUNFISH	I	P	C	S	1	1.5	0.23	60	0.38	40.0

No Species: 11 **Nat. Species:** 10 **Hybrids:** 0 **Total Counted:** 427 **Total Rel. Wt. :** 15930

IBI: 20.0 **MIwb:** 3.8

Appendix Table B-3. Midwest Biodiversity Institute
Fish Species List

Site ID: 10-3 River: 95-996 North Mill Creek RM: 10.20 Date: 09/19/2016

Time Fished: 1570 Distance: 0.200 Drainge (sq mi): 20.7 Depth: 0

Location: Route 173 Lat: 42.46607 Long: -88.00908

Species Code:	Species Name:	Feed Guild	Toler-ance	Breed Guild	IBI Group	No. Fish	Rel. No.	% by No.	Rel. Wt.	% by Wt.	Av. Wt.
34-001	CENTRAL MUDMINNOW	I	T	C		10	15.0	2.35	97	0.37	6.5
37-003	NORTHERN PIKE	P		M	F	2	3.0	0.47	1717	6.58	572.5
43-001	COMMON CARP	O	T	M	G	7	10.5	1.64	13074	50.07	1245.1
43-003	GOLDEN SHINER	I	T	M	N	6	9.0	1.41	52	0.20	5.8
47-004	YELLOW BULLHEAD	I	T	C		70	105.0	16.43	3495	13.39	33.2
47-006	BLACK BULLHEAD	I	P	C		34	51.0	7.98	3069	11.75	60.1
77-006	LARGEMOUTH BASS	C		C	F	4	6.0	0.94	285	1.09	47.5
77-008	GREEN SUNFISH	I	T	C	S	86	129.0	20.19	1357	5.20	10.5
77-009	BLUEGILL SUNFISH	I	P	C	S	165	247.5	38.73	2392	9.16	9.6
77-013	PUMPKINSEED SUNFISH	I	P	C	S	41	61.5	9.62	540	2.07	8.7
77-015	GREEN SF X BLUEGILL SF					1	1.5	0.23	30	0.11	20.0

No Species: 10 **Nat. Species:** 9 **Hybrids:** 1 **Total Counted:** 426 **Total Rel. Wt. :** 26110

IBI: 34.0 **MIwb:** 7.3

APPENDIX C

Upper Des Plaines 2016 Macroinvertebrate Assemblage Data

C-1: Macroinvertebrate IBI Metrics and Scores
C-2: Macroinvertebrate Taxa by Site and Sample

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample	Date	Drainage Area (sq mi)	Sub-samp	Number of: Total Taxa	Number of: Coleoptera Taxa	Number of: Mayfly Taxa	Number of: Intolerant Taxa	MBI	Percent: Percent Scrapers	Percent: Percent EPT	MIBI
DesPlaines River (95-656)													
Year: 2016													
109.30	13-6		08/08/2016	123.67		16(35.0)	0(0.0)	2(19.6)	0(0.0)	5.3(93.4)	0.3(1.1)	3.2(4.3)	21.9
106.60	13-5		08/08/2016	137.29		20(43.0)	1(20.0)	2(19.6)	1(11.1)	5.3(93.4)	1.4(4.7)	11.0(14.9)	29.5
102.90	13-4		08/06/2016	145.55		17(37.0)	1(20.0)	2(19.6)	1(11.1)	5.4(91.8)	0.3(1.1)	49.2(66.5)	35.3
98.70	13-3		08/05/2016	220.29		34(74.0)	4(80.0)	4(39.2)	3(33.3)	5.4(91.8)	16.5(55.8)	22.8(30.8)	57.9
96.82	13-2		07/30/2016	225.36		34(74.0)	4(80.0)	3(29.4)	4(44.4)	5.7(86.9)	7.4(24.9)	4.5(6.1)	49.4
94.20	13-1		07/30/2016	232.03		25(54.0)	2(40.0)	4(39.2)	2(22.2)	4.7(100)	8.6(29.1)	8.0(10.8)	42.2
90.60	13-16		08/04/2016	253.75		23(50.0)	1(20.0)	3(29.4)	5(55.6)	5.1(96.7)	11.8(39.9)	16.2(21.8)	44.8
84.60	16-7		08/03/2016	266.48		32(70.0)	3(60.0)	5(49.0)	5(55.6)	4.8(100)	5.0(16.8)	7.3(9.9)	51.6
83.60	16-5	2	06/29/2016	268.07		29(63.0)	3(60.0)	3(29.4)	4(44.4)	5.0(98.4)	7.9(26.7)	43.4(58.6)	54.4
83.60	16-5		07/25/2016	268.07		34(74.0)	3(60.0)	5(49.0)	4(44.4)	4.7(100)	11.8(39.9)	15.5(21.0)	55.5
82.90	16-8		08/01/2016	268.90		36(78.0)	3(60.0)	4(39.2)	5(55.6)	5.7(86.9)	5.0(16.8)	8.7(11.8)	49.8
80.00	16-4		07/30/2016	273.21		28(61.0)	3(60.0)	5(49.0)	6(66.7)	5.0(98.4)	3.7(12.6)	47.3(63.9)	58.8
76.70	16-3		07/30/2016	314.68		32(70.0)	3(60.0)	6(58.8)	5(55.6)	3.4(100)	6.3(21.1)	27.0(36.4)	57.4
75.40	R5W07648-9		07/30/2016	315.80		21(46.0)	2(40.0)	4(39.2)	3(33.3)	4.4(100)	2.2(7.5)	38.2(51.6)	45.4
71.70	16-1		07/30/2016	358.68		28(61.0)	3(60.0)	3(29.4)	6(66.7)	5.1(96.7)	2.0(6.8)	38.1(51.4)	53.2
Hastings Creek (95-702)													
Year: 2016													
3.12	10-5		08/07/2016	3.91		17(37.0)	1(20.0)	1(9.8)	1(11.1)	8.4(42.6)	40.5(100)	0.4(0.5)	31.6
1.68	10-4		08/07/2016	6.80		9(20.0)	0(0.0)	0(0.0)	3(33.3)	6.8(68.9)	0.0(0.0)	0.0(0.0)	17.5
Unnamed Trib to N. Mill Creek (95-715)													
Year: 2016													
0.04	10-6		08/07/2016	0.99		22(48.0)	0(0.0)	1(9.8)	2(22.2)	4.4(100)	0.3(1.1)	4.8(6.5)	26.8

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample	Date	Drainage Area (sq mi)	Sub-samp	Number of: Total Taxa	Number of: Coleoptera Taxa	Number of: Mayfly Taxa	Number of: Intolerant Taxa	MBI	Percent: Percent Scrapers	Percent: Percent EPT	MIBI
North Mill Creek (95-996)													
Year: 2016													
10.20	10-3	A	08/07/2016	20.79		22(48.0)	2(40.0)	3(29.4)	0(0.0)	6.3(77.1)	7.6(25.7)	14.3(19.3)	34.2
10.20	10-3	B	08/07/2016	20.79		27(59.0)	2(40.0)	3(29.4)	0(0.0)	6.7(70.5)	3.7(12.4)	9.2(12.4)	32.0
8.10	10-2		08/07/2016	29.38		29(63.0)	3(60.0)	2(19.6)	0(0.0)	8.2(45.9)	8.5(28.7)	3.1(4.2)	31.6
1.10	10-1		08/07/2016	31.97		33(72.0)	4(80.0)	2(19.6)	3(33.3)	6.1(80.3)	23.4(79.1)	16.7(22.6)	55.3
Mill Creek (95-995)													
Year: 2016													
17.20	11-6		08/04/2016	4.51		18(39.0)	2(40.0)	1(9.8)	3(33.3)	4.7(100)	1.3(4.4)	0.7(0.9)	32.5
13.80	11-5		08/05/2016	10.43		29(63.0)	2(40.0)	2(19.6)	1(11.1)	7.0(65.6)	3.2(10.6)	4.1(5.5)	30.8
10.10	11-4		08/05/2016	18.33		20(43.0)	2(40.0)	2(19.6)	2(22.2)	5.1(96.7)	4.9(16.6)	13.1(17.7)	36.6
7.20	11-3		08/06/2016	21.36		25(54.0)	3(60.0)	2(19.6)	4(44.4)	4.5(100)	10.4(35.2)	18.6(25.2)	48.3
1.71	11-2		08/08/2016	62.25		18(39.0)	2(40.0)	1(9.8)	1(11.1)	7.1(63.9)	3.5(11.9)	3.5(4.7)	25.8
0.70	11-1		08/06/2016	63.78		37(80.0)	4(80.0)	3(29.4)	4(44.4)	6.2(78.7)	9.9(33.6)	6.6(9.0)	50.7
Newport Drainage Ditch (95-708)													
Year: 2016													
3.03	12-2		08/08/2016	2.81		23(50.0)	1(20.0)	1(9.8)	0(0.0)	7.6(55.7)	28.7(97.0)	2.4(3.3)	33.7
0.70	12-1		08/08/2016	7.35		32(70.0)	2(40.0)	2(19.6)	4(44.4)	5.7(86.9)	18.0(61.0)	2.5(3.4)	46.5
Bull's Brook (95-704)													
Year: 2016													
1.95	13-15		08/02/2016	1.92		29(63.0)	1(20.0)	2(19.6)	3(33.3)	6.4(75.4)	1.7(5.7)	7.3(9.9)	32.4
0.25	13-7	2	06/30/2016	2.69		12(26.0)	3(60.0)	1(9.8)	1(11.1)	3.3(100)	3.1(10.5)	5.6(7.6)	32.1
0.25	13-7		08/04/2016	2.69		23(50.0)	4(80.0)	2(19.6)	5(55.6)	4.0(100)	7.6(25.5)	2.2(3.0)	47.7

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample Date	Drainage Area (sq mi)	Sub-samp	Number of: Total Taxa	Number of: Coleoptera Taxa	Number of: Mayfly Taxa	Number of: Intolerant Taxa	MBI	Percent: Percent Scrapers	Percent: Percent EPT	MIBI
Stoneroller Creek (95-709)												
Year: 2016												
0.42	13-9	08/09/2016	4.08		37(80.0)	3(60.0)	4(39.2)	3(33.3)	6.2(78.7)	33.8(100)	10.6(14.3)	**57.9**
Suburban Country Club Tributary (95-710)												
Year: 2016												
2.75	13-12	08/06/2016	2.37		15(33.0)	0(0.0)	1(9.8)	0(0.0)	7.0(65.6)	40.0(100)	9.7(13.1)	**31.6**
2.00	13-10	08/06/2016	4.02		14(30.0)	1(20.0)	2(19.6)	0(0.0)	7.2(62.3)	0.3(1.1)	0.9(1.3)	**19.2**
Slocum Conrners Creek (95-711)												
Year: 2016												
1.36	13-11	08/06/2016	2.39		29(63.0)	3(60.0)	2(19.6)	3(33.3)	6.2(78.7)	9.2(31.1)	3.2(4.3)	**41.4**
Unnamed Trib to DesPlaines River (95-714)												
Year: 2016												
0.13	13-17	08/04/2016	0.86		12(26.0)	1(20.0)	1(9.8)	0(0.0)	6.5(73.8)	8.9(30.0)	0.7(0.9)	**22.9**
Unnamed Trib - Greenleaf Creek (95-716)												
Year: 2016												
0.40	13-13	08/05/2016	1.06		12(26.0)	0(0.0)	1(9.8)	2(22.2)	5.9(83.6)	0.0(0.0)	0.3(0.5)	**20.3**
West Fork Belvidere Rd. Trib (95-720)												
Year: 2016												
0.21	13-14	08/05/2016	2.30		13(28.0)	2(40.0)	0(0.0)	1(11.1)	6.2(78.7)	12.0(40.5)	0.0(0.0)	**28.3**
0.15	13-8	08/05/2016	3.75		26(57.0)	3(60.0)	2(19.6)	2(22.2)	6.0(82.0)	46.9(100)	1.3(1.7)	**48.9**
Bull Creek (95-051)												
Year: 2016												
5.95	14-6	08/03/2016	2.42		12(26.0)	2(40.0)	0(0.0)	0(0.0)	6.4(75.4)	3.9(13.2)	0.0(0.0)	**22.1**
4.70	14-5	08/03/2016	1.32		24(52.0)	0(0.0)	0(0.0)	1(11.1)	7.4(59.0)	0.0(0.0)	0.0(0.0)	**17.5**

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample	Date	Drainage Area (sq mi)	Sub-samp	Number of				MBI	Percent:		MIBI
						Total Taxa	Coleoptera Taxa	Mayfly Taxa	Intolerant Taxa		Percent Scrapers	Percent EPT	
1.00	14-2		08/04/2016	8.44		18(39.0)	2(40.0)	0(0.0)	2(22.2)	5.9(83.6)	18.3(61.9)	0.3(0.4)	35.3
0.50	14-1		08/04/2016	11.69		39(85.0)	5(100)	3(29.4)	4(44.4)	5.8(85.3)	26.1(88.1)	5.9(8.0)	62.9
West Branch Bull Creek (95-719)													
Year: 2016													
2.54	14-4		08/03/2016	5.10		24(52.0)	0(0.0)	2(19.6)	1(11.1)	8.8(36.1)	2.4(8.2)	3.0(4.1)	18.7
1.60	14-3		08/04/2016	7.05		30(65.0)	5(100)	5(49.0)	3(33.3)	5.5(90.2)	34.9(100)	8.7(11.8)	64.2
Seavey Drainage Ditch (95-390)													
Year: 2016													
3.66	15-3		08/03/2016	5.05		24(52.0)	1(20.0)	1(9.8)	1(11.1)	6.5(73.8)	4.3(14.4)	0.7(0.9)	26.0
0.45	15-8	2	06/30/2016	9.77		28(61.0)	0(0.0)	1(9.8)	1(11.1)	7.3(60.7)	24.8(83.9)	0.3(0.5)	32.4
0.45	15-8		07/29/2016	9.77		18(39.0)	0(0.0)	0(0.0)	1(11.1)	7.2(62.3)	6.2(21.0)	0.0(0.0)	19.1
Forest Lake Drain (95-705)													
Year: 2016													
0.83	15-11		08/02/2016	1.70		17(37.0)	1(20.0)	1(9.8)	1(11.1)	5.7(86.9)	9.7(32.8)	1.3(1.7)	28.5
Indian Creek (95-706)													
Year: 2016													
10.83	15-9		08/02/2016	2.68		13(28.0)	0(0.0)	0(0.0)	2(22.2)	7.6(55.7)	11.9(40.2)	0.0(0.0)	20.9
9.83	15-6		08/02/2016	3.70		22(48.0)	0(0.0)	1(9.8)	2(22.2)	5.9(83.6)	0.0(0.0)	1.7(2.2)	23.7
5.40	15-5		08/01/2016	17.26		24(52.0)	3(60.0)	1(9.8)	3(33.3)	5.5(90.2)	4.7(16.0)	1.8(2.4)	37.7
2.41	15-2		08/01/2016	35.02		36(78.0)	4(80.0)	4(39.2)	4(44.4)	6.1(80.3)	24.5(82.8)	3.6(4.9)	58.5
0.17	15-1	2	07/01/2016	36.43		36(78.0)	4(80.0)	3(29.4)	4(44.4)	6.6(72.1)	22.3(75.3)	5.9(8.0)	55.3
0.17	15-1		07/29/2016	36.43		35(76.0)	4(80.0)	4(39.2)	4(44.4)	5.9(83.6)	20.9(70.5)	15.3(20.7)	59.2

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample	Date	Drainage Area (sq mi)	Sub-samp	Number of: Total Taxa	Coleoptera Taxa	Mayfly Taxa	Intolerant Taxa	MBI	Percent: Percent Scrapers	Percent EPT	MIBI
Kildeer Creek (95-707)													
Year: 2016													
5.20	15-12		08/01/2016	2.08		29(63.0)	2(40.0)	2(19.6)	2(22.2)	6.4(75.4)	11.2(37.7)	0.9(1.3)	**37.0**
4.60	15-7		08/01/2016	2.86		20(43.0)	2(40.0)	2(19.6)	1(11.1)	5.3(93.4)	1.7(5.7)	10.1(13.7)	**32.4**
2.21	15-13		08/01/2016	5.01		33(72.0)	3(60.0)	3(29.4)	3(33.3)	6.3(77.1)	20.6(69.5)	38.0(51.4)	**56.1**
0.17	15-4		08/01/2016	6.80		35(76.0)	3(60.0)	2(19.6)	1(11.1)	6.0(82.0)	10.9(36.8)	6.5(8.7)	**42.0**
W. Branch Indian Creek (95-717)													
Year: 2016													
0.80	15-10		08/02/2016	2.22		18(39.0)	1(20.0)	1(9.8)	2(22.2)	5.6(88.5)	0.3(1.1)	0.7(0.9)	**25.9**
Unnamed Trib to Des Plaines River (95-721)													
Year: 2016													
0.40	16-9		07/31/2016	1.19		35(76.0)	1(20.0)	2(19.6)	4(44.4)	5.9(83.6)	12.7(42.9)	2.5(3.4)	**41.4**
(95-722)													
Year: 2016													
0.80	16-10B		07/01/2016	0.22		27(59.0)	2(40.0)	0(0.0)	3(33.3)	5.1(96.7)	22.7(76.6)	0.3(0.5)	**43.7**
0.80	16-10B		07/29/2016	0.22		25(54.0)	2(40.0)	0(0.0)	2(22.2)	5.8(85.3)	32.7(100)	0.3(0.5)	**43.1**
Buffalo Creek (95-703)													
Year: 2016													
14.00	17-5		08/02/2016	1.37		18(39.0)	2(40.0)	0(0.0)	1(11.1)	6.4(75.4)	2.0(6.6)	0.0(0.0)	**24.6**
7.70	17-3		07/31/2016	9.61		26(57.0)	3(60.0)	2(19.6)	1(11.1)	6.0(82.0)	24.9(84.2)	17.1(23.1)	**48.1**
6.10	17-2		07/31/2016	22.10		28(61.0)	2(40.0)	3(29.4)	5(55.6)	5.8(85.3)	22.9(77.4)	3.4(4.6)	**50.5**
0.75	17-1	2	06/30/2016	29.14		40(87.0)	2(40.0)	4(39.2)	3(33.3)	6.3(77.1)	8.8(29.6)	2.9(4.0)	**44.3**
0.75	17-1		07/24/2016	29.14		26(57.0)	2(40.0)	2(19.6)	3(33.3)	5.8(85.3)	13.6(45.9)	3.7(5.0)	**40.9**

Appendix Table C-1. Illinois Macroinvertebrate IBI metrics and values from the Desplaines River basin survey in 2016 (numbers in paraentheses are the IBI metric scores).

River Mile	Site ID	Sample	Date	Drainage Area (sq mi)	Sub-samp	Number of: Total Taxa	Number of: Coleoptera Taxa	Number of: Mayfly Taxa	Number of: Intolerant Taxa	MBI	Percent: Percent Scrapers	Percent: Percent EPT	MIBI
Buffalo Creek Tributary (95-713)													
Year: 2016													
0.68	17-4		07/31/2016	8.55		22(48.0)	2(40.0)	1(9.8)	2(22.2)	6.7(70.5)	2.7(9.1)	2.0(2.7)	28.9
0.68	17-4		08/01/2016	8.55		1(2.0)	0(0.0)	0(0.0)	0(0.0)	6.5(73.8)	100(100)	0.0(0.0)	25.1
Aptakisic Creek (95-701)													
Year: 2016													
4.70	18-4		07/31/2016	1.09		13(28.0)	0(0.0)	0(0.0)	0(0.0)	6.1(80.3)	6.2(20.9)	0.0(0.0)	18.5
4.30	18-3		07/31/2016	2.30		23(50.0)	0(0.0)	0(0.0)	1(11.1)	6.0(82.0)	10.7(36.2)	0.0(0.0)	25.6
0.80	18-2		07/31/2016	4.94		27(59.0)	1(20.0)	2(19.6)	2(22.2)	6.3(77.1)	2.6(8.9)	6.2(8.4)	30.7
0.50	18-1		07/31/2016	5.50		22(48.0)	1(20.0)	0(0.0)	2(22.2)	6.9(67.2)	1.0(3.4)	0.0(0.0)	23.0
Unnamed Trib to Aptakisic Creek (95-712)													
Year: 2016													
0.05	18-5	2	07/01/2016	0.99		11(24.0)	0(0.0)	0(0.0)	1(11.1)	6.0(82.0)	6.0(20.3)	0.0(0.0)	19.6
0.05	18-5		07/29/2016	0.99		10(22.0)	1(20.0)	0(0.0)	0(0.0)	6.2(78.7)	13.5(45.7)	0.0(0.0)	23.8

Appendix Table C-3. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Russel Road

Site ID: **13-6**

Sample:

Collection Date: 08/08/2016 River Code: 95-656 River: Des Plaines River RM: 109.30

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	2
06201	Hyalella azteca	CG	5	168
11200	Callibaetis sp	CG	4	2
17200	Caenis sp	CG	6	8
22001	Coenagrionidae	PR	5	44
27000	Corduliidae or Libellulidae		0	2
28208	Erythemis simplicicollis	PR	5	1
72700	Anopheles sp	CF	6	1
74501	Ceratopogonidae	PR	5	6
77140	Ablabesmyia peleensis		6	2
78200	Larsia sp	PR	6	38
83003	Dicrotendipes fumidus	CG	6	23
84500	Polypedilum (P.) trigonus	SH	6	6
84960	Pseudochironomus sp	CG	5	8
89501	Ephydridae	CG	8	3
95900	Gyraulus sp	SC	6	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 16 Total Taxa: 16

Number of Organisms: 315 mIBI: 21.92

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hwy 173

Site ID: **13-5**

Sample:

Collection Date: 08/08/2016 River Code: 95-656 River: Des Plaines River RM: 106.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
06201	Hyalella azteca	CG	5	96
06700	Crangonyx sp	CG	4	1
11200	Callibaetis sp	CG	4	14
17200	Caenis sp	CG	6	15
22001	Coenagrionidae	PR	5	59
27000	Corduliidae or Libellulidae		0	3
51600	Polycentropus sp	PR	3	1
59500	Oecetis sp	PR	5	2
59520	Oecetis cinerascens	PR	5	1
69400	Stenelmis sp	SC	7	3
74501	Ceratopogonidae	PR	5	3
77140	Ablabesmyia peleensis		6	1
78200	Larsia sp	PR	6	10
83040	Dicrotendipes neomodestus	CG	6	46
84470	Polypedilum (P.) illinoense	SH	6	2
84500	Polypedilum (P.) trigonus	SH	6	1
84960	Pseudochironomus sp	CG	5	22
85500	Paratanytarsus sp	CG	6	2
85820	Tanytarsus glabrescens group sp 6		0	3
85821	Tanytarsus glabrescens group sp 7	CF	7	1
87200	Odontomyia (O.) sp or Hedriodiscus sp	CG	10	2
89501	Ephydridae	CG	8	1
95100	Physella sp	SC	9	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 23 Total Taxa: 23

Number of Organisms: 290 mIBI: 29.53

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Wadsworth Road

Site ID: 13-4

Sample:

Collection Date: 08/06/2016 River Code: 95-656 River: Des Plaines River RM: 102.90

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	1
03600	Oligochaeta	CG	10	2
06201	Hyalella azteca	CG	5	93
06800	Gammarus sp		3	5
11200	Callibaetis sp	CG	4	30
17200	Caenis sp	CG	6	124
22001	Coenagrionidae	PR	5	35
59500	Oecetis sp	PR	5	1
68700	Dubiraphia sp	CG	5	3
77700	Guttipelopia guttipennis	PR	6	4
78130	Labrundinia neopilosella	PR	4	1
78200	Larsia sp	PR	6	5
78655	Procladius (Holotanypus) sp	PR	8	2
83040	Dicrotendipes neomodestus	CG	6	5
84500	Polypedilum (P.) trigonus	SH	6	2
84960	Pseudochironomus sp	CG	5	1
95100	Physella sp	SC	9	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 17 Total Taxa: 17

Number of Organisms: 315 mIBI: 35.30

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Above Hwy 41

Site ID: 13-3

Sample:

Collection Date: 08/05/2016 River Code: 95-656 River: Des Plaines River RM: 98.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	6
05800	Caecidotea sp	CG	6	2
06201	Hyalella azteca	CG	5	24
06800	Gammarus sp		3	46
08200	Orconectes sp	CG	5	3
11130	Baetis intercalaris	CG	4	3
11200	Callibaetis sp	CG	4	3
13400	Stenacron sp	SC	4	8
17200	Caenis sp	CG	6	8
22001	Coenagrionidae	PR	5	29
52200	Cheumatopsyche sp	CF	6	51
52520	Hydropsyche bidens	CF	5	1
59500	Oecetis sp	PR	5	2
68201	Scirtidae	SC	7	1
68700	Dubiraphia sp	CG	5	29
68901	Macronychus glabratus		2	2
69400	Stenelmis sp	SC	7	39
77120	Ablabesmyia mallochi	CG	6	1
77130	Ablabesmyia rhamphe group	CG	6	1
77355	Clinotanypus pinguis	PR	6	2
77750	Hayesomyia senata or Thienemannimyia norena		5	6
78655	Procladius (Holotanypus) sp	PR	8	1
82820	Cryptochironomus sp	PR	8	2
83040	Dicrotendipes neomodestus	CG	6	1
83158	Endochironomus nigricans	SH	6	24
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
84470	Polypedilum (P.) illinoense	SH	6	10
84540	Polypedilum (Tripodura) scalaenum group	SH	6	4
84700	Stenochironomus sp	SH	3	1
84800	Tribelos jucundum	CG	5	1
85625	Rheotanytarsus sp	CF	6	2
86100	Chrysops sp	CG	7	1
93200	Hydrobiidae	SC	6	4
95100	Physella sp	SC	9	3
97601	Corbicula fluminea	CF	4	5
98001	Pisidiidae		5	3

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa:	37	Total Taxa:	37
Number of Organisms:	333	mIBI:	57.86

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: McClure Ave

Site ID: **13-2**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 96.82

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	16
05800	Caecidotea sp	CG	6	13
06201	Hyalella azteca	CG	5	14
06800	Gammarus sp		3	44
08200	Orconectes sp	CG	5	1
11200	Callibaetis sp	CG	4	1
13400	Stenacron sp	SC	4	2
17200	Caenis sp	CG	6	6
22001	Coenagrionidae	PR	5	11
52200	Cheumatopsyche sp	CF	6	5
68201	Scirtidae	SC	7	1
68700	Dubiraphia sp	CG	5	7
68901	Macronychus glabratus		2	1
69400	Stenelmis sp	SC	7	4
77130	Ablabesmyia rhamphe group	CG	6	15
77355	Clinotanypus pinguis	PR	6	6
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	3
78200	Larsia sp	PR	6	27
78600	Pentaneura inconspicua	PR	3	5
78655	Procladius (Holotanypus) sp	PR	8	1
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82730	Chironomus (C.) decorus group	CG	11	5
82820	Cryptochironomus sp	PR	8	1
83158	Endochironomus nigricans	SH	6	36
84210	Paratendipes albimanus or P. duplicatus	CG	3	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	28
84500	Polypedilum (P.) trigonus	SH	6	13
84520	Polypedilum (Tripodura) halterale group	SH	6	13
85230	Cladotanytarsus mancus group	CG	7	2
93200	Hydrobiidae	SC	6	5
94400	Fossaria sp	SC	7	8
95100	Physella sp	SC	9	3
97601	Corbicula fluminea	CF	4	2
98001	Pisidiidae		5	5

No. Quantitative Taxa:	37	Total Taxa:	37
Number of Organisms:	312	mIBI:	49.39

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hwy 120

Site ID: **13-1**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 94.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	3
03600	Oligochaeta	CG	10	21
04637	Placobdella phalera		8	1
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	27
06800	Gammarus sp		3	145
11130	Baetis intercalaris	CG	4	4
11200	Callibaetis sp	CG	4	2
13400	Stenacron sp	SC	4	4
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	58
23700	Anax sp	PR	5	2
52200	Cheumatopsyche sp	CF	6	5
52570	Hydropsyche simulans	CF	5	1
53800	Hydroptila sp	SC	2	9
68700	Dubiraphia sp	CG	5	7
69400	Stenelmis sp	SC	7	8
78655	Procladius (Holotanypus) sp	PR	8	2
83040	Dicrotendipes neomodestus	CG	6	9
83158	Endochironomus nigricans	SH	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
84470	Polypedilum (P.) illinoense	SH	6	1
85625	Rheotanytarsus sp	CF	6	12
93200	Hydrobiidae	SC	6	1
95100	Physella sp	SC	9	7
97601	Corbicula fluminea	CF	4	2

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 26 Total Taxa: 26

Number of Organisms: 337 mIBI: 42.19

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Dst. Buckley Rd.

Site ID: **13-16**

Sample:

Collection Date: 08/04/2016 River Code: 95-656 River: Des Plaines River RM: 90.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	5
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	17
06800	Gammarus sp		3	77
11130	Baetis intercalaris	CG	4	14
16700	Tricorythodes sp	CG	5	9
17200	Caenis sp	CG	6	2
21300	Hetaerina sp	PR	3	1
52200	Cheumatopsyche sp	CF	6	2
53800	Hydroptila sp	SC	2	25
69400	Stenelmis sp	SC	7	3
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78599	Pentaneura sp	PR	3	3
80410	Cricotopus (C.) sp	SH	8	1
80420	Cricotopus (C.) bicinctus	SH	8	59
80510	Cricotopus (Isocladius) sylvestris group	SH	8	1
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	2
82130	Thienemanniella similis	CG	2	3
82141	Thienemanniella xena	CG	2	1
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	12
84450	Polypedilum (Uresipedilum) flavum	SH	6	23
84470	Polypedilum (P.) illinoense	SH	6	19
85625	Rheotanytarsus sp	CF	6	25
87540	Hemerodromia sp	PR	6	1
93200	Hydrobiidae	SC	6	10
97601	Corbicula fluminea	CF	4	4

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 27 Total Taxa: 27

Number of Organisms: 322 mIBI: 44.77

Appendix Table C-2 Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hollister Dam site - adj. to Hollister Intl.

Site ID: **16-7**

Sample:

Collection Date: 08/03/2016 River Code: 95-656 River: Des Plaines River RM: 84.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	12
03600	Oligochaeta	CG	10	5
04660	Helobdella sp	PA	8	2
06201	Hyalella azteca	CG	5	80
06800	Gammarus sp		3	56
11130	Baetis intercalaris	CG	4	1
11200	Callibaetis sp	CG	4	1
11670	Procloeon viridoculare		4	1
16700	Tricorythodes sp	CG	5	4
17200	Caenis sp	CG	6	1
21300	Hetaerina sp	PR	3	1
22001	Coenagrionidae	PR	5	28
52200	Cheumatopsyche sp	CF	6	2
53800	Hydroptila sp	SC	2	11
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	1
59970	Petrophila sp	SC	5	1
68700	Dubiraphia sp	CG	5	1
68901	Macronychus glabratus		2	1
69400	Stenelmis sp	SC	7	1
77130	Ablabesmyia rhamphe group	CG	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78599	Pentaneura sp	PR	3	26
78655	Procladius (Holotanypus) sp	PR	8	3
80420	Cricotopus (C.) bicinctus	SH	8	3
82730	Chironomus (C.) decorus group	CG	11	1
83000	Dicrotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	14
84470	Polypedilum (P.) illinoense	SH	6	14
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	1
85625	Rheotanytarsus sp	CF	6	19
93200	Hydrobiidae	SC	6	1
95100	Physella sp	SC	9	1
97601	Corbicula fluminea	CF	4	5

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 33 Total Taxa: 33

Number of Organisms: 301 mIBI: 51.61

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Illinois Route 60 - Town Line Rd.

Site ID: 16-5

Sample: 2

Collection Date: 06/29/2016 River Code: 95-656 River: Des Plaines River RM: 83.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	8
03600	Oligochaeta	CG	10	2
06201	Hyalella azteca	CG	5	8
06800	Gammarus sp		3	17
11130	Baetis intercalaris	CG	4	54
13400	Stenacron sp	SC	4	3
16700	Tricorythodes sp	CG	5	46
22001	Coenagrionidae	PR	5	10
52200	Cheumatopsyche sp	CF	6	32
53800	Hydroptila sp	SC	2	1
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	1
68700	Dubiraphia sp	CG	5	1
68901	Macronychus glabratus		2	3
69400	Stenelmis sp	SC	7	4
74100	Simulium sp	CF	6	13
77130	Ablabesmyia rhamphe group	CG	6	1
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	18
78600	Pentaneura inconspicua	PR	3	15
80420	Cricotopus (C.) bicinctus	SH	8	4
80510	Cricotopus (Isocladius) sylvestris group	SH	8	8
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	6
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
85625	Rheotanytarsus sp	CF	6	3
93200	Hydrobiidae	SC	6	5
95100	Physella sp	SC	9	11
96900	Ferrissia sp	SC	7	1
97601	Corbicula fluminea	CF	4	32
98001	Pisidiidae		5	2

No. Quantitative Taxa:	32	Total Taxa:	32
Number of Organisms:	316	mIBI:	54.36

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Illinois Route 60 - Town Line Rd.

Site ID: **16-5**

Sample:

Collection Date: 07/25/2016 River Code: 95-656 River: Des Plaines River RM: 83.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	9
06201	Hyalella azteca	CG	5	72
06800	Gammarus sp		3	46
08451	Palaemonetes kadiakensis		4	1
11130	Baetis intercalaris	CG	4	2
11200	Callibaetis sp	CG	4	5
13400	Stenacron sp	SC	4	1
16700	Tricorythodes sp	CG	5	8
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	30
23700	Anax sp	PR	5	1
52200	Cheumatopsyche sp	CF	6	5
53800	Hydroptila sp	SC	2	23
68700	Dubiraphia sp	CG	5	1
68901	Macronychus glabratus		2	7
69400	Stenelmis sp	SC	7	1
77130	Ablabesmyia rhamphe group	CG	6	4
77355	Clinotanypus pinguis	PR	6	2
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78599	Pentaneura sp	PR	3	18
78655	Procladius (Holotanypus) sp	PR	8	2
80420	Cricotopus (C.) bicinctus	SH	8	3
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	11
83158	Endochironomus nigricans	SH	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	5
84470	Polypedilum (P.) illinoense	SH	6	4
84500	Polypedilum (P.) trigonus	SH	6	2
84520	Polypedilum (Tripodura) halterale group	SH	6	1
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	2
85625	Rheotanytarsus sp	CF	6	5
85800	Tanytarsus sp	CF	7	1
85821	Tanytarsus glabrescens group sp 7	CF	7	1
93200	Hydrobiidae	SC	6	4
95100	Physella sp	SC	9	5
96900	Ferrissia sp	SC	7	1
97601	Corbicula fluminea	CF	4	6

No. Quantitative Taxa:	38	Total Taxa:	38
Number of Organisms:	296	mIBI:	54.36

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Wright Woods Dam site - immediately ust. bike bridge

Site ID: **16-8**

Sample:

Collection Date: 08/01/2016 River Code: 95-656 River: Des Plaines River RM: 82.90

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	7
03600	Oligochaeta	CG	10	32
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	93
06700	Crangonyx sp	CG	4	12
11200	Callibaetis sp	CG	4	1
13400	Stenacron sp	SC	4	1
16700	Tricorythodes sp	CG	5	5
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	45
22300	Argia sp	PR	5	1
23700	Anax sp	PR	5	1
27400	Neurocordulia sp	PR	3	3
52200	Cheumatopsyche sp	CF	6	11
53800	Hydroptila sp	SC	2	2
59407	Nectopsyche candida	SH	3	1
59500	Oecetis sp	PR	5	5
68708	Dubiraphia vittata group	CG	5	3
68901	Macronychus glabratus		2	9
69400	Stenelmis sp	SC	7	1
77120	Ablabesmyia mallochi	CG	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	2
78600	Pentaneura inconspicua	PR	3	15
78655	Procladius (Holotanypus) sp	PR	8	1
82820	Cryptochironomus sp	PR	8	3
83040	Dicrotendipes neomodestus	CG	6	10
84470	Polypedilum (P.) illinoense	SH	6	2
84520	Polypedilum (Tripodura) halterale group	SH	6	4
84540	Polypedilum (Tripodura) scalaenum group	SH	6	5
84960	Pseudochironomus sp	CG	5	1
85230	Cladotanytarsus mancus group	CG	7	4
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	10
85500	Paratanytarsus sp	CG	6	1
85821	Tanytarsus glabrescens group sp 7	CF	7	1
85840	Tanytarsus sepp	CF	7	1
93200	Hydrobiidae	SC	6	1
94201	Lymnaeidae	SC	7	1
95100	Physella sp	SC	9	8
95501	Planorbidae	SC	6	2

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
97601	Corbicula fluminea	CF	4	13

No. Quantitative Taxa: 40 Total Taxa: 40

Number of Organisms: 322 mIBI: 49.75

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Half Day Rd.

Site ID: **16-4**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 80.00

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	6
03600	Oligochaeta	CG	10	4
06201	Hyalella azteca	CG	5	39
06800	Gammarus sp		3	43
11130	Baetis intercalaris	CG	4	17
11200	Callibaetis sp	CG	4	1
13400	Stenacron sp	SC	4	3
16700	Tricorythodes sp	CG	5	39
17200	Caenis sp	CG	6	5
21300	Hetaerina sp	PR	3	2
22001	Coenagrionidae	PR	5	15
52200	Cheumatopsyche sp	CF	6	69
53501	Hydroptilidae	PH	3	2
59407	Nectopsyche candida	SH	3	3
59500	Oecetis sp	PR	5	1
68700	Dubiraphia sp	CG	5	5
68901	Macronychus glabratus		2	1
69400	Stenelmis sp	SC	7	4
74100	Simulium sp	CF	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78600	Pentaneura inconspicua	PR	3	14
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	4
82130	Thienemanniella similis	CG	2	1
83040	Dicrotendipes neomodestus	CG	6	5
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
85500	Paratanytarsus sp	CG	6	1
85625	Rheotanytarsus sp	CF	6	5
95100	Physella sp	SC	9	4

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 28 Total Taxa: 28

Number of Organisms: 296 mIBI: 58.79

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Deerfield Rd.

Site ID: **16-3**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 76.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	5
03600	Oligochaeta	CG	10	1
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	16
06800	Gammarus sp		3	26
11130	Baetis intercalaris	CG	4	1
11670	Procloeon viridoculare		4	3
13400	Stenacron sp	SC	4	2
13570	Maccaffertium terminatum	SC	4	1
16700	Tricorythodes sp	CG	5	47
18100	Anthopotamus sp		4	1
21300	Hetaerina sp	PR	3	4
22001	Coenagrionidae	PR	5	13
22300	Argia sp	PR	5	3
52200	Cheumatopsyche sp	CF	6	7
53800	Hydroptila sp	SC	2	1
59407	Nectopsyche candida	SH	3	2
59500	Oecetis sp	PR	5	2
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	2
67901		CG	6	78
68700	Dubiraphia sp	CG	5	9
68901	Macronychus glabratus		2	5
69400	Stenelmis sp	SC	7	4
78655	Procladius (Holotanypus) sp	PR	8	2
82820	Cryptochironomus sp	PR	8	3
83040	Dicrotendipes neomodestus	CG	6	3
83840	Microtendipes pedellus group	CF	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84520	Polypedilum (Tripodura) halterale group	SH	6	1
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	1
85625	Rheotanytarsus sp	CF	6	2
93200	Hydrobiidae	SC	6	4
95100	Physella sp	SC	9	3
96900	Ferrissia sp	SC	7	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 34 Total Taxa: 34

Number of Organisms: 256 mIBI: 57.42

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: E. Lake Cook Rd.

Site ID: **16-2**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 75.40

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	8
06201	Hyalella azteca	CG	5	35
06800	Gammarus sp		3	85
11130	Baetis intercalaris	CG	4	60
13570	Maccaffertium terminatum	SC	4	1
16700	Tricorythodes sp	CG	5	52
17200	Caenis sp	CG	6	1
21200	Calopteryx sp	PR	4	3
22300	Argia sp	PR	5	2
52200	Cheumatopsyche sp	CF	6	7
68901	Macronychus glabratus		2	1
69400	Stenelmis sp	SC	7	5
74100	Simulium sp	CF	6	38
78599	Pentaneura sp	PR	3	4
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	1
83840	Microtendipes pedellus group	CF	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
85625	Rheotanytarsus sp	CF	6	2
96900	Ferrissia sp	SC	7	1
97601	Corbicula fluminea	CF	4	7

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 22 Total Taxa: 22

Number of Organisms: 317 mIBI: 45.37

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Palantine Frontage Rd. (Willow Road)

Site ID: **16-1**

Sample:

Collection Date: 07/30/2016 River Code: 95-656 River: Des Plaines River RM: 71.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	42
04664	Helobdella stagnalis	PR	8	1
04666	Helobdella papillata	PA	8	1
06201	Hyalella azteca	CG	5	26
06800	Gammarus sp		3	22
11130	Baetis intercalaris	CG	4	6
13400	Stenacron sp	SC	4	1
16700	Tricorythodes sp	CG	5	68
21300	Hetaerina sp	PR	3	2
22001	Coenagrionidae	PR	5	3
52200	Cheumatopsyche sp	CF	6	32
53800	Hydroptila sp	SC	2	1
59407	Nectopsyche candida	SH	3	2
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	3
68700	Dubiraphia sp	CG	5	1
68901	Macronychus glabratus		2	2
69400	Stenelmis sp	SC	7	1
74100	Simulium sp	CF	6	2
78599	Pentaneura sp	PR	3	10
78655	Procladius (Holotanypus) sp	PR	8	2
82820	Cryptochironomus sp	PR	8	2
83040	Dicrotendipes neomodestus	CG	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	5
84470	Polypedilum (P.) illinoense	SH	6	1
84520	Polypedilum (Tripodura) halterale group	SH	6	3
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	8
85625	Rheotanytarsus sp	CF	6	10
93200	Hydrobiidae	SC	6	2
95100	Physella sp	SC	9	1
97601	Corbicula fluminea	CF	4	32
98001	Pisidiidae		5	2

No. Quantitative Taxa:	32	Total Taxa:	32
Number of Organisms:	297	mIBI:	53.15

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hastings Creek @ Grass Lake Rd

Site ID: **10-5**

Sample:

Collection Date: 08/07/2016 River Code: 95-702 River: Hastings Creek RM: 3.12

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	11
03600	Oligochaeta	CG	10	112
04935	Erpobdella punctata punctata	PR	8	2
06800	Gammarus sp		3	4
11200	Callibaetis sp	CG	4	1
68700	Dubiraphia sp	CG	5	2
72150	Pericoma sp	CG	11	1
72600	Aedes sp	CF	8	8
72700	Anopheles sp	CF	6	1
79000	Tanypus sp	PR	8	1
80001	Orthocladiinae	CG	6	2
84750	Stictochironomus sp		5	1
89501	Ephydridae	CG	8	1
94400	Fossaria sp	SC	7	33
95100	Physella sp	SC	9	73
95900	Gyraulus sp	SC	6	9
98001	Pisidiidae		5	22

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 17 Total Taxa: 17

Number of Organisms: 284 mIBI: 31.57

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Ust. Miller Rd.

Site ID: **10-4**

Sample:

Collection Date: 08/07/2016 River Code: 95-702 River: Hastings Creek RM: 1.68

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	218
03600	Oligochaeta	CG	10	76
04664	Helobdella stagnalis	PR	8	9
06800	Gammarus sp		3	3
22001	Coenagrionidae	PR	5	1
78600	Pentaneura inconspicua	PR	3	18
80420	Cricotopus (C.) bicinctus	SH	8	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	1
87540	Hemerodromia sp	PR	6	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 9 Total Taxa: 9

Number of Organisms: 328 mIBI: 17.45

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: **Site ID: 10-6**

Sample:

Collection Date: 08/07/2016 River Code: 95-715 River: Unnamed Trib to N. Mill Creek RM: 0.04

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	15
03600	Oligochaeta	CG	10	9
05800	Caecidotea sp	CG	6	54
06800	Gammarus sp		3	173
08200	Orconectes sp	CG	5	1
11120	Baetis flavistriga	CG	4	3
21200	Calopteryx sp	PR	4	1
52200	Cheumatopsyche sp	CF	6	9
52530	Hydropsyche depravata group	CF	5	1
59500	Oecetis sp	PR	5	1
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	1
72700	Anopheles sp	CF	6	8
77355	Clinotanypus pinguis	PR	6	2
79400	Zavrelimyia sp	PR	8	1
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82820	Cryptochironomus sp	PR	8	3
82880	Cryptotendipes sp	CG	6	7
84210	Paratendipes albimanus or P. duplicatus	CG	3	2
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
87400	Stratiomys sp	CF	10	1
87540	Hemerodromia sp	PR	6	1
94400	Fossaria sp	SC	7	1
98001	Pisidiidae		5	14

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 24 Total Taxa: 24

Number of Organisms: 312 mIBI: 26.80

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Route 173

Site ID: 10-3

Sample: A

Collection Date: 08/07/2016 River Code: 95-996 River: North Mill Creek RM: 10.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	1
03600	Oligochaeta	CG	10	54
05800	Caecidotea sp	CG	6	2
06201	Hyalella azteca	CG	5	87
11200	Callibaetis sp	CG	4	9
13400	Stenacron sp	SC	4	2
17200	Caenis sp	CG	6	34
22001	Coenagrionidae	PR	5	29
68201	Scirtidae	SC	7	12
68708	Dubiraphia vittata group	CG	5	21
77140	Ablabesmyia peleensis		6	10
77700	Guttipelopia guttipennis	PR	6	1
78130	Labrundinia neopilosella	PR	4	3
78200	Larsia sp	PR	6	26
78655	Procladius (Holotanypus) sp	PR	8	1
79000	Tanypus sp	PR	8	1
83051	Dicrotendipes simpsoni	CG	6	1
83158	Endochironomus nigricans	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	1
84500	Polypedilum (P.) trigonus	SH	6	3
85500	Paratanytarsus sp	CG	6	4
93200	Hydrobiidae	SC	6	1
95100	Physella sp	SC	9	9

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 23 Total Taxa: 23

Number of Organisms: 315 mIBI: 34.22

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Route 173

Site ID: 10-3

Sample: B

Collection Date: 08/07/2016 River Code: 95-996 River: North Mill Creek RM: 10.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	72
06201	Hyalella azteca	CG	5	79
11200	Callibaetis sp	CG	4	4
13400	Stenacron sp	SC	4	3
17200	Caenis sp	CG	6	22
22001	Coenagrionidae	PR	5	22
52200	Cheumatopsyche sp	CF	6	1
68201	Scirtidae	SC	7	8
68708	Dubiraphia vittata group	CG	5	24
72420	Chaoborus sp		0	2
77140	Ablabesmyia peleensis		6	4
77355	Clinotanypus pinguis	PR	6	1
77700	Guttipelopia guttipennis	PR	6	2
78200	Larsia sp	PR	6	36
78655	Procladius (Holotanypus) sp	PR	8	2
79000	Tanypus sp	PR	8	5
82730	Chironomus (C.) decorus group	CG	11	6
82880	Cryptotendipes sp	CG	6	2
83051	Dicrotendipes simpsoni	CG	6	2
83158	Endochironomus nigricans	SH	6	10
83300	Glyptotendipes (G.) sp	CF	10	3
84000	Parachironomus sp	PR	8	1
84470	Polypedilum (P.) illinoense	SH	6	2
84500	Polypedilum (P.) trigonus	SH	6	8
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84800	Tribelos jucundum	CG	5	2
85001	Tanytarsini	CF	6	1
85500	Paratanytarsus sp	CG	6	1
95100	Physella sp	SC	9	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 29 Total Taxa: 29

Number of Organisms: 327 mIBI: 34.22

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Kelly Road

Site ID: **10-2**

Sample:

Collection Date: 08/07/2016 River Code: 95-996 River: North Mill Creek RM: 8.10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	17
03600	Oligochaeta	CG	10	28
05800	Caecidotea sp	CG	6	2
06201	Hyalella azteca	CG	5	1
08200	Orconectes sp	CG	5	3
11130	Baetis intercalaris	CG	4	2
17200	Caenis sp	CG	6	1
21200	Calopteryx sp	PR	4	7
22001	Coenagrionidae	PR	5	4
47600	Sialis sp	PR	4	2
52200	Cheumatopsyche sp	CF	6	4
52530	Hydropsyche depravata group	CF	5	3
68201	Scirtidae	SC	7	1
68700	Dubiraphia sp	CG	5	3
69400	Stenelmis sp	SC	7	12
74501	Ceratopogonidae	PR	5	2
77130	Ablabesmyia rhamphe group	CG	6	2
77355	Clinotanypus pinguis	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	3
79000	Tanypus sp	PR	8	1
82730	Chironomus (C.) decorus group	CG	11	17
82820	Cryptochironomus sp	PR	8	3
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	4
83051	Dicrotendipes simpsoni	CG	6	4
83300	Glyptotendipes (G.) sp	CF	10	128
84450	Polypedilum (Uresipedilum) flavum	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	1
85800	Tanytarsus sp	CF	7	2
95100	Physella sp	SC	9	14
98001	Pisidiidae		5	41

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 31 Total Taxa: 31

Number of Organisms: 318 mIBI: 31.63

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Milbourne Road

Site ID: **10-1**

Sample:

Collection Date: 08/07/2016 River Code: 95-996 River: North Mill Creek RM: 1.10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	8
03600	Oligochaeta	CG	10	27
08200	Orconectes sp	CG	5	1
11130	Baetis intercalaris	CG	4	14
13400	Stenacron sp	SC	4	12
21200	Calopteryx sp	PR	4	9
22001	Coenagrionidae	PR	5	17
52200	Cheumatopsyche sp	CF	6	22
52530	Hydropsyche depravata group	CF	5	2
68201	Scirtidae	SC	7	26
68700	Dubiraphia sp	CG	5	31
68901	Macronychus glabratus		2	3
69400	Stenelmis sp	SC	7	26
72700	Anopheles sp	CF	6	3
77120	Ablabesmyia mallochi	CG	6	9
77130	Ablabesmyia rhamphe group	CG	6	4
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	11
78655	Procladius (Holotanypus) sp	PR	8	9
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82730	Chironomus (C.) decorus group	CG	11	1
82820	Cryptochironomus sp	PR	8	4
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	1
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	4
84100	Paracladopelma sp		0	1
84460	Polypedilum (P.) fallax group	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	14
84520	Polypedilum (Tripodura) halterale group	SH	6	4
84540	Polypedilum (Tripodura) scalaenum group	SH	6	12
84700	Stenochironomus sp	SH	3	4
84750	Stictochironomus sp		5	1
85625	Rheotanytarsus sp	CF	6	3
94400	Fossaria sp	SC	7	5
95100	Physella sp	SC	9	1
98001	Pisidiidae		5	2
99001	Unionidae	CF	1	1

No. Quantitative Taxa:	37	Total Taxa:	37
Number of Organisms:	299	mIBI:	55.28

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Wick Street

Site ID: **11-6**

Sample:

Collection Date: 08/04/2016 River Code: 95-995 River: Mill Creek RM: 17.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	10
05800	Caecidotea sp	CG	6	29
06201	Hyalella azteca	CG	5	1
06800	Gammarus sp		3	92
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	12
59730	Triaenodes melaca		0	1
68201	Scirtidae	SC	7	2
68700	Dubiraphia sp	CG	5	126
77001	Tanypodinae	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	5
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	CG	3	1
82730	Chironomus (C.) decorus group	CG	11	1
82880	Cryptotendipes sp	CG	6	1
83840	Microtendipes pedellus group	CF	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	12
95100	Physella sp	SC	9	2
98001	Pisidiidae		5	7

No. Quantitative Taxa:	18	Total Taxa:	18
Number of Organisms:	306	mIBI:	32.49

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Washington St

Site ID: **11-5**

Sample:

Collection Date: 08/05/2016 River Code: 95-995 River: Mill Creek RM: 13.80

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	5
03600	Oligochaeta	CG	10	70
05800	Caecidotea sp	CG	6	7
06800	Gammarus sp		3	19
11200	Callibaetis sp	CG	4	1
17200	Caenis sp	CG	6	5
22001	Coenagrionidae	PR	5	62
59500	Oecetis sp	PR	5	1
59520	Oecetis cinerascens	PR	5	6
68201	Scirtidae	SC	7	4
68700	Dubiraphia sp	CG	5	37
77100	Ablabesmyia sp	CG	6	1
77355	Clinotanypus pinguis	PR	6	1
78200	Larsia sp	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	17
79000	Tanypus sp	PR	8	7
80510	Cricotopus (Isocladius) sylvestris group	SH	8	1
82730	Chironomus (C.) decorus group	CG	11	1
82800	Cladopelma sp	CG	6	9
82880	Cryptotendipes sp	CG	6	6
83051	Dicrotendipes simpsoni	CG	6	3
83100	Einfeldia sp	CG	10	4
83158	Endochironomus nigricans	SH	6	8
83300	Glyptotendipes (G.) sp	CF	10	20
84470	Polypedilum (P.) illinoense	SH	6	1
84500	Polypedilum (P.) trigonus	SH	6	1
84750	Stictochironomus sp		5	1
85500	Paratanytarsus sp	CG	6	1
85800	Tanytarsus sp	CF	7	1
95100	Physella sp	SC	9	6
98001	Pisidiidae		5	10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 31 Total Taxa: 31

Number of Organisms: 317 mIBI: 30.78

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Route 45

Site ID: 11-4

Sample:

Collection Date: 08/05/2016 River Code: 95-995 River: Mill Creek RM: 10.10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	1
03600	Oligochaeta	CG	10	16
05800	Caecidotea sp	CG	6	41
06800	Gammarus sp		3	67
08200	Orconectes sp	CG	5	1
11200	Callibaetis sp	CG	4	1
13400	Stenacron sp	SC	4	14
22001	Coenagrionidae	PR	5	15
23700	Anax sp	PR	5	1
52200	Cheumatopsyche sp	CF	6	25
68700	Dubiraphia sp	CG	5	75
69400	Stenelmis sp	SC	7	1
77355	Clinotanypus pinguis	PR	6	23
77500	Conchapelopia sp	PR	6	3
78600	Pentaneura inconspicua	PR	3	8
78655	Procladius (Holotanypus) sp	PR	8	6
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	1
84520	Polypedilum (Tripodura) halterale group	SH	6	4
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 20 Total Taxa: 20

Number of Organisms: 305 mIBI: 36.56

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Sterns School Road

Site ID: **11-3**

Sample:

Collection Date: 08/06/2016 River Code: 95-995 River: Mill Creek RM: 7.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	24
06800	Gammarus sp		3	152
08200	Orconectes sp	CG	5	2
11130	Baetis intercalaris	CG	4	58
13400	Stenacron sp	SC	4	1
21200	Calopteryx sp	PR	4	1
22001	Coenagrionidae	PR	5	4
68201	Scirtidae	SC	7	1
68901	Macronychus glabratus		2	9
69400	Stenelmis sp	SC	7	29
74100	Simulium sp	CF	6	1
74650	Atrichopogon sp	PR	2	1
80420	Cricotopus (C.) bicinctus	SH	8	2
82820	Cryptochironomus sp	PR	8	3
82880	Cryptotendipes sp	CG	6	3
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	2
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
84700	Stenochironomus sp	SH	3	1
84750	Stictochironomus sp		5	1
85625	Rheotanytarsus sp	CF	6	13
85800	Tanytarsus sp	CF	7	1
87200	Odontomyia (O.) sp or Hedriodiscus sp	CG	10	1
94400	Fossaria sp	SC	7	1
95100	Physella sp	SC	9	1
98001	Pisidiidae		5	1

No. Quantitative Taxa:	27	Total Taxa:	27
Number of Organisms:	317	mIBI:	48.34

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hunt Club Road

Site ID: **11-2**

Sample:

Collection Date: 08/08/2016 River Code: 95-995 River: Mill Creek RM: 1.71

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	61
03600	Oligochaeta	CG	10	8
06800	Gammarus sp		3	1
11130	Baetis intercalaris	CG	4	3
52200	Cheumatopsyche sp	CF	6	5
52530	Hydropsyche depravata group	CF	5	1
52550	Hydropsyche frisoni	CF	5	1
68700	Dubiraphia sp	CG	5	2
69400	Stenelmis sp	SC	7	9
77120	Ablabesmyia mallochi	CG	6	1
77130	Ablabesmyia rhamphe group	CG	6	3
77750	Hayesomyia senata or Thienemannimyia norena		5	4
79000	Tanypus sp	PR	8	1
82820	Cryptochironomus sp	PR	8	2
83040	Dicrotendipes neomodestus	CG	6	13
83300	Glyptotendipes (G.) sp	CF	10	77
84155	Paralauterborniella nigrohalteralis	CG	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	32
84470	Polypedilum (P.) illinoense	SH	6	1
84520	Polypedilum (Tripodura) halterale group	SH	6	5
84540	Polypedilum (Tripodura) scalaenum group	SH	6	13
95100	Physella sp	SC	9	1
98001	Pisidiidae		5	40

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 23 Total Taxa: 23

Number of Organisms: 285 mIBI: 25.78

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Dilley's Road

Site ID: **11-1**

Sample:

Collection Date: 08/06/2016 River Code: 95-995 River: Mill Creek RM: 0.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	5
04637	Placobdella phalera		8	1
06800	Gammarus sp		3	12
11130	Baetis intercalaris	CG	4	7
13400	Stenacron sp	SC	4	3
16700	Tricorythodes sp	CG	5	1
21200	Calopteryx sp	PR	4	1
22001	Coenagrionidae	PR	5	3
52200	Cheumatopsyche sp	CF	6	7
52570	Hydropsyche simulans	CF	5	1
59400	Nectopsyche sp	SH	3	1
68201	Scirtidae	SC	7	2
68700	Dubiraphia sp	CG	5	14
68901	Macronychus glabratus		2	1
69400	Stenelmis sp	SC	7	23
77130	Ablabesmyia rhamphe group	CG	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78655	Procladius (Holotanypus) sp	PR	8	1
79000	Tanypus sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	3
82130	Thienemanniella similis	CG	2	1
82730	Chironomus (C.) decorus group	CG	11	24
82820	Cryptochironomus sp	PR	8	10
82880	Cryptotendipes sp	CG	6	5
83040	Dicrotendipes neomodestus	CG	6	98
83400	Harnischia sp	CG	6	1
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	2
84155	Paralauterborniella nigrohalteralis	CG	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	11
84470	Polypedilum (P.) illinoense	SH	6	9
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	12
85230	Cladotanytarsus mancus group	CG	7	3
85625	Rheotanytarsus sp	CF	6	1
85800	Tanytarsus sp	CF	7	7
86100	Chrysops sp	CG	7	1
93200	Hydrobiidae	SC	6	1
95100	Physella sp	SC	9	1
97601	Corbicula fluminea	CF	4	14
98200	Pisidium sp	CF	5	8
98600	Sphaerium sp	CG	5	2

No. Quantitative Taxa: 41 Total Taxa: 41

Number of Organisms: 302 mIBI: 50.72

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: 21st Street

Site ID: **12-2**

Sample:

Collection Date: 08/08/2016 River Code: 95-708 River: Newport Drainage Ditch RM: 3.03

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	15
06201	Hyalella azteca	CG	5	34
11200	Callibaetis sp	CG	4	6
22001	Coenagrionidae	PR	5	10
27000	Corduliidae or Libellulidae		0	1
48200	Chauliodes sp	PR	4	1
52200	Cheumatopsyche sp	CF	6	1
54601	Phryganeidae	SH	3	1
69400	Stenelmis sp	SC	7	3
72700	Anopheles sp	CF	6	4
72900	Culex sp	CF	8	6
74501	Ceratopogonidae	PR	5	1
77100	Ablabesmyia sp	CG	6	5
77130	Ablabesmyia rhamphe group	CG	6	1
77355	Clinotanypus pinguis	PR	6	6
79000	Tanypus sp	PR	8	24
82730	Chironomus (C.) decorus group	CG	11	32
82770	Chironomus (C.) riparius group	CG	11	2
83051	Dicrotendipes simpsoni	CG	6	4
83158	Endochironomus nigricans	SH	6	14
83300	Glyptotendipes (G.) sp	CF	10	6
84470	Polypedilum (P.) illinoense	SH	6	2
84500	Polypedilum (P.) trigonus	SH	6	2
85800	Tanytarsus sp	CF	7	6
94201	Lymnaeidae	SC	7	5
95100	Physella sp	SC	9	75
98001	Pisidiidae		5	22

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 27 Total Taxa: 27

Number of Organisms: 289 mIBI: 33.69

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Newport Drainage Ditch @ Kilbourne Ave

Site ID: **12-1**

Sample:

Collection Date: 08/08/2016 River Code: 95-708 River: Newport Drainage Ditch RM: 0.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	6
06201	Hyalella azteca	CG	5	46
06800	Gammarus sp		3	11
11200	Callibaetis sp	CG	4	3
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	32
27000	Corduliidae or Libellulidae		0	1
53800	Hydroptila sp	SC	2	3
68201	Scirtidae	SC	7	2
68700	Dubiraphia sp	CG	5	85
77355	Clinotanypus pinguis	PR	6	2
77500	Conchapelopia sp	PR	6	2
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78200	Larsia sp	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	1
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	CG	3	1
82730	Chironomus (C.) decorus group	CG	11	4
83040	Dicrotendipes neomodestus	CG	6	2
83050	Dicrotendipes lucifer	CG	6	2
83051	Dicrotendipes simpsoni	CG	6	1
83158	Endochironomus nigricans	SH	6	3
83840	Microtendipes pedellus group	CF	6	7
84000	Parachironomus sp	PR	8	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	2
84470	Polypedilum (P.) illinoense	SH	6	3
84750	Stictochironomus sp		5	36
85800	Tanytarsus sp	CF	7	3
93200	Hydrobiidae	SC	6	2
94400	Fossaria sp	SC	7	12
95100	Physella sp	SC	9	35
95501	Planorbidae	SC	6	1
95900	Gyraulus sp	SC	6	1
96900	Ferrissia sp	SC	7	1
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 34 Total Taxa: 34

Number of Organisms: 316 mIBI: 46.47

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Almond Rd.

Site ID: **13-15**

Sample:

Collection Date: 08/02/2016 River Code: 95-704 River: Bull's Brook RM: 1.95

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	35
04664	Helobdella stagnalis	PR	8	70
05800	Caecidotea sp	CG	6	107
06201	Hyalella azteca	CG	5	2
06800	Gammarus sp		3	21
11200	Callibaetis sp	CG	4	24
13400	Stenacron sp	SC	4	1
21300	Hetaerina sp	PR	3	3
22001	Coenagrionidae	PR	5	6
23600	Aeshna sp	PR	4	1
27000	Corduliidae or Libellulidae		0	1
59500	Oecetis sp	PR	5	1
68700	Dubiraphia sp	CG	5	1
74501	Ceratopogonidae	PR	5	4
77500	Conchapelopia sp	PR	6	4
78200	Larsia sp	PR	6	6
78655	Procladius (Holotanypus) sp	PR	8	6
79000	Tanypus sp	PR	8	2
82730	Chironomus (C.) decorus group	CG	11	1
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	3
83002	Dicrotendipes modestus	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	8
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	1
85800	Tanytarsus sp	CF	7	6
87540	Hemerodromia sp	PR	6	1
93900	Elimia sp	SC	6	1
95100	Physella sp	SC	9	4
98200	Pisidium sp	CF	5	28

No. Quantitative Taxa:	31	Total Taxa:	31
Number of Organisms:	354	mIBI:	32.43

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Milwaukee Ave. (Route 21)

Site ID: 13-7

Sample: 2

Collection Date: 06/30/2016 River Code: 95-704 River: Bull's Brook RM: 0.25

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	1
05800	Caecidotea sp	CG	6	5
06800	Gammarus sp		3	284
08200	Orconectes sp	CG	5	1
11120	Baetis flavistriga	CG	4	15
22001	Coenagrionidae	PR	5	1
34500	Perlesta placida complex	PR	4	1
52200	Cheumatopsyche sp	CF	6	2
68700	Dubiraphia sp	CG	5	1
69200	Optioservus sp	SC	4	2
69400	Stenelmis sp	SC	7	8
82820	Cryptochironomus sp	PR	8	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 12 Total Taxa: 12

Number of Organisms: 322 mIBI: 32.14

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Milwaukee Ave. (Route 21)

Site ID: **13-7**

Sample:

Collection Date: 08/04/2016 River Code: 95-704 River: Bull's Brook RM: 0.25

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	6
03600	Oligochaeta	CG	10	10
05800	Caecidotea sp	CG	6	25
06800	Gammarus sp		3	145
11120	Baetis flavistriga	CG	4	1
13400	Stenacron sp	SC	4	2
21200	Calopteryx sp	PR	4	4
21300	Hetaerina sp	PR	3	62
22001	Coenagrionidae	PR	5	1
52530	Hydropsyche depravata group	CF	5	1
57900	Pycnopsyche sp	SH	3	1
59400	Nectopsyche sp	SH	3	2
68700	Dubiraphia sp	CG	5	24
68901	Macronychus glabratus		2	2
69200	Optioservus sp	SC	4	11
69400	Stenelmis sp	SC	7	11
77500	Conchapelopia sp	PR	6	1
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	1
83840	Microtendipes pedellus group	CF	6	1
84460	Polypedilum (P.) fallax group	SH	6	1
84750	Stictochironomus sp		5	2
98001	Pisidiidae		5	3

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 23 Total Taxa: 23

Number of Organisms: 318 mIBI: 32.14

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Stone Roller @ Lake Carina

Site ID: **13-9**

Sample:

Collection Date: 08/09/2016 River Code: 95-709 River: Stoneroller Creek RM: 0.42

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	17
03600	Oligochaeta	CG	10	13
05800	Caecidotea sp	CG	6	5
06201	Hyalella azteca	CG	5	11
08200	Orconectes sp	CG	5	1
11130	Baetis intercalaris	CG	4	19
11200	Callibaetis sp	CG	4	4
13400	Stenacron sp	SC	4	1
17200	Caenis sp	CG	6	3
21300	Hetaerina sp	PR	3	2
22001	Coenagrionidae	PR	5	7
52200	Cheumatopsyche sp	CF	6	3
53501	Hydroptilidae	PH	3	1
59500	Oecetis sp	PR	5	1
68700	Dubiraphia sp	CG	5	18
69200	Optioservus sp	SC	4	4
69400	Stenelmis sp	SC	7	96
71300	Limonia sp	SH	3	1
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	2
80420	Cricotopus (C.) bicinctus	SH	8	6
80430	Cricotopus (C.) tremulus group	SH	8	2
82730	Chironomus (C.) decorus group	CG	11	2
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	5
83040	Dicrotendipes neomodestus	CG	6	29
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	14
83840	Microtendipes pedellus group	CF	6	10
84210	Paratendipes albimanus or P. duplicatus	CG	3	1
84300	Phaenopsectra obediens group	SC	4	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	4
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
84750	Stictochironomus sp		5	1
84960	Pseudochironomus sp	CG	5	1
85500	Paratanytarsus sp	CG	6	3
85625	Rheotanytarsus sp	CF	6	3
85800	Tanytarsus sp	CF	7	1
86100	Chrysops sp	CG	7	1
89501	Ephydridae	CG	8	1
97710	Dreissena polymorpha		99	3
98001	Pisidiidae		5	2

No. Quantitative Taxa: 42 Total Taxa: 42

Number of Organisms: 305 mIBI: 57.94

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: E. of Northwestern Ave.

Site ID: **13-12**

Sample:

Collection Date: 08/06/2016 River Code: 95-710 River: Suburban Country Club Trib RM: 2.75

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	42
04664	Helobdella stagnalis	PR	8	1
05800	Caecidotea sp	CG	6	87
11200	Callibaetis sp	CG	4	28
22001	Coenagrionidae	PR	5	2
72900	Culex sp	CF	8	2
77470	Coelotanypus sp	PR	4	1
79000	Tanypus sp	PR	8	2
82730	Chironomus (C.) decorus group	CG	11	1
82770	Chironomus (C.) riparius group	CG	11	1
85800	Tanytarsus sp	CF	7	2
87200	Odontomyia (O.) sp or Hedriodiscus sp	CG	10	2
94800	Stagnicola sp	SC	7	73
95100	Physella sp	SC	9	29
95900	Gyraulus sp	SC	6	14
98001	Pisidiidae		5	3

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 16 Total Taxa: 16

Number of Organisms: 290 mIBI: 31.63

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Suburban Country Club Trib @ Shirley Dr

Site ID: **13-10**

Sample:

Collection Date: 08/06/2016 River Code: 95-710 River: Suburban Country Club Trib RM: 2.00

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	21
03600	Oligochaeta	CG	10	134
06201	Hyalella azteca	CG	5	123
11200	Callibaetis sp	CG	4	2
17200	Caenis sp	CG	6	1
22001	Coenagrionidae	PR	5	28
68700	Dubiraphia sp	CG	5	2
72700	Anopheles sp	CF	6	1
78200	Larsia sp	PR	6	3
83000	Dicrotendipes sp	CG	6	1
84470	Polypedilum (P.) illinoense	SH	6	2
84960	Pseudochironomus sp	CG	5	1
95100	Physella sp	SC	9	1
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 14 Total Taxa: 14

Number of Organisms: 321 mIBI: 19.17

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Mill Creek Rd.; E. of I-94

Site ID: **13-11**

Sample:

Collection Date: 08/06/2016 River Code: 95-711 River: Slocum Conrners Creek RM: 1.36

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	80
05800	Caecidotea sp	CG	6	39
06201	Hyalella azteca	CG	5	1
06800	Gammarus sp		3	39
13400	Stenacron sp	SC	4	1
17200	Caenis sp	CG	6	1
21300	Hetaerina sp	PR	3	1
47600	Sialis sp	PR	4	2
52200	Cheumatopsyche sp	CF	6	3
52530	Hydropsyche depravata group	CF	5	5
68700	Dubiraphia sp	CG	5	11
69200	Optioservus sp	SC	4	1
69400	Stenelmis sp	SC	7	24
78655	Procladius (Holotanypus) sp	PR	8	2
79000	Tanypus sp	PR	8	1
82730	Chironomus (C.) decorus group	CG	11	5
82820	Cryptochironomus sp	PR	8	3
83040	Dicrotendipes neomodestus	CG	6	2
83300	Glyptotendipes (G.) sp	CF	10	1
83840	Microtendipes pedellus group	CF	6	10
84210	Paratendipes albimanus or P. duplicatus	CG	3	51
84315	Phaenopsectra flavipes	SC	4	1
84460	Polypedilum (P.) fallax group	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84750	Stictochironomus sp		5	22
85500	Paratanytarsus sp	CG	6	2
85625	Rheotanytarsus sp	CF	6	1
85800	Tanytarsus sp	CF	7	1
95100	Physella sp	SC	9	2
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 30 Total Taxa: 30

Number of Organisms: 315 mIBI: 41.43

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Behind pump station off of Sprucewood Lane

Site ID: **13-17**

Sample:

Collection Date: 08/04/2016 River Code: 95-714 River: Unnamed Trib to Des Plaines River RM: 0.13

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	66
04664	Helobdella stagnalis	PR	8	2
17200	Caenis sp	CG	6	2
68700	Dubiraphia sp	CG	5	1
71700	Pilaria sp		0	3
71900	Tipula sp	SH	4	1
72501	Culicidae	CG	8	1
78702	Psectrotanypus dyari	PR	8	2
82770	Chironomus (C.) riparius group	CG	11	1
95100	Physella sp	SC	9	24
96264	Planorbella (Pierosoma) pilsbryi	SC	6	2
98001	Pisidiidae		5	188

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 12 Total Taxa: 12

Number of Organisms: 293 mIBI: 22.92

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Swanson Trigg Conservation Area - (Kenwood Av) 42.3700 -87.9085

Site ID: **13-13**

Sample:

Collection Date: 08/05/2016 River Code: 95-716 River: Unnamed Trib-Greenleaf Creek RM: 0.40

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	47
03600	Oligochaeta	CG	10	27
04664	Helobdella stagnalis	PR	8	2
05800	Caecidotea sp	CG	6	164
06800	Gammarus sp		3	24
17200	Caenis sp	CG	6	1
22001	Coenagrionidae	PR	5	1
77500	Conchapelopia sp	PR	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	10
84470	Polypedilum (P.) illinoense	SH	6	1
84750	Stictochironomus sp		5	3
98001	Pisidiidae		5	26

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 12 Total Taxa: 12

Number of Organisms: 307 mIBI: 20.30

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Leonard Dr.

Site ID: **13-14**

Sample:

Collection Date: 08/05/2016 River Code: 95-720 River: West Fork Belvidere Rd. Trib RM: 0.21

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	61
03600	Oligochaeta	CG	10	51
04935	Erpobdella punctata punctata	PR	8	1
05800	Caecidotea sp	CG	6	99
21200	Calopteryx sp	PR	4	1
22001	Coenagrionidae	PR	5	2
68700	Dubiraphia sp	CG	5	2
69400	Stenelmis sp	SC	7	41
77500	Conchapelopia sp	PR	6	2
82820	Cryptochironomus sp	PR	8	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	51
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	6
98001	Pisidiidae		5	23

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 14 Total Taxa: 14

Number of Organisms: 342 mIBI: 28.33

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Belvidere Rd Tributary @ Highway 21 and 120

Site ID: **13-8**

Sample:

Collection Date: 08/05/2016 River Code: 95-720 River: West Fork Belvidere Rd. Trib RM: 0.15

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	28
03600	Oligochaeta	CG	10	8
04664	Helobdella stagnalis	PR	8	3
05800	Caecidotea sp	CG	6	28
06201	Hyalella azteca	CG	5	1
06700	Crangonyx sp	CG	4	1
06800	Gammarus sp		3	49
08200	Orconectes sp	CG	5	3
11200	Callibaetis sp	CG	4	1
17200	Caenis sp	CG	6	3
21200	Calopteryx sp	PR	4	3
21300	Hetaerina sp	PR	3	4
22001	Coenagrionidae	PR	5	3
68201	Scirtidae	SC	7	3
68700	Dubiraphia sp	CG	5	7
69400	Stenelmis sp	SC	7	141
77120	Ablabesmyia mallochi	CG	6	1
77500	Conchapelopia sp	PR	6	3
77750	Hayesomyia senata or Thienemannimyia norena		5	1
83300	Glyptotendipes (G.) sp	CF	10	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
84460	Polypedilum (P.) fallax group	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	2
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
84750	Stictochironomus sp		5	3
85500	Paratanytarsus sp	CG	6	1
93200	Hydrobiidae	SC	6	3
95100	Physella sp	SC	9	2
98001	Pisidiidae		5	11

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 29 Total Taxa: 29

Number of Organisms: 318 mIBI: 48.93

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hazelnut Xing

Site ID: **14-6**

Sample:

Collection Date: 08/03/2016 River Code: 95-051 River: Bull Creek RM: 5.95

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	23
04664	Helobdella stagnalis	PR	8	85
05800	Caecidotea sp	CG	6	4
06201	Hyalella azteca	CG	5	1
68700	Dubiraphia sp	CG	5	1
69400	Stenelmis sp	SC	7	2
77500	Conchapelopia sp	PR	6	1
80001	Orthocladiinae	CG	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
85400	Micropsectra sp	CG	4	3
95100	Physella sp	SC	9	10
98001	Pisidiidae		5	58
98200	Pisidium sp	CF	5	117

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 13 Total Taxa: 13

Number of Organisms: 307 mIBI: 22.09

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Adj. University Drive

Site ID: **14-5**

Sample:

Collection Date: 08/03/2016 River Code: 95-051 River: Bull Creek RM: 4.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	94
03600	Oligochaeta	CG	10	87
04664	Helobdella stagnalis	PR	8	15
04960	Erpobdella sp (= Mooreobdella)	PR	8	4
06201	Hyalella azteca	CG	5	2
22001	Coenagrionidae	PR	5	7
27000	Corduliidae or Libellulidae		0	1
74501	Ceratopogonidae	PR	5	2
78200	Larsia sp	PR	6	28
78655	Procladius (Holotanypus) sp	PR	8	2
79000	Tanypus sp	PR	8	5
80410	Cricotopus (C.) sp	SH	8	1
82800	Cladopelma sp	CG	6	1
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	2
83040	Dicrotendipes neomodestus	CG	6	5
83051	Dicrotendipes simpsoni	CG	6	11
83158	Endochironomus nigricans	SH	6	1
83300	Glyptotendipes (G.) sp	CF	10	5
84000	Parachironomus sp	PR	8	10
84010	Parachironomus "abortivus" (sensu Simpson & Bode, 1980)	PR	8	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	5
84700	Stenochironomus sp	SH	3	2
85001	Tanytarsini	CF	6	1
85800	Tanytarsus sp	CF	7	11
86501	Stratiomyidae	CG	10	1
98001	Pisidiidae		5	10

No. Quantitative Taxa:	28	Total Taxa:	28
Number of Organisms:	318	mIBI:	17.45

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Route 137

Site ID: **14-2**

Sample:

Collection Date: 08/04/2016 River Code: 95-051 River: Bull Creek RM: 1.00

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	6
03600	Oligochaeta	CG	10	39
04664	Helobdella stagnalis	PR	8	1
06201	Hyalella azteca	CG	5	2
06800	Gammarus sp		3	1
22001	Coenagrionidae	PR	5	6
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	1
69200	Optioservus sp	SC	4	1
69400	Stenelmis sp	SC	7	1
80420	Cricotopus (C.) bicinctus	SH	8	2
82820	Cryptochironomus sp	PR	8	1
83840	Microtendipes pedellus group	CF	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	3
84700	Stenochironomus sp	SH	3	1
84750	Stictochironomus sp		5	2
93200	Hydrobiidae	SC	6	56
96120	Menetus (Micromenetus) dilatatus	SC	6	1
98200	Pisidium sp	CF	5	70
98600	Sphaerium sp	CG	5	126

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 20 Total Taxa: 20

Number of Organisms: 322 mIBI: 35.31

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hwy 21

Site ID: **14-1**

Sample:

Collection Date: 08/04/2016 River Code: 95-051 River: Bull Creek RM: 0.50

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	17
03600	Oligochaeta	CG	10	3
04960	Erpobdella sp (= Mooreobdella)	PR	8	1
06201	Hyalella azteca	CG	5	57
06800	Gammarus sp		3	2
11130	Baetis intercalaris	CG	4	3
11200	Callibaetis sp	CG	4	2
17200	Caenis sp	CG	6	1
22001	Coenagrionidae	PR	5	22
52200	Cheumatopsyche sp	CF	6	9
52530	Hydropsyche depravata group	CF	5	3
68201	Scirtidae	SC	7	5
68700	Dubiraphia sp	CG	5	4
68901	Macronychus glabratus		2	2
69200	Optioservus sp	SC	4	4
69400	Stenelmis sp	SC	7	25
77120	Ablabesmyia mallochi	CG	6	2
77140	Ablabesmyia peleensis		6	1
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	3
78200	Larsia sp	PR	6	2
78655	Procladius (Holotanypus) sp	PR	8	3
81459	Orthocladius (O.) sp or Paratrichocladius sp		0	1
82730	Chironomus (C.) decorus group	CG	11	1
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	4
83040	Dicrotendipes neomodestus	CG	6	5
83300	Glyptotendipes (G.) sp	CF	10	1
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	6
83840	Microtendipes pedellus group	CF	6	2
84210	Paratendipes albimanus or P. duplicatus	CG	3	3
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	3
84500	Polypedilum (P.) trigonus	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	5
84700	Stenochironomus sp	SH	3	1
85500	Paratanytarsus sp	CG	6	4
85625	Rheotanytarsus sp	CF	6	1
86900	Myxosargus sp	CG	10	2
93200	Hydrobiidae	SC	6	19
94400	Fossaria sp	SC	7	3
95100	Physella sp	SC	9	11
95900	Gyraulus sp	SC	6	12
98001	Pisidiidae		5	44

No. Quantitative Taxa: 44 Total Taxa: 44

Number of Organisms: 303 mIBI: 62.89

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Northwind Blvd. - access 1600 behind warehouse

Site ID: **14-4**

Sample:

Collection Date: 08/03/2016 River Code: 95-719 River: West Branch Bull Creek RM: 2.54

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	13
03600	Oligochaeta	CG	10	198
04664	Helobdella stagnalis	PR	8	21
04935	Erpobdella punctata punctata	PR	8	2
05800	Caecidotea sp	CG	6	10
06201	Hyalella azteca	CG	5	1
11200	Callibaetis sp	CG	4	8
16700	Tricorythodes sp	CG	5	1
22001	Coenagrionidae	PR	5	6
52200	Cheumatopsyche sp	CF	6	1
71800	Pseudolimnophila sp		0	1
72150	Pericoma sp	CG	11	3
74501	Ceratopogonidae	PR	5	4
79000	Tanypus sp	PR	8	3
80410	Cricotopus (C.) sp	SH	8	1
80420	Cricotopus (C.) bicinctus	SH	8	3
80510	Cricotopus (Isocladius) sylvestris group	SH	8	12
82141	Thienemanniella xena	CG	2	1
82730	Chironomus (C.) decorus group	CG	11	5
82820	Cryptochironomus sp	PR	8	1
83000	Dicrotendipes sp	CG	6	2
83002	Dicrotendipes modestus	CG	6	2
83040	Dicrotendipes neomodestus	CG	6	1
83051	Dicrotendipes simpsoni	CG	6	7
83300	Glyptotendipes (G.) sp	CF	10	5
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
85260	Cladotanytarsus vanderwulpi group	CG	7	1
85800	Tanytarsus sp	CF	7	1
95100	Physella sp	SC	9	8
98001	Pisidiidae		5	5

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 30 Total Taxa: 30

Number of Organisms: 329 mIBI: 18.73

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Countryside Drive

Site ID: 14-3

Sample:

Collection Date: 08/04/2016 River Code: 95-719 River: West Branch Bull Creek RM: 1.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	18
05800	Caecidotea sp	CG	6	1
06800	Gammarus sp		3	58
08200	Orconectes sp	CG	5	1
11120	Baetis flavistriga	CG	4	1
11130	Baetis intercalaris	CG	4	8
11200	Callibaetis sp	CG	4	4
13400	Stenacron sp	SC	4	2
16700	Tricorythodes sp	CG	5	1
17200	Caenis sp	CG	6	1
21300	Hetaerina sp	PR	3	5
22001	Coenagrionidae	PR	5	1
52200	Cheumatopsyche sp	CF	6	6
52530	Hydropsyche depravata group	CF	5	5
68201	Scirtidae	SC	7	5
68700	Dubiraphia sp	CG	5	29
68901	Macronychus glabratus		2	1
69200	Optioservus sp	SC	4	22
69400	Stenelmis sp	SC	7	83
77500	Conchapelopia sp	PR	6	4
79000	Tanypus sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	1
80430	Cricotopus (C.) tremulus group	SH	8	1
81650	Parametriocnemus sp	CG	4	3
81690	Paratrichocladius sp	CG	6	1
82820	Cryptochironomus sp	PR	8	3
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	3
84470	Polypedilum (P.) illinoense	SH	6	2
84750	Stictochironomus sp		5	10
85500	Paratanytarsus sp	CG	6	2

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 32 Total Taxa: 32

Number of Organisms: 285 mIBI: 64.18

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Gregg's Parkway

Site ID: **15-3**

Sample:

Collection Date: 08/03/2016 River Code: 95-390 River: Seavey Drainage Ditch RM: 3.66

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	29
03600	Oligochaeta	CG	10	86
05800	Caecidotea sp	CG	6	6
06201	Hyalella azteca	CG	5	85
16700	Tricorythodes sp	CG	5	2
22001	Coenagrionidae	PR	5	24
69400	Stenelmis sp	SC	7	1
74501	Ceratopogonidae	PR	5	1
77500	Conchapelopia sp	PR	6	2
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78200	Larsia sp	PR	6	1
80420	Cricotopus (C.) bicinctus	SH	8	5
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	2
84210	Paratendipes albimanus or P. duplicatus	CG	3	38
84300	Phaenopsectra obediens group	SC	4	2
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
84750	Stictochironomus sp		5	1
85625	Rheotanytarsus sp	CF	6	1
85800	Tanytarsus sp	CF	7	3
94201	Lymnaeidae	SC	7	1
95100	Physella sp	SC	9	5
96120	Menetus (Micromenetus) dilatatus	SC	6	4
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 26 Total Taxa: 26

Number of Organisms: 306 mIBI: 25.99

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Vernon Hills GC - hole number 3

Site ID: 15-8

Sample: 2

Collection Date: 06/30/2016 River Code: 95-390 River: Seavey Drainage Ditch RM: 0.45

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	15
03600	Oligochaeta	CG	10	70
04664	Helobdella stagnalis	PR	8	25
04960	Erpobdella sp (= Mooreobdella)	PR	8	1
05800	Caecidotea sp	CG	6	4
06201	Hyalella azteca	CG	5	11
11130	Baetis intercalaris	CG	4	1
22001	Coenagrionidae	PR	5	9
23501	Aeshnidae	PR	4	1
74100	Simulium sp	CF	6	17
74501	Ceratopogonidae	PR	5	1
77500	Conchapelopia sp	PR	6	6
77800	Helopelopia sp	PR	4	1
78600	Pentaneura inconspicua	PR	3	3
78655	Procladius (Holotanypus) sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	11
80510	Cricotopus (Isocladius) sylvestris group	SH	8	17
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82800	Cladopelma sp	CG	6	1
82880	Cryptotendipes sp	CG	6	1
83000	Dicrotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	11
83840	Microtendipes pedellus group	CF	6	2
84000	Parachironomus sp	PR	8	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
85625	Rheotanytarsus sp	CF	6	2
85800	Tanytarsus sp	CF	7	1
93200	Hydrobiidae	SC	6	56
95100	Physella sp	SC	9	13
95900	Gyraulus sp	SC	6	5
98001	Pisidiidae		5	7

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 31 Total Taxa: 31

Number of Organisms: 298 mIBI: 32.42

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Vernon Hills GC - hole number 3

Site ID: **15-8**

Sample:

Collection Date: 07/29/2016 River Code: 95-390 River: Seavey Drainage Ditch RM: 0.45

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	66
03600	Oligochaeta	CG	10	116
04664	Helobdella stagnalis	PR	8	6
04666	Helobdella papillata	PA	8	2
04960	Erpobdella sp (= Mooreobdella)	PR	8	2
05800	Caecidotea sp	CG	6	2
06201	Hyalella azteca	CG	5	40
22001	Coenagrionidae	PR	5	29
23700	Anax sp	PR	5	1
27001	Corduliidae	PR	4	1
77355	Clinotanypus pinguis	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	3
82730	Chironomus (C.) decorus group	CG	11	1
82800	Cladopelma sp	CG	6	3
82880	Cryptotendipes sp	CG	6	2
83040	Dicrotendipes neomodestus	CG	6	4
84210	Paratendipes albimanus or P. duplicatus	CG	3	16
85625	Rheotanytarsus sp	CF	6	1
93200	Hydrobiidae	SC	6	20
98001	Pisidiidae		5	6

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 20 Total Taxa: 20

Number of Organisms: 322 mIBI: 32.42

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Hawthorne Grove Rd.

Site ID: **15-11**

Sample:

Collection Date: 08/02/2016 River Code: 95-705 River: Forest Lake Drain RM: 0.83

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	5
03600	Oligochaeta	CG	10	19
04901	Erpobdellidae	PR	8	2
05800	Caecidotea sp	CG	6	4
06201	Hyalella azteca	CG	5	183
06800	Gammarus sp		3	1
16700	Tricorythodes sp	CG	5	1
21200	Calopteryx sp	PR	4	1
22001	Coenagrionidae	PR	5	9
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	3
68700	Dubiraphia sp	CG	5	4
77500	Conchapelopia sp	PR	6	19
84450	Polypedilum (Uresipedilum) flavum	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	1
87400	Stratiomys sp	CF	10	1
93200	Hydrobiidae	SC	6	13
95100	Physella sp	SC	9	18
98001	Pisidiidae		5	31

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 18 Total Taxa: 18

Number of Organisms: 319 mIBI: 28.48

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Midlothian Rd.

Site ID: **15-9**

Sample:

Collection Date: 08/02/2016 River Code: 95-706 River: Indian Creek RM: 10.83

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	128
04935	Erpobdella punctata punctata	PR	8	2
05800	Caecidotea sp	CG	6	1
74100	Simulium sp	CF	6	5
77500	Conchapelopia sp	PR	6	3
80420	Cricotopus (C.) bicinctus	SH	8	9
80430	Cricotopus (C.) tremulus group	SH	8	1
80510	Cricotopus (Isocladius) sylvestris group	SH	8	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	4
84520	Polypedilum (Tripodura) halterale group	SH	6	1
92300	Valvata sp	SC	2	2
95100	Physella sp	SC	9	34
95900	Gyraulus sp	SC	6	1
98001	Pisidiidae		5	21
98200	Pisidium sp	CF	5	94

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 16 Total Taxa: 16

Number of Organisms: 311 mIBI: 20.88

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Washitay Ave

Site ID: **15-6**

Sample:

Collection Date: 08/02/2016 River Code: 95-706 River: Indian Creek RM: 9.83

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	9
03600	Oligochaeta	CG	10	11
04664	Helobdella stagnalis	PR	8	3
04964	Erpobdella microstoma	PR	8	8
05800	Caecidotea sp	CG	6	181
06201	Hyalella azteca	CG	5	12
06800	Gammarus sp		3	14
07800	Cambarus sp	CG	5	1
11200	Callibaetis sp	CG	4	5
22001	Coenagrionidae	PR	5	2
72700	Anopheles sp	CF	6	2
72900	Culex sp	CF	8	1
74100	Simulium sp	CF	6	4
77500	Conchapelopia sp	PR	6	4
78700	Psectrotanypus sp		0	1
80001	Orthocladiinae	CG	6	1
80420	Cricotopus (C.) bicinctus	SH	8	1
82770	Chironomus (C.) riparius group	CG	11	1
84000	Parachironomus sp	PR	8	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	2
84500	Polypedilum (P.) trigonus	SH	6	2
84700	Stenochironomus sp	SH	3	1
87200	Odontomyia (O.) sp or Hedriodiscus sp	CG	10	1
98001	Pisidiidae		5	13
98200	Pisidium sp	CF	5	21

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 26 Total Taxa: 26

Number of Organisms: 303 mIBI: 23.69

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Oakwood Rd.

Site ID: **15-5**

Sample:

Collection Date: 08/01/2016 River Code: 95-706 River: Indian Creek RM: 5.40

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	1
03600	Oligochaeta	CG	10	33
04664	Helobdella stagnalis	PR	8	2
04960	Erpobdella sp (= Mooreobdella)	PR	8	1
05800	Caecidotea sp	CG	6	53
06201	Hyalella azteca	CG	5	66
06800	Gammarus sp		3	45
08200	Orconectes sp	CG	5	5
13400	Stenacron sp	SC	4	6
21300	Hetaerina sp	PR	3	4
22001	Coenagrionidae	PR	5	14
68201	Scirtidae	SC	7	5
68700	Dubiraphia sp	CG	5	35
68901	Macronychus glabratus		2	1
78130	Labrundinia neopilosella	PR	4	1
78200	Larsia sp	PR	6	2
78655	Procladius (Holotanypus) sp	PR	8	6
82730	Chironomus (C.) decorus group	CG	11	1
82880	Cryptotendipes sp	CG	6	2
84470	Polypedilum (P.) illinoense	SH	6	1
85800	Tanytarsus sp	CF	7	1
93200	Hydrobiidae	SC	6	3
94400	Fossaria sp	SC	7	1
96900	Ferrissia sp	SC	7	1
98600	Sphaerium sp	CG	5	49

No. Quantitative Taxa:	25	Total Taxa:	25
Number of Organisms:	339	mIBI:	37.66

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Sullivan Woods Preserve, North of Creekview Dr.

Site ID: **15-2**

Sample:

Collection Date: 08/01/2016 River Code: 95-706 River: Indian Creek RM: 2.41

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	11
03600	Oligochaeta	CG	10	34
04510	Hirudinida	PR	8	1
04664	Helobdella stagnalis	PR	8	1
05800	Caecidotea sp	CG	6	4
06201	Hyalella azteca	CG	5	22
06800	Gammarus sp		3	7
08200	Orconectes sp	CG	5	2
11130	Baetis intercalaris	CG	4	1
11200	Callibaetis sp	CG	4	1
13400	Stenacron sp	SC	4	5
17200	Caenis sp	CG	6	2
21200	Calopteryx sp	PR	4	17
22001	Coenagrionidae	PR	5	78
52200	Cheumatopsyche sp	CF	6	2
68700	Dubiraphia sp	CG	5	9
68901	Macronychus glabratus		2	2
69200	Optioservus sp	SC	4	9
69400	Stenelmis sp	SC	7	31
74100	Simulium sp	CF	6	1
77130	Ablabesmyia rhamphe group	CG	6	2
77500	Conchapelopia sp	PR	6	3
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78599	Pentaneura sp	PR	3	1
78655	Procladius (Holotanypus) sp	PR	8	2
82820	Cryptochironomus sp	PR	8	1
83040	Dicrotendipes neomodestus	CG	6	1
83840	Microtendipes pedellus group	CF	6	4
84450	Polypedilum (Uresipedilum) flavum	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	2
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
84700	Stenochironomus sp	SH	3	1
85625	Rheotanytarsus sp	CF	6	2
86001	Tabanidae	PR	7	2
93200	Hydrobiidae	SC	6	16
95100	Physella sp	SC	9	8
96120	Menetus (Micromenetus) dilatatus	SC	6	5
97601	Corbicula fluminea	CF	4	3
98001	Pisidiidae		5	3

No. Quantitative Taxa:	39	Total Taxa:	39
Number of Organisms:	302	mIBI:	58.53

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Marriot Inn parking lot - adj. Cranes Landing GC

Site ID: 15-1

Sample: 2

Collection Date: 07/01/2016 River Code: 95-706 River: Indian Creek RM: 0.17

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	15
03600	Oligochaeta	CG	10	21
04664	Helobdella stagnalis	PR	8	1
04960	Erpobdella sp (= Mooreobdella)	PR	8	2
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	27
06700	Crangonyx sp	CG	4	8
08200	Orconectes sp	CG	5	2
11120	Baetis flavistriga	CG	4	1
13400	Stenacron sp	SC	4	1
16700	Tricorythodes sp	CG	5	7
22001	Coenagrionidae	PR	5	3
49400	Sisyra sp	PR	1	2
52200	Cheumatopsyche sp	CF	6	10
68700	Dubiraphia sp	CG	5	3
68901	Macronychus glabratus		2	1
69200	Optioservus sp	SC	4	11
69400	Stenelmis sp	SC	7	50
74100	Simulium sp	CF	6	1
77500	Conchapelopia sp	PR	6	8
77750	Hayesomyia senata or Thienemannimyia norena		5	4
78600	Pentaneura inconspicua	PR	3	1
78655	Procladius (Holotanypus) sp	PR	8	2
80410	Cricotopus (C.) sp	SH	8	2
80420	Cricotopus (C.) bicinctus	SH	8	81
80430	Cricotopus (C.) tremulus group	SH	8	3
80480	Cricotopus (Isocladius) sp		0	1
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	6
82820	Cryptochironomus sp	PR	8	3
83040	Dicrotendipes neomodestus	CG	6	4
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	4
84470	Polypedilum (P.) illinoense	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	11
84750	Stictochironomus sp		5	3
85500	Paratanytarsus sp	CG	6	3
85625	Rheotanytarsus sp	CF	6	5
93200	Hydrobiidae	SC	6	4
93900	Elimia sp	SC	6	6
98001	Pisidiidae		5	1

No. Quantitative Taxa:	40	Total Taxa:	40
Number of Organisms:	323	mIBI:	55.32

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Marriot Inn parking lot - adj. Cranes Landing GC

Site ID: **15-1**

Sample:

Collection Date: 07/29/2016 River Code: 95-706 River: Indian Creek RM: 0.17

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	24
03600	Oligochaeta	CG	10	32
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	102
06700	Crangonyx sp	CG	4	2
11130	Baetis intercalaris	CG	4	6
13400	Stenacron sp	SC	4	3
16700	Tricorythodes sp	CG	5	38
17200	Caenis sp	CG	6	1
21300	Hetaerina sp	PR	3	2
22001	Coenagrionidae	PR	5	13
52200	Cheumatopsyche sp	CF	6	1
53800	Hydroptila sp	SC	2	1
68025	Ectopria sp	SC	4	1
68700	Dubiraphia sp	CG	5	5
69200	Optioservus sp	SC	4	8
69400	Stenelmis sp	SC	7	47
74100	Simulium sp	CF	6	1
77130	Ablabesmyia rhamphe group	CG	6	1
77500	Conchapelopia sp	PR	6	1
78599	Pentaneura sp	PR	3	2
80420	Cricotopus (C.) bicinctus	SH	8	2
82141	Thienemanniella xena	CG	2	1
82820	Cryptochironomus sp	PR	8	4
83040	Dicrotendipes neomodestus	CG	6	2
83840	Microtendipes pedellus group	CF	6	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
84460	Polypedilum (P.) fallax group	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	3
85500	Paratanytarsus sp	CG	6	1
85625	Rheotanytarsus sp	CF	6	6
85800	Tanytarsus sp	CF	7	1
93200	Hydrobiidae	SC	6	3
93900	Elimia sp	SC	6	2
95100	Physella sp	SC	9	3
97601	Corbicula fluminea	CF	4	1
98001	Pisidiidae		5	1

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 37 Total Taxa: 37

Number of Organisms: 326 mIBI: 55.32

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: IL Rt. 22

Site ID: **15-12**

Sample:

Collection Date: 08/01/2016 River Code: 95-707 River: Kildeer Creek RM: 5.20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	87
03600	Oligochaeta	CG	10	46
04664	Helobdella stagnalis	PR	8	4
05800	Caecidotea sp	CG	6	6
06201	Hyalella azteca	CG	5	8
11001	Baetidae	CG	4	1
16700	Tricorythodes sp	CG	5	1
21001	Calopterygidae	PR	3	3
22001	Coenagrionidae	PR	5	2
52200	Cheumatopsyche sp	CF	6	1
68700	Dubiraphia sp	CG	5	3
69400	Stenelmis sp	SC	7	4
74100	Simulium sp	CF	6	1
77100	Ablabesmyia sp	CG	6	1
77130	Ablabesmyia rhamphe group	CG	6	1
77500	Conchapelopia sp	PR	6	4
80420	Cricotopus (C.) bicinctus	SH	8	12
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	CG	3	1
81240	Nanocladius (N.) distinctus	CG	3	2
82820	Cryptochironomus sp	PR	8	2
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	2
83300	Glyptotendipes (G.) sp	CF	10	5
84010	Parachironomus "abortivus" (sensu Simpson & Bode, 1980)	PR	8	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	23
84450	Polypedilum (Uresipedilum) flavum	SH	6	32
84470	Polypedilum (P.) illinoense	SH	6	2
85625	Rheotanytarsus sp	CF	6	2
85800	Tanytarsus sp	CF	7	1
87540	Hemerodromia sp	PR	6	1
93200	Hydrobiidae	SC	6	32
98200	Pisidium sp	CF	5	15
98600	Sphaerium sp	CG	5	14

No. Quantitative Taxa:	33	Total Taxa:	33
Number of Organisms:	323	mIBI:	37.02

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Salem Lake Drive S. of Rt 22

Site ID: **15-7**

Sample:

Collection Date: 08/01/2016 River Code: 95-707 River: Kildeer Creek RM: 4.60

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	4
03600	Oligochaeta	CG	10	5
06201	Hyalella azteca	CG	5	176
11200	Callibaetis sp	CG	4	17
17200	Caenis sp	CG	6	12
21300	Hetaerina sp	PR	3	1
22001	Coenagrionidae	PR	5	54
28001	Libellulidae	PR	4	1
52200	Cheumatopsyche sp	CF	6	1
68700	Dubiraphia sp	CG	5	2
69400	Stenelmis sp	SC	7	2
77355	Clinotanypus pinguis	PR	6	1
77500	Conchapelopia sp	PR	6	3
77700	Guttipelopia guttipennis	PR	6	2
78200	Larsia sp	PR	6	2
78655	Procladius (Holotanypus) sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	2
84500	Polypedilum (P.) trigonus	SH	6	4
95100	Physella sp	SC	9	3
98001	Pisidiidae		5	3

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 20 Total Taxa: 20

Number of Organisms: 296 mIBI: 32.37

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Willowbrook Rd. S. of Half Day Rd.

Site ID: **15-13**

Sample:

Collection Date: 08/01/2016 River Code: 95-707 River: Kildeer Creek RM: 2.21

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	6
03600	Oligochaeta	CG	10	27
04664	Helobdella stagnalis	PR	8	8
04960	Erpobdella sp (= Mooreobdella)	PR	8	7
05800	Caecidotea sp	CG	6	7
06800	Gammarus sp		3	11
08200	Orconectes sp	CG	5	1
11130	Baetis intercalaris	CG	4	13
13400	Stenacron sp	SC	4	11
16700	Tricorythodes sp	CG	5	2
21200	Calopteryx sp	PR	4	11
27000	Corduliidae or Libellulidae		0	1
52200	Cheumatopsyche sp	CF	6	78
52530	Hydropsyche depravata group	CF	5	17
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	PR	5	1
68201	Scirtidae	SC	7	1
68700	Dubiraphia sp	CG	5	4
69400	Stenelmis sp	SC	7	49
70501	Tipulidae	SH	4	1
74100	Simulium sp	CF	6	3
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	2
78655	Procladius (Holotanypus) sp	PR	8	23
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	2
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	1
84450	Polypedilum (Uresipedilum) flavum	SH	6	10
84460	Polypedilum (P.) fallax group	SH	6	2
84470	Polypedilum (P.) illinoense	SH	6	4
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
84700	Stenochironomus sp	SH	3	2
85800	Tanytarsus sp	CF	7	1
87400	Stratiomys sp	CF	10	1
87540	Hemerodromia sp	PR	6	2
93200	Hydrobiidae	SC	6	5
98001	Pisidiidae		5	3

No. Quantitative Taxa:	37	Total Taxa:	37
Number of Organisms:	321	mIBI:	56.09

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Port Clinton Rd at Kildeer Creek

Site ID: **15-4**

Sample:

Collection Date: 08/01/2016 River Code: 95-707 River: Kildeer Creek RM: 0.17

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01320	Hydra sp	PR	6	1
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	14
04666	Helobdella papillata	PA	8	1
06201	Hyalella azteca	CG	5	98
13400	Stenacron sp	SC	4	5
17200	Caenis sp	CG	6	13
21300	Hetaerina sp	PR	3	1
22001	Coenagrionidae	PR	5	19
27000	Corduliidae or Libellulidae		0	1
52200	Cheumatopsyche sp	CF	6	1
68201	Scirtidae	SC	7	15
68700	Dubiraphia sp	CG	5	23
69400	Stenelmis sp	SC	7	2
71900	Tipula sp	SH	4	1
77500	Conchapelopia sp	PR	6	6
77750	Hayesomyia senata or Thienemannimyia norena		5	2
78200	Larsia sp	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	35
82730	Chironomus (C.) decorus group	CG	11	2
82820	Cryptochironomus sp	PR	8	3
82880	Cryptotendipes sp	CG	6	3
83040	Dicrotendipes neomodestus	CG	6	2
83051	Dicrotendipes simpsoni	CG	6	1
83158	Endochironomus nigricans	SH	6	3
83300	Glyptotendipes (G.) sp	CF	10	1
84470	Polypedilum (P.) illinoense	SH	6	3
84520	Polypedilum (Tripodura) halterale group	SH	6	2
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
84960	Pseudochironomus sp	CG	5	1
85800	Tanytarsus sp	CF	7	1
86001	Tabanidae	PR	7	1
87400	Stratiomys sp	CF	10	1
93200	Hydrobiidae	SC	6	2
95100	Physella sp	SC	9	5
96120	Menetus (Micromenetus) dilatatus	SC	6	3
97601	Corbicula fluminea	CF	4	4
98001	Pisidiidae		5	13

No. Quantitative Taxa:	38	Total Taxa:	38
Number of Organisms:	294	mIBI:	42.03

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Gilmer Rd.

Site ID: **15-10**

Sample:

Collection Date: 08/02/2016 River Code: 95-717 River: W. Branch Indian Creek RM: 0.80

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	125
03600	Oligochaeta	CG	10	16
04664	Helobdella stagnalis	PR	8	2
04964	Erpobdella microstoma	PR	8	1
05800	Caecidotea sp	CG	6	21
06700	Crangonyx sp	CG	4	17
17200	Caenis sp	CG	6	2
22001	Coenagrionidae	PR	5	9
69400	Stenelmis sp	SC	7	1
72150	Pericoma sp	CG	11	1
77500	Conchapelopia sp	PR	6	2
82800	Cladopelma sp	CG	6	1
82880	Cryptotendipes sp	CG	6	1
83300	Glyptotendipes (G.) sp	CF	10	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	3
84450	Polypedilum (Uresipedilum) flavum	SH	6	1
84470	Polypedilum (P.) illinoense	SH	6	1
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	3
84700	Stenochironomus sp	SH	3	1
92310	Valvata bicarinata		0	11
98001	Pisidiidae		5	84

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 22 Total Taxa: 22

Number of Organisms: 307 mIBI: 25.93

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Timberleaf Lane

Site ID: **16-9**

Sample:

Collection Date: 07/31/2016 River Code: 95-721 River: Unnamed Trib to Des Plaines River RM: 0.40

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	49
04664	Helobdella stagnalis	PR	8	2
04666	Helobdella papillata	PA	8	2
05800	Caecidotea sp	CG	6	11
06201	Hyalella azteca	CG	5	41
06800	Gammarus sp		3	62
11200	Callibaetis sp	CG	4	1
17200	Caenis sp	CG	6	2
21200	Calopteryx sp	PR	4	5
22001	Coenagrionidae	PR	5	6
27000	Corduliidae or Libellulidae		0	1
27500	Somatochlora sp	PR	1	1
52200	Cheumatopsyche sp	CF	6	1
59500	Oecetis sp	PR	5	4
69400	Stenelmis sp	SC	7	3
77130	Ablabesmyia rhamphe group	CG	6	2
77500	Conchapelopia sp	PR	6	8
78130	Labrundinia neopilosella	PR	4	1
78200	Larsia sp	PR	6	1
78599	Pentaneura sp	PR	3	1
78655	Procladius (Holotanypus) sp	PR	8	18
78702	Psectrotanypus dyari	PR	8	1
79000	Tanypus sp	PR	8	1
82820	Cryptochironomus sp	PR	8	2
82885	Cryptotendipes pseudotener	CG	6	1
83158	Endochironomus nigricans	SH	6	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	20
84315	Phaenopsectra flavipes	SC	4	3
84470	Polypedilum (P.) illinoense	SH	6	2
84520	Polypedilum (Tripodura) halterale group	SH	6	7
84750	Stictochironomus sp		5	1
85500	Paratanytarsus sp	CG	6	3
85800	Tanytarsus sp	CF	7	2
93200	Hydrobiidae	SC	6	16
94201	Lymnaeidae	SC	7	1
95100	Physella sp	SC	9	17
98001	Pisidiidae		5	6
98200	Pisidium sp	CF	5	7

No. Quantitative Taxa:	38	Total Taxa:	38
Number of Organisms:	315	mIBI:	41.43

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: St. Marys Rd.

Site ID: **16-10B**

Sample:

Collection Date: 07/01/2016 River Code: 95-722 River: Werhane Lake Drain RM: 0.80

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	20
04664	Helobdella stagnalis	PR	8	2
05800	Caecidotea sp	CG	6	13
06800	Gammarus sp		3	108
08200	Orconectes sp	CG	5	2
22001	Coenagrionidae	PR	5	1
23600	Aeshna sp	PR	4	1
52200	Cheumatopsyche sp	CF	6	1
68700	Dubiraphia sp	CG	5	18
69400	Stenelmis sp	SC	7	1
74100	Simulium sp	CF	6	1
77130	Ablabesmyia rhamphe group	CG	6	1
77355	Clinotanypus pinguis	PR	6	6
77500	Conchapelopia sp	PR	6	1
77750	Hayesomyia senata or Thienemannimyia norena		5	1
78655	Procladius (Holotanypus) sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	1
80510	Cricotopus (Isocladius) sylvestris group	SH	8	1
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	3
82101	Thienemanniella taurocapita	CG	2	1
82820	Cryptochironomus sp	PR	8	2
83840	Microtendipes pedellus group	CF	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	3
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84750	Stictochironomus sp		5	3
93200	Hydrobiidae	SC	6	56
95100	Physella sp	SC	9	11
98001	Pisidiidae		5	39

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 28 Total Taxa: 28

Number of Organisms: 300 mIBI: 43.73

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: St. Marys Rd.

Site ID: **16-10B**

Sample:

Collection Date: 07/29/2016 River Code: 95-722 River: Werhane Lake Drain RM: 0.80

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	2
03600	Oligochaeta	CG	10	49
04935	Erpobdella punctata punctata	PR	8	1
05800	Caecidotea sp	CG	6	9
06800	Gammarus sp		3	71
21200	Calopteryx sp	PR	4	1
22001	Coenagrionidae	PR	5	1
23600	Aeshna sp	PR	4	1
59500	Oecetis sp	PR	5	1
68708	Dubiraphia vittata group	CG	5	13
69400	Stenelmis sp	SC	7	2
71900	Tipula sp	SH	4	1
77355	Clinotanypus pinguis	PR	6	1
77500	Conchapelopia sp	PR	6	4
78655	Procladius (Holotanypus) sp	PR	8	2
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	1
83002	Dicrotendipes modestus	CG	6	2
84210	Paratendipes albimanus or P. duplicatus	CG	3	2
84450	Polypedilum (Uresipedilum) flavum	SH	6	2
84540	Polypedilum (Tripodura) scalaenum group	SH	6	1
84750	Stictochironomus sp		5	3
87400	Stratiomys sp	CF	10	1
93200	Hydrobiidae	SC	6	90
95100	Physella sp	SC	9	6
98001	Pisidiidae		5	4
98200	Pisidium sp	CF	5	3
98600	Sphaerium sp	CG	5	25

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 28 Total Taxa: 28

Number of Organisms: 300 mIBI: 43.73

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Quentin Rd.

Site ID: **17-5**

Sample:

Collection Date: 08/02/2016 River Code: 95-703 River: Buffalo Creek RM: 14.00

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	95
03600	Oligochaeta	CG	10	55
04664	Helobdella stagnalis	PR	8	1
05800	Caecidotea sp	CG	6	62
06201	Hyalella azteca	CG	5	28
22001	Coenagrionidae	PR	5	3
68708	Dubiraphia vittata group	CG	5	1
69400	Stenelmis sp	SC	7	1
77500	Conchapelopia sp	PR	6	1
80420	Cricotopus (C.) bicinctus	SH	8	5
83040	Dicrotendipes neomodestus	CG	6	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	23
84470	Polypedilum (P.) illinoense	SH	6	2
85625	Rheotanytarsus sp	CF	6	1
85800	Tanytarsus sp	CF	7	1
95100	Physella sp	SC	9	2
95900	Gyraulus sp	SC	6	3
98001	Pisidiidae		5	3
98200	Pisidium sp	CF	5	20

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 19 Total Taxa: 19

Number of Organisms: 308 mIBI: 24.59

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Checker Road

Site ID: **17-3**

Sample:

Collection Date: 07/31/2016 River Code: 95-703 River: Buffalo Creek RM: 7.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	7
03600	Oligochaeta	CG	10	12
05800	Caecidotea sp	CG	6	21
06201	Hyalella azteca	CG	5	38
11130	Baetis intercalaris	CG	4	5
13400	Stenacron sp	SC	4	3
21200	Calopteryx sp	PR	4	3
22001	Coenagrionidae	PR	5	4
52200	Cheumatopsyche sp	CF	6	36
52530	Hydropsyche depravata group	CF	5	4
68201	Scirtidae	SC	7	1
68708	Dubiraphia vittata group	CG	5	36
69400	Stenelmis sp	SC	7	64
77500	Conchapelopia sp	PR	6	1
80420	Cricotopus (C.) bicinctus	SH	8	3
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	4
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	CF	6	4
83840	Microtendipes pedellus group	CF	6	4
84470	Polypedilum (P.) illinoense	SH	6	7
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
84700	Stenochironomus sp	SH	3	1
85800	Tanytarsus sp	CF	7	1
85821	Tanytarsus glabrescens group sp 7	CF	7	1
86100	Chrysops sp	CG	7	1
87540	Hemerodromia sp	PR	6	1
95100	Physella sp	SC	9	2
98200	Pisidium sp	CF	5	13

No. Quantitative Taxa:	29	Total Taxa:	29
Number of Organisms:	281	mIBI:	48.13

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Lake Cook Rd @ Farington Ditch

Site ID: **17-2**

Sample:

Collection Date: 07/31/2016 River Code: 95-703 River: Buffalo Creek RM: 6.10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	29
03600	Oligochaeta	CG	10	13
04664	Helobdella stagnalis	PR	8	1
04960	Erpobdella sp (= Mooreobdella)	PR	8	1
05800	Caecidotea sp	CG	6	23
06201	Hyalella azteca	CG	5	94
06700	Crangonyx sp	CG	4	1
11130	Baetis intercalaris	CG	4	1
11200	Callibaetis sp	CG	4	1
16700	Tricorythodes sp	CG	5	1
21300	Hetaerina sp	PR	3	1
52200	Cheumatopsyche sp	CF	6	2
53800	Hydroptila sp	SC	2	5
68700	Dubiraphia sp	CG	5	1
69400	Stenelmis sp	SC	7	56
77130	Ablabesmyia rhamphe group	CG	6	1
78600	Pentaneura inconspicua	PR	3	8
82121	Thienemanniella lobapodema	CG	2	1
82880	Cryptotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	2
84450	Polypedilum (Uresipedilum) flavum	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	3
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
85265	Cladotanytarsus vanderwulpi group sp 5	CG	7	1
85625	Rheotanytarsus sp	CF	6	3
85814	Tanytarsus glabrescens group		7	1
87540	Hemerodromia sp	PR	6	1
93200	Hydrobiidae	SC	6	6
95100	Physella sp	SC	9	1
98001	Pisidiidae		5	29

No. Quantitative Taxa:	31	Total Taxa:	31
Number of Organisms:	297	mIBI:	50.45

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Plum Creek Drive (Wolf Dr)

Site ID: 17-1

Sample: 2

Collection Date: 06/30/2016 River Code: 95-703 River: Buffalo Creek RM: 0.75

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	22
03600	Oligochaeta	CG	10	50
04660	Helobdella sp	PA	8	1
04960	Erpobdella sp (= Mooreobdella)	PR	8	2
05800	Caecidotea sp	CG	6	3
06201	Hyalella azteca	CG	5	10
06700	Crangonyx sp	CG	4	2
06800	Gammarus sp		3	29
08200	Orconectes sp	CG	5	1
11120	Baetis flavistriga	CG	4	2
13400	Stenacron sp	SC	4	3
16700	Tricorythodes sp	CG	5	2
17200	Caenis sp	CG	6	1
22001	Coenagrionidae	PR	5	4
23700	Anax sp	PR	5	1
59500	Oecetis sp	PR	5	1
68700	Dubiraphia sp	CG	5	1
69400	Stenelmis sp	SC	7	5
77500	Conchapelopia sp	PR	6	12
77750	Hayesomyia senata or Thienemannimyia norena		5	3
78130	Labrundinia neopilosella	PR	4	1
78140	Labrundinia pilosella	PR	4	1
78200	Larsia sp	PR	6	1
78600	Pentaneura inconspicua	PR	3	2
78655	Procladius (Holotanypus) sp	PR	8	3
80410	Cricotopus (C.) sp	SH	8	2
80420	Cricotopus (C.) bicinctus	SH	8	18
80510	Cricotopus (Isocladius) sylvestris group	SH	8	3
81825	Rheocricotopus (Psilocricotopus) robacki	CG	6	1
82730	Chironomus (C.) decorus group	CG	11	1
82820	Cryptochironomus sp	PR	8	4
82880	Cryptotendipes sp	CG	6	3
83040	Dicrotendipes neomodestus	CG	6	7
84210	Paratendipes albimanus or P. duplicatus	CG	3	3
84470	Polypedilum (P.) illinoense	SH	6	5
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	8
84750	Stictochironomus sp		5	7
85230	Cladotanytarsus mancus group	CG	7	2
85625	Rheotanytarsus sp	CF	6	3
85800	Tanytarsus sp	CF	7	1
87540	Hemerodromia sp	PR	6	1
93200	Hydrobiidae	SC	6	11
95100	Physella sp	SC	9	6
96100	Menetus (Micromenetus) sp	SC	6	2
98001	Pisidiidae		5	56

No. Quantitative Taxa: 46 Total Taxa: 46

Number of Organisms: 308 mIBI: 44.31

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Plum Creek Drive (Wolf Dr)

Site ID: **17-1**

Sample:

Collection Date: 07/24/2016 River Code: 95-703 River: Buffalo Creek RM: 0.75

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	60
03600	Oligochaeta	CG	10	37
04964	Erpobdella microstoma	PR	8	1
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	12
06800	Gammarus sp		3	45
11130	Baetis intercalaris	CG	4	1
16700	Tricorythodes sp	CG	5	8
22001	Coenagrionidae	PR	5	3
52200	Cheumatopsyche sp	CF	6	1
53501	Hydroptilidae	PH	3	2
68700	Dubiraphia sp	CG	5	1
69400	Stenelmis sp	SC	7	5
77500	Conchapelopia sp	PR	6	9
78599	Pentaneura sp	PR	3	4
78655	Procladius (Holotanypus) sp	PR	8	2
80420	Cricotopus (C.) bicinctus	SH	8	1
83040	Dicrotendipes neomodestus	CG	6	13
84210	Paratendipes albimanus or P. duplicatus	CG	3	3
84450	Polypedilum (Uresipedilum) flavum	SH	6	4
84470	Polypedilum (P.) illinoense	SH	6	7
84540	Polypedilum (Tripodura) scalaenum group	SH	6	26
84750	Stictochironomus sp		5	9
85625	Rheotanytarsus sp	CF	6	4
93200	Hydrobiidae	SC	6	37
95100	Physella sp	SC	9	2
97601	Corbicula fluminea	CF	4	8
98200	Pisidium sp	CF	5	11
98600	Sphaerium sp	CG	5	7

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 29 Total Taxa: 29

Number of Organisms: 324 mIBI: 44.31

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Lake Cook Rd @ Buffalo Creek Trib

Site ID: **17-4**

Sample:

Collection Date: 07/31/2016 River Code: 95-713 River: UT to Buffalo Creek @ RM XX.X RM: 0.68

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	10
03600	Oligochaeta	CG	10	79
04960	Erpobdella sp (= Mooreobdella)	PR	8	1
05800	Caecidotea sp	CG	6	10
06201	Hyalella azteca	CG	5	23
08200	Orconectes sp	CG	5	1
17200	Caenis sp	CG	6	1
22001	Coenagrionidae	PR	5	10
52200	Cheumatopsyche sp	CF	6	5
68708	Dubiraphia vittata group	CG	5	1
69400	Stenelmis sp	SC	7	8
77500	Conchapelopia sp	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	1
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	CG	3	1
82730	Chironomus (C.) decorus group	CG	11	1
82820	Cryptochironomus sp	PR	8	1
83002	Dicrotendipes modestus	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	3
84210	Paratendipes albimanus or P. duplicatus	CG	3	2
84450	Polypedilum (Uresipedilum) flavum	SH	6	5
84470	Polypedilum (P.) illinoense	SH	6	12
84520	Polypedilum (Tripodura) halterale group	SH	6	1
84540	Polypedilum (Tripodura) scalaenum group	SH	6	19
84750	Stictochironomus sp		5	1
85800	Tanytarsus sp	CF	7	3
85821	Tanytarsus glabrescens group sp 7	CF	7	1
96120	Menetus (Micromenetus) dilatatus	SC	6	26
98200	Pisidium sp	CF	5	50
98600	Sphaerium sp	CG	5	45

No. Quantitative Taxa:	29	Total Taxa:	29
Number of Organisms:	323	mIBI:	28.90

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: N. Buffalo Grove Rd. (Twin Creeks Park)

Site ID: **18-4**

Sample:

Collection Date: 07/31/2016 River Code: 95-701 River: Aptakisic Creek RM: 4.70

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	42
04664	Helobdella stagnalis	PR	8	20
05800	Caecidotea sp	CG	6	1
06201	Hyalella azteca	CG	5	101
06700	Crangonyx sp	CG	4	1
07800	Cambarus sp	CG	5	1
78655	Procladius (Holotanypus) sp	PR	8	1
80420	Cricotopus (C.) bicinctus	SH	8	5
82770	Chironomus (C.) riparius group	CG	11	5
82880	Cryptotendipes sp	CG	6	1
93200	Hydrobiidae	SC	6	15
95100	Physella sp	SC	9	4
98001	Pisidiidae		5	110

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 13 Total Taxa: 13

Number of Organisms: 307 mIBI: 18.46

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Copperwood Dr. bike xing

Site ID: **18-3**

Sample:

Collection Date: 07/31/2016 River Code: 95-701 River: Aptakisic Creek RM: 4.30

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	20
03600	Oligochaeta	CG	10	33
04664	Helobdella stagnalis	PR	8	9
06201	Hyalella azteca	CG	5	69
22001	Coenagrionidae	PR	5	38
77120	Ablabesmyia mallochi	CG	6	1
77130	Ablabesmyia rhamphe group	CG	6	3
77500	Conchapelopia sp	PR	6	7
78130	Labrundinia neopilosella	PR	4	1
78655	Procladius (Holotanypus) sp	PR	8	4
80510	Cricotopus (Isocladius) sylvestris group	SH	8	1
82820	Cryptochironomus sp	PR	8	1
82880	Cryptotendipes sp	CG	6	1
83002	Dicrotendipes modestus	CG	6	2
83040	Dicrotendipes neomodestus	CG	6	4
84210	Paratendipes albimanus or P. duplicatus	CG	3	14
84470	Polypedilum (P.) illinoense	SH	6	25
85500	Paratanytarsus sp	CG	6	5
85625	Rheotanytarsus sp	CF	6	1
85821	Tanytarsus glabrescens group sp 7	CF	7	1
87400	Stratiomys sp	CF	10	1
93200	Hydrobiidae	SC	6	27
95100	Physella sp	SC	9	4
96120	Menetus (Micromenetus) dilatatus	SC	6	2
98200	Pisidium sp	CF	5	27
98600	Sphaerium sp	CG	5	7

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 26 Total Taxa: 26

Number of Organisms: 308 mIBI: 25.61

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Pekara Rd, West of Hwy. 21

Site ID: **18-2**

Sample:

Collection Date: 07/31/2016 River Code: 95-701 River: Aptakisic Creek RM: 0.80

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
03600	Oligochaeta	CG	10	12
04601	Glossiphoniidae	PR	8	1
04664	Helobdella stagnalis	PR	8	2
04666	Helobdella papillata	PA	8	1
06201	Hyalella azteca	CG	5	44
06800	Gammarus sp		3	12
11200	Callibaetis sp	CG	4	1
17200	Caenis sp	CG	6	16
22001	Coenagrionidae	PR	5	10
59500	Oecetis sp	PR	5	2
68700	Dubiraphia sp	CG	5	47
77120	Ablabesmyia mallochi	CG	6	4
77130	Ablabesmyia rhamphe group	CG	6	26
78655	Procladius (Holotanypus) sp	PR	8	11
79000	Tanypus sp	PR	8	2
80420	Cricotopus (C.) bicinctus	SH	8	1
80510	Cricotopus (Isocladius) sylvestris group	SH	8	1
81240	Nanocladius (N.) distinctus	CG	3	3
82730	Chironomus (C.) decorus group	CG	11	4
82820	Cryptochironomus sp	PR	8	6
83040	Dicrotendipes neomodestus	CG	6	4
83051	Dicrotendipes simpsoni	CG	6	5
83158	Endochironomus nigricans	SH	6	2
83300	Glyptotendipes (G.) sp	CF	10	31
84000	Parachironomus sp	PR	8	6
84470	Polypedilum (P.) illinoense	SH	6	16
84520	Polypedilum (Tripodura) halterale group	SH	6	4
84540	Polypedilum (Tripodura) scalaenum group	SH	6	2
84960	Pseudochironomus sp	CG	5	2
85230	Cladotanytarsus mancus group	CG	7	1
93200	Hydrobiidae	SC	6	2
95100	Physella sp	SC	9	6
97601	Corbicula fluminea	CF	4	4
98001	Pisidiidae		5	14

No. Quantitative Taxa:	34	Total Taxa:	34
Number of Organisms:	305	mIBI:	30.74

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Aspen Road

Site ID: **18-1**

Sample:

Collection Date: 07/31/2016 River Code: 95-701 River: Aptakisic Creek RM: 0.50

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	7
03600	Oligochaeta	CG	10	58
05800	Caecidotea sp	CG	6	1
06800	Gammarus sp		3	5
22001	Coenagrionidae	PR	5	4
68700	Dubiraphia sp	CG	5	2
74100	Simulium sp	CF	6	17
77115	Ablabesmyia janta	CG	6	1
77120	Ablabesmyia mallochi	CG	6	1
77355	Clinotanypus pinguis	PR	6	1
78655	Procladius (Holotanypus) sp	PR	8	2
80420	Cricotopus (C.) bicinctus	SH	8	14
80430	Cricotopus (C.) tremulus group	SH	8	2
82730	Chironomus (C.) decorus group	CG	11	1
82800	Cladopelma sp	CG	6	1
82820	Cryptochironomus sp	PR	8	4
83000	Dicrotendipes sp	CG	6	1
83040	Dicrotendipes neomodestus	CG	6	16
83300	Glyptotendipes (G.) sp	CF	10	2
84000	Parachironomus sp	PR	8	1
84210	Paratendipes albimanus or P. duplicatus	CG	3	1
84470	Polypedilum (P.) illinoense	SH	6	143
84960	Pseudochironomus sp	CG	5	1
93200	Hydrobiidae	SC	6	3
98001	Pisidiidae		5	10

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 25 Total Taxa: 25

Number of Organisms: 299 mIBI: 22.97

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Dst. Aptakapsic Rd.; W of N. Buffalo Grove Rd., Twins Cr Prk.

Site ID: 18-5

Sample: 2

Collection Date: 07/01/2016 River Code: 95-712 River: Unnamed Trib to Aptakisic Creek RM: 0.05

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	63
03600	Oligochaeta	CG	10	36
04664	Helobdella stagnalis	PR	8	4
04666	Helobdella papillata	PA	8	1
04935	Erpobdella punctata punctata	PR	8	5
05800	Caecidotea sp	CG	6	2
06201	Hyalella azteca	CG	5	2
06800	Gammarus sp		3	1
22001	Coenagrionidae	PR	5	1
77500	Conchapelopia sp	PR	6	2
93200	Hydrobiidae	SC	6	13
96120	Menetus (Micromenetus) dilatatus	SC	6	5
98001	Pisidiidae		5	164

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 13 Total Taxa: 13

Number of Organisms: 299 mIBI: 19.63

Appendix Table C-2. Macroinvertebrate taxa collected by MBI at sites in the Desplaines Study Area.

Site: Dst. Aptakapsic Rd.; W of N. Buffalo Grove Rd., Twins Cr Prk.

Site ID: **18-5**

Sample:

Collection Date: 07/29/2016 River Code: 95-712 River: Unnamed Trib to Aptakisic Creek RM: 0.05

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.
01801	Turbellaria	PR	6	85
03600	Oligochaeta	CG	10	31
04664	Helobdella stagnalis	PR	8	1
04666	Helobdella papillata	PA	8	2
04935	Erpobdella punctata punctata	PR	8	4
06201	Hyalella azteca	CG	5	1
22001	Coenagrionidae	PR	5	1
69400	Stenelmis sp	SC	7	1
85821	Tanytarsus glabrescens group sp 7	CF	7	1
93200	Hydrobiidae	SC	6	22
96120	Menetus (Micromenetus) dilatatus	SC	6	13
98001	Pisidiidae		5	41
98200	Pisidium sp	CF	5	63

Taxa Code	Taxa	Feed Grp	Tol.	Qt./Ql.

No. Quantitative Taxa: 13 Total Taxa: 13

Number of Organisms: 266 mIBI: 19.63

APPENDIX D

Upper Des Plaines 2016 Habitat Data

D-1: Upper Des Plaines 2016 QHEI Metrics and Scores

Appendix D-1. QHEI metric scores for sites sampled by MBI in the Des Plaines River study area in 2016.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
(95656) DesPlaines River									
Year: 2016									
109.30	**51.00**	0.0	15.0	11.0	8.00	7.0	0.0	5.64 - (10)	**Fair**
106.60	**50.25**	0.0	16.0	11.0	5.25	8.0	0.0	5.15 - (10)	**Fair**
102.90	**48.50**	0.0	14.0	10.0	7.50	7.0	0.0	4.67 - (10)	**Fair**
98.70	**81.00**	13.0	18.0	17.0	8.00	11.0	4.0	4.26 - (10)	**Excellent**
96.82	**83.00**	14.0	17.0	19.0	7.00	11.0	5.0	4.03 - (10)	**Excellent**
94.20	**80.75**	15.0	18.0	17.0	6.75	11.0	5.0	3.61 - (8)	**Excellent**
90.60	**74.75**	14.0	17.0	17.0	5.75	10.0	3.0	3.32 - (8)	**Good**
84.60	**78.25**	12.0	18.0	17.0	7.25	11.0	5.0	2.77 - (8)	**Excellent**
83.60	**71.00**	14.0	16.0	16.0	7.00	9.0	1.0	2.72 - (8)	**Good**
82.90	**79.75**	16.0	16.0	16.0	7.75	11.0	5.0	2.63 - (8)	**Excellent**
80.00	**73.50**	14.0	15.0	16.0	5.50	10.0	5.0	2.38 - (8)	**Good**
76.70	**80.50**	15.0	16.0	16.0	9.50	11.0	5.0	2.23 - (8)	**Excellent**
75.40	**77.50**	14.0	16.0	16.0	7.50	11.0	5.0	2.19 - (8)	**Excellent**
71.70	**78.00**	16.0	14.0	16.0	8.00	11.0	5.0	2.13 - (8)	**Excellent**
(95702) Hastings Creek									
Year: 2016									
3.12	**57.00**	11.5	12.0	17.0	5.50	2.0	1.0	10.50 - (8)	**Fair**
1.68	**38.50**	9.0	7.0	8.5	4.00	3.0	1.0	6.86 - (6)	**Poor**
(95715) Unnamed Trib to N. Mill Creek									
Year: 2016									
0.04	**61.00**	9.0	9.0	20.0	7.50	4.0	1.5	15.69 - (10)	**Good**
(95996) North Mill Creek									
Year: 2016									
10.20	**52.00**	-2.0	17.0	11.0	6.00	8.0	2.0	7.68 - (10)	**Fair**
8.10	**75.50**	12.0	14.0	19.0	4.50	12.0	4.0	6.74 - (10)	**Excellent**
1.10	**70.00**	12.0	15.0	15.5	5.50	12.0	4.0	5.24 - (6)	**Good**
(95995) Mill Creek									
Year: 2016									
17.20	**40.00**	4.0	9.0	10.0	5.00	4.0	0.0	10.78 - (8)	**Poor**
13.80	**49.00**	0.0	16.0	8.5	8.50	6.0	0.0	6.71 - (10)	**Fair**
10.10	**57.00**	11.5	15.0	12.0	5.50	5.0	2.0	5.37 - (6)	**Fair**
7.20	**63.00**	12.0	14.0	17.0	4.00	7.0	3.0	5.56 - (6)	**Good**
1.71	**79.00**	14.0	16.0	19.0	5.50	12.0	4.5	7.40 - (8)	**Excellent**
0.70	**71.00**	12.0	16.0	17.5	5.50	9.0	3.0	7.30 - (8)	**Good**

Appendix D-1. QHEI metric scores for sites sampled by MBI in the Des Plaines River study area in 2016.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
(95708) Newport Drainage Ditch									
Year: 2016									
3.03	**38.00**	0.0	14.0	8.5	5.50	6.0	0.0	3.68 - (4)	**Poor**
0.70	**47.00**	9.0	15.0	11.0	4.00	2.0	0.0	6.65 - (6)	**Fair**
(95704) Bull's Brook									
Year: 2016									
1.95	**63.25**	12.0	15.0	19.0	3.75	3.0	2.5	32.57 - (8)	**Good**
0.25	**64.00**	12.0	13.0	19.0	5.00	5.0	2.0	32.77 - (8)	**Good**
(95709) Stoneroller Creek									
Year: 2016									
0.42	**72.75**	12.0	13.0	17.0	8.75	8.0	4.0	19.18 - (10)	**Good**
(95710) Suburban Country Club Tributary									
Year: 2016									
2.75	**41.50**	0.0	14.0	7.0	8.50	2.0	0.0	15.97 - (10)	**Poor**
2.00	**47.00**	11.0	10.0	8.0	4.00	4.0	0.0	15.72 - (10)	**Fair**
(95711) Slocum Conrners Creek									
Year: 2016									
1.36	**61.50**	14.0	13.0	17.0	3.50	4.0	2.0	30.60 - (8)	**Good**
(95714) Unnamed Trib to DesPlaines River									
Year: 2016									
0.13	**62.00**	10.0	13.0	17.0	10.00	2.0	0.0	26.83 - (10)	**Good**
(95716) Unnamed Trib - Greenleaf Creek									
Year: 2016									
0.40	**68.50**	13.5	15.0	19.5	5.00	4.0	1.5	26.98 - (10)	**Good**
(95720) West Fork Belvidere Rd. Trib									
Year: 2016									
0.21	**57.50**	10.0	14.0	15.0	4.50	4.0	2.0	36.62 - (8)	**Fair**
0.15	**69.50**	14.0	14.0	19.5	5.50	6.0	2.5	33.63 - (8)	**Good**
(95051) Bull Creek									
Year: 2016									
5.95	**54.50**	6.5	14.0	17.0	5.00	4.0	2.0	9.05 - (6)	**Fair**
4.70	**52.00**	5.0	13.0	14.0	7.00	5.0	0.0	13.95 - (8)	**Fair**
1.00	**57.50**	11.5	15.0	15.5	4.00	5.0	2.5	3.96 - (4)	**Fair**
0.50	**89.50**	17.0	18.0	19.0	6.50	12.0	7.0	6.26 - (10)	**Excellent**
(95719) West Branch Bull Creek									

Appendix D-1. QHEI metric scores for sites sampled by MBI in the Des Plaines River study area in 2016.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
Year: 2016									
2.54	**32.50**	0.0	11.0	8.0	5.50	4.0	0.0	4.40 - (4)	**Poor**
1.60	**64.00**	14.0	15.0	18.0	5.00	5.0	3.0	2.85 - (4)	**Good**
(95390) Seavey Drainage Ditch									
Year: 2016									
3.66	**65.50**	12.5	15.0	13.5	5.50	8.0	1.0	25.48 - (10)	**Good**
0.45	**54.00**	12.0	12.0	11.0	3.00	4.0	2.0	16.84 - (10)	**Fair**
(95705) Forest Lake Drain									
Year: 2016									
0.83	**58.00**	2.0	13.0	17.0	8.00	5.0	5.0	38.51 - (8)	**Fair**
(95706) Indian Creek									
Year: 2016									
10.83	**62.25**	11.5	13.0	17.0	6.25	3.0	1.5	22.55 - (10)	**Good**
9.83	**65.50**	11.5	15.0	18.0	5.50	5.0	0.5	21.94 - (10)	**Good**
5.40	**59.75**	8.0	11.0	12.0	5.75	10.0	3.0	16.00 - (10)	**Fair**
2.41	**79.00**	13.0	18.0	17.0	7.00	8.0	6.0	15.13 - (10)	**Excellent**
0.17	**64.50**	14.0	14.0	10.0	3.50	9.0	4.0	12.87 - (10)	**Good**
(95707) Kildeer Creek									
Year: 2016									
5.20	**46.50**	4.5	14.0	13.0	4.00	5.0	2.0	43.04 - (4)	**Fair**
4.60	**53.50**	9.5	12.0	17.0	6.00	5.0	0.0	40.83 - (4)	**Fair**
2.21	**58.00**	10.0	12.0	14.0	6.00	6.0	2.0	31.36 - (8)	**Fair**
0.17	**61.00**	9.5	14.0	14.5	4.00	8.0	1.0	23.96 - (10)	**Good**
(95717) W. Branch Indian Creek									
Year: 2016									
0.80	**63.00**	12.0	15.0	19.0	4.00	5.0	0.0	34.19 - (8)	**Good**
(95718) Trib to Werhane Lake Drain									
Year: 2016									
0.10	**49.50**	10.0	12.0	13.0	8.50	2.0	0.0	48.80 - (4)	**Fair**
(95721) Unnamed Trib to Des Plaines River									
Year: 2016									
0.40	**59.00**	14.0	12.0	13.0	9.00	3.0	0.0	13.85 - (8)	**Fair**
(95703) Buffalo Creek									
Year: 2016									
14.00	**66.00**	12.0	16.0	14.5	5.50	6.0	4.0	38.18 - (8)	**Good**
7.70	**69.00**	11.5	14.0	17.0	7.50	6.0	3.0	17.56 - (10)	**Good**

Appendix D-1. QHEI metric scores for sites sampled by MBI in the Des Plaines River study area in 2016.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
(95703) Buffalo Creek									
Year: 2016									
6.10	**60.50**	10.5	13.0	15.0	4.50	5.0	2.5	17.28 - (10)	**Good**
0.75	**51.00**	14.0	10.0	7.0	4.00	5.0	1.0	15.83 - (10)	**Fair**
(95713) Buffalo Creek Tributary									
Year: 2016									
0.68	**63.00**	10.5	16.0	13.0	4.00	8.0	1.5	20.09 - (10)	**Good**
(95701) Aptakisic Creek									
Year: 2016									
4.70	**52.50**	9.0	12.0	11.5	5.00	4.0	1.0	20.84 - (10)	**Fair**
4.30	**57.00**	11.5	13.0	11.0	3.50	4.0	4.0	18.14 - (10)	**Fair**
0.80	**46.00**	10.0	10.0	9.0	3.00	4.0	2.0	10.70 - (8)	**Fair**
0.50	**52.00**	9.0	14.0	7.0	4.00	8.0	2.0	10.37 - (8)	**Fair**
(95712) Unnamed Trib to Aptakisic Creek									
Year: 2016									
0.05	**47.00**	6.0	14.0	11.0	4.00	2.0	0.0	19.34 - (10)	**Fair**