2015

Macroinvertebrate Assessment

Minnehaha Creek

Six Mile Creek

Schutz Creek

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To:	Minnehaha Creek Watershed District 15320 Minnetonka Blvd Minnetonka, MN 55345
Subject:	Macroinvertebrate Assessment of Minnehaha Creek, Six Mile Creek and Schutz Creek
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Executive Summary

In 2013, aquatic macroinvertebrates were colleced in Minnehaha Creek from Lake Minnetonka to the Mississippi River, and five tributary streams to Lake Minnetonka (Figures 2-3). These same sites were monitored in 2003. The overall conclusions are very comparable between the 2003 and 2013 MCWD studies and the 2013 MPCA Assessment of the watershed.

In 2015, selected sites from Minnehaha Creek and the tributary streams to Lake Minnetonka were monitored again (Figures 2-3). The 2015 results had some variation from 2013, but overall were similar in showing the impact of urbanization and stream channelization in this area.

In 2013 Minnehaha Creek showed fair habitat and biological community diversity in the first 6 sites after Lake Minnetonka, and as it flows through Minneapolis the biological community declined. This showed the effect of urbanization on the creek and it's biological community. In 2015, the results from different sites were more variable, and some of the downstream sites had similar IBI scores to the headwaters sites. Minnehaha Creek is listed as impaired by the Minnesota Pollution Control Agency (MPCA) for chloride, fecal coliform, dissolved oxygen, and macroinvertebrate and fish IBIs (Figure 1).

The combination of degraded habitat and poor water quality have affected the biological community in these streams. Stream restoration projects in these areas could show improvement in the biological community. It is helpful to have these data sets as a "before" condition to any future improvements.

MPCA Assessment 2013

The Minnesota Pollution Control Agency completed the Mississippi River – Twin Cities Watershed Monitoring and Assessment Report in September 2013. The Minnehaha Creek Subwatershed Summary can be found on pages 85-98 (MPCA 2013).

For Six Mile Creek, the aquatic life assessments have been deferred until the adoption of Tiered Aquatic Life Uses due to the stream being predominatnly (>50%) channelized or having biological data limted to a station occurring on a channelized portion of the stream (MPCA 2013).

Minnehaha Creek, from Lake Minnetonka to the Mississippi River, was found to exceed the criteria for macroinvertebrate IBIs with a potential severe impairment. It also has existing impariments for Fish IBI, dissolved oxygen, chloride and bacteria. Minnehaha Creek is listed as non-suporting for aquatic life and aquatic recreation (MPCA 2013).

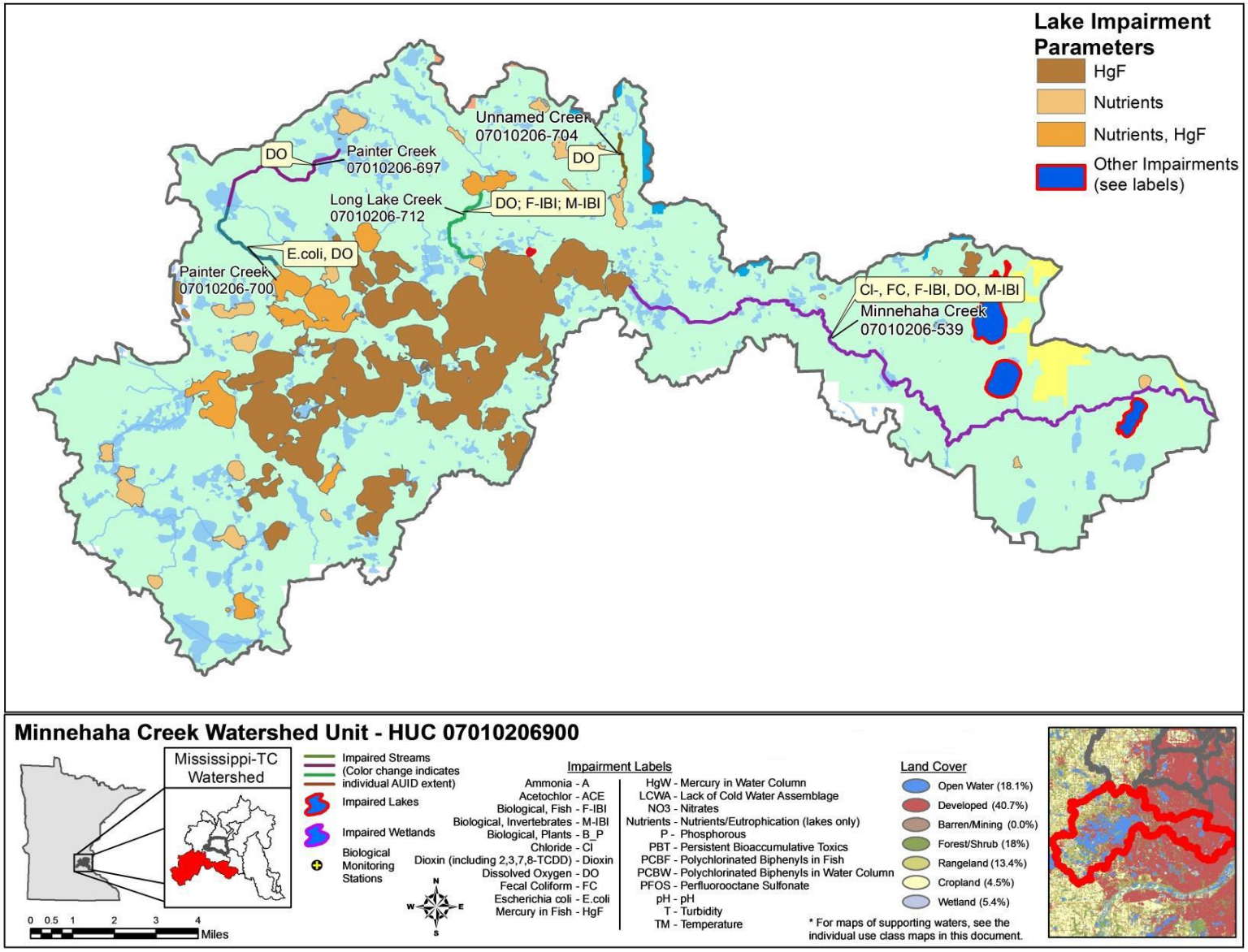

Figure 1. MPCA assessments for the Minnehaha Creek Watershed, 2013. This map was created by the MPCA (MPCA 2013).

Methods

Sample Sites

In 2003, MCWD contracted with Interfluve to conduct macroinvertebrate monitoring in the upper watershed of Lake Minnetonka and Minnehaha Creek. The same sites from the 2003 study were monitored in a 2013 study, with a total of 27 sites in the Upper Watershed and 22 sites along Minnehaha Creek (Figures 2-3). The Minnesota Pollution Control Agency has also monitored sites in these watersheds (Figures 2-3).

In 2015, Six Mile Creek, Schutz Creek and Minnehaha Creek were monitored again at selected sites, including one new site, CSI13. See the 2015 sites marked in red in Figures 2-3.

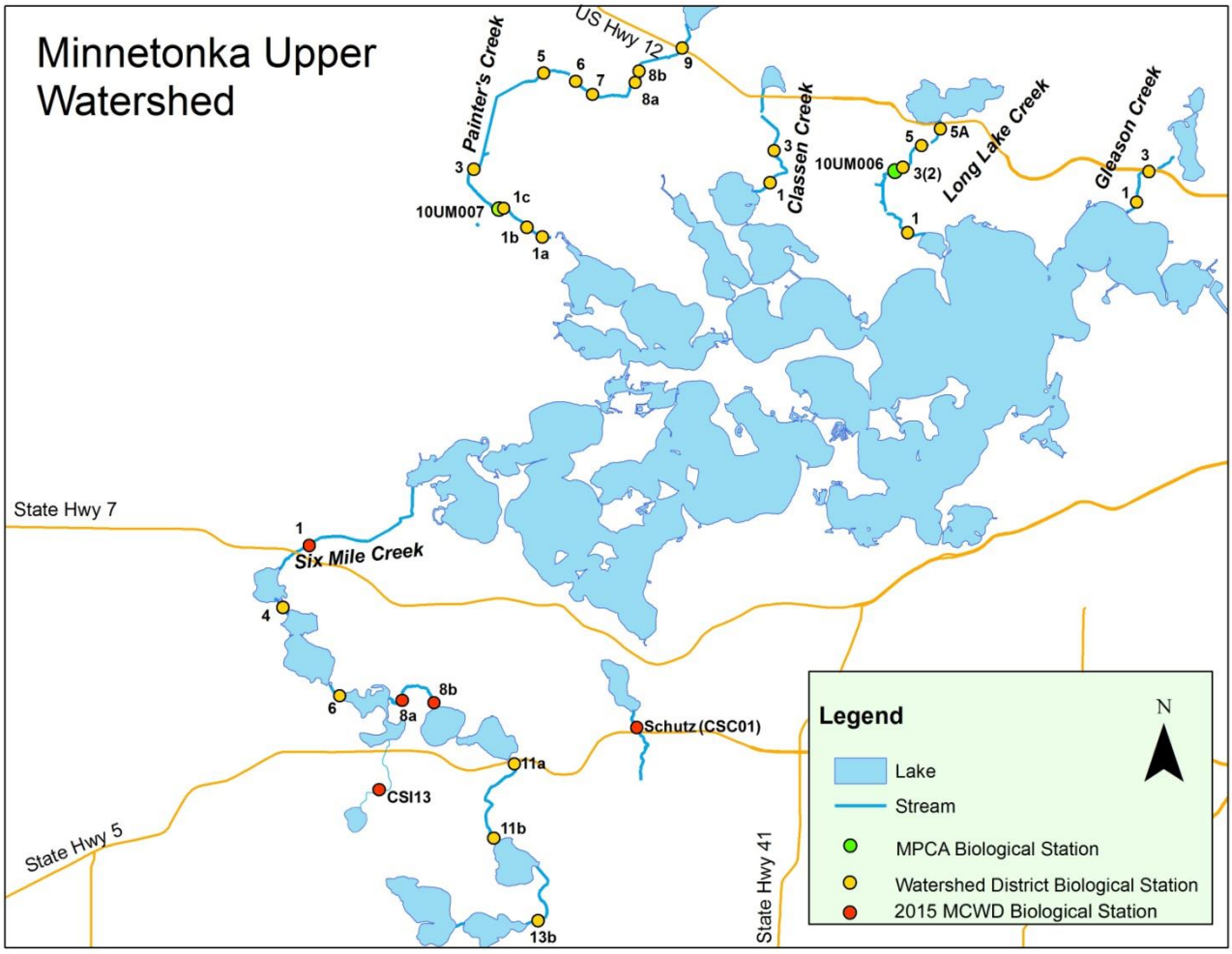

Figure 2. Macroinvertebrate monitoring sites in the Upper Watershed of Lake Minnetonka.

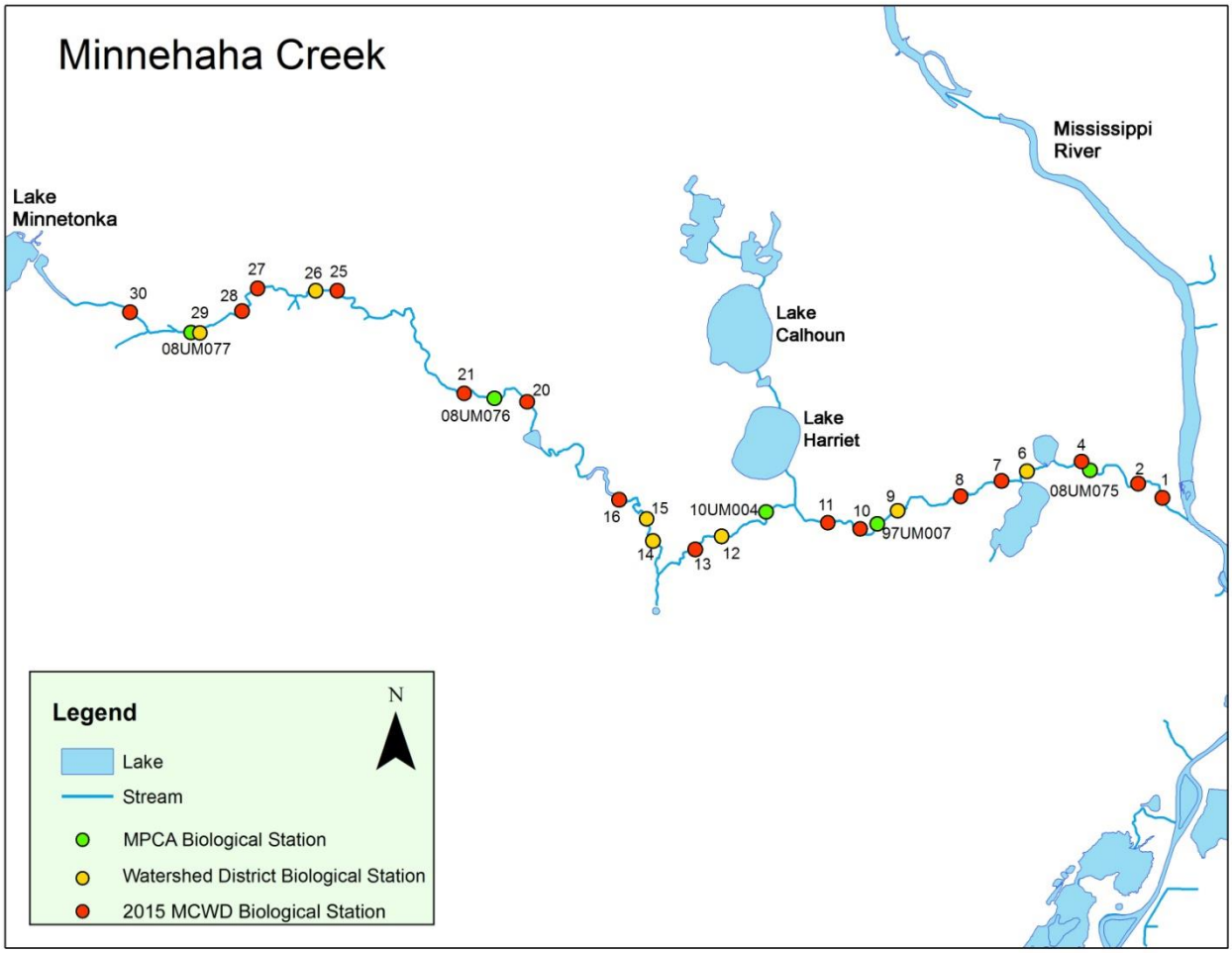

Figure 3. Macroinvertebrate monitoring sites on Minnehaha Creek.

Sample Collection

Aquatic macroinvertebrate samples were collected with a D-frame net following the MPCA's protocols for multi-habitat collection of stream invertebrates (MPCA), which is similar to the USEPA Rapid Bioassessment Protocols for Use in Streams and Rivers (USEPA 1997).

Sample Processing

Macroinvertebrate samples were hand-delivered to RMB Environmental Laboratories (RMBEL) in Detroit Lakes for processing. Taxa were identified to genus where possible and enumerated. The chironomidae family was identified to genus by Dr. Leonard C. Ferrington, Jr. at the University of Minnesota.

Data Management and Assessment

The data were entered into a Microsoft Excel database. The data were sent to Joel Chirhart at the MPCA to be run through their Index of Biological Integrity (IBI) database developed for the State of Minnesota. These data were graphed and included in tables in this report. They were also compared to data collected by the MPCA at the same sites.

Results

Overall Metrics

Overall, 126 taxa were recorded for the 2015 project (Appendix 1). The most taxon rich site was Schutz Creek CSC01. Of the Six Mile Creek sites, the most taxon rich were CSI13 and 8A (Table 1). In comparing the 2013 metrics to the 2015 metrics, Schutz Creek was very similar both years. The Six Mile Creek sites varied a bit between 2013 and 2015.

Table 1. Richness metrics of Upper Watershed Streams sorted by the most rich to the least rich site.

	POET* Richness		Chironomidae Richness		Total Richness	
Site	**2013**	**2015**	**2013**	**2015**	**2013**	**2015**
Schutz Creek CSC01	5	1	17	20	45	42
Six Mile Creek CSI13	Not sampled	3	Not sampled	17	Not sampled	36
Six Mile Creek 8A	7	3	9	17	29	35
Six Mile Creek 8B	7	5	17	15	34	27
Six Mile Creek 1	3	3	10	7	25	17
Six Mile Creek 6	4	Not sampled	13	Not sampled	32	Not sampled
Six Mile Creek 11A	4	Not sampled	14	Not sampled	27	Not sampled
Six Mile Creek 11B	2	Not sampled	17	Not sampled	27	Not sampled
Six Mile Creek 4	3	Not sampled	12	Not sampled	26	Not sampled
Six Mile Creek 13B	0	Not sampled	10	Not sampled	17	Not sampled

**POET = Taxa richness of Plecoptera, Odonata, Ephemeroptera, & Trichoptera (Baetid taxa treated as one taxon)*

In 2013 in Minnehaha Creek, the sites closest to the headwaters (Lake Minnetonka) had the highest taxon richness. This pattern wasn't as clear in 2015 and sites varied more.

In comparing 2013 to 2015, most of the sites had higher richness in 2015. Only two sites, 25 and 27 had higher richness in 2013 (Table 2). Sites 28 and 2 had consistently high richness in both 2013 and 2015. These two sites are on opposite ends of Minnehaha Creek. Their richness could be tied to habitat quality.

Table 2. Richness metrics of Minnehaha Creek sorted by the most rich to the least rich site.

Site	POET* Richness		Chironomidae Richness		Total Richness	
	2013	2015	2013	2015	2013	2015
Minnehaha Creek 28	8	4	10	20	32	41
Minnehaha Creek 2	5	8	10	9	33	39
Minnehaha Creek 13	4	6	6	20	19	37
Minnehaha Creek 4	3	5	6	16	14	37
Minnehaha Creek 21	4	6	9	14	26	35
Minnehaha Creek 7	6	5	9	16	29	34
Minnehaha Creek 11	6	5	9	17	26	34
Minnehaha Creek 8	5	4	13	15	27	33
Minnehaha Creek 10	4	6	6	14	23	33
Minnehaha Creek 30	5	3	7	15	17	33
Minnehaha Creek 25	9	5	13	12	34	32
Minnehaha Creek 1	2	4	7	13	18	31
Minnehaha Creek 16	4	7	9	9	24	30
Minnehaha Creek 20	4	5	7	12	16	29
Minnehaha Creek 27	10	1	8	12	34	15
Minnehaha Creek 26	8	Not sampled	5	Not sampled	29	Not sampled
Minnehaha Creek 29	10	Not sampled	8	Not sampled	26	Not sampled
Minnehaha Creek 9	2	Not sampled	10	Not sampled	25	Not sampled
Minnehaha Creek 14	4	Not sampled	7	Not sampled	24	Not sampled
Minnehaha Creek 15	5	Not sampled	8	Not sampled	23	Not sampled
Minnehaha Creek 6	5	Not sampled	7	Not sampled	23	Not sampled
Minnehaha Creek 12	3	Not sampled	6	Not sampled	22	Not sampled

**POET = Taxa richness of Plecoptera, Odonata, Ephemeroptera, & Trichoptera (Baetid taxa treated as one taxon)*

Index of Biological Integrity (IBI)

An IBI is a tool used to identify and classify water pollution problems. An IBI associates anthropogenic influences on a water body with biological health in the water body. It usually runs on a scale from 1-100, with 100 being a pristine habitat and fully functioning ecosystem, and a 1 being a severely impacted and unhealthy ecosystem.

The MPCA developed an IBI database for the State of Minnesota (MPCA 2014). This database takes into account the stream type and location in the state. All the MCWD sites fell under stream classification 5 – Southern Streams Riffle/Run or 6 – Southern Streams Glide/Pool. What determined the site classification is if riffle habitat was present at the site or not (Tables 3-4).

Table 3. Six Mile Creek site descriptions and invertebrate class assignments.

Site Name	Invertebrate Class (MPCA)	Site Description
Six Mile Creek 1	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek 11A	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek 11B	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek 13B	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek 4	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek 6	5 - Southern Streams Riffle/Run	riffle/run with cobble, gravel and boulder
Six Mile Creek 8A	5 - Southern Streams Riffle/Run	riffle/run with cobble, gravel and boulder
Six Mile Creek 8B	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Six Mile Creek CSI13	6 - Southern Streams Glide/Pool	wetland/marsh areas located between lakes
Schutz Creek CSC01	5 - Southern Streams Riffle/Run	riffle/run with cobble, gravel and boulder

Table 4. Minnehaha Creek site descriptions and invertebrate class assignments.

Site Name		Invertebrate Class (MPCA)	Site Description
Minnehaha Creek	1	5 - Southern Streams Riffle/Run	riffle/run with cobble and gravel
Minnehaha Creek	2	5 - Southern Streams Riffle/Run	riffle/run with cobble, gravel and boulder
Minnehaha Creek	4	5 - Southern Streams Riffle/Run	riffle/run with gravel and sand
Minnehaha Creek	6	6 - Southern Streams Glide/Pool	glide/pool with gravel
Minnehaha Creek	7	5 - Southern Streams Riffle/Run	riffle/run with cobble and woody substrate
Minnehaha Creek	8	5 - Southern Streams Riffle/Run	riffle/run with cobble and woody substrate
Minnehaha Creek	9	6 - Southern Streams Glide/Pool	glide/pool with cobble and woody substrate
Minnehaha Creek	10	6 - Southern Streams Glide/Pool	glide/pool with cobble and woody substrate
Minnehaha Creek	11	6 - Southern Streams Glide/Pool	glide/pool with cobble and woody substrate
Minnehaha Creek	12	5 - Southern Streams Riffle/Run	riffle/run with cobble and woody substrate
Minnehaha Creek	13	5 - Southern Streams Riffle/Run	riffle/run with boulder and woody substrate
Minnehaha Creek	14	5 - Southern Streams Riffle/Run	riffle/run with boulder and woody substrate
Minnehaha Creek	15	6 - Southern Streams Glide/Pool	glide/pool with gravel and woody substrate
Minnehaha Creek	16	5 - Southern Streams Riffle/Run	riffle/run with cobble and woody substrate
Minnehaha Creek	20	6 - Southern Streams Glide/Pool	glide/pool with gravel and rooted vegetation
Minnehaha Creek	21	5 - Southern Streams Riffle/Run	riffle/run with cobble and woody substrate
Minnehaha Creek	25	6 - Southern Streams Glide/Pool	glide/pool with boulder, wood, and veg.
Minnehaha Creek	26	5 - Southern Streams Riffle/Run	riffle/run with boulder, wood, and veg.
Minnehaha Creek	27	6 - Southern Streams Glide/Pool	glide/pool with cobble, wood and veg.
Minnehaha Creek	28	6 - Southern Streams Glide/Pool	glide/pool with cobble, wood and veg.
Minnehaha Creek	29	5 - Southern Streams Riffle/Run	riffle/run with boulder, wood and veg.
Minnehaha Creek	30	6 - Southern Streams Glide/Pool	glide/pool with gravel, wood and veg.

In the Upper Watershed Streams, the IBIs were quite different in 2015 than 2013 with the exception of Six Mile Creek site 8A (Figure 4). For Minnehaha Creek, there was a significant declining trend in IBI from the headwaters to the pour point of the Creek in 2013. In 2015, there was no clear trend and the IBIs varied more.

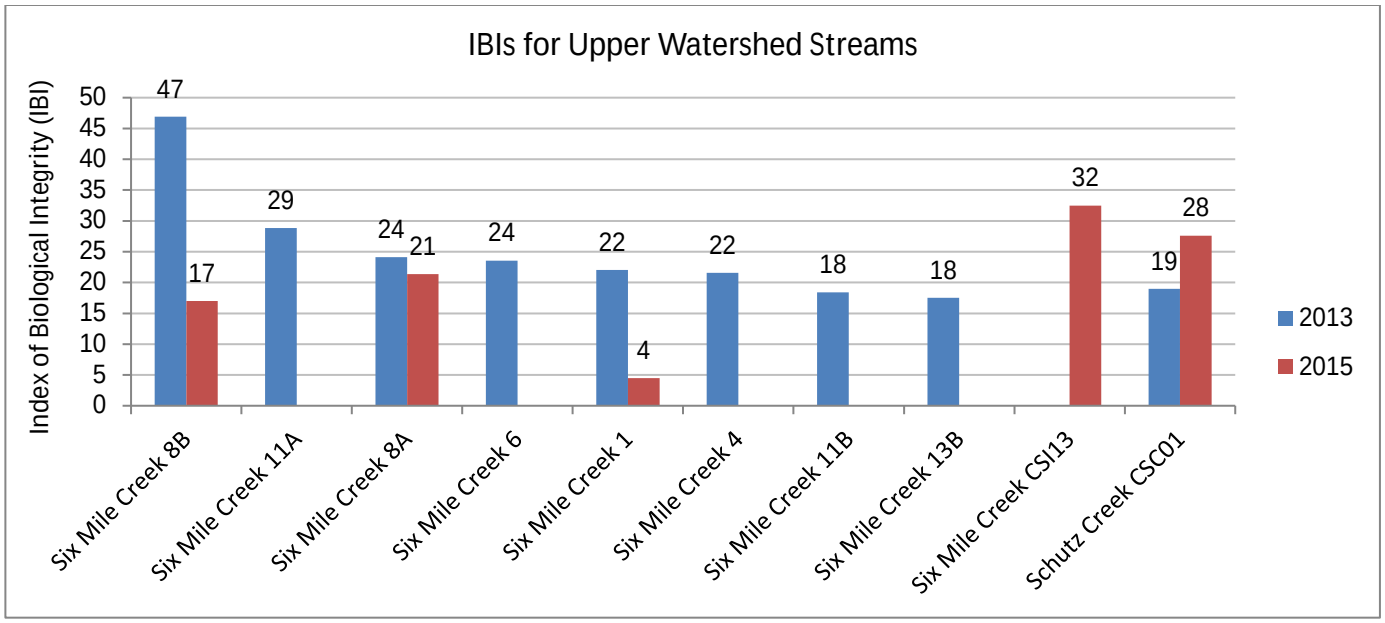

Figure 4. IBIs for Upper Watershed Streams ranked in order from highest to lowest IBI in 2013.

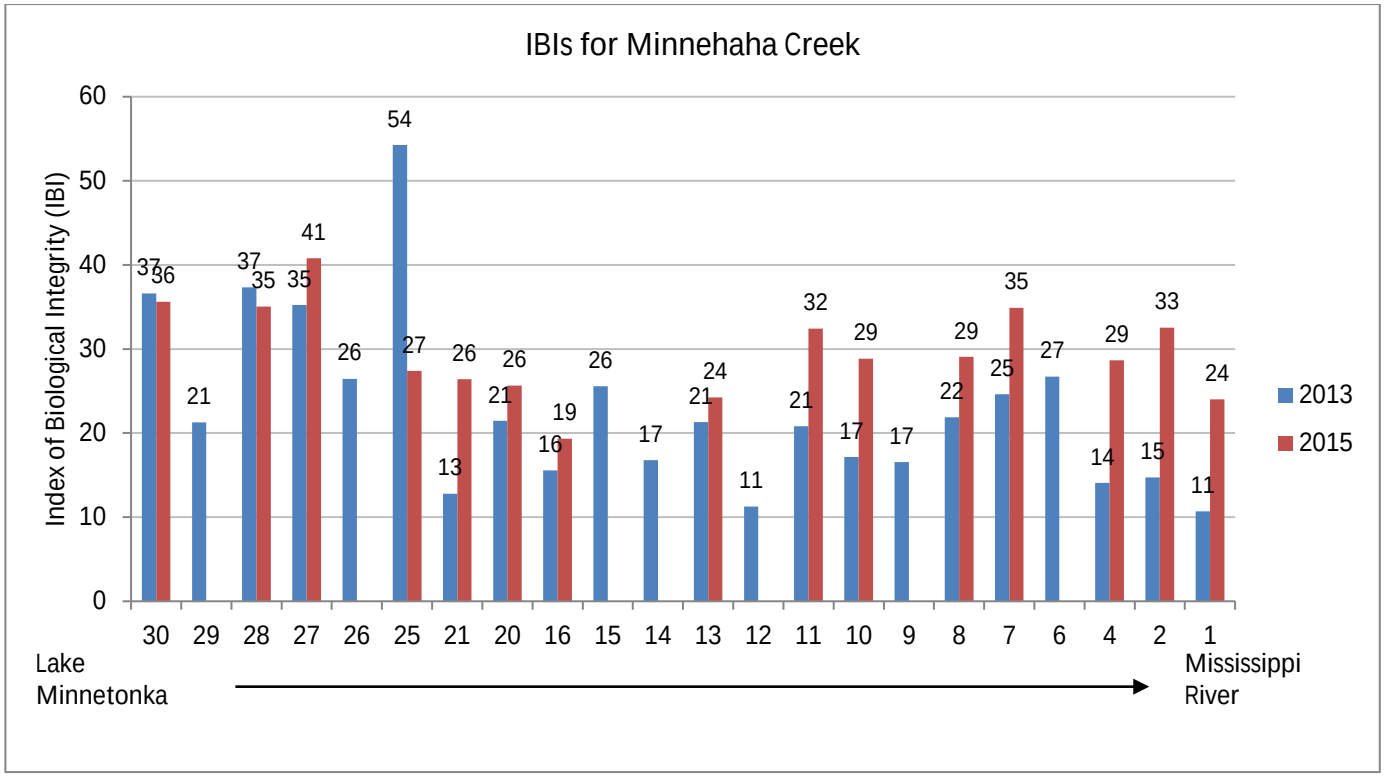

Figure 5. IBIs for Minnehaha Creek in order from the headwaters at Lake Minnetonka to the Mississippi River.

Tiered Aquatic Life Uses

The MPCA has developed new standards for biological assessment of streams in Minnesota (Table 5) (MPCA 2014). These standards help apply the IBIs to understand the stream health better and compare it to what it was before human influence.

The results from this study were compared to the different use categories. The Modified Use category was developed for streams that have been channelized and altered so that the habitat is unable to support a full biological community. When properly managed (i.e. maintaining buffers, etc), these sites should strive to meet the Modified Use goal (MPCA 2014).

In the 2015 study, Six Mile Creek CSI13 and Schutz Creek CSC01 met and Six Mile Creek 8A was just slightly under the Modified Use goal. Sites Six Mile Creek 1 and 8B were well below the Modified Use goal (Figures 6-7).

In the 2015 study, all the Minnehaha sites except for 10, 16, 20, and 25 met the Modified Use goal. Sites 10, 20 and 25 were close though, and within 5 points of the Modified Use goal (Figures 8-9).

Table 5. Tiered Aquatic Life Uses as determined by the MCPA (MPCA 2014).

Use Category	**Description**
Exceptional Use	Evident changes in structure due to loss of some rare native taxa; shifts in relative abundance; ecosystem level functions fully maintained.
General Use	Overall balanced distribution of all expected major groups; ecosystem functions largely maintained through redundant attributes.
Modified Use	Sensitive taxa markedly diminished; conspicuously unbalanced distribution of major taxonomic groups; ecosystem function shows reduced complexity and redundancy.

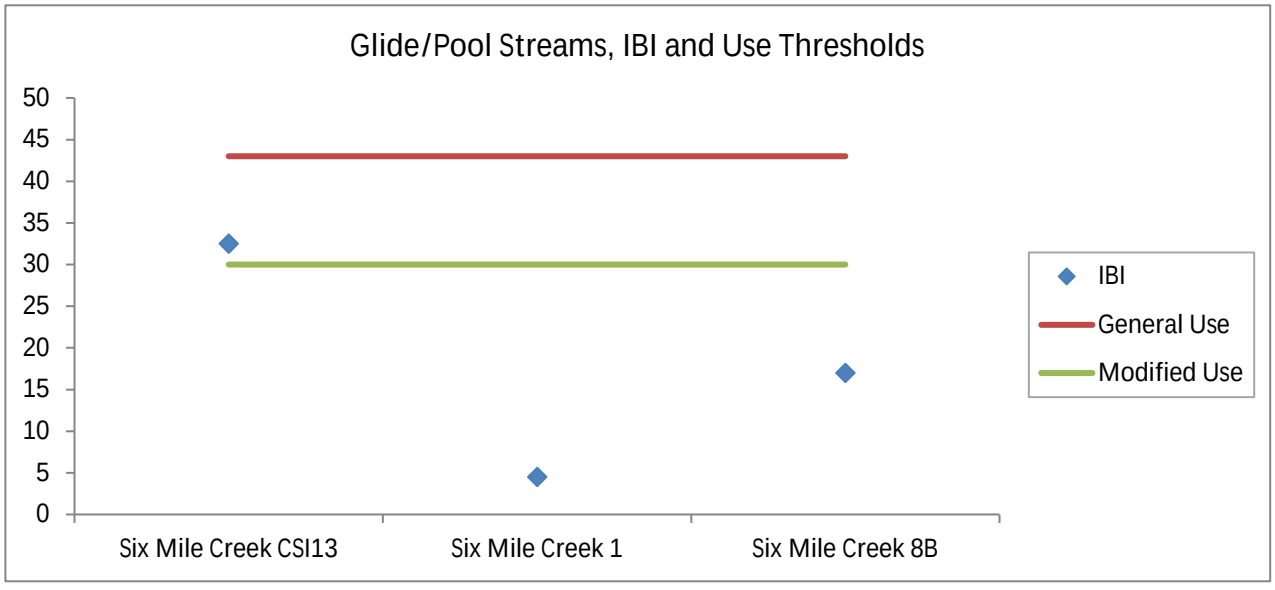

Figure 6. 2015 Upper Watershed IBIs compared to the MPCA's Use Thresholds in glide/pool habitats.

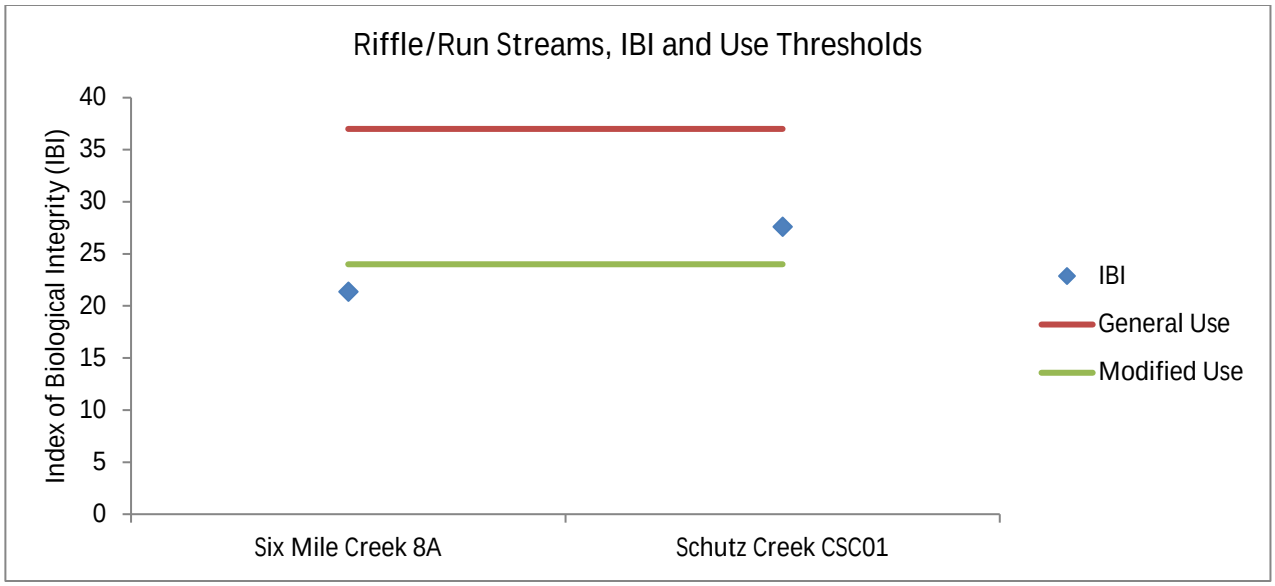

Figure 7. 2015 Upper Watershed IBIs compared to the MPCA's Use Thresholds in riffle/run habitats.

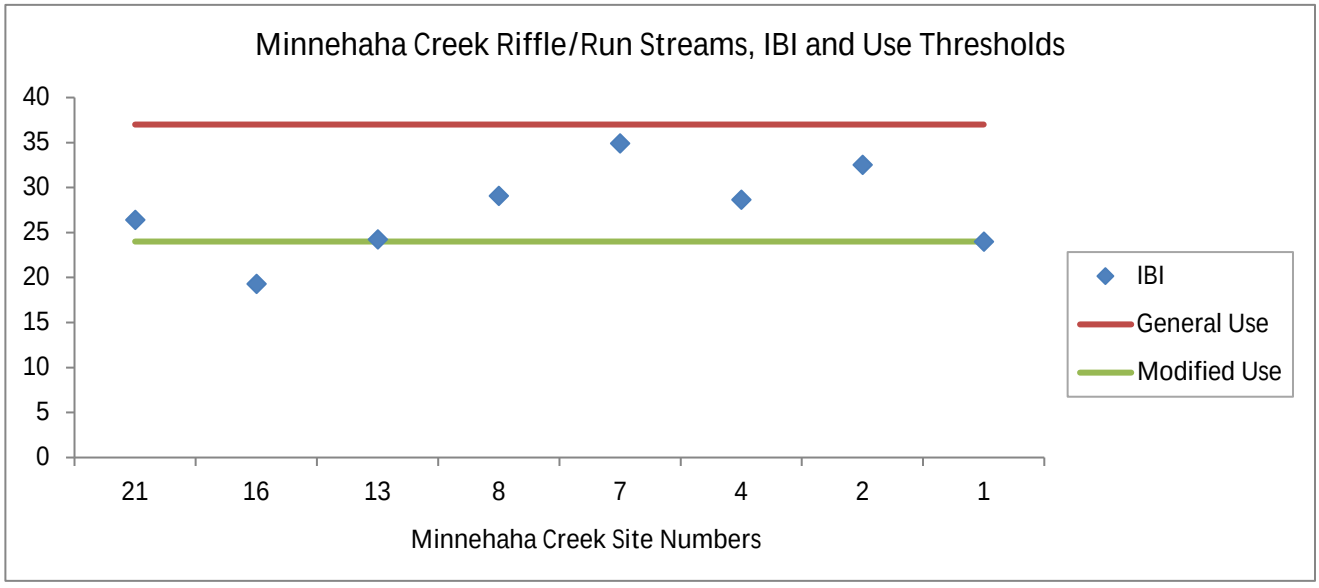

Figure 8. 2015 IBIs for Minnehaha Creek compared to the MPCA's Use Thresholds in riffle/run habitats.

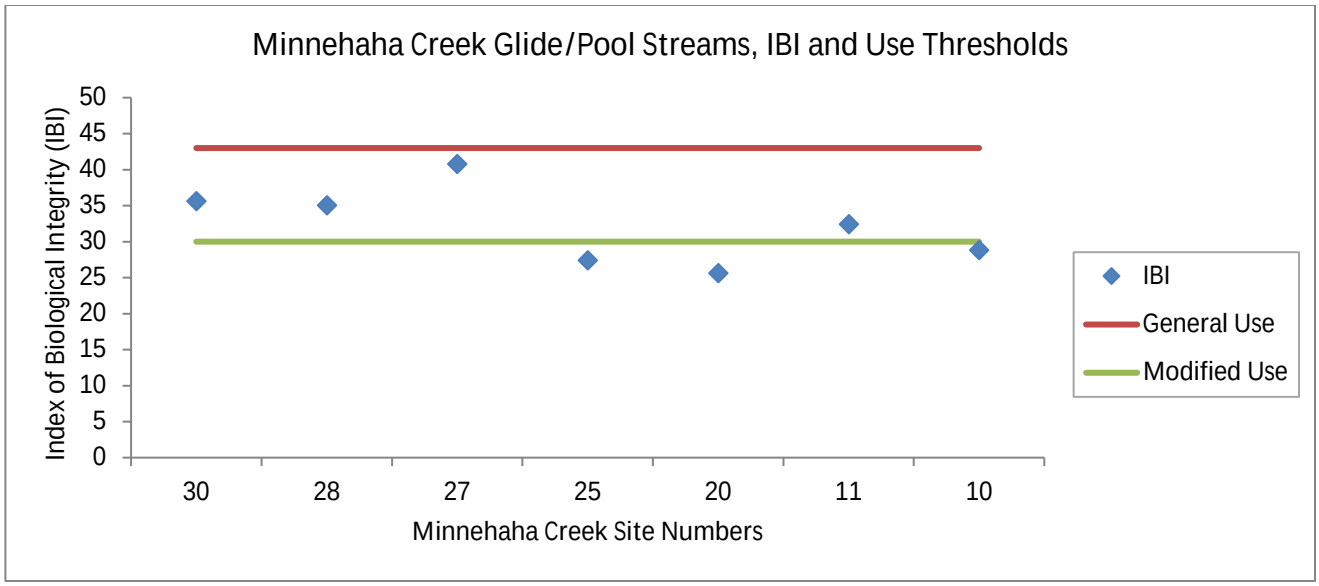

Figure 9. 2015 IBIs for Minnehaha Creek compared to the MPCA's Use Thresholds in glide/pool habitats.

Comparison to MPCA Results

The MPCA has monitored some of the same sites as the MCWD and have found similar results for the most part. They have listed these streams as >50% channelized, which affects the biological community. Two of the Minnehaha Creek sites have lower IBIs in this study than in the MPCA study. One factor that could have impacted the difference was that the summer of 2013 had very high water, and could have affected the biological community.

Table 6. Comparison of MPCA biological monitoring results to the MCWD biological monitoring results.

	MPCA Biological Station ID	**MCWD 2015 IBI**	**MCWD 2013 IBI**	**MPCA 2010 IBI**	**MPCA 2008 IBI**
Minnehaha Creek	08UM077	Not sampled	21	37	22
Minnehaha Creek	08UM076	26	21	43	67
Minnehaha Creek	10UM004	Not sampled	21	26	NA
Minnehaha Creek	97UM007	29	17	25	22
Minnehaha Creek	08UM075	29	14	34	36

Invasive Species

Lake Minnetonka is on the MNDNR Infested Waters List as infested for Zebra mussels. Zebra mussels were found at Minnehaha Creek sites 4 and 28 in 2015 samples. No Zebra mussels were found in Upper Watershed stream sites in 2015 samples .

Discussion

Overall, the majority of the sites monitored in this study had low IBIs and poor habitat conditions. The depressed macroinvertebrate community appears to be due to the lack of habitat variety at these sites and some water quality issues such as low dissolved oxygen. The MPCA lists these sites as heavily channelized and impacted by development, and the macroinvertebrate community reflects this impact. When goal-setting for future water quality, the Modified Use Goal (Table 5) could be considered as a goal for management.

Schutz Lake Creek

Schutz Lake Creek was found by the MPCA to meet aquatic life indicator criteria and be fully supporting to aquatic life (MPCA 2013). Just one site was monitored on Schutz Lake Creek in this study. This site has high habitat diversity and is forested. It also had the highest taxon richness of all the sites in the 2013 and 2015 study (45 and 42 respectively, Table 1). The IBI (27) met the Modified Use goal. There were some taxa present with low pollution tolerance scores: Tipulidae Crane Flies (4), Leptoceridae Caddisflies (4.3), and some Chironomidae flies (*Tanytarsus* [5], *Parametriocnemus* [5.2]). There were also some higher tolerant species such as *Physa* snails (10), Oligochaeta worms (10) and *Anopheles* mosquitoes (8).

Six Mile Creek

Six Mile Creek was found by the MPCA to be fully supporting for aquatic recreation (MPCA 2013). All the sites sampled on Six Mile Creek were within wetland/marsh areas located between lakes. The taxon richness ranged from 17 to 42 taxa. Sites 8A and CSI13 showed good overall diversity and good POET diversity. Tipulidae Crane Flies, some low tolerant Chironomidae flies (*Microtendipes*, *Tanytarsus*) were found at Site 8A. Low tolerant Chironomidae flies were also found at site CSI13 (*Endotribelos*, *Microtendipes*, *Tanytarsus*).

In the 2015 study, Six Mile Creek CSI13 met and Six Mile Creek 8A was just slightly under the Modified Use goal. Sites Six Mile Creek 1 and 8B were well below the Modified Use goal (Figures 6-7). Stream restoration work could take place on these sites to work towards bringing the macroinvertebrate communities up to the Modified Use goal.

Minnehaha Creek

Minnehaha Creek has a relatively fair biological community for an urban stream, with all but five sites meeting the Modified Use IBI goal, and three of those five sites just under the Modified Use IBI goal (Figures 8-9). These sites also had moderate POET richness, ranging from 4-8 taxa. Notable POET taxa included numerous caddisfly genera of Hydropsychidae, Hydroptilidae, Leptoceridae, and mayfly genera of Baetidae, Leptohyphidae, and Heptageniidae. Only site 16 was over 5 points away from the Modified Use IBI goal (Figures 8-9).

Sisyridae Spongilaflies, which are specialists on freshwater sponges, were found at sites 28 and 30. The presence of freshwater sponges was noted in the field notes for sites 11, 13, 16, 21, 27, 28 but not 30.

Minnehaha Creek site 27 scored the best IBI of all sites in this study at 41, almost reaching the General Use IBI goal. It contained many genera of Chironomidae flies, including *Tanytarsus*, *Orthocladius*/*Cricotopus*, *Rheotanytarsus*, and *Stenochironomus*, which have lower tolerance values.

Minnehaha Creek is listed as impaired by the MPCA for macroinvertebrate IBI, fish IBI, dissolved oxygen, chloride and bacteria. Minnehaha Creek is listed as non-suporting for aquatic life and aquatic recreation (MPCA 2013).

Future Project Ideas

Because of the year-to-year differences of the weather, precipitation, water body use, flooding, temperature, water levels, etc., it is helpful to have more than one year of monitoring results when fully understanding a stream's water quality, habitat quality and resulting macroinvertebrate community. This project summarizes the second year of biological monitoring for Minnehaha Creek, Six Mile Creek and Schutz Creek. A second year of data could be collected on the remaining Upper Watershed streams as well to better understand their biological communities.

Stream habitat restoration projects could be considered for most of these streams. In addition to restoring varied habitat, any water quality issues must also be identified and fixed. Low dissolved oxygen is one of the water quality parameters that can affect the macroinvertebrate community the most, and many of these stream reaches are impaired for dissolved oxygen. Re-testing the macroinvertebrate community a couple years after a stream restoration project would be a great way to measure the effectiveness of the restoration and quality of the habitat.

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Appendix 1: Project Taxon List

	Taxon	Family	Genus	Species
1	**Amphipoda**	**Gammaridae**	*Gammarus*	
2		**Hyalellidae**	*Hyalella*	
3	**Bivalvia**	**Sphaeriidae**	*Pisidium*	
4	**Coleoptera**	**Carabidae**		
5		**Dytiscidae**	*Acilius*	
6			*Ilybius*	
7			*Liodessus*	
8		**Elmidae**	*Dubiraphia*	
9			*Stenelmis*	
10		**Haliplidae**	*Haliplus*	
11			*Peltodytes*	
12		**Hydrophilidae**	*Tropisternus*	
13	**Collembola**			
14	**Decapoda**	**Cambaridae**		
15	**Diptera**	**Ceratopogonidae**	*Atrichopogon*	
16			*Bezzia/Palpomyia*	
17		**Chironomidae**	*Ablabesmyia*	
18			*Apedilum*	
19			*Brillia*	
20			*Cardiocladius*	
21			*Chaetocladius*	
22			*Chironomus*	
23			*Cladopelma*	
24			*Cladotanytarsus*	
25			*Conchapelopia/Thiennemannimyia*	
26			*Corynoneura*	
27			*Cricotopus*	
28			*Cryptochironomus*	
29			*Dicrotendipes*	
30			*Endochironomus*	
31			*Endotribelos*	
32			*Glyptotendipes*	
33			*Guttipelopia*	
34			*Labrundinia*	
35			*Larsia*	
36			*Limnophyes*	
37			*Metriocnemus*	
38			*Microtendipes*	
39			*Nanocladius*	

	Taxon	Family	Genus	Species
40			*Nilothauma*	
41			*Orthocladius/Cricotopus*	
42			*Parachironomus*	
43			*Paracladopelma*	
44			*Parakiefferiella*	
45			*Paralauterborniella*	
46			*Paramerina*	
47			*Parametriocnemus*	
48			*Paratanytarsus*	
49			*Paratendipes*	
50			*Phaenopsectra*	
51			*Polypedilum*	
52			*Procladius*	
53			*Psectrocladius*	
54			*Pseudochironomus*	
55			*Psilometriocnemus*	
56			*Rheocricotopus*	
57			*Rheotanytarsus*	
58			*Stenochironomus*	
59			*Tanypus*	
60			*Tanytarsus*	
61			*Thienemanniella*	
62			*Tvetenia*	
63			*Zavrelimyia*	
64		**Culicidae**	*Anopheles*	
65			*Culex*	
66		**Empididae**	*Hemerodromia*	
67		**Psychodidae**	*Psychoda*	
68		**Simuliidae**	*Simulium*	
69		**Stratiomyidae**	*Odontomyia*	
70		**Tabanidae**		
71		**Tipulidae**	*Helius*	
72			*Helius/Limonia*	
73			*Tipula*	
74	**Ephemeroptera**	**Baetidae**	*Acentrella*	
75			*Baetis*	
76			*Labiobaetis*	
77		**Caenidae**	*Caenis*	
78		**Heptageniidae**	*Heptagenia*	
79			*Maccaffertium*	
80			*Stenacron*	

	Taxon	Family	Genus	Species
81		**Leptohyphidae**	*Tricorythodes*	
82	**Gastropoda**	**Ancylidae**		
83		**Dreissenidae**	*Dreissena*	*polymorpha*
84		**Hydrobiidae**	*Amnicola*	
85		**Lymnaeidae**	*Lymnaea*	
86			*Stagnicola*	
87		**Physidae**	*Physa*	
88		**Planorbidae**	*Gyraulus*	*deflectus*
89			*Planorbella*	
90	**Hemiptera**	**Belostomatidae**	*Belostoma*	
91		**Corixidae**	*Trichocorixa*	
92		**Gerridae**	*Aquarius*	
93			*Gerris*	
94			*Metrobates*	
95			*Rhumatobates*	
96		**Mesoveliidae**	*Mesovelia*	
97		**Nepidae**	*Ranatra*	
98		**Notonectidae**	*Notonecta*	
99		**Pleidae**	*Neoplea*	
100		**Veliidae**	*Microvelia*	
101			*Rhagovelia*	
102	**Hirudinea**	**Erpobdellidae**	*Erpobdella*	*punctata*
103			*Mooreobdella*	*fervida*
104		**Glossiphoniidae**	*Helobdella*	*stagnalis*
105	**Hydracarina**			
106	**Isopoda**	**Asellidae**	*Asellus*	
107	**Lepidoptera**	**Pyralidae**		
108	**Megaloptera**	**Corydalidae**	*Chauliodes*	
109	**Neuroptera**	**Sisyridae**	*Sisyra*	
110	**Odonata**	**Aeschnidae**	*Aeschna*	
111			*Anax*	
112		**Calopterygidae**	*Calopteryx*	
113			*Hetaerina*	
114		**Coenagrionidae**	*Coenagrion/Enallagma*	
115		**Libellulidae**	*Libellula*	
116			*Sympetrum*	
117	**Oligochaeta**			
118	**Trichoptera**	**Hydropsychidae**	*Ceratopsyche*	
119			*Cheumatopsyche*	
120			*Hydropsyche*	
121		**Hydroptilidae**	*Ochotrichia*	

Taxon	Family	Genus	Species	Taxon
122			*Oxythiera*	
123		**Leptoceridae**	*Leptocerus*	
124			*Nectopsyche*	
125			*Oecetis*	
126	**Tricladida**			