

Appendix B

Water Quality Monitoring



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Technical Memorandum

To: Bassett Creek Watershed Management Commissioners
From: Barr Engineering Company (Matt Hernick)
Subject: 2008 Bassett Creek Fish Index of Biological Integrity (IBI)
Date: December 11, 2008
Project: 23/27-0051.08-2008-503
c: Len Kremer

In the summer of 2008 Minnesota Pollution Control Agency (MPCA) staff conducted electro-fishing at four locations in Bassett Creek and its tributaries. Backpack electro-fishing units were used to stun fish in the creek, which were classified, measured, weighed, and released. The data that MPCA gathered (see Table 2) were forwarded to Barr Engineering Co. and used to calculate the Index of Biological Integrity (IBI) for fish in Bassett Creek. The calculations followed the standard methods defined in the *Index of Biological Integrity Guidance for Coolwater Rivers and Streams of the Upper Mississippi River Basin*, published by the MPCA Biological Monitoring Program in 2002. An entire stream is considered impaired for fish if the IBI for fish in any section is below 46.

Results of the IBI calculation are shown in Table 1. Two of the four sites do not meet the MPCA standard (i.e. IBI less than 46), thus Bassett Creek is impaired. All of the 2008 fish data for the creek are listed in Table 2, and Tables 3 – 6 display the components of the IBI calculation at each site.

Table 1: IBI Calculation Results

Site Evaluated in 2008	Site #	Fish IBI	Impaired?
Downstream of Penn Ave. in Minneapolis	00UM105	53	No
Upstream of Douglas Drive in Crystal	00UM094	0	Yes
Downstream of Hwy 55 in Golden Valley	08UM074	56	No
At Dresden Lane in Golden Valley	97UM006	44	Yes
Bassett Creek		--	Yes

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Table 2: 2008 Bassett Creek Fish Data

Waterbody Name & Location	Visit Date	Station Length (m)	Fish Species Common Name	# of Individuals	Weight (g)	Length Min (mm)	Length Max (mm)	Anomalies
Bassett Creek Downstream of Penn Ave. Minneapolis	6/17	420	creek chub	16	259	95	119	
			johnny darter	14	26	42	64	
			black crappie	11	639	155	165	1 lesion
			spotfin shiner	2	9	70	77	
			blacknose dace	1	6	80	80	
			bluntnose minnow	30	75	47	84	
			fathead minnow	1	3	68	68	
			bluegill	5	195	98	151	
			green sunfish	13	120	55	85	
			hybrid sunfish	1	5	63	63	
			yellow bullhead	1	42	138	138	
			black bullhead	20	2683	114	232	1 lesion
			white sucker	20	968	30	443	
North Branch of Bassett Creek Upstream of Douglas Drive	6/19	150	black bullhead	60	3435	66	226	
			common carp	11	632	115	180	2 eroded fins, 1 lesion
			goldfish	1	137	175	175	
Bassett Creek Downstream of Hwy 55 Golden Valley	7/28	192	common carp	27	275	51	116	1 lesion
			creek chub	12	256	52	154	
			bigmouth shiner	2	0.5	40	47	
			iowa darter	3	2	46	58	
			fathead minnow	11	39	36	71	
			white sucker	3	78	61	142	
			blacknose dace	6	52	37	96	
			green sunfish	1	0.5	29	29	
			johnny darter	21	53	29	67	
			central mudminnow	1	6	75	75	
yellow bullhead	1	0.5	36	36				
Bassett Creek at Dresden Ln Golden Valley	7/28	175	white sucker	69	8275	51	366	2 lesions, 1 deformity
			creek chub	82	3606	47	193	
			common carp	1	9	75	75	
			brook stickleback	1	1	46	46	
			fathead minnow	12	13	39	44	
			central mudminnow	9	54	39	85	
			green sunfish	15	215	61	100	
			johnny darter	35	49	31	67	
			northern pike	3	995	165	495	

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Table 3

00UM105 Bassett Creek		Downstream of Penn Ave. in Minneapolis		
Year	Sample Date	IBI Metrics	IBI Metric Scores	Fish IBI
2008	6/17/2008	Species Richness and Composition Metrics		
		Total Number of Species (12)	7	
		Number of wetland species* (1)	5	
		Number of minnow species* (1)	2	
		Number of intolerant species (0)	0	
		Percent tolerant species (75%)	2	
		Percent dominant two species (37%)	10	
		Trophic and Reproductive Function Metrics		
		Number of invertivore species* (3)	5	
		Percent simple lithophils (16%)	2	
Fish Abundance and Condition Metrics				
Number of fish per 100 meters* (8.1)	10			
Percent DELT anomalies (1%)	10			
Fish IBI (Total Metric Score)	53		53	

Table 4

00UM094 North Branch of Bassett Creek		Upstream of Douglas Drive in Crystal		
Year	Sample Date	IBI Metrics	IBI Metric Scores	Fish IBI
2008	6/19/2008	Species Richness and Composition Metrics		
		Total Number of Species (2)	0	
		Number of wetland species* (0)	0	
		Number of minnow species* (0)	0	
		Number of intolerant species (0)	0	
		Percent tolerant species (100)	0	
		Percent dominant two species (100)	0	
		Trophic and Reproductive Function Metrics		
		Number of invertivore species* (0)	0	
		Percent simple lithophils (0)	0	
		Fish Abundance and Condition Metrics		
		Number of fish per 100 meters* (1)	0	
		Percent DELT anomalies (4%)	0	
Fish IBI (Total Metric Score)	0		0	

*Number of wetland species, number of minnow species, number of invertivore species, and number of fish per 100 meters do not include tolerant species.

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Table 5

08UM074 Bassett Creek Downstream of Hwy 55 in Golden Valley

Year	Sample Date	IBI Metrics	IBI Metric Scores	Fish IBI
2008	7/28/2008	Species Richness and Composition Metrics		
		Total Number of Species (11)	7	
		Number of wetland species* (2)	5	
		Number of minnow species* (1)	2	
		Number of intolerant species (1)	5	
		Percent tolerant species (69%)	5	
		Percent dominant two species (55%)	7	
		Trophic and Reproductive Function Metrics		
		Number of invertivore species* (3)	5	
		Percent simple lithophils (10%)	0	
Fish Abundance and Condition Metrics				
Number of fish per 100 meters* (14.1)	10			
Percent DELT anomalies (1%)	10			
Fish IBI (Total Metric Score)	56	56		

Table 6

97UM006 Bassett Creek At Dresden Lane in Golden Valley

Year	Sample Date	IBI Metrics	IBI Metric Scores	Fish IBI
2008	7/28/2008	Species Richness and Composition Metrics		
		Total Number of Species (9)	5	
		Number of wetland species* (1)	5	
		Number of minnow species* (0)	0	
		Number of intolerant species (0)	0	
		Percent tolerant species (83%)	2	
		Percent dominant two species (67%)	5	
		Trophic and Reproductive Function Metrics		
		Number of invertivore species* (1)	2	
		Percent simple lithophils (30%)	5	
Fish Abundance and Condition Metrics				
Number of fish per 100 meters* (21.7)	10			
Percent DELT anomalies (1%)	10			
Fish IBI (Total Metric Score)	44	44		

*Number of wetland species, number of minnow species, number of invertivore species, and number of fish per 100 meters do not include tolerant species.