

Cuyahoga River Upstream of Mill Creek
July 26, 2012
River Mile: 11.95
Collection Method: Boat Electroshocking
Drainage Area: 710 miles²
Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	22	4.000	--	0	---
Moxostoma erythrurum Golden redhorse	4	1.600	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	4	0.663	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	16	1.010	Highly Tolerant	0	---
Minytrema melanops Spotted Sucker	1	0.250	--	0	---
Cyprinus carpio Common carp	9	16.750	Highly Tolerant	0	---
Carassius auratus Goldfish	3	0.662	Highly Tolerant	1	Lesion
Notropis atherinoides Common Emerald shiner	24	0.076	--	0	---
Cyprinella spiloptera Spotfin shiner	35	0.200	--	0	---
Notropis stramineus Sand shiner	4	0.010	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	4	0.014	Highly Tolerant	0	---
Ictalurus punctatus Channel catfish	3	2.188	--	0	---
Noturus flavus Stonecat Madtom	1	0.047	Intolerant	0	---
Morone americana White perch	1	0.112	--	0	---
Ambloplites rupestris Northern rockbass	1	0.058	--	0	---

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River Mile: 11.95

Micropterus dolomieu Smallmouth bass	18	0.938	Moderately Intolerant	2	Lesion
Lepomis gulosus Warmouth sunfish	2	0.060	--	0	---
Lepomis cyanellus Green sunfish	22	0.318	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	20	0.710	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	9	0.268	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	1	0.020	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	1	0.512	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	4	0.040	--	0	---
Totals	<u>209</u>	<u>30.506</u>		<u>3</u>	

*DELT anomalies were observed on	1.435	% of the fish collected.
Index of Biotic Integrity (IBI) =	36	(Marginally Good)
Modified Index of Well-Being (MIwb) =	8.8	(Good)
Shannon Diversity Index, no.	2.623	
Shannon Diversity Index, wt.	1.732	
N	300	
B	23.2	

Cuyahoga River Upstream of Mill Creek
September 17, 2012
River Mile: 11.95
Collection Method: Boat Electroshocking
Drainage Area: 710 miles²
Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	103	3.622	--	0	---
Oncorhynchus mykiss Rainbow trout	2	2.018	--	0	---
Carpionodes cyprinus Central quillback carpsucker	1	0.900	--	0	---
Moxostoma anisurum Silver Redhorse	2	2.750	Moderately Intolerant	0	---
Moxostoma erythrurum Golden redhorse	10	5.020	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	2	0.028	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	18	4.350	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	28	2.900	Highly Tolerant	0	---
Minytrema melanops Spotted Sucker	4	0.058	--	0	---
Cyprinus carpio Common carp	9	24.222	Highly Tolerant	1	Lesion
Carassius auratus Goldfish	3	0.825	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	45	0.152	--	0	---
Notropis chrysocephalus Striped shiner	4	0.018	--	0	---
Cyprinella spiloptera Spotfin shiner	79	0.154	--	0	---
Notropis stramineus Sand shiner	2	0.008	Moderately Intolerant	0	---

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Pimephales notatus Bluntnose minnow	8	0.022	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	1	0.008	--	0	---
Ictalurus natalis Yellow bullhead	2	0.196	Highly Tolerant	0	---
Pylodictis olivaris Flathead Catfish	1	0.342	--	0	---
Noturus flavus Stonecat Madtom	1	0.010	Intolerant	0	---
Labidesthes sicculus Brook silverside	1	0.002	Moderately Intolerant	0	---
Morone chrysops White bass	2	0.022	--	0	---
Pomoxis nigromaculatus Black crappie	1	0.184	--	0	---
Ambloplites rupestris Northern rockbass	5	0.710	--	0	---
Micropterus dolomieu Smallmouth bass	11	3.228	Moderately Intolerant	2	Deformity & lesion
Micropterus salmoides Largemouth bass	4	0.150	--	0	---
Lepomis cyanellus Green sunfish	10	0.170	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	11	0.466	Moderately Tolerant	1	Lesion
Lepomis gibbosus Pumpkinseed sunfish	1	0.030	Moderately Tolerant	0	---
Perca flavescens Yellow perch	2	0.072	--	0	---
Percina caprodes Northern logperch darter	2	0.028	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	1	0.002	Moderately Intolerant	0	---

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Etheostoma caeruleum Rainbow darter	1	0.002	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	6	0.024	--	0	---
Totals	<u>383</u>	<u>52.693</u>		<u>4</u>	

*DELT anomalies were observed on	1.044	% of the fish collected.
Index of Biotic Integrity (IBI) =	36	(Marginally Good)
Modified Index of Well-Being (MIwb) =	9.6	(Exceptional)
Shannon Diversity Index, no.	2.491	
Shannon Diversity Index, wt.	2.005	
N	630	
B	44.63	

Cuyahoga River Downstream of Mill Creek

July 26, 2012

River Mile: 11.30

Collection Method: Boat Electroshocking

Drainage Area: 730 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	33	3.725	--	0	---
Moxostoma erythrurum Golden redhorse	4	1.925	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	3	1.220	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	27	5.025	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	61	1.076	Highly Tolerant	0	---
Cyprinus carpio Common carp	1	1.800	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	1	0.002	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	119	0.390	--	0	---
Notropis cornutus Common shiner	17	0.078	--	0	---
Cyprinella spiloptera Spotfin shiner	19	0.068	--	0	---
Notropis stramineus Sand shiner	3	0.008	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	6	0.022	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	2	0.012	--	0	---
Ictalurus punctatus Channel catfish	9	6.950	--	2	Eroded barbel/Lesion
Pylodictis olivaris Flathead Catfish	2	0.380	--	0	---

Cuyahoga River Downstream of Mill Creek

July 26, 2012

River Mile: 11.30

Morone americana White perch	1	0.070	--	0	---
Ambloplites rupestris Northern rockbass	2	0.182	--	0	---
Micropterus dolomieu Smallmouth bass	56	6.975	Moderately Intolerant	1	Lesion
Micropterus salmoides Largemouth bass	1	0.004	--	0	---
Lepomis cyanellus Green sunfish	5	0.068	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	9	0.456	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	4	0.084	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	3	0.010	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	7	0.042	--	0	---
Totals	<u>395</u>	<u>30.572</u>		<u>3</u>	

*DELT anomalies were observed on	0.759	% of the fish collected.
Index of Biotic Integrity (IBI) =	38	(Marginally Good)
Modified Index of Well-Being (MIwb) =	9.6	(Exceptional)
Shannon Diversity Index, no.	2.307	
Shannon Diversity Index, wt.	2.114	
N	626	
B	54.98	

Cuyahoga River Downstream of Mill Creek

September 17, 2012

River Mile: 11.30

Collection Method: Boat Electroshocking

Drainage Area: 730 miles²

Collection Distance: 0.2 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	124	3.062	--	0	---
Carpoides cyprinus Central quillback carpsucker	9	0.060	--	0	---
Moxostoma erythrurum Golden redhorse	2	1.050	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	2	0.013	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	30	4.724	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	25	0.151	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	1	0.010	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	3	0.010	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	33	0.114	--	0	---
Notropis cornutus Common shiner	5	0.052	--	0	---
Cyprinella spiloptera Spotfin shiner	54	0.125	--	0	---
Notropis stramineus Sand shiner	11	0.022	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	17	0.040	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	3	0.068	--	0	---
Ictalurus punctatus Channel catfish	1	1.250	--	0	---

**Cuyahoga River Downstream of Mill Creek
September 17, 2012**

River Mile: 11.30

Morone americana White perch	2	0.082	--	0	---
Micropterus dolomieu Smallmouth bass	10	1.409	Moderately Intolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	3	0.086	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	3	0.047	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	1	0.004	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	1	0.400	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	3	0.009	--	0	---
Totals	<u>343</u>	<u>12.788</u>		<u>0</u>	

*DELT anomalies were observed on	0	% of the fish collected.
Index of Biotic Integrity (IBI) =	30	(Fair)
Modified Index of Well-Being (MIwb) =	9.6	(Exceptional)
Shannon Diversity Index, no.	2.173	
Shannon Diversity Index, wt.	1.851	
N	1327	
B	56.75	

Cuyahoga River Downstream of Mill Creek

October 10, 2012

River Mile: 11.30

Collection Method: Boat Electroshocking

Drainage Area: 730 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELT #	Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	102	2.243	--	0	---
Oncorhynchus mykiss Rainbow trout	2	3.100	--	0	---
Carpoides cyprinus Central quillback carpsucker	3	0.030	--	0	---
Moxostoma erythrurum Golden redhorse	4	2.520	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	5	1.302	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	39	7.970	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	56	1.860	Highly Tolerant	0	---
Cyprinus carpio Common carp	1	4.000	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	1	0.010	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	28	0.064	--	0	---
Notropis cornutus Common shiner	4	0.160	--	0	---
Cyprinella spiloptera Spotfin shiner	56	0.102	--	0	---
Notropis stramineus Sand shiner	19	0.034	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	19	0.050	Highly Tolerant	1	Lesion
Morone americana White perch	2	0.278	--	0	---

**Cuyahoga River Downstream of Mill Creek
October 10, 2012**

River Mile: 11.30

Micropterus dolomieu Smallmouth bass	21	2.102	Moderately Intolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	2	0.034	Moderately Tolerant	0	---
Perca flavescens Yellow perch	1	0.012	--	0	---
Percina caprodes Northern logperch darter	6	0.100	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	3	0.016	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	4	0.024	--	0	---
Totals	<u><u>378</u></u>	<u><u>26.011</u></u>		<u><u>1</u></u>	

*DELT anomalies were observed on	0.265	% of the fish collected.
Index of Biotic Integrity (IBI) =	32	(Fair)
Modified Index of Well-Being (MIwb) =	9.3	(Very Good)
Shannon Diversity Index, no.	2.282	
Shannon Diversity Index, wt.	2.076	
N	586	
B	33.38	

Cuyahoga River Upstream of Southerly WWTC

August 8, 2012

River Mile: 10.75

Collection Method: Boat Electroshocking

Drainage Area: 743 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	37	4.140	--	0	---
Carpoides cyprinus Central quillback carpsucker	1	0.006	--	0	---
Moxostoma erythrurum Golden redhorse	16	3.875	Moderately Intolerant	1	Lesion
Hypentelium nigricans Northern hog sucker	54	6.625	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	37	1.496	Highly Tolerant	0	---
Cyprinus carpio Common carp	5	18.750	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	3	0.012	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	30	0.100	--	0	---
Notropis cornutus Common shiner	2	0.008	--	0	---
Cyprinella spiloptera Spotfin shiner	14	0.088	--	0	---
Notropis stramineus Sand shiner	28	0.070	Moderately Intolerant	0	---
Ericymba buccata Silverjaw minnow	1	0.006	--	0	---
Pimephales notatus Bluntnose minnow	6	0.024	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	31	0.102	--	0	---
Ictalurus punctatus Channel catfish	15	15.700	--	0	---

Cuyahoga River Upstream of Southerly WWTC

August 8, 2012

River Mile: 10.75

Ictalurus natalis Yellow bullhead	1	0.200	Highly Tolerant	0	---
Noturus flavus Stonecat Madtom	1	0.008	Intolerant	0	---
Morone americana White perch	1	0.084	--	0	---
Pomoxis nigromaculatus Black crappie	1	0.180	--	0	---
Micropterus dolomieu Smallmouth bass	31	3.540	Moderately Intolerant	5	Lesion
Micropterus salmoides Largemouth bass	1	0.008	--	0	---
Lepomis cyanellus Green sunfish	3	0.040	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	2	0.060	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	1	0.016	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	19	0.265	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	2	0.007	Moderately Intolerant	0	---
Etheostoma caeruleum Rainbow darter	1	0.002	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	3	2.425	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	8	0.040	--	0	---
Totals	<u>355</u>	<u>57.877</u>		<u>6</u>	

*DELT anomalies were observed on	1.69	% of the fish collected.
Index of Biotic Integrity (IBI) =	40	(Good)
Modified Index of Well-Being (MIwb) =	9.9	(Exceptional)
Shannon Diversity Index, no.	2.722	
Shannon Diversity Index, wt.	1.878	
N	582	

Cuyahoga River Upstream of Southerly WWTC
August 8, 2012
River Mile: 10.75

B

74.46

Cuyahoga River Upstream of Southerly WWTC

October 11, 2012

River Mile: 10.75

Collection Method: Boat Electroshocking

Drainage Area: 743 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Lepisosteus osseus Longnose Gar	1	0.500	--	0	---
Esox lucius Northern pike	1	1.275	--	0	---
Moxostoma erythrurum Golden redhorse	5	2.200	Moderately Intolerant	1	Lesion
Moxostoma macrolepidotum Shorthead redhorse	6	2.130	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	34	7.981	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	42	4.275	Highly Tolerant	1	Multiple
Notropis atherinoides Common Emerald shiner	23	0.070	--	1	Deformity
Notropis cornutus Common shiner	2	0.010	--	0	---
Cyprinella spiloptera Spotfin shiner	53	0.051	--	0	---
Notropis stramineus Sand shiner	266	0.578	Moderately Intolerant	0	---
Ericymba buccata Silverjaw minnow	12	0.046	--	0	---
Pimephales notatus Bluntnose minnow	17	0.044	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	48	0.215	--	0	---
Ictalurus punctatus Channel catfish	11	11.920	--	0	---
Morone chrysops White bass	1	0.012	--	0	---

**Cuyahoga River Upstream of Southerly WWTC
October 11, 2012**

River Mile: 10.75

Ambloplites rupestris Northern rockbass	1	0.010	--	0	---
Micropterus dolomieu Smallmouth bass	6	1.022	Moderately Intolerant	0	---
Micropterus salmoides Largemouth bass	1	0.120	--	0	---
Lepomis cyanellus Green sunfish	4	0.520	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	2	0.058	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	3	0.022	--	0	---
Totals	<u><u>539</u></u>	<u><u>33.059</u></u>		<u><u>3</u></u>	

*DELT anomalies were observed on	0.557	% of the fish collected.
Index of Biotic Integrity (IBI) =	36	(Marginally Good)
Modified Index of Well-Being (MIwb) =	9.2	(Very Good)
Shannon Diversity Index, no.	1.882	
Shannon Diversity Index, wt.	1.883	
N	946	
B	56.4	

Cuyahoga River Downstream of Southerly
August 8, 2012
River Mile: 10.10
Collection Method: Boat Electroshocking
Drainage Area: 744 miles²
Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	77	6.550	--	0	---
Carpionodes cyprinus Central quillback carpsucker	2	0.352	--	0	---
Moxostoma anisurum Silver Redhorse	3	2.430	Moderately Intolerant	0	---
Moxostoma erythrurum Golden redhorse	4	2.250	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	6	1.425	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	23	3.362	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	29	4.885	Highly Tolerant	0	---
Cyprinus carpio Common carp	1	1.500	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	1	0.006	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	36	0.142	--	0	---
Notropis cornutus Common shiner	2	0.040	--	0	---
Cyprinella spiloptera Spotfin shiner	11	0.058	--	0	---
Notropis stramineus Sand shiner	32	0.102	Moderately Intolerant	0	---
Notropis volucellus Mimic Shiner	5	0.015	Common Intolerant	0	---
Pimephales notatus Bluntnose minnow	13	0.050	Highly Tolerant	0	---

Cuyahoga River Downstream of Southerly

August 8, 2012

River Mile: 10.10

Campostoma anomalum Central stoneroller minnow	19	0.022	--	0	---
Ictalurus punctatus Channel catfish	5	3.500	--	3	Deformity & Erosions
Ictalurus natalis Yellow bullhead	1	0.210	Highly Tolerant	0	---
Pylodictis olivaris Flathead Catfish	3	0.725	--	0	---
Morone americana White perch	6	0.530	--	0	---
Micropterus dolomieu Smallmouth bass	22	2.256	Moderately Intolerant	3	Erosion & Lesion
Micropterus salmoides Largemouth bass	1	0.020	--	0	---
Lepomis cyanellus Green sunfish	7	0.114	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	3	0.180	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	2	0.094	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	4	0.060	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	2	0.014	--	0	---
Totals	<u>320</u>	<u>30.892</u>		<u>6</u>	

*DELT anomalies were observed on	1.875	% of the fish collected.
Index of Biotic Integrity (IBI) =	34	(Fair)
Modified Index of Well-Being (MIwb) =	10.1	(Exceptional)
Shannon Diversity Index, no.	2.626	
Shannon Diversity Index, wt.	2.396	
N	520	
B	47.17	

Cuyahoga River Downstream of Southerly WWTC

October 11, 2012

River Mile: 10.10

Collection Method: Boat Electroshocking

Drainage Area: 744 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELT #	Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	192	10.525	--	0	---
Oncorhynchus mykiss Rainbow trout	1	2.000	--	0	---
Moxostoma anisurum Silver Redhorse	1	0.925	Moderately Intolerant	0	---
Moxostoma erythrurum Golden redhorse	12	5.790	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	6	0.880	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	18	3.114	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	36	4.112	Highly Tolerant	0	---
Cyprinus carpio Common carp	4	7.000	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	64	0.112	--	0	---
Cyprinella spiloptera Spotfin shiner	64	0.164	--	0	---
Notropis stramineus Sand shiner	42	0.114	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	26	0.090	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	4	0.032	--	0	---
Ictalurus punctatus Channel catfish	11	8.850	--	3	Erosion
Ictalurus natalis Yellow bullhead	1	0.350	Highly Tolerant	0	---

**Cuyahoga River Downstream of Southerly WWTC
October 11, 2012**

River Mile: 10.10

Morone americana White perch	5	0.310	--	0	---
Micropterus dolomieu Smallmouth bass	21	4.028	Moderately Intolerant	0	---
Lepomis gulosus Warmouth sunfish	1	0.078	--	0	---
Lepomis cyanellus Green sunfish	7	0.120	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	5	0.022	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	1	0.010	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	5	0.040	Moderately Intolerant	0	---
Etheostoma blenniodes Greenside darter	2	0.008	Moderately Intolerant	0	---
Etheostoma caeruleum Rainbow darter	1	0.002	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	8	0.030	--	0	---
Totals	<u>538</u>	<u>48.706</u>		<u>3</u>	

*DELT anomalies were observed on	0.558	% of the fish collected.
Index of Biotic Integrity (IBI) =	34	(Fair)
Modified Index of Well-Being (MIwb) =	10.0	(Exceptional)
Shannon Diversity Index, no.	2.269	
Shannon Diversity Index, wt.	2.216	
N	900	
B	69.39	

Cuyahoga River Upstream of Big Creek

August 3, 2012

River Mile: 8.60

Collection Method: Boat Electroshocking

Drainage Area: 745 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	14	1.475	--	0	---
Moxostoma erythrurum Golden redhorse	1	0.006	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	5	1.125	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	76	7.525	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	23	1.110	Highly Tolerant	0	---
Cyprinus carpio Common carp	1	1.400	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	1	0.002	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	28	0.075	--	0	---
Cyprinella spiloptera Spotfin shiner	24	0.106	--	0	---
Notropis stramineus Sand shiner	61	0.118	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	6	0.030	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	21	0.104	--	0	---
Ictalurus punctatus Channel catfish	5	7.330	--	0	---
Pylodictis olivaris Flathead Catfish	2	0.020	--	0	---
Morone americana White perch	2	0.222	--	0	---

Cuyahoga River Upstream of Big Creek

August 3, 2012

River Mile: 8.60

Ambloplites rupestris Northern rockbass	2	0.420	--	0	---
Micropterus dolomieu Smallmouth bass	10	1.948	Moderately Intolerant	0	---
Lepomis cyanellus Green sunfish	3	0.012	Highly Tolerant	0	---
HYBRID Green SF X Pumpkinseed	2	0.030	--	0	---
Percina caprodes Northern logperch darter	11	0.016	Moderately Intolerant	0	---
Etheostoma caeruleum Rainbow darter	2	0.004	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	1	1.550	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	13	0.090	--	0	---
Totals	<u>314</u>	<u>24.718</u>		<u>0</u>	

*DELT anomalies were observed on	0	% of the fish collected.
Index of Biotic Integrity (IBI) =	42	(Good)
Modified Index of Well-Being (MIwb) =	9.4	(Very Good)
Shannon Diversity Index, no.	2.43	
Shannon Diversity Index, wt.	1.963	
N	526	
B	43.64	

Cuyahoga River Upstream of Big Creek
October 10, 2012
River Mile: 8.60
Collection Method: Boat Electroshocking
Drainage Area: 745 miles²
Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	92	1.900	--	0	---
Oncorhynchus mykiss Rainbow trout	2	0.975	--	0	---
Moxostoma anisurum Silver Redhorse	1	1.675	Moderately Intolerant	0	---
Moxostoma erythrurum Golden redhorse	2	1.475	Moderately Intolerant	0	---
Moxostoma macrolepidotum Shorthead redhorse	7	0.242	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	35	5.253	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	22	1.125	Highly Tolerant	0	---
Cyprinus carpio Common carp	1	5.750	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	49	0.152	--	0	---
Notropis cornutus Common shiner	1	0.006	--	0	---
Cyprinella spiloptera Spotfin shiner	87	0.374	--	0	---
Notropis stramineus Sand shiner	65	0.118	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	12	0.046	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	54	0.400	--	0	---
Ictalurus punctatus Channel catfish	4	4.427	--	0	---

Cuyahoga River Upstream of Big Creek

October 10, 2012

River Mile: 8.60

Morone chrysops White bass	2	0.020	--	0	---
Morone americana White perch	1	0.150	--	0	---
Micropterus dolomieu Smallmouth bass	14	2.232	Moderately Intolerant	2	Deformity/Multiple
Micropterus salmoides Largemouth bass	1	0.048	--	0	---
Lepomis gibbosus Pumpkinseed sunfish	1	0.122	Moderately Tolerant	0	---
HYBRID Green SF X Pumpkinseed	1	0.030	--	0	---
Etheostoma blenniodes Greenside darter	1	0.006	Moderately Intolerant	0	---
Etheostoma caeruleum Rainbow darter	1	0.004	Moderately Intolerant	0	---
Neogobius melanostomus Round goby	1	0.006	--	0	---
Totals	<u>457</u>	<u>26.536</u>		<u>2</u>	

*DELT anomalies were observed on	0.438	% of the fish collected.
Index of Biotic Integrity (IBI) =	34	(Fair)
Modified Index of Well-Being (MIwb) =	9.7	(Exceptional)
Shannon Diversity Index, no.	2.264	
Shannon Diversity Index, wt.	2.255	
N	834	
B	36.91	

Cuyahoga River Downstream of Big Creek

August 3, 2012

River Mile: 7.00

Collection Method: Boat Electroshocking

Drainage Area: 786 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELT # Anomalies	Description
Dorosoma cepedianum Eastern gizzard shad	72	7.520	--	0	---
Moxostoma erythrurum Golden redhorse	7	3.842	Moderately Intolerant	1	Lesion
Moxostoma macrolepidotum Shorthead redhorse	3	1.158	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	3	0.550	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	13	3.718	Highly Tolerant	1	Lesion
Cyprinus carpio Common carp	1	4.250	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	1	0.008	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	4	0.022	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	52	0.056	--	0	---
Notropis cornutus Common shiner	1	0.006	--	0	---
Cyprinella spiloptera Spotfin shiner	2	0.016	--	0	---
Pimephales notatus Bluntnose minnow	4	0.012	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	33	0.100	--	0	---
Ictalurus punctatus Channel catfish	2	1.110	--	0	---
Ictalurus natalis Yellow bullhead	5	0.422	Highly Tolerant	0	---

Cuyahoga River Downstream of Big Creek

August 3, 2012

River Mile: 7.00

Pylodictis olivaris Flathead Catfish	2	0.110	--	0	---
Micropterus dolomieu Smallmouth bass	22	2.564	Moderately Intolerant	0	---
Micropterus salmoides Largemouth bass	4	0.076	--	0	---
Lepomis cyanellus Green sunfish	2	0.028	Highly Tolerant	0	---
Percina caprodes Northern logperch darter	1	0.012	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	1	0.490	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	28	0.122	--	0	---
Totals	<u>263</u>	<u>26.192</u>		<u>2</u>	

*DELT anomalies were observed on	0.76	% of the fish collected.
Index of Biotic Integrity (IBI) =	32	(Fair)
Modified Index of Well-Being (MIwb) =	9.1	(Very Good)
Shannon Diversity Index, no.	2.249	
Shannon Diversity Index, wt.	2.062	
N	410	
B	35.22	

Cuyahoga River Downstream of Big Creek

October 11, 2012

River Mile: 7.00

Collection Method: Boat Electroshocking

Drainage Area: 786 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Lepisosteus osseus Longnose Gar	1	0.158	--	0	---
Dorosoma cepedianum Eastern gizzard shad	316	7.675	--	0	---
Moxostoma anisurum Silver Redhorse	1	0.900	Moderately Intolerant	0	---
Moxostoma erythrurum Golden redhorse	3	1.800	Moderately Intolerant	0	---
Hypentelium nigricans Northern hog sucker	2	0.432	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	12	2.575	Highly Tolerant	0	---
Cyprinus carpio Common carp	3	10.250	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	64	0.206	--	0	---
Cyprinella spiloptera Spotfin shiner	5	0.020	--	0	---
Notropis stramineus Sand shiner	2	0.006	Moderately Intolerant	0	---
Pimephales notatus Bluntnose minnow	1	0.006	Highly Tolerant	0	---
Camptostoma anomalum Central stoneroller minnow	2	0.008	--	0	---
Ictalurus punctatus Channel catfish	4	3.450	--	1	Erosion
Ictalurus natalis Yellow bullhead	2	0.342	Highly Tolerant	1	Lesion
Labidesthes sicculus Brook silverside	2	0.006	Moderately Intolerant	0	---

**Cuyahoga River Downstream of Big Creek
October 11, 2012**

River Mile: 7.00

Morone chrysops White bass	1	0.008	--	0	---
Morone americana White perch	1	0.008	--	0	---
Micropterus dolomieu Smallmouth bass	6	0.874	Moderately Intolerant	1	Lesion
Micropterus salmoides Largemouth bass	1	0.052	--	0	---
Lepomis macrochirus Northern bluegill sunfish	3	0.036	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	10	0.060	--	0	---
Totals	<u><u>442</u></u>	<u><u>28.872</u></u>		<u><u>3</u></u>	

*DELT anomalies were observed on	0.679	% of the fish collected.
Index of Biotic Integrity (IBI) =	26	(Fair)
Modified Index of Well-Being (MIwb) =	8.0	(Fair)
Shannon Diversity Index, no.	1.161	
Shannon Diversity Index, wt.	1.805	
N	826	
B	31.26	

Cuyahoga River at Head of Navigation Channel

June 28, 2012

River Mile: 5.90

Collection Method: Boat Electroshocking

Drainage Area: 787 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	11	1.030	--	0	---
Moxostoma macrolepidotum Shorthead redhorse	1	0.240	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	33	0.098	Highly Tolerant	0	---
Minytrema melanops Spotted Sucker	1	1.250	--	0	---
Cyprinus carpio Common carp	5	21.500	Highly Tolerant	0	---
Carassius auratus Goldfish	3	1.600	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	1	0.070	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	5	0.008	--	0	---
Ictalurus punctatus Channel catfish	1	1.200	--	1	Deformity
Ictalurus natalis Yellow bullhead	1	0.232	Highly Tolerant	0	---
Morone americana White perch	8	0.468	--	0	---
Micropterus dolomieu Smallmouth bass	8	1.658	Moderately Intolerant	0	---
Micropterus salmoides Largemouth bass	3	0.500	--	0	---
Lepomis gulosus Warmouth sunfish	1	0.102	--	0	---
Lepomis cyanellus Green sunfish	5	0.060	Highly Tolerant	0	---

**Cuyahoga River at Head of Navigation Channel
June 28, 2012**

River Mile: 5.90

Lepomis macrochirus Northern bluegill sunfish	6	0.424	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	8	0.550	Moderately Tolerant	0	---
Aplodinotus grunniens Freshwater drum	1	1.880	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	6	0.048	--	0	---
 Totals	 <u>108</u>	 <u>32.918</u>		 <u>1</u>	

*DELT anomalies were observed on	0.926	% of the fish collected.
Index of Biotic Integrity (IBI) =	30	(Fair)
Modified Index of Well-Being (MIwb) =	7.6	(Fair)
Shannon Diversity Index, no.	2.424	
Shannon Diversity Index, wt.	1.483	
N	92	
B	17.68	

Cuyahoga River at Head of Navigation Channel

August 13, 2012

River Mile: 5.90

Collection Method: Boat Electroshocking

Drainage Area: 787 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELTA Anomalies #	Description
Dorosoma cepedianum Eastern gizzard shad	102	5.320	--	0	---
Ictiobus bubalus Smallmouth buffalo	3	13.300	--	0	---
Moxostoma erythrurum Golden redhorse	1	0.500	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	11	1.512	Highly Tolerant	0	---
Minytrema melanops Spotted Sucker	5	3.350	--	0	---
Cyprinus carpio Common carp	10	60.250	Highly Tolerant	0	---
Carassius auratus Goldfish	2	1.490	Highly Tolerant	1	Lesion
Notemigonus crysoleucas Golden shiner	6	0.200	Highly Tolerant	0	---
Semotilus atromaculatus Creek chub	1	0.010	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	46	0.062	--	0	---
Notropis cornutus Common shiner	4	0.028	--	0	---
Cyprinella spiloptera Spotfin shiner	3	0.018	--	0	---
Pimephales notatus Bluntnose minnow	14	0.048	Highly Tolerant	0	---
Campostoma anomalum Central stoneroller minnow	1	0.010	--	0	---
Ictalurus punctatus Channel catfish	1	3.000	--	1	Multiple

**Cuyahoga River at Head of Navigation Channel
August 13, 2012**

River Mile: 5.90

Ictalurus natalis Yellow bullhead	3	0.580	Highly Tolerant	0	---
Ambloplites rupestris Northern rockbass	1	0.010	--	0	---
Micropterus dolomieu Smallmouth bass	7	0.200	Moderately Intolerant	0	---
Micropterus salmoides Largemouth bass	11	1.016	--	0	---
Lepomis gulosus Warmouth sunfish	3	0.300	--	0	---
Lepomis cyanellus Green sunfish	11	0.128	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	7	0.260	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	1	0.078	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	4	0.010	--	0	---
Totals	<u>258</u>	<u>91.680</u>		<u>2</u>	

*DELT anomalies were observed on	0.775	% of the fish collected.
Index of Biotic Integrity (IBI) =	32	(Fair)
Modified Index of Well-Being (MIwb) =	8.5	(Marginally Good)
Shannon Diversity Index, no.	2.225	
Shannon Diversity Index, wt.	1.293	
N	392	
B	54.9	

Cuyahoga River at Abandoned Marina (Formerly Scaravelli's)

June 29, 2012

River Mile: 2.75

Collection Method: Boat Electroshocking

Drainage Area: 806 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELT Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	3	0.114	--	0	---
Moxostoma macrolepidotum Shorthead redhorse	1	0.518	Moderately Intolerant	0	---
Cyprinus carpio Common carp	5	7.822	Highly Tolerant	0	---
Ictalurus nebulosus Brown bullhead	2	1.450	Highly Tolerant	1	Lesion
Morone americana White perch	1	0.022	--	0	---
Lepomis cyanellus Green sunfish	3	0.040	Highly Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	8	0.570	Moderately Tolerant	0	---
Aplodinotus grunniens Freshwater drum	1	1.550	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	2	0.013	--	0	---
Totals	<u><u>26</u></u>	<u><u>12.099</u></u>		<u><u>1</u></u>	

*DELT anomalies were observed on 3.846 % of the fish collected.

Index of Biotic Integrity (IBI) = 20 (Poor)

Modified Index of Well-Being (MIwb) = 5.6 (Poor)

Shannon Diversity Index, no. 1.949

Shannon Diversity Index, wt. 1.16

N 26

B 5.504

Cuyahoga River at Abandoned Marina (Formerly Scaravelli's)

August 13, 2012

River Mile: 2.75

Collection Method: Boat Electroshocking

Drainage Area: 806 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELT #	Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	152	2.570	--	2	Deformity
Moxostoma macrolepidotum Shorthead redhorse	2	0.010	Moderately Intolerant	0	---
Catostomus commersonii Common white sucker	59	0.516	Highly Tolerant	0	---
Cyprinus carpio Common carp	8	14.916	Highly Tolerant	0	---
Carassius auratus Goldfish	2	0.440	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	15	0.246	Highly Tolerant	1	Lesion
Notropis atherinoides Common Emerald shiner	42	0.040	--	0	---
Pimephales notatus Bluntnose minnow	1	0.002	Highly Tolerant	0	---
HYBRID Common Carp x Goldfish	1	1.400	Highly Tolerant	0	---
Ictalurus punctatus Channel catfish	4	6.450	--	1	Multiple
Morone chrysops White bass	9	0.063	--	0	---
Morone americana White perch	72	1.092	--	0	---
Micropterus salmoides Largemouth bass	14	2.717	--	0	---
Lepomis cyanellus Green sunfish	1	0.026	Highly Tolerant	0	---
Lepomis macrochirus Northern bluegill sunfish	3	0.218	Moderately Tolerant	0	---

Cuyahoga River at Abandoned Marina (Formerly Scaravelli's)

August 13, 2012

River Mile: 2.75

Lepomis gibbosus	8	0.550	Moderately	0	---
Pumpkinseed sunfish			Tolerant		

Totals	<u>393</u>	<u>31.256</u>		<u>4</u>	
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*DELT anomalies were observed on	1.018	% of the fish collected.
Index of Biotic Integrity (IBI) =	26	(Fair)
Modified Index of Well-Being (MIwb) =	8.2	(Marginally Good)
Shannon Diversity Index, no.	1.874	
Shannon Diversity Index, wt.	1.654	
N	468	
B	25.24	

Cuyahoga River Near Mouth of River in Navigation Channel

June 29, 2012

River Mile: 0.20

Collection Method: Boat Electroshocking

Drainage Area: 809 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	#	DELTA Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	85	3.134	--	0	---
Cyprinus carpio Common carp	2	5.420	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	3	0.166	Highly Tolerant	0	---
Ictalurus punctatus Channel catfish	1	0.098	--	1	Erosion
Ictalurus natalis Yellow bullhead	1	0.172	Highly Tolerant	0	---
Morone chrysops White bass	6	0.371	--	1	Erosion
Morone americana White perch	1	0.072	--	0	---
Ambloplites rupestris Northern rockbass	3	0.496	--	0	---
Micropterus dolomieu Smallmouth bass	1	0.054	Moderately Intolerant	0	---
Micropterus salmoides Largemouth bass	18	4.252	--	0	---
Lepomis macrochirus Northern bluegill sunfish	9	0.420	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	6	0.534	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	4	0.043	Moderately Intolerant	0	---
Totals	<u>140</u>	<u>15.232</u>		<u>2</u>	

*DELTA anomalies were observed on
Index of Biotic Integrity (IBI) =

1.429 % of the fish collected.
28 (Fair)

**Cuyahoga River Near Mouth of River in Navigation Channel
June 29, 2012**

River Mile: 0.20
(Fair)

Modified Index of Well-Being (Mlwb) =	7.4
Shannon Diversity Index, no.	1.481
Shannon Diversity Index, wt.	1.662
N	266
B	18.8

Cuyahoga River Near Mouth of River in Navigation Channel

August 15, 2012

River Mile: 0.20

Collection Method: Boat Electroshocking

Drainage Area: 813 miles²

Collection Distance: 0.5 km

Species	Number	Weight (kg)	Pollution Tolerance	DELT #	Anomalies Description
Dorosoma cepedianum Eastern gizzard shad	137	5.400	--	0	---
Cyprinus carpio Common carp	1	5.250	Highly Tolerant	0	---
Notemigonus crysoleucas Golden shiner	2	0.018	Highly Tolerant	0	---
Notropis atherinoides Common Emerald shiner	159	0.165	--	0	---
Ictalurus natalis Yellow bullhead	1	0.180	Highly Tolerant	1	Multiple
Morone chrysops White bass	1	0.012	--	0	---
Morone americana White perch	1	0.050	--	0	---
Ambloplites rupestris Northern rockbass	2	0.220	--	0	---
Micropterus salmoides Largemouth bass	14	3.610	--	0	---
Lepomis macrochirus Northern bluegill sunfish	2	0.142	Moderately Tolerant	0	---
Lepomis gibbosus Pumpkinseed sunfish	1	0.070	Moderately Tolerant	0	---
Percina caprodes Northern logperch darter	1	0.012	Moderately Intolerant	0	---
Aplodinotus grunniens Freshwater drum	1	1.300	Moderately Tolerant	0	---
Neogobius melanostomus Round goby	1	0.002	--	0	---
Totals	<u><u>324</u></u>	<u><u>16.431</u></u>		<u><u>1</u></u>	

**Cuyahoga River Near Mouth of River in Navigation Channel
August 15, 2012**

River Mile: 0.20

*DELT anomalies were observed on	0.309	% of the fish collected.
Index of Biotic Integrity (IBI) =	32	(Fair)
Modified Index of Well-Being (MIwb) =	7.4	(Fair)
Shannon Diversity Index, no.	1.086	
Shannon Diversity Index, wt.	1.518	
N	636	
B	21.86	