Biological and Aquatic Life Use Attainment Study of Chapman Creek

2000

Clark County, Ohio

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INTRODUCTION

The former Tremont City Landfill, IWD Liquid Chemical Barrel Fill and Waste Transfer Station are being evaluated by a United States Environmental Protection Agency (USEPA) site assessment team. As part of this evaluation, USEPA requested that the Ohio EPA conduct an aquatic ecological assessment of Chapman Creek, a stream adjacent to the southern portion of the landfill property, and which is tributary to the Mad River.

Specific objectives of this evaluation were to:

1) Establish biological conditions in Chapman Creek by evaluating fish and macroinvertebrate communities, and

2) Determine the aquatic life attainment status of Chapman Creek with regard to the Coldwater Habitat (CWH) aquatic life use designation codified in the Ohio Water Quality Standards.

SUMMARY

A total of 3.4 miles of Chapman Creek was assessed in 2000 by Ohio EPA. Based on the performance of the biological communities, all 3.4 miles assessed were in full attainment of the Coldwater Habitat aquatic life use (Table 1). The biological integrity of Chapman Creek was represented by good to exceptional conditions. Sampling during 2000 reconfirmed the appropriateness of the Coldwater Habitat use designation. Biological results from 2000 did not indicate impacts to the aquatic community associated with the Tremont City Landfill.

Table 1. Attainment status of the existing aquatic life use for Chapman Creek based on biological sampling conducted during July through September, 2000.

RIVER MILE Fish/Invert.	IBI	MIwb	ICI	QHEI	Attainment Status	Site Location
Chapman Creek *Eastern Corn Belt Plain (ECBP) - CWH Use Designation*						
2.6 / 2.6	36^{ns}	8.8	48	75.0	FULL	Upstream Landfill, Willow Dale Rd.
2.1 / 2.0	37^{ns}	8.5	48	74.0	FULL	Adjacent Tremont City Landfill
1.4/ 1.1	41	8.8	52	75.5	FULL	Downstream Landfill, Hominy Ridge Rd.

* Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion ($\leq$4 IBI or ICI units; $\leq$0.5 MIwb units).

Table 2. Sampling locations in Chapman Creek, 2000. Type of sampling included fish community (F) and macroinvertebrate community (M).

Stream/ River Mile	Type of Sampling	Latitude	Longitude	Landmark
2.6	F,M	40 01 00	83 51 56	Willow Dale Rd.
2.1	F	40 00 55	83 51 22	Adj. Tremont City Landfill, Snyder Domer Rd.
2.0	M	40 00 53	83 51 20	Adj. Tremont City Landfill, Snyder Domer Rd.
1.4	F	40 00 39	83 50 49	Hominy Ridge Rd.
1.1	M	40 00 34	83 50 32	Downstream Hominy Ridge Rd.

METHODS

All chemical, physical, and biological field, laboratory, data processing, and data analysis methodologies and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 1989a) and Biological Criteria for the Protection of Aquatic Life, Volumes I-III (Ohio Environmental Protection Agency 1987a, 1987b, 1989b, 1989c), and The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application (Rankin 1989, 1995) for aquatic habitat assessment.

Use attainment status is a term describing the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing aquatic use attainment status involves a primary reliance on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-14). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Three attainment status results are possible at each sampling location - Full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (Table 1) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.*, Full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and a sampling location description.

Physical habitat was evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the habitat characteristics used to determine the QHEI score which generally ranges from 20 to less than 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are *generally* conducive to the existence of warmwater faunas whereas scores less than 45 generally cannot support a warmwater assemblage consistent with the WWH biological criteria. Scores greater than 75 frequently typify habitat conditions which have the ability to support exceptional warmwater faunas.

RESULTS

Physical Habitat For Aquatic Life

Physical habitat was evaluated in Chapman Creek at each fish sampling location. Qualitative Habitat Evaluation Index (QHEI) scores are detailed in Table 3. Gravel and sand predominated the bottom substrates at each location sampled, with lesser amounts of boulders, slabs, and cobbles. Natural channel conditions were evident at each location assessed, with a moderate to narrow riparian corridor established. Instream channel development was good, with a mixture of pool, riffle and run habitats. Maximum pool depths at the threes sites varied between 75 and 110 centimeters**,** with deeper pool areas (greater than 70 cm) important for supporting diverse fish communities. Normal silt and embeddedness conditions of the substrates was evident at the three sampling locations - this condition was an improvement from previous years sampling at RM 0.9 (near Upper Valley Pike) where sediment bedload was severe. QHEI scores for Chapman Creek ranged between 74.0 and 75.5. These scores are indicative of very good to excellent stream and riparian habitat.

Fish Community Assessment

Fish communities were assessed at three Chapman Creek sites on July 6 and September 18, 2000 (Figure 1). The three sites were located at Willow Dale Road. (RM 2.6), adjacent to Snyder Domer Road and the Tremont City Landfill (RM 2.1) and Hominy Ridge Road (RM 1.4). The fish communities were sampled at each site twice using pulsed DC electrofishing equipment, with sampling distances varying between 180 and 200 meters. Fish were processed in the field, and included identifying each individual to species, measuring the weight of fish, and recording any external abnormalities.

Marginally good to good fish communities were collected at the three fish sampling locations in Chapman Creek. IBI scores ranged from 36 at RM 2.6 to 41 at RM 1.4, and MIwb scores ranged from 8.5 at RM 2.1 to 8.8 at RMs 2.6 and 1.4. These scores met the ecoregional biocriteria established for Warmwater

Habitat (EWH) streams and rivers in Ohio. Specific coolwater species collected from Chapman Creek included redside dace and mottled sculpin, and these were used to assess the appropriateness of the CWH aquatic life use. The abundance of these two species at each site varied between 13.5% (RM 2.6) and 22.7% (RM 1.4). Cumulatively at the 3 sites, 16.7% of the fish community was comprised of coolwater species. The abundance of these coolwater fish species at each site, as well as the overall good quality of the fish communities, documented achievement of the CWH aquatic life use.

Past Ohio EPA collections of fish communities included samples collected at RMs 4.0 and 0.9 during 1994 and 1984. During 1984, fish community conditions declined downstream from the Tremont City Landfill, where some channel modification, elevated ammonia-N and bottom siltation were observed (IBI scores: RM 4.0 = 46, RM 0.9 = 36). Collections during 1994 indicated comparable IBI results between the two sampling locations. A greyish-white flocculent material on the bottom of Chapman Creek downstream from the Tremont City Landfill (RM 0.9) was observed in 1984 and 1994 . The flocculent material was not observed during 2000. These results provide evidence of some past fish community impact in the lower reach of Chapman Creek that may have been associated with the Tremont City Landfill.

Macroinvertebrate Assessment

Macroinvertebrates were collected from artificial substrates and from the natural habitats of three Chapman Creek sites on August 22, 2000. The three sites were located at Willow Dale Rd. (RM 2.6), adj. Snyder Domer Rd. and the Tremont City Landfill (RM 2.0), and downstream from Hominy Ridge Rd. (RM 1.1). The artificial substrate collection provided quantitative data and consisted of a composite sample of 5 modified Hester-Dendy multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample was also collected. This sampling effort consisted of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Total collecting time at a site ranged from 100 to 120 minutes. Invertebrate Community Index (ICI) scores were calculated from the sampling results and, along with the composition of taxa collected, were used to assess the status of the designated Coldwater Habitat (CWH) aquatic life use designation of Chapman Creek.

Very good to exceptional macroinvertebrate communities were collected at each sampling location. ICI scores ranged from 48 at RMs 2.6 and 2.0 to 52 at RM 1.1. These scores exceeded the codified ecoregional biocriterion established for Exceptional Warmwater Habitat (EWH) streams and rivers in Ohio. All sites were well represented numerically and compositionally by pollution sensitive organisms including 23 to 25 taxa of mayflies and caddisflies. Specific coolwater taxa collected from the sampling sites, which were used to assess the appropriateness of the CWH aquatic life use, included 5 taxa (5.4% abundance) at RM 2.6, 5 taxa (15.5% abundance) at RM 2.0, and 4 taxa (5.2% abundance) at RM 1.1. Cumulatively at the 3 sites, 7 coolwater taxa were collected including 2 caddisflies and 5 midges. The diversity and abundance of these coolwater taxa at each site as well as the overall high quality of the macroinvertebrate communities, were sufficient to document achievement of the CWH aquatic life use.

Historical Ohio EPA collections of macroinvertebrates included two 1994 samples collected at RMs 4.0 and 0.9 and one 1984 collection from RM 1.5. Good (RMs 1.5 and 0.9) and exceptional (RM 4.0) communities were collected. These results provided evidence of some past macroinvertebrate community impact in the lower reach of Chapman Creek that may have implicated the Tremont City Landfill. However, there were no indications of impacts associated with the landfill based on taxa diversity and organism abundance of the macroinvertebrate community collected in 2000.

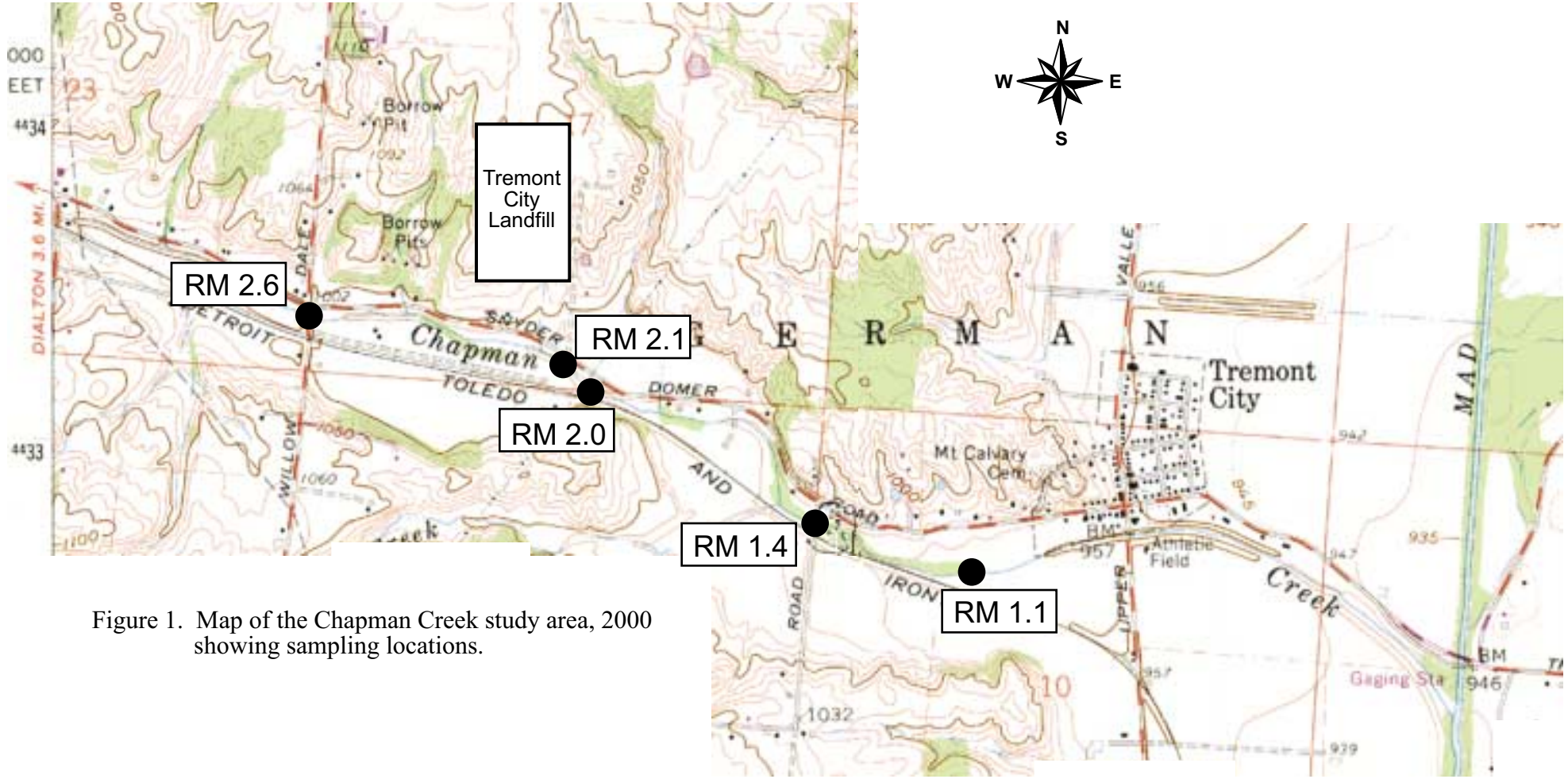

Figure 1. Map of the Chapman Creek study area, 2000 showing sampling locations.

Table 3. Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for sites sampled in Chapman Creek, 2000.

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes: No Channelization or Recovered	Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	**Total WWH Attributes**	MWH Attributes — *High Influence*: Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	**Total HI. MWH Attributes**	*Moderate Influence*: Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	**Total MI. MWH Attributes**	**(MWH HI.+1)/(WWH+1) Ratio**	**(MWH MI.+1)/(WWH+1) Ratio**
(14-120) Chapman Creek																																	
Year: 2000																																	
2.6	**75.0**	17.54	■	■	■	■	■	■	■	■	■	■	9						0			▲									1	0.10	0.20
2.1	**74.0**	27.77	■	■	■	■	■	■	■	■	■	■	9						0			▲									1	0.10	0.20
1.4	**75.5**	28.57	■	■	■	■	■	■	■	■	■	■	9						0			▲									1	0.10	0.20

REFERENCES

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APPENDICES

Appendix Table 1. Index of Biotic Integrity scores for sites sampled in Chapman Creek, 2000.

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies			
Chapman Creek - (14120)																	
Year: 2000																	
2.60	E	07/06/2000	22	15(3)	2(3)	2(3)	1(1)	2(3)	45(5)	32(3)	3(5)	0.0(1)	23(1)	0.0(5)	2196(5)	38	8.8
2.60	E	09/18/2000	22	13(3)	1(1)	2(3)	1(1)	2(3)	37(5)	30(3)	7(5)	0.0(1)	23(1)	0.2(3)	3252(5)	34	8.9
2.10	E	07/06/2000	22	14(3)	0(1)	2(3)	1(1)	3(3)	56(5)	44(3)	3(5)	0.0(1)	27(3)	0.0(5)	1460(5)	38	8.4
2.10	E	09/18/2000	22	13(3)	0(1)	2(3)	1(1)	3(3)	58(5)	49(3)	5(5)	0.0(1)	24(1)	0.0(5)	2109(5)	36	8.6
1.40	E	07/06/2000	24	16(3)	1(1)	2(3)	3(3)	3(3)	39(5)	29(5)	6(5)	0.1(1)	39(3)	0.0(5)	1400(5)	42	8.6
1.40	E	09/18/2000	24	15(3)	1(1)	2(3)	1(1)	3(3)	42(5)	25(5)	8(5)	0.0(1)	30(3)	0.0(5)	2312(5)	40	8.9

na - Qualitative data, Modified Iwb not applicable.

▲ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Code: **14-120**	Stream: **Chapman Creek**	Sample Date: **2000**
River Mile: **2.60**	Basin: Great Miami River	Date Range: 07/06/2000
	Time Fished: 7560 sec Drain Area: 22.3 sq mi	Thru: 09/18/2000
	Dist Fished: 0.40 km No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	149	111.75	2.85	1.21	5.23	10.78
White Sucker	W	O	S	T	260	195.00	4.97	2.38	10.31	12.20
Blacknose Dace	N	G	S	T	946	709.50	18.07	2.06	8.92	2.90
Creek Chub	N	G	N	T	368	276.00	7.03	2.91	12.64	10.56
South. Redbelly Dace	N	H	S		162	121.50	3.10	0.20	0.85	1.61
Redside Dace	N	I	S	I	226	169.50	4.32	0.47	2.02	2.75
Striped Shiner	N	I	S		37	27.75	0.71	0.18	0.78	6.46
Silverjaw Minnow	N	I	M		1	0.75	0.02	0.00	0.02	5.00
Bluntnose Minnow	N	O	C	T	15	11.25	0.29	0.06	0.24	4.87
Central Stoneroller	N	H	N		2,262	1,696.50	43.22	11.14	48.30	6.56
Green Sunfish	S	I	C	T	13	9.75	0.25	0.11	0.46	10.86
Bluegill Sunfish	S	I	C	P	2	1.50	0.04	0.01	0.03	4.50
Greenside Darter	D	I	S	M	46	34.50	0.88	0.11	0.49	3.28
Rainbow Darter	D	I	S	M	265	198.75	5.06	0.38	1.66	1.93
Mottled Sculpin		I	C		482	361.50	9.21	1.86	8.07	5.14
Mile Total					5,234	3,925.50		23.06		
Number of Species					15					
Number of Hybrids					0					

River Code: **14-120**	Stream: **Chapman Creek**	Sample Date: **2000**
River Mile: **2.10**	Basin: Great Miami River	Date Range: 07/06/2000
	Time Fished: 6900 sec Drain Area: 22.5 sq mi	Thru: 09/18/2000
	Dist Fished: 0.36 km No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	72	60.00	1.78	0.22	1.62	3.72
White Sucker	W	O	S	T	161	134.17	3.99	1.12	8.10	8.33
Blacknose Dace	N	G	S	T	1,387	1,155.83	34.37	3.09	22.39	2.67
Creek Chub	N	G	N	T	344	286.67	8.52	2.71	19.59	9.44
South. Redbelly Dace	N	H	S		137	114.17	3.39	0.26	1.85	2.24
Redside Dace	N	I	S	I	272	226.67	6.74	0.68	4.89	2.98
Striped Shiner	N	I	S		12	10.00	0.30	0.07	0.54	7.42
Sand Shiner	N	I	M	M	1	0.83	0.02	0.00	0.03	4.00
Silverjaw Minnow	N	I	M		5	4.17	0.12	0.02	0.17	5.60
Bluntnose Minnow	N	O	C	T	3	2.50	0.07	0.01	0.04	2.00
Central Stoneroller	N	H	N		989	824.17	24.50	3.36	24.34	4.08
Greenside Darter	D	I	S	M	25	20.83	0.62	0.10	0.74	4.88
Rainbow Darter	D	I	S	M	252	210.00	6.24	0.39	2.85	1.87
Orangethroat Darter	D	I	S		1	0.83	0.02	0.00	0.01	2.00
Fantail Darter	D	I	C		3	2.50	0.07	0.00	0.02	1.00
Mottled Sculpin		I	C		372	310.00	9.22	1.77	12.83	5.71
Mile Total					4,036	3,363.33		13.81		
Number of Species					16					
Number of Hybrids					0					

River Code: **14-120**	Stream: **Chapman Creek**	Sample Date: **2000**
River Mile: **1.40**	Basin: Great Miami River	Date Range: 07/06/2000
	Time Fished: 6780 sec Drain Area: 24.3 sq mi	Thru: 09/18/2000
	Dist Fished: 0.40 km No of Passes: 2	Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	73	54.75	2.17	0.86	4.96	15.78
White Sucker	W	O	S	T	222	166.50	6.61	3.43	19.68	20.60
Blacknose Dace	N	G	S	T	335	251.25	9.98	0.77	4.42	3.06
Creek Chub	N	G	N	T	303	227.25	9.03	3.44	19.76	15.15
South. Redbelly Dace	N	H	S		48	36.00	1.43	0.08	0.47	2.27
Redside Dace	N	I	S	I	415	311.25	12.36	1.16	6.67	3.74
Silver Shiner	N	I	S	I	1	0.75	0.03	0.00	0.01	3.00
Striped Shiner	N	I	S		47	35.25	1.40	0.32	1.86	9.21
Silverjaw Minnow	N	I	M		10	7.50	0.30	0.03	0.19	4.30
Bluntnose Minnow	N	O	C	T	23	17.25	0.69	0.05	0.29	2.96
Central Stoneroller	N	H	N		1,301	975.75	38.75	5.16	29.63	5.29
Rock Bass	S	C	C		1	0.75	0.03	0.00	0.03	6.00
Bluegill Sunfish	S	I	C	P	1	0.75	0.03	0.03	0.17	40.00
Greenside Darter	D	I	S	M	60	45.00	1.79	0.19	1.08	4.18
Banded Darter	D	I	S	I	1	0.75	0.03	0.00	0.01	2.00
Rainbow Darter	D	I	S	M	167	125.25	4.97	0.31	1.77	2.46
Fantail Darter	D	I	C		1	0.75	0.03	0.00	0.01	2.00
Mottled Sculpin		I	C		348	261.00	10.37	1.57	8.99	6.00
Mile Total					3,357	2,517.75		17.43		
Number of Species					18					
Number of Hybrids					0					

Appendix Table 2. Invertebrate Community Index (ICI) scores by site in Chapman Creek, 2000.

River Mile	Drainage Area (sq mi)	Number of				Percent:					Qual. EPT	Eco-region	ICI
		Total Taxa	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddis-flies	Tany-tarsini	Other Dipt/NI	Tolerant Organisms			
Chapman Creek (14-120)													
Year: 2000													
2.60	22.3	42(6)	7(6)	6(6)	22(6)	21.6(4)	1.5(2)	14.6(4)	61.6(2)	6.1(6)	20(6)	5	48
2.00	22.5	40(6)	10(6)	5(6)	19(4)	21.8(4)	1.1(2)	24.6(6)	51.8(2)	5.6(6)	25(6)	5	48
1.10	24.7	51(6)	11(6)	6(6)	24(6)	36.6(6)	2.5(2)	18.4(4)	42.2(4)	4.4(6)	23(6)	5	52

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/22/2000 River Code: 14-120 River: Chapman Creek RM: 2.60

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	20 +
01801	*Turbellaria*	1 +
03600	*Oligochaeta*	8
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydracarina*	4 +
11015	*Acerpenna sp*	+
11120	*Baetis flavistriga*	13 +
11130	*Baetis intercalaris*	1 +
11250	*Centroptilum sp (w/o hindwing pads)*	+
11430	*Diphetor hageni*	+
11650	*Procloeon sp (w/ hindwing pads)*	+
12200	*Isonychia sp*	+
13400	*Stenacron sp*	79 +
13521	*Stenonema femoratum*	7
13590	*Stenonema vicarium*	141 +
16200	*Eurylophella sp*	36
17200	*Caenis sp*	12 +
21200	*Calopteryx sp*	+
23600	*Aeshna sp*	+
23909	*Boyeria vinosa*	1 +
24501	*Gomphidae*	+
45300	*Sigara sp*	+
47600	*Sialis sp*	+
50301	*Chimarra aterrima*	+
51400	*Nyctiophylax sp*	1
51600	*Polycentropus sp*	1 +
52200	*Cheumatopsyche sp*	9 +
52430	*Ceratopsyche morosa group*	1 +
52440	*Ceratopsyche slossonae*	7 +
53300	*Glossosoma sp*	+
53800	*Hydroptila sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	1 +
59310	*Mystacides sepulchralis*	+
60900	*Peltodytes sp*	+
63300	*Hydroporus sp*	+
65800	*Berosus sp*	+
67800	*Tropisternus sp*	+
68075	*Psephenus herricki*	+
68201	*Scirtidae*	+
68700	*Dubiraphia sp*	8
68707	*Dubiraphia quadrinotata*	+
68708	*Dubiraphia vittata group*	+

Taxa Code	Taxa	Quant/Qual
69225	*Optioservus fastiditus*	+
70600	*Antocha sp*	+
71100	*Hexatoma sp*	+
74100	*Simulium sp*	+
74501	*Ceratopogonidae*	4
77120	*Ablabesmyia mallochi*	+
77500	*Conchapelopia sp*	124 +
77800	*Helopelopia sp*	56 +
78450	*Nilotanypus fimbriatus*	4
78500	*Paramerina fragilis*	+
79400	*Zavrelimyia sp*	+
80370	*Corynoneura lobata*	96
82101	*Thienemanniella taurocapita*	16
82141	*Thienemanniella xena*	8
82220	*Tvetenia discoloripes group*	+
82730	*Chironomus (C.) decorus group*	+
83840	*Microtendipes pedellus group*	+
84210	*Paratendipes albimanus or P. duplicatus*	80 +
84300	*Phaenopsectra obediens group*	80 +
84440	*Polypedilum (P.) aviceps*	14 +
84450	*Polypedilum (P.) flavum*	138 +
84460	*Polypedilum (P.) fallax group*	29
84480	*Polypedilum (P.) laetum group*	+
84540	*Polypedilum (Tripodura) scalaenum group*	87 +
84750	*Stictochironomus sp*	+
85261	*Cladotanytarsus vanderwulpi group Type 1*	7
85500	*Paratanytarsus sp*	7
85501	*Paratanytarsus n.sp 1*	51
85625	*Rheotanytarsus exiguus group*	51 +
85720	*Stempellinella n.sp nr. flavidula*	22 +
85802	*Tanytarsus curticornis group*	36
85818	*Tanytarsus glabrescens group sp 4*	14
85821	*Tanytarsus glabrescens group sp 7*	7
86100	*Chrysops sp*	+
87540	*Hemerodromia sp*	8
95100	*Physella sp*	45 +
96002	*Helisoma anceps anceps*	+

No. Quantitative Taxa: 42 Total Taxa: 82
No. Qualitative Taxa: 64 ICI: **48**
Number of Organisms: 1335 Qual EPT: 20

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/22/2000 River Code: 14-120 River: Chapman Creek RM: 2.00

Taxa Code	Taxa	Quant/Qual
01320	*Hydra sp*	3
01801	*Turbellaria*	+
01900	*Nemertea*	2
03600	*Oligochaeta*	18
05900	*Lirceus sp*	+
06201	*Hyalella azteca*	+
07875	*Cambarus (Tubericambarus) sp A*	+
08250	*Orconectes (Procericambarus) rusticus*	+
08601	*Hydracarina*	1
11018	*Acerpenna macdunnoughi*	11 +
11120	*Baetis flavistriga*	48 +
11130	*Baetis intercalaris*	1 +
11430	*Diphetor hageni*	1 +
11650	*Procloeon sp (w/ hindwing pads)*	+
12200	*Isonychia sp*	+
13100	*Nixe sp*	+
13400	*Stenacron sp*	29 +
13561	*Stenonema pulchellum*	6 +
13590	*Stenonema vicarium*	137 +
14950	*Leptophlebia sp or Paraleptophlebia sp*	2
16200	*Eurylophella sp*	1 +
17200	*Caenis sp*	10 +
18600	*Ephemera sp*	+
21200	*Calopteryx sp*	9 +
23909	*Boyeria vinosa*	+
24501	*Gomphidae*	+
45300	*Sigara sp*	+
50301	*Chimarra aterrima*	+
51600	*Polycentropus sp*	+
52200	*Cheumatopsyche sp*	4 +
52430	*Ceratopsyche morosa group*	2 +
52440	*Ceratopsyche slossonae*	2 +
52450	*Ceratopsyche sparna*	1 +
52530	*Hydropsyche depravata group*	+
53300	*Glossosoma sp*	+
53800	*Hydroptila sp*	+
57900	*Pycnopsyche sp*	+
58505	*Helicopsyche borealis*	3 +
59310	*Mystacides sepulchralis*	+
63300	*Hydroporus sp*	+
64800	*Uvarus sp*	+
65800	*Berosus sp*	+
67750	*Sperchopsis tesselatus*	+
68075	*Psephenus herricki*	+
68130	*Helichus sp*	+
68601	*Ancyronyx variegata*	+
68708	*Dubiraphia vittata group*	+
68901	*Macronychus glabratus*	+
69225	*Optioservus fastiditus*	+
69400	*Stenelmis sp*	+
70600	*Antocha sp*	+
71100	*Hexatoma sp*	+
71800	*Pseudolimnophila sp*	+
74100	*Simulium sp*	+
74501	*Ceratopogonidae*	1
77500	*Conchapelopia sp*	176 +
77800	*Helopelopia sp*	58 +
78140	*Labrundinia pilosella*	4
78450	*Nilotanypus fimbriatus*	12
80370	*Corynoneura lobata*	56
80750	*Eukiefferiella devonica group*	+
81231	*Nanocladius (N.) crassicornus or N. (N.) "rectinervis"*	9
81650	*Parametriocnemus sp*	9
82101	*Thienemanniella taurocapita*	4
82141	*Thienemanniella xena*	8
82820	*Cryptochironomus sp*	+
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*	17
84210	*Paratendipes albimanus or P. duplicatus*	+
84300	*Phaenopsectra obediens group*	+
84450	*Polypedilum (P.) flavum*	156 +
84460	*Polypedilum (P.) fallax group*	35
84470	*Polypedilum (P.) illinoense*	+
84480	*Polypedilum (P.) laetum group*	+
84540	*Polypedilum (Tripodura) scalaenum group*	+
84700	*Stenochironomus sp*	+
84750	*Stictochironomus sp*	+
85501	*Paratanytarsus n.sp 1*	164
85625	*Rheotanytarsus exiguus group*	9
85720	*Stempellinella n.sp nr. flavidula*	17
85802	*Tanytarsus curticornis group*	78
85814	*Tanytarsus glabrescens group*	9
86100	*Chrysops sp*	+
87540	*Hemerodromia sp*	5
95100	*Physella sp*	10 +
95501	*Planorbidae*	+

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/22/2000 River Code: 14-120 River: Chapman Creek RM: 2.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa:	40	Total Taxa:	85
No. Qualitative Taxa:	64	ICI:	**48**
Number of Organisms:	1128	Qual EPT:	25

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/22/2000 River Code: 14-120 River: Chapman Creek RM: 1.10

Taxa Code	Taxa	Quant/Qual	
01320	*Hydra sp*	8	
01801	*Turbellaria*	7	+
03600	*Oligochaeta*	24	
06201	*Hyalella azteca*		+
08250	*Orconectes (Procericambarus) rusticus*		+
08601	*Hydracarina*	16	
11010	*Acentrella sp*		+
11018	*Acerpenna macdunnoughi*	142	+
11120	*Baetis flavistriga*	396	+
11130	*Baetis intercalaris*	24	+
11430	*Diphetor hageni*	7	+
11650	*Procloeon sp (w/ hindwing pads)*		+
12200	*Isonychia sp*	8	+
13400	*Stenacron sp*	10	+
13521	*Stenonema femoratum*	7	+
13590	*Stenonema vicarium*	475	+
16200	*Eurylophella sp*	32	
16700	*Tricorythodes sp*	8	
17200	*Caenis sp*	16	+
18600	*Ephemera sp*		+
21200	*Calopteryx sp*	2	+
22001	*Coenagrionidae*		+
23909	*Boyeria vinosa*	1	+
24900	*Gomphus sp*		+
43570	*Neoplea sp*		+
47600	*Sialis sp*		+
50301	*Chimarra aterrima*	1	+
51600	*Polycentropus sp*		+
52200	*Cheumatopsyche sp*	16	+
52430	*Ceratopsyche morosa group*	39	+
52440	*Ceratopsyche slossonae*	14	+
52450	*Ceratopsyche sparna*	5	+
52530	*Hydropsyche depravata group*	2	
53800	*Hydroptila sp*		+
57900	*Pycnopsyche sp*		+
58505	*Helicopsyche borealis*		+
59410	*Nectopsyche diarina*		+
59500	*Oecetis sp*		+
63300	*Hydroporus sp*		+
65800	*Berosus sp*		+
67800	*Tropisternus sp*		+
68130	*Helichus sp*		+
68601	*Ancyronyx variegata*	8	+
69225	*Optioservus fastiditus*		+
69400	*Stenelmis sp*		+

Taxa Code	Taxa	Quant/Qual	
70600	*Antocha sp*	3	
71900	*Tipula sp*		+
72340	*Dixella sp*		+
74501	*Ceratopogonidae*		+
77500	*Conchapelopia sp*	274	+
77800	*Helopelopia sp*	18	+
78140	*Labrundinia pilosella*	8	
80370	*Corynoneura lobata*	120	
80410	*Cricotopus (C.) sp*	36	
80420	*Cricotopus (C.) bicinctus*	109	
81465	*Orthocladius (O.) carlatus*	55	
81650	*Parametriocnemus sp*	55	+
81690	*Paratrichocladius sp*	18	
81825	*Rheocricotopus (Psilocricotopus) robacki*	18	
82101	*Thienemanniella taurocapita*	152	
82200	*Tvetenia bavarica group*		+
82220	*Tvetenia discoloripes group*		+
82820	*Cryptochironomus sp*		+
83003	*Dicrotendipes fumidus*	18	
83820	*Microtendipes "caelum" (sensu Simpson & Bode, 1980)*		+
84210	*Paratendipes albimanus or P. duplicatus*		+
84300	*Phaenopsectra obediens group*		+
84440	*Polypedilum (P.) aviceps*	36	+
84450	*Polypedilum (P.) flavum*	292	+
84480	*Polypedilum (P.) laetum group*		+
84540	*Polypedilum (Tripodura) scalaenum group*	18	+
84750	*Stictochironomus sp*		+
85261	*Cladotanytarsus vanderwulpi group Type 1*	36	
85500	*Paratanytarsus sp*	18	
85501	*Paratanytarsus n.sp 1*	55	
85625	*Rheotanytarsus exiguus group*	384	
85720	*Stempellinella n.sp nr. flavidula*		+
85800	*Tanytarsus sp*	18	
85802	*Tanytarsus curticornis group*	18	
85821	*Tanytarsus glabrescens group sp 7*	36	
86100	*Chrysops sp*		+
87540	*Hemerodromia sp*	9	
94201	*Lymnaeidae*	1	
95100	*Physella sp*	2	+
96900	*Ferrissia sp*	1	

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Collection Date: 08/22/2000 River Code: 14-120 River: Chapman Creek RM: 1.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual

No. Quantitative Taxa:	51	Total Taxa:	85
No. Qualitative Taxa:	59	ICI:	**52**
Number of Organisms:	3076	Qual EPT:	23