

WALNUT CREEK/ SYCAMORE CREEK

Site Evaluation

August - October, 1993

Proposed Fairfield County WWTP

OEPA Technical Report EAS/1993-12-4

Division of Surface Water
Ecological Assessment Section
1685 Westbelt Drive
Columbus, Ohio 43228

December 13, 1993

Summary

Fish and macroinvertebrate samples were collected in the lower Sycamore Creek and in Walnut Creek upstream and downstream from the confluence with Sycamore Creek between August and October, 1993. The purpose of the study was to determine the current biological condition of Sycamore Creek and Walnut Creek in the area of a proposed Fairfield County wastewater treatment plant.

- Sycamore Creek and Walnut Creek physical habitat within the sampling locations was good to excellent and adequate for supporting warmwater or exceptional warmwater biological communities. Sand and gravel predominated the substrates at all three sampling locations and instream cover was moderate to extensive. The riparian habitat was fair along Sycamore Creek and good along Walnut Creek.
- Biological communities in Sycamore Creek (RM 0.1) and Walnut Creek, upstream (RM 29.9/ 29.8) and downstream (RM 29.0/ 26.5) from Sycamore Creek, attained the criteria for the exceptional warmwater habitat use designation (Table 1).
- A significant improvement in biological communities was observed in the sampled segment of Walnut Creek since the last Ohio EPA survey in 1982. This may well be due to improvements in water quality which occurred since that time.
- One silver lamprey, an Ohio threatened fish species (Ohio DNR 1992), was collected in Walnut Creek downstream from Sycamore Creek.

Physical Habitat for Aquatic Life

- Sycamore Creek physical habitat was evaluated in the lower 0.2 miles of the stream. The substrates were predominated by gravel and sand, instream cover was moderate and pool and riffle development was good. The Qualitative Habitat Evaluation Index (QHEI) score (77) was reflective of good to excellent instream habitat (Table 2). Modified warmwater habitat attributes were completely absent from Sycamore Creek at RM 0.1.
- Physical habitats in Walnut Creek between RM 29.9 and 26.5 were considered good to excellent (QHEI scores of 76 and 81, respectively). Sand and gravel predominated the bottom substrates and pool, riffle and run development was considered good. Instream cover was moderate to extensive, with a large number of cover types present.

Macroinvertebrate Community

Qualitative macroinvertebrate samples were collected from Sycamore Creek at Benadum Rd. (RM 0.1) and Walnut Creek downstream from Pickerington Road (RM 29.8) and adjacent to Amanda Road (RM 29.0). Collection data is summarized in Table 3 and taxa lists are attached in Appendix 1. Samples were collected, processed and identified using standard Ohio EPA qualitative macroinvertebrate methods (Ohio EPA 1989).

- Sixteen EPT taxa (taxa richness of mayflies, stoneflies, and caddisflies) were collected from the Sycamore Creek site. This value exceeds the 95th percentile (approximately 14 EPT) of state-wide reference sites for comparable drainage areas. The Qualitative Community Tolerance Value (QCTV) at the site was 37.8, which was somewhat below the 75th percentile QCTV (39.4) of exceptional and good Ohio locations of similar size in the Eastern Corn Belt Plains ecoregion. However, based on the high EPT and total taxa richness (55) this site was evaluated as having an exceptional macroinvertebrate community. In 1984, a qualitative sample was collected at RM 2.7 and included 39 total taxa and 10 EPT taxa. Based on the EPT and total taxa richness, this site was evaluated as good. Due to the different sampling locations, however, it was difficult to evaluate if the high quality community in 1993 indicated an overall improved condition in Sycamore Creek.
- Macroinvertebrate communities at the two Walnut Creek sites yielded EPT taxa counts (20 at RM 29.8, 21 at RM 29.0) above the 95th percentile EPT (19) of the statewide reference sites of similar size. QCTVs, however, were below the 75th percentile (QCTV = 39.4) of exceptional and good Ohio locations of similar size in the Eastern Corn Belt Plains ecoregion. Based on the high EPT and total taxa richness (78 at RM 29.8, 73 at RM 29.0) these two sites were evaluated as having exceptional macroinvertebrate communities. Walnut Creek was sampled in 1982 between RMs 47.0 and 1.2. ICI scores ranged from 24 (fair) at RM 38.9 to 48 (exceptional) at RM 23.5. The ICI at RM 28.9 scored in the good range (ICI= 40); qualitative sampling at the site produced 39 total taxa and 7 EPT taxa. These values were substantially lower than the 73 total taxa and 21 EPT taxa collected in 1993. The 1993 results indicated a significant improvement in the quality of the macroinvertebrate community at this site since 1982.

Fish Community

Fish were collected from Sycamore Creek at Benadum Rd. (RM 0.1) and from Walnut Creek downstream from Pickerington Road (RM 29.9) and at Waterloo Road (RM 26.5). Collection data are summarized in Table 4 and fish species lists are attached in Appendix 2. One sampling pass was conducted at each location using standard Ohio EPA pulsed D.C. electrofishing methods (Ohio EPA 1989).

- The fish community in Sycamore Creek at RM 0.1 was reflective of very good to exceptional quality. The IBI (50) and MIwb (8.9) scores exceeded the Exceptional Warmwater Habitat (EWH) biocriteria, with the MIwb in the non-significant departure range. A high number of species were collected (22), including significant numbers of golden redhorse, northern hog sucker, rock bass and four darter species. Similar results were recorded in Sycamore Creek at RM 2.7 during 1984 (IBI = 50, number of species = 25).
- The two Walnut Creek sites (RM 29.9 and 26.5) supported exceptional fish communities. The IBI (50 and 54) and MIwb (9.7 and 10.0) scores exceeded the EWH biocriteria, and were reflective of exceptional quality. Significant populations of silver redhorse, golden redhorse, northern hog sucker, smallmouth bass, spotted bass and three darter species were noted. One silver lamprey, an Ohio threatened fish species, was collected in Walnut Creek at RM 26.5.
- The fish community from RMs 29.9 and 26.5 were sampled during 1982 as part of a larger survey of Walnut Creek and several tributaries. The IBI (35 and 39) and MIwb (8.7 and 8.8) scores were in the fair to good range. These values were appreciably lower than the IBI (50 and 54) and MIwb (9.7 and 10.0) scores observed during 1993. The 1993 results indicated a significant improvement in the quality of the fish communities since 1982 and likely reflect improved water quality.

Table 1. Aquatic life use attainment status for Walnut Creek and Sycamore Creek based on data collected during August - October, 1993. Attainment status is based on biocriteria for the Eastern Corn Belt Plain ecoregion of Ohio (OAC 3745-1-07, Table 7-17).

River Mile Fish/Invert.	Modified		Attainment			
	IBI	Iwb	ICI ^a	QHEI	Status	Comments
<i>Eastern Corn Belt Plain Ecoregion - WWH use designation</i>						
1992						
<i>Walnut Creek</i>						
29.9/ 29.8	50	9.7	E	81	FULL	Attains EWH criteria
26.5/ 29.0	54	10.0	E	76	FULL	Attains EWH criteria
<i>Sycamore Creek</i>						
0.1/ 0.1	50	8.9 ^{ns}	E	77	FULL	Attains EWH criteria
1982						
<i>Walnut Creek</i>						
29.8/ 28.9	35*	8.7	40	72 ^b	PARTIAL	Fair -Very Good
26.5/ -	39 ^{ns}	8.8	-	73 ^b	FULL	Marginally Good - Good
<i>Sycamore Creek</i>						
2.7/ 2.7	50	-	G	-	FULL	Good - Exceptional

Ecoregion Biocriteria: Eastern Corn Belt Plain (ECBP)

<u>INDEX - Site Type</u>	<u>WWH</u>	<u>EWH</u>
IBI - Wading	40	50
Mod. Iwb - Wading	8.3	9.4
IBI - Boat	42	48
Mod. Iwb - Boat	8.5	9.6
ICI	36	46

* - Significant departure from ecoregion biocriteria: poor and very poor results are underlined.

ns- Nonsignificant departure from ecoregion biocriteria (4 IBI or ICI units; 0.5 Iwb units).

a - Narrative evaluation used in lieu of ICI (E=Exceptional, G= Good, F= Fair, P= Poor)

b - Qualitative Habitat Evaluation Index (QHEI) values for 1982 based on 'old' version.

Table 2. Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for the Walnut Creek study area, August - October, 1993.

Table 2. Qualitative Habitat Evaluation Index (QHEI) matrix showing modified and warmwater habitat characteristics for the Walnut Creek study area, August - October, 1993.

River Mile	Gradient (ft/mile)	Key QHEI Components	WWH Attributes									MWH Attributes																			
												High Influence			Moderate Influence																
			No Channelization or Recovered Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low/Natural Overall Embeddedness	Max. Depth > 40 cm	Low/No Riffle Embeddedness	Total WWH Attributes	Channelized or No Recovery Silt/Muck Substrates	Low Sinuosity	Sparse/No Cover	Max. Depth < 40 cm (WD/HW)	Total H.L. MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low/No Sinuosity	Only 1-2 Cover Types	Intermittent & Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffe	Total M.L. MWH Attributes	MWH H.L./WWH Ratio
(02-078) Walnut Creek																															
Year: 93																															
29.9	81.0	DJA	5.56	■	■	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	0	■	▲	■	■	■	■	1	0.10	0.20
26.5	76.0	DJA	3.21	■	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	0	■	▲	■	■	■	■	1	0.10	0.20	
(02-085) Sycamore Creek																															
Year: 93																															
0.1	77.0	DJA	12.99	■	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	0	■	■	■	■	■	■	0	0.10	0.10	

Table 3. Summary of macroinvertebrate data collected from natural substrates (qualitative sampling) in Sycamore Creek and Walnut Creek, August 27, 1993.

<u>Stream</u> River Mile	No. Qual. Taxa	QCTV	Qual. EPT	Relative Density	Predominant Organisms	Narrative Evaluation
<i>Sycamore Creek</i>						
0.1	55	37.8	16	Moderate	Caddisflies Mayflies Midges	Exceptional
<i>Walnut Creek</i>						
29.8	78	38.5	20	Mod.-High	Caddisflies Mayflies Midges	Exceptional
29.0	73	38.8	21	Moderate	Caddisflies Midges	Exceptional

Table 4. Fish community indices based on pulsed D.C. electrofishing samples from Sycamore Creek and Walnut Creek during September and October, 1993. All sites were sampled using the wading method.

Stream River Mile	Number of Species	Relative Number	Relative Weight	QHEI	Modified Index of Well-being	Index of Biotic Integrity	Narrative Evaluation
<i>Walnut Creek</i>							
29.9	26	1324	44.5	81	9.7	50	Exceptional
26.5	28	777	79.4	76	10.0	54	Exceptional
<i>Sycamore Creek</i>							
0.1	22	1317	20.8	77	8.9	50	Very Good- Exceptional

References

- Ohio Department of Natural Resources. 1992. Species of animals that are considered to be endangered, threatened, of special interest, extirpated, or extinct in Ohio. May, 1992. Div. of Wildlife, Inservice Note 659, 10 pp.
- Ohio Environmental Protection Agency. 1989. Biological criteria for the protection of aquatic life: Vol. III. Standardized field and laboratory methods for assessing fish and macroinvertebrate communities. Div. of Water Quality Planning and Assessment, Ecological Assessment Section, Columbus, Ohio.

Appendix 1. Macroinvertebrate taxa lists for Walnut Creek and Sycamore Creek, 1993.

**Ohio EPA Water Quality Monitoring and Assessment Section
Macroinvertebrate Collection**

Collection Date: 08/27/93 River Code:02-078 River: Walnut Creek

RM: 29.80

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
00401	<i>Spongillidae</i>	0 +	68708	<i>Dubiraphia vittata group</i>	0 +
03360	<i>Plumatella sp</i>	0 +	68901	<i>Macronychus glabratus</i>	0 +
03451	<i>Urnatella gracilis</i>	0 +	69400	<i>Stenelmis sp</i>	0 +
06201	<i>Hyaella azteca</i>	0 +	71100	<i>Hexatoma sp</i>	0 +
08250	<i>Orconectes (Procericambarus) rusticus</i>	0 +	74100	<i>Simulium sp</i>	0 +
11120	<i>Baetis flavistriga</i>	0 +	74501	<i>Ceratopogonidae</i>	0 +
11130	<i>Baetis intercalaris</i>	0 +	77120	<i>Ablabesmyia mallochi</i>	0 +
11300	<i>Baetidae (formerly in Centroptilum)</i>	0 +	77500	<i>Conchapelopia sp</i>	0 +
12200	<i>Isonychia sp</i>	0 +	77740	<i>Hayesomyia senata</i>	0 +
13000	<i>Leucrocuta sp</i>	0 +	77800	<i>Helopelopia sp</i>	0 +
13400	<i>Stenacron sp</i>	0 +	78350	<i>Meropelopia sp</i>	0 +
13510	<i>Stenonema exiguum</i>	0 +	78401	<i>Natarsia species A (sensu Roback, 1978)</i>	0 +
13570	<i>Stenonema terminatum</i>	0 +	78450	<i>Nilotanypus fimbriatus</i>	0 +
13590	<i>Stenonema vicarium</i>	0 +	78650	<i>Procladius sp</i>	0 +
16700	<i>Tricorythodes sp</i>	0 +	80310	<i>Cardiocladius obscurus</i>	0 +
17200	<i>Caenis sp</i>	0 +	80430	<i>Cricotopus (C.) tremulus group</i>	0 +
18600	<i>Ephemera sp</i>	0 +	82730	<i>Chironomus (C.) decorus group</i>	0 +
21300	<i>Hetaerina sp</i>	0 +	82820	<i>Cryptochironomus sp</i>	0 +
22001	<i>Coenagrionidae</i>	0 +	83002	<i>Dicrotendipes modestus</i>	0 +
22300	<i>Argia sp</i>	0 +	83040	<i>Dicrotendipes neomodestus</i>	0 +
23909	<i>Boyeria vinosa</i>	0 +	83300	<i>Glyptotendipes (Phytotendipes) sp</i>	0 +
45100	<i>Palmacorixa sp</i>	0 +	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	0 +
45300	<i>Sigara sp</i>	0 +	84060	<i>Parachironomus pectinatellae</i>	0 +
45400	<i>Trichocorixa sp</i>	0 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	0 +
47600	<i>Sialis sp</i>	0 +	84300	<i>Phaenopsectra obediens group</i>	0 +
48410	<i>Corydalus cornutus</i>	0 +	84450	<i>Polypedilum (P.) convictum</i>	0 +
50315	<i>Chimarra obscura</i>	0 +	84460	<i>Polypedilum (P.) fallax group</i>	0 +
51300	<i>Neureclipsis sp</i>	0 +	84470	<i>Polypedilum (P.) illinoense</i>	0 +
52200	<i>Cheumatopsyche sp</i>	0 +	85230	<i>Cladotanytarsus mancus group</i>	0 +
52430	<i>Ceratopsyche morosa group</i>	0 +	85500	<i>Paratanytarsus sp</i>	0 +
52530	<i>Hydropsyche depravata group</i>	0 +	85625	<i>Rheotanytarsus exiguus group</i>	0 +
52540	<i>Hydropsyche dicantha</i>	0 +	85814	<i>Tanytarsus glabrescens group</i>	0 +
52570	<i>Hydropsyche simulans</i>	0 +	87501	<i>Empididae</i>	0 +
53800	<i>Hydroptila sp</i>	0 +	95100	<i>Physella sp</i>	0 +
60900	<i>Peltodytes sp</i>	0 +	96900	<i>Ferrissia sp</i>	0 +
63900	<i>Laccophilus sp</i>	0 +	98600	<i>Sphaerium sp</i>	0 +
65800	<i>Berosus sp</i>	0 +	99200	<i>Alasmidonta marginata</i>	0 +
67500	<i>Laccobius sp</i>	0 +			
67800	<i>Tropisternus sp</i>	0 +			
68075	<i>Psephenus herricki</i>	0 +			
68601	<i>Ancyronyx variegata</i>	0 +			

**Ohio EPA Water Quality Monitoring and Assessment Section
Macroinvertebrate Collection**

Collection Date: 08/27/93 River Code: 02-078 River: Walnut Creek

RM: 29.80

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
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No. Quantitative Taxa: 0 Total Taxa: 78

No. Qualitative Taxa: 78 ICI:

Number of Organisms: 0 Qual EPT:

**Ohio EPA Water Quality Monitoring and Assessment Section
Macroinvertebrate Collection**

Collection Date: 08/27/93 River Code: 02-078 River: Walnut Creek

RM: 29.00

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
00401	<i>Spongillidae</i>	0 +	68130	<i>Helichus sp</i>	0 +
01801	<i>Turbellaria</i>	0 +	68601	<i>Ancyronyx variegata</i>	0 +
03040	<i>Fredericella sp</i>	0 +	68707	<i>Dubiraphia quadrinotata</i>	0 +
03121	<i>Paludicella articulata</i>	0 +	68901	<i>Macronychus glabratus</i>	0 +
03451	<i>Urnatella gracilis</i>	0 +	69400	<i>Stenelmis sp</i>	0 +
06201	<i>Hyaella azteca</i>	0 +	70600	<i>Antocha sp</i>	0 +
06700	<i>Crangonyx sp</i>	0 +	71100	<i>Hexatoma sp</i>	0 +
08250	<i>Orconectes (Procericambarus) rusticus</i>	0 +	77120	<i>Ablabesmyia mallochi</i>	0 +
08601	<i>Hydracarina</i>	0 +	77500	<i>Conchapelopia sp</i>	0 +
11120	<i>Baetis flavistriga</i>	0 +	78450	<i>Nilotanypus fimbriatus</i>	0 +
11130	<i>Baetis intercalaris</i>	0 +	78650	<i>Procladius sp</i>	0 +
11200	<i>Callibaetis sp</i>	0 +	80420	<i>Cricotopus (C.) bicinctus</i>	0 +
11300	<i>Baetidae (formerly in Centroptilum)</i>	0 +	80430	<i>Cricotopus (C.) tremulus group</i>	0 +
11400	<i>Baetidae (formerly in Cloeon)</i>	0 +	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	0 +
12200	<i>Isonychia sp</i>	0 +	82730	<i>Chironomus (C.) decorus group</i>	0 +
13000	<i>Leucrocuta sp</i>	0 +	82820	<i>Cryptochironomus sp</i>	0 +
13400	<i>Stenacron sp</i>	0 +	83040	<i>Dicrotendipes neomodestus</i>	0 +
13510	<i>Stenonema exiguum</i>	0 +	83300	<i>Glyptotendipes (Phytotendipes) sp</i>	0 +
13521	<i>Stenonema femoratum</i>	0 +	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	0 +
13570	<i>Stenonema terminatum</i>	0 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	0 +
16700	<i>Tricorythodes sp</i>	0 +	84470	<i>Polypedilum (P.) illinoense</i>	0 +
17200	<i>Caenis sp</i>	0 +	84612	<i>Saetheria tylus</i>	0 +
18600	<i>Ephemera sp</i>	0 +	84750	<i>Stictochironomus sp</i>	0 +
21200	<i>Calopteryx sp</i>	0 +	84888	<i>Xenochironomus xenolabis</i>	0 +
22001	<i>Coenagrionidae</i>	0 +	85230	<i>Cladotanytarsus mancus group</i>	0 +
22300	<i>Argia sp</i>	0 +	85500	<i>Paratanytarsus sp</i>	0 +
23909	<i>Boyeria vinosa</i>	0 +	85625	<i>Rheotanytarsus exiguus group</i>	0 +
45100	<i>Palmacorixa sp</i>	0 +	85800	<i>Tanytarsus sp</i>	0 +
45300	<i>Sigara sp</i>	0 +	85814	<i>Tanytarsus glabrescens group</i>	0 +
45400	<i>Trichocorixa sp</i>	0 +	87501	<i>Empididae</i>	0 +
47600	<i>Sialis sp</i>	0 +	95100	<i>Physella sp</i>	0 +
50315	<i>Chimarra obscura</i>	0 +	96900	<i>Ferrissia sp</i>	0 +
51300	<i>Neureclipsis sp</i>	0 +			
52200	<i>Cheumatopsyche sp</i>	0 +			
52430	<i>Ceratopsyche morosa group</i>	0 +	No. Quantitative Taxa: 0	Total Taxa: 73	
52530	<i>Hydropsyche depravata group</i>	0 +	No. Qualitative Taxa: 73	ICI:	
52570	<i>Hydropsyche simulans</i>	0 +	Number of Organisms: 0	Qual EPT:	
53800	<i>Hydroptila sp</i>	0 +			
60900	<i>Peltodytes sp</i>	0 +			
65800	<i>Berosus sp</i>	0 +			
68075	<i>Psephenus herricki</i>	0 +			

**Ohio EPA Water Quality Monitoring and Assessment Section
Macroinvertebrate Collection**

Collection Date: 08/27/93 River Code: 02-085 River: Sycamore Creek

RM: 0.10

Taxa Code	Taxa	Quan/Qual	Taxa Code	Taxa	Quan/Qual
01801	<i>Turbellaria</i>	0 +	83000	<i>Dicrotendipes sp</i>	0 +
03600	<i>Oligochaeta</i>	0 +	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	0 +
06201	<i>Hyalella azteca</i>	0 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	0 +
07840	<i>Cambarus (Cambarus) sciotensis</i>	0 +	84300	<i>Phaenopsectra obediens group</i>	0 +
08200	<i>Orconectes sp</i>	0 +	84450	<i>Polypedilum (P.) convictum</i>	0 +
11130	<i>Baetis intercalaris</i>	0 +	84460	<i>Polypedilum (P.) fallax group</i>	0 +
11200	<i>Callibaetis sp</i>	0 +	84470	<i>Polypedilum (P.) illinoense</i>	0 +
11300	<i>Baetidae (formerly in Centroptilum)</i>	0 +	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	0 +
11400	<i>Baetidae (formerly in Cloeon)</i>	0 +	85800	<i>Tanytarsus sp</i>	0 +
12200	<i>Isonychia sp</i>	0 +	85814	<i>Tanytarsus glabrescens group</i>	0 +
13000	<i>Leucrocuta sp</i>	0 +	85840	<i>Tanytarsus guerlus group</i>	0 +
13400	<i>Stenacron sp</i>	0 +	87501	<i>Empididae</i>	0 +
13521	<i>Stenonema femoratum</i>	0 +	95907	<i>Gyraulus (Torquis) parvus</i>	0 +
13590	<i>Stenonema vicarium</i>	0 +	96900	<i>Ferrissia sp</i>	0 +
16700	<i>Tricorythodes sp</i>	0 +			
17200	<i>Caenis sp</i>	0 +			
21200	<i>Calopteryx sp</i>	0 +	No. Quantitative Taxa: 0		Total Taxa: 55
22001	<i>Coenagrionidae</i>	0 +	No. Qualitative Taxa: 55		ICI:
23909	<i>Boyeria vinosa</i>	0 +	Number of Organisms: 0		Qual EPT:
43570	<i>Neoplea sp</i>	0 +			
45100	<i>Palmacorixa sp</i>	0 +			
45400	<i>Trichocorixa sp</i>	0 +			
47600	<i>Sialis sp</i>	0 +			
48410	<i>Corydalus cornutus</i>	0 +			
50315	<i>Chimarra obscura</i>	0 +			
52200	<i>Cheumatopsyche sp</i>	0 +			
52430	<i>Ceratopsyche morosa group</i>	0 +			
52530	<i>Hydropsyche depravata group</i>	0 +			
52570	<i>Hydropsyche simulans</i>	0 +			
60900	<i>Peltodytes sp</i>	0 +			
65800	<i>Berosus sp</i>	0 +			
67800	<i>Tropisternus sp</i>	0 +			
68075	<i>Psephenus herricki</i>	0 +			
68708	<i>Dubiraphia vittata group</i>	0 +			
69400	<i>Stenelmis sp</i>	0 +			
71100	<i>Hexatoma sp</i>	0 +			
74501	<i>Ceratopogonidae</i>	0 +			
77120	<i>Ablabesmyia mallochi</i>	0 +			
77500	<i>Conchapelopia sp</i>	0 +			
82730	<i>Chironomus (C.) decorus group</i>	0 +			
82820	<i>Cryptochironomus sp</i>	0 +			

Appendix 2. Relative abundance of fish species by river mile collected in Walnut Creek (02078) and Sycamore Creek (02085) during 1993.

Species List

River Code: 02-078	Stream: Walnut Creek	Sample Date: 1993
River Mile: 29.90	Basin: Scioto River	Date Range: 09/27/93
Data Source: 01	Time Fished: 3930 sec Drain Area: 114.0 sq mi	
Purpose:	Dist Fished: 0.20 km No of Passes: 1	Sampler Type: D

Species Name / Stage / ODNR Status	IBI	Feed	Breed		# of	Relative	% by	Relative	% by	Ave(gm)
	Grp	Grp	Grp	Tol	Fish	Number	Number	Weight	Weight	Weight
SILVER REDHORSE (C)	R	I	S	M	18	27.00	2.04	1.67	3.75	61.87
GOLDEN REDHORSE (C)	R	I	S	M	65	97.50	7.36	2.15	4.82	22.00
NORTHERN HOG SUCKER (C)	R	I	S	M	205	307.50	23.22	23.25	52.22	75.60
WHITE SUCKER (C)	W	O	S	T	27	40.50	3.06	3.92	8.81	96.87
SPOTTED SUCKER (C)	R	I	S		1	1.50	0.11	0.63	1.41	418.00
COMMON CARP (C)	G	O	M	T	1	1.50	0.11	5.70	12.80	3,800.00
GOLDEN SHINER (C)	N	I	M	T	1	1.50	0.11	0.01	0.01	4.00
BLACKNOSE DACE (C)	N	G	S	T	1	1.50	0.11	0.00	0.00	1.00
CREEK CHUB (C)	N	G	N	T	3	4.50	0.34	0.02	0.04	4.00
SUCKERMOUTH MINNOW (C)	N	I	S		11	16.50	1.25	0.07	0.15	4.09
SILVER SHINER (C)	N	I	S	I	18	27.00	2.04	0.13	0.28	4.61
STRIPED SHINER (C)	N	I	S		40	60.00	4.53	1.30	2.91	21.59
SPOTFIN SHINER (C)	N	I	M		74	111.00	8.38	0.17	0.38	1.51
SAND SHINER (C)	N	I	M	M	35	52.50	3.96	0.10	0.22	1.91
BLUNTNOSE MINNOW (C)	N	O	C	T	22	33.00	2.49	0.11	0.26	3.45
CENTRAL STONEROLLER (C)	N	H	N		106	159.00	12.00	1.02	2.30	6.43
ROCK BASS (A)	S	C	C		1	1.50	0.11	0.08	0.18	53.00
ROCK BASS (B)	S	C	C		2	3.00	0.23	0.12	0.27	39.50
SMALLMOUTH BASS (A)	F	C	C	M	12	18.00	1.36	1.64	3.67	90.82
SMALLMOUTH BASS (B)	F	C	C	M	5	7.50	0.57	0.06	0.13	7.60
SPOTTED BASS (A)	F	C	C		4	6.00	0.45	0.81	1.83	135.50
SPOTTED BASS (B)	F	C	C		15	22.50	1.70	0.13	0.30	5.93
LARGEMOUTH BASS (A)	F	C	C		3	4.50	0.34	0.19	0.43	42.67
GREEN SUNFISH (C)	S	I	C	T	18	27.00	2.04	0.31	0.70	11.53
LONGEAR SUNFISH (C)	S	I	C	M	16	24.00	1.81	0.44	0.99	18.38
GREEN SF X BLUEGILL (C)					2	3.00	0.23	0.04	0.09	13.00
JOHNNY DARTER (C)	D	I	C		4	6.00	0.45	0.01	0.02	1.25
GREENSIDE DARTER (C)	D	I	S	M	131	196.50	14.84	0.37	0.83	1.89
BANDED DARTER (C)	D	I	S	I	35	52.50	3.96	0.06	0.14	1.20
MOTTLED SCULPIN (C)		I	C		7	10.50	0.79	0.03	0.07	2.71
<i>Mile Total</i>					883	1,324.50		44.52		
<i>Number of Species</i>					26					
<i>Number of Hybrids</i>					1					

Species List

River Code: 02-078	Stream: Walnut Creek	Sample Date: 1993
River Mile: 26.50	Basin: Scioto River	Date Range: 10/12/93
Data Source: 01	Time Fished: 2800 sec	Drain Area: 146.0 sq mi
Purpose:	Dist Fished: 0.20 km	No of Passes: 1
		Sampler Type: D

Species Name / Stage / ODNR Status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
SILVER LAMPREY (C) [T]		P	N		1	1.50	0.19	0.01	0.01	4.00
GIZZARD SHAD (C)		O	M		21	31.50	4.05	3.84	4.83	121.80
QUILLBACK CARPSUCKER (C)	C	O	M		1	1.50	0.19	0.33	0.42	220.00
SILVER REDHORSE (C)	R	I	S	M	21	31.50	4.05	2.64	3.32	83.73
GOLDEN REDHORSE (C)	R	I	S	M	44	66.00	8.49	22.77	28.69	345.00
NORTHERN HOG SUCKER (C)	R	I	S	M	132	198.00	25.48	8.85	11.15	44.70
WHITE SUCKER (C)	W	O	S	T	25	37.50	4.83	4.26	5.36	113.47
SPOTTED SUCKER (C)	R	I	S		2	3.00	0.39	0.35	0.44	117.50
COMMON CARP (C)	G	O	M	T	13	19.50	2.51	24.00	30.24	1,230.77
CREEK CHUB (C)	N	G	N	T	1	1.50	0.19	0.01	0.01	7.00
SUCKERMOUTH MINNOW (C)	N	I	S		20	30.00	3.86	0.12	0.15	4.00
SILVER SHINER (C)	N	I	S	I	2	3.00	0.39	0.01	0.02	4.00
STRIPED SHINER (C)	N	I	S		30	45.00	5.79	0.79	1.00	17.60
SPOTFIN SHINER (C)	N	I	M		19	28.50	3.67	0.14	0.18	4.95
SAND SHINER (C)	N	I	M	M	10	15.00	1.93	0.02	0.03	1.60
BLUNTNOSE MINNOW (C)	N	O	C	T	10	15.00	1.93	0.05	0.06	3.00
CENTRAL STONEROLLER (C)	N	H	N		39	58.50	7.53	0.29	0.36	4.91
YELLOW BULLHEAD (C)		I	C	T	5	7.50	0.97	0.97	1.22	129.60
ROCK BASS (A)	S	C	C		2	3.00	0.39	0.37	0.47	124.00
ROCK BASS (B)	S	C	C		2	3.00	0.39	0.06	0.07	19.00
SMALLMOUTH BASS (A)	F	C	C	M	5	7.50	0.97	1.12	1.41	149.60
SMALLMOUTH BASS (B)	F	C	C	M	2	3.00	0.39	0.02	0.02	6.00
SPOTTED BASS (A)	F	C	C		14	21.00	2.70	5.79	7.29	275.50
SPOTTED BASS (B)	F	C	C		4	6.00	0.77	0.05	0.07	9.00
GREEN SUNFISH (C)	S	I	C	T	28	42.00	5.41	0.88	1.11	21.00
BLUEGILL SUNFISH (C)	S	I	C	P	9	13.50	1.74	0.29	0.36	21.11
LONGEAR SUNFISH (C)	S	I	C	M	18	27.00	3.47	0.47	0.59	17.29
JOHNNY DARTER (C)	D	I	C		4	6.00	0.77	0.01	0.01	1.00
GREENSIDE DARTER (C)	D	I	S	M	26	39.00	5.02	0.10	0.12	2.52
BANDED DARTER (C)	D	I	S	I	5	7.50	0.97	0.01	0.02	1.80
FRESHWATER DRUM (C)			M	P	3	4.50	0.58	0.76	0.96	168.33
<i>Mile Total</i>					518	777.00		79.36		
<i>Number of Species</i>					28					
<i>Number of Hybrids</i>					0					

Species List

River Code: 02-085	Stream: Sycamore Creek	Sample Date: 1993
River Mile: 0.10	Basin: Scioto River	Date Range: 09/27/93
Data Source: 01	Time Fished: 3029 sec Drain Area: 24.3 sq mi	
Purpose:	Dist Fished: 0.20 km No of Passes: 1	Sampler Type: D

Species Name / Stage / ODNR Status	IBI	Feed Grp	Breed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
GOLDEN REDHORSE (C)	R	I	S	M	30	45.00	3.42	0.14	0.66	3.07
NORTHERN HOG SUCKER (C)	R	I	S	M	53	79.50	6.04	7.42	35.63	93.27
WHITE SUCKER (C)	W	O	S	T	40	60.00	4.56	3.34	16.03	55.60
BLACKNOSE DACE (C)	N	G	S	T	9	13.50	1.03	0.02	0.09	1.33
CREEK CHUB (C)	N	G	N	T	118	177.00	13.44	0.98	4.69	5.52
SUCKERMOUTH MINNOW (C)	N	I	S		11	16.50	1.25	0.06	0.28	3.55
SILVER SHINER (C)	N	I	S	I	1	1.50	0.11	0.01	0.03	4.00
STRIPED SHINER (C)	N	I	S		47	70.50	5.35	1.97	9.48	28.00
SPOTFIN SHINER (C)	N	I	M		14	21.00	1.59	0.05	0.25	2.50
SAND SHINER (C)	N	I	M	M	2	3.00	0.23	0.01	0.02	1.50
SILVERJAW MINNOW (C)	N	I	M		1	1.50	0.11	0.01	0.02	3.00
BLUNTNOSTE MINNOW (C)	N	O	C	T	26	39.00	2.96	0.05	0.23	1.23
CENTRAL STONEROLLER (C)	N	H	N		381	571.50	43.39	2.30	11.05	4.02
YELLOW BULLHEAD (C)		I	C	T	5	7.50	0.57	1.40	6.72	186.40
ROCK BASS (A)	S	C	C		7	10.50	0.80	0.93	4.47	88.57
ROCK BASS (B)	S	C	C		10	15.00	1.14	0.37	1.76	24.40
SMALLMOUTH BASS (A)	F	C	C	M	4	6.00	0.46	0.68	3.29	114.00
SMALLMOUTH BASS (B)	F	C	C	M	2	3.00	0.23	0.02	0.11	7.50
GREEN SUNFISH (C)	S	I	C	T	34	51.00	3.87	0.81	3.89	15.88
BLUEGILL SUNFISH (C)	S	I	C	P	2	3.00	0.23	0.04	0.20	14.00
JOHNNY DARTER (C)	D	I	C		11	16.50	1.25	0.02	0.08	1.00
GREENSIDE DARTER (C)	D	I	S	M	48	72.00	5.47	0.16	0.77	2.23
BANDED DARTER (C)	D	I	S	I	20	30.00	2.28	0.05	0.23	1.60
RAINBOW DARTER (C)	D	I	S	M	2	3.00	0.23	0.01	0.03	2.00
<i>Mile Total</i>					878	1,317.00		20.81		
<i>Number of Species</i>					22					
<i>Number of Hybrids</i>					0					